DoD-1 SDS (GPALS)

11-90

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: SDS-GPALS

AS OF DATE: December 31, 1991

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1. ([redacted]) Designation and Nomenclature (Popular Name):
Strategic Defense System - Global Protection Against Limited Strikes

2. ([redacted]) DoD Component: SDIO

3. ([redacted]) Responsible Office and Telephone Number:

Strategic Defense Initiative Organization, The Pentagon Washington, DC 20301-7100	AMB Henry F. Cooper Assigned: July 23, 1990 AV 225-7060 COMM 703 695-7060

4. ([redacted]) Program Elements/Procurement Line Items:

RDT&E:
PE 0603214C (Shared), 0603215C (Shared), 0603216C (Shared), 0603217C (Shared)
PE 0603218C (Shared), 0604220C (Shared), 0603744C (Shared), 0604225C (Shared)
PE 0603220C (Shared), 0603221C (Shared), 0603222C (Shared), 0603223C (Shared)
MILCON:
PE 0604220C (Shared)

CLEARED [redacted] PUBLICATION
MAR 24 1992 4
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

[redacted] by: SDIO Classification Guide, dated June 1990
Declassify on: OADR
Downgrade Instructions:

92-0678

(THIS PAGE IS [redacted])

[redacted]

5. [redacted] **Related Programs:**
No related programs

6. [redacted] **Mission and Description:**
Global Protection Against Limited Strikes (GPALS) when fully implemented, will provide a capability to protect the United States, U.S. forces deployed overseas, U.S. power projection forces, and U.S. friends and allies against limited ballistic missile attacks of all ranges, irrespective of their source. These attacks could be accidental, unauthorized, or deliberate, and involve ICBMs, SLBMs or shorter range ballistic missiles from the old Soviet Union or other nations. One of the key elements of GPALS is the increased priority on theater missile defense. The GPALS system will detect and engage ballistic missiles in the boost/post-boost, midcourse, and terminal stages of their flight using a combination of space-based and surface-based sensors, weapons, and command and control. The exact allocation of functions will not be fixed until the overall system design is determined based on current research and competing element concepts. Additionally, the Missile Defense Act of 1991 directs the Department of Defense to develop for deployment by 1996 an ABM Treaty compliant ballistic missile defense system as the initial step toward deployment of an anti-ballistic missile system that is capable of providing a highly effective defense of the U.S. against limited attacks of ballistic missiles, and to pursue the development of advanced theater missile defense systems with the objective of deploying such systems by the mid-1990's.

7. [redacted] **Program Highlights:**
a. [redacted] Significant Historical Developments --

In 1983 the President challenged the U.S. scientific community to investigate whether new technologies could be used to counter nuclear ballistic missiles. Shortly after this challenge, the President directed that an intensive analysis be conducted to identify the most promising technologies. The results of the Defensive Technologies (Fletcher) Study provided the basis for the initial actions to structure the technology content and management organization of the Strategic Defense Initiative (SDI) Program. In April 1984, the Secretary of Defense established the Strategic Defense Initiative Organization (SDIO) as a Defense Agency. As a result of the research, technical progress and successes in tests of evolving technologies, the Under Secretary of Defense for Acquisition in September 1987, approved the recommendation of the Defense Acquisition Board (DAB) for selected SDI concepts and technologies to enter the Demonstration/Validation phase of the defense acquisition process, Milestone I (for Phase I). The Phase I system was to be designed to deter and, if deterrence failed, disrupt a massive Soviet attack on the continential United States by intercepting and destroying a significant number of Soviet missiles and warheads.

7a. [redacted] Program Highlights (Cont'd):

Continued technical progress and the changing nature of the threat the United States will face in the 1990s and beyond has caused the SDI program to evolve to the SDS-GPALS program which is intended to accomplish the goal of providing effective defense against limited attacks for the U.S., and U.S. forces and allies and friends abroad. Thus, the SDS-GPALS System will satisfy previously stated valid military needs to protect against limited ballistic missile strikes as stated in the USCINCSPACE Operational Requirements for Phase I Strategic Ballistic Missile Defense. During the President's State of the Union address on 29 January 1991, he directed refocus of the SDI Program to "...provide protection from limited ballistic missile strikes, whatever their source."

b. [redacted] Significant Developments Since Last Report --
On 12 September 1991, an Acquisition Decision Memorandum (ADM) was signed by the Under Secretary of Defense (Acquisition) which authorized six Major Defense Acquisition Programs (MDAPs) for SDIO. These MDAPS were established based on an internal DOD "White Paper" which outlined SDIO's management strategy to USD(A) for these programs. On 5 December 1991, the President signed into law the FY 1992 Defense Authorization Act, which included the Missile Defense Act of 1991. Possible program changes mandated by this new guidance requires the Department to re-evaluate the current program and its acquisition strategy to include: development schedule, cost estimates, performance requirements, and the selection of technologies and architecture for the initial deployment. The Missile Defense Act of 1991 directs that such a plan be provided to the Congress within 180 days of passage of the 1992 Authorization Act (Tentatively Jun 92).

SDS-GPALS will satisfy its mission requirements.

c. [redacted] Changes Since As Of Date --
None.

8. [redacted] Threshold Breaches:
An Acquisition Program Baseline has not been established.

9. [redacted] Schedule:

9a. (U) Schedule (Cont'd):

a. (U) Milestones --	Planning Estimate	Approved Program	Current Estimate
Milestone I SDS Phase I (DAB)	SEP 87	N/A	SEP 87
Milestone I GBR-SDS Phase I (DAB)	JUN 90	N/A	JUN 90
Milestone II (DAB)	TBD	N/A	TBD
Milestone III (DAB)	TBD	N/A	TBD
IOC	TBD	N/A	TBD

* Denotes Non-APB data elements

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Planning Estimate:
Under Secretary of Defense for Acquisition Decision Memorandum, Subject: Strategic Defense Initiative (SDI) Program dated September 17, 1987 and Acquisition Decision Memorandum dated June 19,1990.

(U) Approved Program: None.

10. (U) Performance Characteristics:

a. (U) Performance --	PE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
Control - Reaction Time Percent Outage Restoration within 10 min	TBD	N/A / N/A	N/A	TBD
Detect - Identify by Booster type & Track all Type of Reentry Vehicle	TBD	N/A / N/A	N/A	TBD
Engage - First wave in	TBD	N/A / N/A	N/A	TBD

(b)(1) [redacted]

10a. [redacted] **Performance Characteristics (Cont'd):**

	PE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				
Destroyed or Non SS-18 Reentry Vehicles				

* Denotes Non-APB data elements

b. ([redacted]) Previous Change Explanations -- None.

c. ([redacted]) Current Change Explanations --

None.

d. ([redacted]) References --

([redacted]) Planning Estimate:
Under Secretary of Defense for Acquisition Decision Memorandum, Subject: Strategic Defense Initiative (SDI) Program dated September 17, 1987 and Acquisition Decision Memorandum dated June 19,1990.

([redacted]) Approved Program: None.

11. ([redacted]) **Total Program Cost and Quantity:** (Current Estimate in Millions of Dollars)

a. [redacted] Cost --	Planning Estimate	Approved Program	Current Estimate
Development (RDT&E)	20835.5	0.0	21467.1
Procurement	0.0	N/A	0.0
Total Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	42.2	0.0	63.1
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 88 Base-Year $	20877.7	0.0	21530.2

11a. [redacted] **Total Program Cost and Quantity (Cont'd):**

	Planning Estimate	Approved Program	Current Estimate
Escalation	6754.7	0.0	6967.2
Development (RDT&E)	(6741.9)	(0.0)	(6947.8)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(12.8)	(0.0)	(19.4)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	27632.4	0.0	28497.4
b. [redacted] Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	0	N/A	N/A
Total	0	N/A	0

c. [redacted] Foreign Military Sales --
None.

d. [redacted] Nuclear Costs --
None.

e. [redacted] References --

[redacted] Planning Estimate:
Under Secretary of Defense for Acquisition Decision Memorandum, Subject: Strategic Defense Initiative (SDI) Program dated September 17, 1987 and Acquisition Decision Memorandum dated June 19,1990.

[redacted] Approved Program: None.

12. [redacted] **Program Acquisition/Current Procurement Unit Cost Summary:**

[redacted] Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	27577.4	0.0	55.0	27632.4
Previous Changes:				
Economic	+284.8	-	+1.0	+285.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+3046.7	-	+25.5	+3072.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+3331.5	-	+26.5	+3358.0
Current Changes:				
Economic	-751.1	-	-0.9	-752.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1742.9	-	+1.9	-1741.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-2494.0	-	+1.0	-2493.0
Total Changes	+837.5	-	+27.5	+865.0
Current Estimate	28414.9	-	82.5	28497.4

13a. (U) **Cost Variance Analysis (Cont'd):**

a. (U) Summary -- (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	20835.5	0.0	42.2	20877.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1220.2	-	+16.0	+1236.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1220.2	-	+16.0	+1236.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-588.6	-	+4.9	-583.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-588.6	-	+4.9	-583.7
Total Changes	+631.6	-	+20.9	+652.5
Current Estimate	21467.1	-	63.1	21530.2

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised Escalation Indices
Estimating: Adjustment for Current and Prior Year Inflation Offset.
Increased Program Costs for a second Ground Based Interceptor and Theater Missile Defense requirements.

MILCON
Economic: Revised Escalation Indices.
Estimating: Additional costs for facilities to support the restructured GPALS program.

13c. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Escalation Indices (Economic)	N/A	-823.7
Adjustment for Program change related escalation associated with negative changes (Economic)	N/A	72.6
Adjustment for current and prior year inflation offset (Estimating)	43.7	51.3
Refinement of Estimate and to reflect cost and technical changes associated with the Missile Defense Act of 1991 (Estimating)	-632.3	-1794.2
Total Changes	-588.6	-2494.0
(2) MILCON		
Revised Escalation Indices (Economic)	N/A	-0.9
Refinement of Planning and Design Requirements (Estimating)	4.9	1.9
Total Changes	4.9	1.0

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E --

(U) GSTS:	Target	Initial Contract Price Ceiling	Qty
McDonnell Douglas Space, Huntington Beach, CA			
DASG60-88-C-0139, CPIF/AF	$184.3	N/A	0
Award: September 30, 1988			
Definitized: September 30, 1988			

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$593.9	N/A	0	$593.9	$593.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$-0.7
Cumulative Variances To Date (11/24/91)	$0.8	$-1.5
Net Change	$0.8	$-0.8

Explanation of Change:

The cost and schedule variance have no impact on this contract or the program.

[redacted] SE&I:
General Electric, Blue Bell, PA
SDIO84-88-C-0020, CPAF
Award: May 12, 1988
Definitized: May 12, 1988

Initial Contract Price		
Target	Ceiling	Qty
$236.0	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$321.8	N/A	0	$325.8	$325.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/30/91)	$0.9	$-0.9
Net Change	$0.9	$-0.9

Explanation of Change:

The favorable cost variance is the result of GE successfully completing the tasks within the cost objectives and the unfavorable schedule variance is within the variances allowed for the contract. These variances have no impact on this contract or the program.

The Estimated Price at Completion includes unpriced work of $3.9M.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Initial Contract Price		
([redacted]) GBI:	Target	Ceiling	Qty
Lockheed Missiles, Sunnyvale, CA DASG60-86-C-0014, CPIF/AF Award: January 26, 1986 Definitized: January 26, 1986	$468.0	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$673.6	N/A	0	$734.1	$720.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-69.3	$-4.0
Cumulative Variances To Date (12/30/91)	$-87.8	$-0.3
Net Change	$-18.5	$3.7

Explanation of Change:

The overrun is primarily attributed to three causes: (1) the subcontracted effort for the Propulsion & Reaction Control System (P&RCS); (2) the subcontracted effort for the Seeker; and (3) the LMSC in-house ground software effort. All three efforts were basically completed shortly before the successful FTV flight test in January 1991, and since that time the cost variance has been stabilized. The expected overrun is fully funded, and no serious FY funding problems are anticipated for this contract.

Target Price of $673.6M does not include authorized unpriced work.

Contractor's Estimated Price at Completion of $734.1M includes authorized unpriced work.

Program Manager's Estimated Price at Completion of $720.2M includes authorized unpriced work.

Note: Approximately $200M of the authorized unpriced work reflected in the above figures has now been definitized and placed into the contract.

	Initial Contract Price		
[redacted] ERINT:	Target	Ceiling	Qty
Ling Temco Vought, Dallas, TX DASG60-87-C-0031, CPIF Award: April 10, 1987 Definitized: April 10, 1987	$80.0	N/A	0

15. [redacted] **Contract Information:** Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$305.9	N/A	0	$305.9	$305.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-2.3	$-5.9
Cumulative Variances To Date (10/31/91)	$-8.0	$-10.9
Net Change	$-5.7	$-5.0

Explanation of Change:

LTV has experienced technical anomalies resulting in cost and schedule problems with all three major subcontractors (Rockwell, Honeywell and Atlantic Research Corporation (ARC)), as well as in-house effort. Rockwell provides the Radar Sensor effort and is claiming a $5.7M overrun. Honeywell provides the Inertia Measurement Unit effort and is claiming a $1.7M overrun. ARC provides the Altitude Control Motor and Solid Rocket Motor and is claiming a $1.1M overrun. LTV is currently re-evaluating their estimate-at-completion to include the impact of these subcontractor overruns in addition to in-house technical concerns. Extensive work-around plans are in place to minimize cost and schedule variances.

[redacted] PRE-EMD BRILLIANT PEBBL:
MARTIN MARIETTA, DENVER, CO
SDIO84-91-C-0017, CPAF
Award: May 24, 1991
Definitized: May 24, 1991

Initial Contract Price		
Target	Ceiling	Qty
$318.7	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$372.4	N/A	0	$372.4	$372.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (10/31/91)	$-0.8	$-2.2
Net Change	$-0.8	$-2.2

Explanation of Change:

The cost and schedule variance is associated with the rework effort within the space segment. This variance is being closely monitored and presently does not adversely impact the contract or the program.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Initial Contract Price		
([redacted]) PRE-EMD BRILLIANT PEBBL:	Target	Ceiling	Qty
TRW, Inc., Redondo Beach, CA SDIO84-91-C-0020, CPAF Award: May 24, 1991 Definitized: May 24, 1991	$340.5	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$385.7	N/A	0	$385.7	$385.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (10/31/91)	$-1.1	$0.0
Net Change	$-1.1	$0.0

Explanation of Change:

The cost variance is attributable to the space segment. There is no schedule variance for this contract at this time. The cost variance is being closely monitored and presently does not adversely impact the contract or program.

16. ([redacted]) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. ([redacted]) Program Status --

(1) Percent Program Completed: 33.3% (5 yrs/15 yrs)

(2) Percent Program Cost Appropriated: 12.1% ($3444.6 / $28497.4)

16b. ([redacted]) Program Funding Summary (Cont'd):

b. ([redacted]) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY88-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2002)	Total
RDT&E	1539.2	1888.9	2648.2	22338.6	28414.9
Procurement	-	-	-	-	-
MILCON	11.4	5.1	10.0	56.0	82.5
O&M	-	-	-	-	-
Total	1550.6	1894.0	2658.2	22394.6	28497.4

c. ([redacted]) Annual Summary --

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 0400 RDT&E, Defense Agencies								
1988				144.3	147.5	147.5	147.5	3.9
1989				161.1	171.9	171.9	169.3	4.0
1990				276.2	306.2	306.2	204.2	4.1
1991				796.1	913.6	875.4	424.4	3.9
1992				1595.0	1888.9	920.1		3.1
1993				2164.8	2648.2			3.3
1994				3242.5	4097.2			3.3
1995				3384.3	4415.1			3.3

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 0400 RDT&E, Defense Agencies (Cont'd)								
1996				2465.4	3319.4			3.2
1997				2217.6	3081.3			3.2
1998				2147.6	3079.4			3.2
1999				1582.3	2341.5			3.2
2000				699.3	1067.9			3.2
2001				470.9	742.1			3.2
2002				119.7	194.7			3.2
Subtot				21467.1	28414.9	2421.1	945.4	
Appropriation: 0500 Military Construction,Defense Agencies								
1991				9.6	11.4	11.4	2.1	3.9
1992				4.2	5.1	2.5		3.1
1993				7.9	10.0			3.3
1994				16.0	21.0			3.3
1995				12.6	17.0			3.3
1996				6.5	9.0			3.2
1997				6.3	9.0			3.2
Subtot				63.1	82.5	13.9	2.1	

16c. [redacted] **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 0500 Military Construction,Defense Agencies (Cont'd)								
Grand Total				21530.2	28497.4	2435.0	947.5	

17. [redacted] **Production Rate Data:**

a. ([redacted]) Not applicable for Pre-Milestone II programs.

b. ([redacted]) Not applicable for Pre-Milestone II programs.

c. ([redacted]) Not applicable for Pre-Milestone II programs.

d. ([redacted]) Deliveries (Plan/Actual) -- None.

e. ([redacted]) Not applicable for Pre-Milestone II programs.

18. [redacted] **Operating and Support Costs:**

Not applicable for Pre-Milestone II programs.

91-028

A-28 PATRIOT

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: PATRIOT

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 19 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

Cost or Applicable
as Amended
19 MAR 1992
SECURITY REVIEW, OFFICE, HQDA

1. (U) **Designation and Nomenclature (Popular Name):**
Guided Missile System, Air Defense (PATRIOT)

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**

PROJECT MANAGER	COL JAMES E. GUSTINE
PATRIOT PROJECT OFFICE	Assigned: May 6, 1991
ATTN: SFAE-AD-PA	AV 645-3240 COMM (205) 955-3240
REDSTONE ARS, AL 35898-5620	

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 64307A Project D291, D212, D213
PROCUREMENT:
APPN 2032 ICN C49100 (Army)
APPN 2032 ICN CA0252 (Army)
MILCON:
PE 049800, 133500, 133600, 133700, 134600, 134700, 134800, 134900

[redacted] by: PATRIOT DCG DATED AUGUST 20, 1990
Declassify on: Originating Agency Determination Required (OADR)
Downgrade Instructions: Regraded UNCLASS when separated from [redacted] formats

(THIS PAGE IS [redacted])

92-0590

5. (U) Related Programs:
Improved HAWK and JTMD Anti-Tactical Missile

6. (U) Mission and Description:
1. SYSTEM DESCRIPTION:

- PATRIOT is a high-to-medium altitude, long-range air defense missile system which provides air defense of ground combat forces and high-value assets against the air threat of the 1980s and 1990s. PATRIOT is designed to cope with enemy defense suppression tactics which may include saturation, manuever, and electronic countermeasures (ECM). In the Field Army, PATRIOT air defenses will be complemented by short-range, low altitude forward area defense weapons and will be integrated with other ground and air assets in the overall air defense of the theater of operations. PATRIOT has replaced the NIKE-HERCULES missile system and some HAWK systems. The system provides a high probability of target kill, multiple simultaneous engagement of high performance air breathing targets and tactical ballistic missiles in an ECM environment at a rapid rate of fire. PATRIOT unique equipment at Headquarters and Headquarters Battery (HHB) includes the Information and Coordination Central (ICC), four Communications Relay Groups (CRG), their associated Antenna Mast Group (AMG), and a trailer mounted power unit. Peculiar equipment associated with a PATRIOT Fire Unit includes the Radar Set (RS), Engagement Control Station (ECS), AMG, Electric Power Plant (EPP), and Launcher Station (LS). The PATRIOT Radar Set is a multifunction phased array radar which performs a variety of surveillance, acquisition, and guidance tasks in directing a battery of LS armed with four ready missiles each. The number of LS in a Fire Unit is normally eight, however, this number may be tailored based on the situation and mission.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --

(U) The PATRIOT (formerly SAM-D) Weapon System development program began in 1965 when the Secretary of Defense authorized Concept Definition (CD). In flight tests conducted in April 1978, a PATRIOT missile successfully intercepted an F-102 target drone with a standoff jammer background. OT II began on November 19, 1979, was completed March 10, 1980 and limited production was approved. In September 1984, PATRIOT was given authority to fully deploy.

(U) Foreign Military Sales Cases were signed in February 1984 by The Netherlands for four PATRIOT Fire Units and by Germany in February 1985 for 14 units. In October 1985, a Memorandum of Understanding for the coproduction of 26 Fire Units and supporting equipment was signed with the Government of Japan.

7a. [redacted] Program Highlights (Cont'd):

[redacted] During 1985, the first two PATRIOT battalions were successfully deployed in Europe. In November 1987, the PATRIOT Anti-Tactical Missile (ATM) capability (PAC-2) was successfully tested. The FY87-91 PATRIOT Production Multiyear Contract for 4,491 missiles and 45 fire units was awarded to Raytheon Corporation in the firm-fixed-price amount of $3,550,000,000.

[redacted] The Raytheon contract for the Multimode Seeker Demonstration which increases the number of simultaneous engagements and improved Electronic Counter Counter Measures (ECCM) capabilities, was initiated in July 1989. During 1989, 32 flight tests were successfully conducted; of these, 1 was conducted against a tactical missile, 1 was fired as a surveillance round and was used as a target for the tactical missile test, and the remaining 30 were against air breathing targets. Search, track, and post deployment software tests were successfully conducted during 1989.

[redacted] A Memorandum of Understanding was signed with Italy in March 1988 to provide 20 radars, 20 ECS's and 4 ICC's to Italy in exchange for four Spada air defense missile systems for short range air defense of selected U.S. military bases in Italy and services/facilities in Italy for other U.S. requirements. A Foreign Military Sales Case was signed in 1990 with Saudi Arabia for 6 tactical fire units, and a Presidental Determination authorized a $117 Million, 506A Drawdown to the Government of Israel for PATRIOT equipment.

[redacted] In August 1990, the Second Battalion, Seventh ADA and the Third Battalion, Forty Third ADA were deployed to Saudi Arabia in support of Operation Desert Shield. The PATRIOT Emergency Operation Center (EOC) was established on August 15, 1990 to act as a focal point to support PATRIOT units in Saudi Arabia, Israel and Turkey.

[redacted] To date, the deployed PATRIOT Systems have demonstrated a Meantime-Between-Failure (MTBF) in excess of 60 hours which is more than twice the established requirement.

(b)(1)



7b. [redacted] Program Highlights (Cont'd):

This system will satisfy mission requirements.

c. [redacted] Changes Since As Of Date --
None

8. [redacted] Threshold Breaches:
There are no breaches to the Acquisition Program Baseline, March 1989 and there are no Nunn-McCurdy unit cost breaches.

9. [redacted] Schedule:

a. [redacted] Milestones --	Development Estimate	Approved Program	Current Estimate
Initiation of ADDEV	MAY 67	N/A	MAY 67
Contract for ED	MAR 72	N/A	MAR 72
First Electronic Countermeasures (ECM) Flight	AUG 76	N/A	DEC 76
Delivery of FU-2 to White Sands Missile Range	JAN 77	N/A	JUL 77
Completion of Phae II ECM Search/Track Tests	JUN 77	N/A	DEC 77
Start of Producibility Engineering and Planning (PEP)	OCT 77	N/A	OCT 77
Delivery of FU-3 to White Sands Missile Range	SEP 78	N/A	DEC 78
Delivery of FU-5 to White Sands Missile Range	JAN 79	N/A	FEB 79
Contract for Initial Production Facilities (IPF)	APR 79	N/A	MAR 79
Contractor Flight Tests Completed and Start of DT/OT II Testing	JUL 79	N/A	JAN 80
First Modular Digital Airborne Guidance System (MDAGS) Flight	OCT 78	N/A	SEP 78
Completion of DT/OT testing	MAY 80	N/A	DEC 80
Limited Production Decision (DSARC III)	N/A	SEP 80	SEP 80
Completion of SDDM Test			
Unit 1	JAN 81	JAN 81	JAN 81
Unit 2	JUN 81	JUL 81	JUL 81
Unit 3	OCT 81	OCT 81	OCT 81
Unit 4	MAY 83	SEP 84	SEP 84
Full Production Decision	APR 80	APR 82	APR 82
Compl of Component/System Design Confirmation	SEP 82	FEB 83	FEB 83

9a. [redacted] Schedule (Cont'd):

[redacted] Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Physical Configuration Audit	N/A	DEC 82	DEC 82
IOC (CONUS)	APR 82	JUN 83	JUN 83
CONUS Battalion Initial Deployment			
2nd	N/A	MAR 88	JAN 88
3rd	N/A	SEP 88	SEP 88
Backfill for Full Deployment CONUS Battalion			
2nd	N/A	SEP 89	NOV 88
3rd	N/A	DEC 89	APR 89
1st (Final Unit Equipped)	N/A	MAR 94	MAR 94
Under Sec Army MS I (Collective Tng Read) Rev	N/A	OCT 83	OCT 83
Under Sec Army MS II (Read for FOE) Rev	N/A	JUL 84	JUL 84
Under Sec Army MS III (Deploy Read) Rev	N/A	OCT 84	OCT 84
Under Sec Army MS IV (Compl of FOE) Rev	N/A	NOV 84	NOV 84
IOC (OCONUS-USAREUR)	N/A	MAR 85	MAR 85
OCONUS Battalion Initial Deployment			
2nd	N/A	AUG 85	AUG 85
3rd	N/A	OCT 86	OCT 86
4th	N/A	APR 87	APR 87
5th	N/A	DEC 87	SEP 87
6th	N/A	JUN 88	MAR 88
7th (US owned/GE manned E-7)	N/A	JUN 89	NOV 89
8th (E-9)	N/A	DEC 89	OCT 89
9th (US owned/GE manned E-8)	N/A	SEP 91	SEP 91
Backfill for Full Deployment OCONUS Battalion	N/A		
1st	N/A	SEP 90	AUG 90
2nd	N/A	DEC 90	N/A (Ch-1)
3rd	N/A	SEP 91	N/A (Ch-1)
4th	N/A	MAR 92	N/A (Ch-1)
5th	N/A	SEP 92	N/A (Ch-1)
6th	N/A	MAR 93	N/A (Ch-1)
7th	N/A	JUN 90	N/A (Ch-1)
8th	N/A	DEC 93	N/A (Ch-1)
9th	N/A	JUN 92	N/A (Ch-1)

b. [redacted] Previous Change Explanations --

The differences reflect delays in initial availability of Fire Units 1, 2, and 3 and interruptions of the flight test program for Modular Digital Airborne Guidance System (MDAGS) integration. System integration difficulties delayed the completion of contractor flight

9b. [redacted] Schedule (Cont'd):
tests, start and completion of DT/OT II, full production decision, and the IOC date. Additionally, the differences reflect delays in delivery of production hardware. Schedules were adjusted to incorporate additional stress and reliability verification testing prior to the beginning of SDDM Test Unit 4 (Follow-On Evaluation). IOC changed from February 1982 to June 1983 to reflect a change from TRADOC to the CONUS IOC. New milestones were added to reflect revisions to the DAE Baseline. Deployment milestones were changed to reflect actual deployments and the Department of the Army (DA) Deployment Schedule dated June 1989.

c. [redacted] Current Change Explanations --

(CH-1) Backfills for Full Deployment OCONUS Battalion 2nd through 9th will no longer take place due to worldwide force structure/deployment changes. A revised/restructured deployment schedule is being developed by DCSOPS. When finalized, new milestones will be added to the approved Acquisition Program Baseline (APB) and SAR.

d. [redacted] References --

([redacted]) Development Estimate:
SDDM, dated September 10, 1980; DCP #50, approved October 14, 1976.

([redacted]) Approved Program:
DAE Approved Acquisition Program Baseline dated March 02, 1989.

10. ([redacted]) Performance Characteristics:

a. [redacted] Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
SDDM, dated September 10, 1980; DCP #50, approved October 14, 1976.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated March 02, 1989.

11. ([redacted]) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. ([redacted]) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	1106.2	1554.0	1554.0
Procurement	3121.2	3286.2	3189.2
Flyaway	(2997.0)		(2741.1)
Total Flyaway	(2997.0)		(2741.1)
Other Wpn Procurement Costs			(154.5)
Total Other Wpn Sys	(0.0)		(154.5)
Peculiar Support	(26.7)		(91.3)
Initial Spares	(97.5)		(202.3)
Construction (MILCON)	40.0	65.0	59.9
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 72 Base-Year $	4267.4	4905.2	4803.1
Escalation	973.1	7463.7	7334.2
Development (RDT&E)	(93.8)	(580.5)	(580.5)
Procurement	(848.6)	(6782.6)	(6664.2)
Construction (MILCON)	(30.7)	(100.6)	(89.5)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	5240.5	12368.9	12137.3

b. ([redacted]) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	234	103	100
Total	234	103	100

Quantity excludes 5 RDTE units that are not considered to be fully configured end items. This procurement quantity also does not include the 3 fire units bought with NATO Air Base Defense Funds.

c. ([redacted]) Foreign Military Sales --
The following represents Foreign Military Sales implemented cases through December 31, 1991:

Germany	$1.20B	Saudi Arabia	$1.038B
Netherlands	.35B	Japan	.066B
NAMSA	.01B	Israel	.108B

d. ([redacted]) Nuclear Costs -- None.

e. ([redacted]) References --

([redacted]) Development Estimate:
SDDM, dated September 10, 1980; DCP #50, approved October 14, 1976.

([redacted]) Approved Program:
DAE Approved Acquisition Program Baseline dated March 02, 1989.

11e. ([redacted]) Total Program Cost and Quantity (Cont'd):

12. ([redacted]) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. [redacted] Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	12137.3	11799.2	12137.3
(2) Quantity	100	100	100
(3) Unit Cost	121.37	117.99	121.37
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	156.1	156.1	29.3
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	156.1	156.1	29.3
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

NOTE:
Current procurement unit of measure is missiles in lieu of Fire Units. The Current Estimate quantity cannot be edited (zero represents Fire Unit procurement). The following table reflects correct missile procurement data:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. [redacted] Current Procurement--	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY)	156.1	156.1	29.3
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	156.1	156.1	29.3
(2) Quantity	97	97	0
(3) Unit Cost	1.61	1.61	N/A

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1200.0	3969.8	70.7	5240.5
Previous Changes:				
Economic	+78.3	+2280.3	-35.2	+2323.4
Quantity	-87.8	-724.3	-79.4	-891.5
Schedule	+322.4	+2024.6	+2.7	+2349.7
Engineering	+331.0	-434.2	-	-103.2
Estimating	+132.4	+1447.7	+194.2	+1774.3
Other	+27.6	-	-	+27.6
Support	+130.6	+951.4	-3.6	+1078.4
Subtotal	+934.5	+5545.5	+78.7	+6558.7
Current Changes:				
Economic	-	-19.1	-	-19.1
Quantity	-	+311.2	-	+311.2
Schedule	-	-	-	-
Engineering	-	+10.0	-	+10.0
Estimating	-	+96.3	-	+96.3
Other	-	-	-	-
Support	-	-60.3	-	-60.3
Subtotal	-	+338.1	-	+338.1
Total Changes	+934.5	+5883.6	+78.7	+6896.8
Current Estimate	2134.5	9853.4	149.4	12137.3

13a. ([redacted]) Cost Variance Analysis (Cont'd):

a. ([redacted]) Summary -- (FY 1972 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1106.2	3121.2	40.0	4267.4
Previous Changes:				
Quantity	-65.1	-1009.2	-45.4	-1119.7
Schedule	+231.4	+443.3	-	+674.7
Engineering	+129.4	-419.6	-	-290.2
Estimating	+64.0	+606.7	+67.1	+737.8
Other	+24.5	-	-	+24.5
Support	+63.6	+357.0	-1.8	+418.8
Subtotal	+447.8	-21.8	+19.9	+445.9
Current Changes:				
Quantity	-	+79.1	-	+79.1
Schedule	-	-	-	-
Engineering	-	+2.6	-	+2.6
Estimating	-	+41.2	-	+41.2
Other	-	-	-	-
Support	-	-33.1	-	-33.1
Subtotal	-	+89.8	-	+89.8
Total Changes	+447.8	+68.0	+19.9	+535.7
Current Estimate	1554.0	3189.2	59.9	4803.1

b. ([redacted]) Previous Change Explanations --

RDT&E

Economic: Revised escalation rates.

Quantity: Reduction in test hardware and missiles.

Schedule: Program stretchout/redirection and acceleration of deployment.

Engineering: Improvements in Electronic Counter-Counter Measures (ECCM) to accomodate state-of-the-art changes.

Estimating: Changes in Producibility, Engineering and Planning (PEP), redefined estimating procedures, adding Rationalization, Standardization and Interroperability (RSI) and increased development tasks.

Other: Reflects a negotiated overrun.

13b. [redacted] Cost Variance Analysis (Cont'd):

Support: Changes in training, maintenance concept and support equipment.

PROCUREMENT

Economic: Revised escalation rates.

Quantity: Reduction of 134 fire units and reconfiguration of a fire unit to 8 launchers from 5.

Schedule: Change from 24 to 12 fire units per year and stretchout caused by program redirection and funding cuts.

Engineering: Elimination of nuclear warhead, change missile guidance, computer memory, antenna mast set, fuze, radar side lobe cancellers, and ATM.

Estimating: Reflects refined estimating techniques, deletion of non-peculiar GFE, Navy transfer, and savings due to FMS and multi-year procurement (FY87-91). Revised estimate based on 89 BCE NATO Maintenance and Support Agency (NAMSA) scope reduction (PATRIOT Maintenance Facility Four deletion). Deletion of procurement of North Finding Module, ARM Decoy, reductions in contractor engineering, integrated logistics support, and software support.

Support: Reduction in Initial Spares, increase in Training Devices, transfer of Total Package Fielding (TPF), First Destination Transportation and New Equipment Training from OMA to Support.

MILCON

Economic: Revised escalation rates.

Quantity: Deletion of CONUS fire units and reduction of two European sites based on US/German agreement.

Estimating: Change in reporting requirements, revised estimate to defer construction of facilities.

Support: Deletion of FY92 funding for Ft. Lewis Facility.

c. [redacted] Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year

13c. [redacted] Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Correction of prior variances to reconcile flyaway and support costs		
(Estimating)	33.1	60.3
(Support)	-33.1	-60.3
Current Changes		
Revised Escalation Indices. (Economic)		-19.1
Increase of 463 missiles (Quantity)	79.1	311.2
Global Positioning Systems to support Emplacement Enhancement Mod to improve position determination. (Engineering)	2.6	10.0
Refinement of Tech Support Estimate. (Estimating)	3.4	17.9
Current/Prior Inflation Offset (Estimating)	4.7	18.1
Total Changes	89.8	338.1

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. [redacted] Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
7.215	6.899	4.077	0.441	1.411	2.352	--	--	15.180	22.395

b. [redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
22.395	23.043	24.207	23.497	-0.932	18.706	0.276	10.181	98.978	121.373

15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a.([redacted]) RDT&E --

[redacted] FY89 ENGINEERING DEV:
RAYTHEON, BEDFORD, MA
DAAH01-89-C-0458, CPIF
Award: April 10, 1989
Definitized: April 1, 1989

Initial Contract Price		
Target	Ceiling	Qty
$14.5	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$87.5	N/A	0	$87.5	$87.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-0.6	$-2.0
Cumulative Variances To Date (10/27/91)	$-1.0	$-1.2
Net Change	$-0.4	$0.8

Explanation of Change:

Cost Variance due to module design and software integration problems associated with Pulse Doppler Processor (PDP) and fabrication problems with microelectronics chips associated with Expanded Weapon Control Computer (EWCC). This cost variance is insignificant and does not impact the contract. Schedule variance due to module redesign to incorporate new R-15 type module in the PDP, and introduction of new "Sea-of-Gates" technology in the EWCC which reduced the development/test cycles plus associated support activities.

[redacted] FY91 ENGINEERING DEV:
RAYTHEON, BEDFORD, MA
DAAH01-91-C-0602, CPIF
Award: September 25, 1991
Definitized: September 25, 1991

Initial Contract Price		
Target	Ceiling	Qty
$58.0	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$58.0	N/A	0	$58.0	$58.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

b. ([redacted]) Procurement --

([redacted]) FY87-91 MULTIYEAR:

	Initial Contract Price		
	Target	Ceiling	Qty
RAYTHEON, BEDFORD, MA DAAH01-87-C-A025, FFP Award: March 31, 1987 Definitized: March 31, 1987	$3550.0	N/A	45

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$5129.8	N/A	74	$5105.4	$5105.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract performance reporting is not required for this FFP contract.

16. ([redacted]) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. ([redacted]) Program Status --

(1) Percent Program Completed: 84.8% (28 yrs/33 yrs)

(2) Percent Program Cost Appropriated: 99.4% ($12068.5 / $12137.3)

b. ([redacted]) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY65-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	2134.5	-	-	-	2134.5
Procurement	9628.5	156.1	29.3	39.5	9853.4
MILCON	149.4	-	-	-	149.4
O&M	-	-	-	-	-
Total	11912.4	156.1	29.3	39.5	12137.3

16c. ([redacted]) Program Funding Summary (Cont'd):

c. ([redacted]) Annual Summary --

Fiscal Year	Qty	Flyaway FY72 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1965				17.8	13.6	13.6	13.6	1.9
1966				18.8	15.0	15.0	15.0	2.7
1967				14.7	12.0	12.0	12.0	3.2
1968				33.0	28.0	28.0	28.0	3.7
1969				67.1	59.9	59.9	59.9	4.7
1970				63.2	59.4	59.4	59.4	5.5
1971				84.2	83.1	83.1	83.1	5.2
1972				110.9	115.3	115.3	115.3	4.7
1973				153.9	170.9	170.9	170.9	4.3
1974				164.5	193.8	193.8	193.8	8.0
1975				81.4	104.2	104.2	104.2	10.9
1976				95.8	129.9	129.9	129.9	6.6
197T				28.5	40.0	40.0	40.0	2.9
1977				126.1	182.0	182.0	182.0	2.6
1978				136.6	214.3	214.3	214.3	6.8
1979				132.1	228.1	228.1	228.1	8.4
1980				69.9	128.5	128.5	128.5	10.6

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY72 Dollars Nonrec	Flyaway FY72 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)								
1981				36.6	74.5	74.5	72.9	10.6
1982				23.4	51.2	51.2	49.8	7.6
1983				19.5	44.6	44.6	43.1	4.9
1984				32.9	78.4	78.4	76.1	3.8
1985				24.5	60.4	60.4	60.1	3.4
1986				18.6	47.4	47.4	46.6	2.8
Subtot				1554.0	2134.5	2134.5	2126.6	
Appropriation: 2032 Missile Procurement, Army								
1979		37.1		37.1	67.1	67.1	67.1	9.0
1980	5	43.7	140.5	204.4	413.8	397.0	395.2	11.8
1981	5	5.9	169.3	214.9	485.6	440.4	437.4	11.6
1982	9	14.6	224.2	284.1	733.7	674.6	665.9	14.3
1983	12	11.1	241.1	301.6	848.8	769.1	759.0	9.1
1984	12	14.1	253.9	314.9	957.0	838.4	833.0	8.0
1985	12	7.2	260.9	326.3	1025.4	915.0	913.8	3.4
1986	12		246.9	292.5	945.2	873.1	861.2	2.8
1987	12		242.6	286.4	957.6	939.0	923.5	2.7

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY72 Dollars Nonrec	Flyaway FY72 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2032 Missile Procurement, Army (Cont'd)								
1988	12		219.9	264.6	917.6	892.6	873.6	3.0
1989	9		206.8	235.5	842.0	827.5	781.7	4.2
1990			171.2	179.8	680.1	659.8	308.5	4.0
1991			183.4	192.8	754.6	702.2	191.5	3.9
1992			38.2	38.6	156.1	27.1	0.2	3.1
1993			6.2	7.0	29.3			3.3
1994			2.3	2.3	10.0			3.3
1995				2.0	9.1			3.3
1996				2.5	11.4			3.2
1997				1.9	9.0			3.2
Subtot	100	133.7	2607.4	3189.2	9853.4	9022.9	8011.6	

(1) Then Year totals as shown for FY90 and FY91 do not include $237.3M and $248.2 respectively for the Italian Agreement to provide 20 Radars, 20 ECSs, and 4 ICCs. (2) Flyaway beyond the last procurement year is for in-house costs to support production.

Appropriation: 2050 Military Construction, Army								
1972				1.4	1.4	1.4	1.4	5.9
1979								9.3

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY72 Dollars Nonrec	Flyaway FY72 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2050 Military Construction, Army (Cont'd)								
1980				1.9	3.8	3.8	3.8	10.6
1981								10.6
1982				14.1	31.2	31.2	31.2	7.6
1983				19.2	48.1	48.1	48.1	4.9
1984				5.9	15.4	15.4	15.4	3.8
1985								3.4
1986				6.9	19.1	19.1	19.1	2.8
1987				7.0	19.9	19.9	19.9	2.7
1988				2.2	6.6	6.6	6.6	3.0
1989				0.4	1.1	1.1	1.1	4.2
1990				0.9	2.8	2.8	2.8	4.0
Subtot				59.9	149.4	149.4	149.4	
Grand Total	100	133.7	2607.4	4803.1	12137.3	11306.8	10287.6	

17. ([redacted]) Production Rate Data:

a. ([redacted]) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1978	4	0	0	0
1979	18	0	0	0
1980	36	5	5	5
1981	36	5	5	5
1982	36	9	9	9
1983	36	12	12	12
1984	36	15	12	12
1985	32	17	12	15
1986	0	17	12	15
1987	0	17	12	15
1988	0	6	12	12
1989	0	0	9	N/A

b. ([redacted]) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	4690.2	+112.9	4803.1	+90.7	4712.4
(TY $)	11312.2	+825.1	12137.3	0.0	12137.3
PAUC Cost (BY $)	20.044	27.987	48.031	+0.907	47.124
(TY $)	48.343	73.030	121.373	0.000	121.373

17c. ([redacted]) Production Rate Data (Cont'd):

c. ([redacted]) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	SEP 80	0	SEP 80	N/A	SEP 80
Duration (in MON)	123	15	138	15	123
End Date(MON YY)	DEC 90	15	MAR 92	N/A	DEC 90

d. ([redacted]) Deliveries (Plan/Actual) --

	To Date
RDT&E	5/5
Procurement	100/100

e. ([redacted]) Approved Design-to-Cost Objective -- N/A.

18. ([redacted]) Operating and Support Costs:

a. ([redacted]) Assumptions and Ground Rules --

The concept of operation is 69 tactical fire units with each USAREUR Fire Unit operating on an average of 3909 hours/year. The costs are the direct cost to support the primary personnel and to operate the Fire Units. The O&S consumables are replenishment spares, repair parts, and POL. The Direct Depot Maintenance are the labor, materials, and transportation for repair of major Fire Unit component parts, and software support. The sustaining investment consists of modification kits and support operations. Other Direct Support costs include maintenance civilian labor, and other direct support for mod kit installation. The Indirect Costs are for indirect support operations, Military Occupational Specialty (MOS) training cost, Quarters Maintenance and Utilities, Post Production Engineering, Central Supply, Unit Operations, Base Operations, and training activities. The O&S assumptions and costs are based on PATRIOT Operating Tempo, Fire Unit Mean Time Between Failure (MTBF), and the PATRIOT Baseline Cost Estimate, dated November, 1991. There is no antecedent system.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1972 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Fire Unit	Avg Annual Cost Per Fire Unit (Antecedent)
Personnel	0.3	N/A
O&S Consumables	0.8	N/A
Direct Depot Maintenance	0.5	N/A
Sustaining Investment	0.3	N/A
Other Direct Costs	0.1	N/A
Indirect Costs	0.5	N/A
Total	2.5	N/A

c. (U) Contractor Support Costs -- None.

A-20 LASER HELLFIRE

91-063

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LASER HELLFIRE

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
LASER HELLFIRE

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
PROJECT MANAGER, AIR-TO-GROUND MSL — COL ROBERT E. HUSTON
SYS PROJ OFC ATTN: SFAE-FS-HD — Assigned: February 1, 1988
RSA, AL 35898-5610 — AV 746-1365 COMM (205) 876-1365

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 23802 Project D045
PE 23747 Project D045
PE 64310 Project D074
PROCUREMENT:
APPN 2032 ICN SSN C70100 (Army)
APPN 2032 ICN SSN C70200 (Army)

CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 23 1992 6
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

[redacted] HELLFIRE Security Classification Guide
Declassify on: Originating Agency Determination Required (OADR)
Downgrade Instructions: Not Subject to Automatic Downgrade

Concur in Classification as Marked
23 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

(THIS PAGE IS [redacted])

[redacted]

OASD(PA) DFOISR 92-T-0661

5. [redacted] **Related Programs:**
AH-64 Apache Helicopter; OH-58D Kiowa Warrior Helicopter; Ground/Vehicular Laser Locator Designator; High Mobility Multipurpose Wheeled Vehicle (HMMWV); Improved TOW Vehicle (ITV); Navy AH-1W Helicopter.

6. [redacted] **Mission and Description:**
HELLFIRE is an air-to-ground missile system designed to defeat individual hardpoint targets and minimize exposure of the delivery vehicle to enemy fire. The missile configuration has the capability for modular seeker replacements. The present production missile utilizes a laser seeker and has an improved warhead which provides greater lethality against near-term threat armor. The present production missile, designated the interim warhead missile, is eight inches longer and eight pounds heavier than the original production configuration. Development of an optimized version is nearing completion which will provide hardening of the laser seeker against countermeasures, further warhead improvements, replacement of the mechanical fuze with an electronics fuze, and a return to the original HELLFIRE length and weight. A version utilizing a radar frequency seeker, Longbow HELLFIRE, is in full scale development. HELLFIRE does not replace another missile system in the air-to-ground role.

Laser HELLFIRE is employed on the AH-64 Apache helicopter as the primary point target weapon and also on the Navy AH-1W. The OH-58D Kiowa Warrior helicopter, configured to employ Laser HELLFIRE, is planned for fielding in FY 92. The system has also been qualified for use on the UH-60 Black Hawk helicopter. Demonstrations of Ground Launched Laser HELLFIRE have been conducted on the High Mobility Multipurpose Wheeled Vehicle and the Improved TOW Vehicle. The Government of Sweden has adapted the Laser HELLFIRE missile for a coastal defense role.

7. [redacted] **Program Highlights:**

a. [redacted] Significant Historical Developments --
The Advanced Development (AD) Program was initiated in 1972 and on 30 Mar 76, DOD approved entry into full-scale engineering development of HELLFIRE with fielding to be concurrent with the Apache Helicopter (AH-64). Approval for full scale production of Laser HELLFIRE was granted on 30 Mar 82. During the first (FY 82) and second (FY 83) production buys, seekers were procured from Martin Marietta Orlando Aerospace (MMOA) and provided to Rockwell International Corporation (RIC) as government furnished equipment (GFE) for assembly into all-up-rounds. Dual source competition with a split of the award quantity was the acquisition strategy from FY 84 through FY 89. After competition between the two sources, the total quantity in FY 90 was awarded to RIC on 7 Mar 90, with firm-fixed-price options for FY 91 and FY 92. A warhead development program to improve warhead

7a. (U) **Program Highlights (Cont'd):**

lethality against near-term threat armor was completed Jan 90 and was cut-in to production with the FY 90 Buy. The HELLFIRE Optimized Missile System (HOMS) was also competed between the two sources and the development contract was awarded to Martin Marietta on 2 Mar 90 with not-to-exceed ranged missile production options for FYs 93, 94, 95 and 96.

b. (U) Significant Developments Since Last Report --
A total of 4672 missiles were delivered to the Army in CY 91, which brings total Army deliveries to 33,369. The first interim warhead missiles were delivered in Sep 91, 5 months ahead of the FY 90 contract schedule. Significant developments for the HELLFIRE Optimized Missile development program include completion of the critical design review, qualification of all missile subassemblies, completion of missile controlled flight tests and achievement of length and weight requirements. Missile pre-production flight tests are in progress.

The Laser HELLFIRE Modular Missile System satisfies all mission requirements.

c. (U) Changes Since As Of Date --
Colonel Charles W. Greer replaced Colonel Robert E. Huston as Project Manager effective 3 Feb 92.

8. (U) **Threshold Breaches:**
There are no breaches to the Acquisition Program Baseline (APB), 4 February 1991. There are no Nunn/McCurdy Unit Cost breaches.

9. (U) **Schedule:**

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Advanced Development			
Start	DEC 72	N/A	DEC 72
Complete	OCT 75	N/A	OCT 75
Milestone II	FEB 76	N/A	FEB 76
Operational Test (OT) (COBRA)			
Start	AUG 79	N/A	AUG 79
Complete	DEC 79	N/A	DEC 79
Milestone IIIA	NOV 81	N/A	NOV 81
Milestone III Decision Review	FEB 80	MAR 82	MAR 82
TRADOC FUE	N/A	DEC 85	DEC 85

9a. (U) **Schedule (Cont'd):**

(U) Milestones (Cont'd) --

	Development Estimate	Approved Program	Current Estimate
FORSCOM FUE	N/A	MAY 86	MAY 86
Initial Operational Capability (IOC) (on AH-64)	MAY 83	JUL 86	JUL 86
USAREUR FUE	N/A	JAN 87	JAN 87
National Guard FUE	N/A	NOV 87	NOV 87
Contract Award - HELLFIRE Optimized Missile System (HOMS)	N/A	JUL 89	JUL 89
ECP Available - Interim Warhead	N/A	JAN 90	JAN 90
First Production Contract Award (FY 90 Buy) Interim Warhead Missile	N/A	MAR 90	MAR 90
HOMS Critical Design Review Completed	N/A	APR 91	APR 91
First Production Delivery (FY 90 Buy) Interim Warhead Missile	N/A	FEB 92	SEP 91(Ch-1)
HOMS Qualification Test	N/A	N/S	
Start	N/A	FEB 92	FEB 92
Completed	N/A	APR 92	MAY 92(Ch-2)
First Production Contract Award (FY 92 Buy) HOMS (LRIP)	N/A	JUN 92	JUN 92
First Article Test (HOMS)			
Start	N/A	JAN 94	JAN 94
Complete	N/A	APR 94	APR 94
First Production Delivery (FY 92 Buy) (HOMS)	N/A	JUN 94	JUN 94

NOTE: FMS Cases do not affect schedule milestones.

b. (U) Previous Change Explanations --

The program experienced an accumulation of approximately 2 years in schedule slippage during full-scale development. Schedule changes resulted from reduction of RDT&E funding, delays in procurement funding and delays in testing caused by late delivery of hardware and correction of deficiencies revealed in earlier tests. The completion of production validation testing was delayed 6 months because of problems that occurred in production start-up. The current estimate for initial operating capability (IOC) was changed to Jul 86 to reflect the actual date that IOC was achieved on AH-64. The following historical milestones were deleted after they were no longer applicable: Competitive AD Contracts - Start/Complete, ED Contract Award, PQT-C (Contractor) - Start/Complete, Production Contract Award, Prod Val Tests Complete, Full-Scale Production, and Missile Fly-to-Buy(FTB) Lot Acceptance Test Start (FY 84 Buy). DAE Baseline, Apr 89, elements were added: TRADOC/FORSCOM/USAREUR/

9b. (U) **Schedule (Cont'd):**
National Guard FUE, Contract Award - Interim Warhead/Optimized Msl, ECP Avail - Interim Warhead/Optimized Msl, FY 89-96 Contract Award, First Del FY 88-96. Change Explanations (1989): First delivery (FY 90 Buy was projected to be delayed 6 mos to Feb 92 due to delays in completion of the interim warhead development program (2 mos) and first article test (FAT) (4 mos) required to introduce the interim warhead into the FY 90 Buy. Change Explanations (1990): The following milestones were no longer applicable and were deleted: Contract Award - Interim Warhead, FY 89, 91, 93, 94, 95, & 96 Msl Contract Award, First Delivery (FY 88, 89, 91, 93, 94, 95 & 96), and ECP Available - Optimized Msl. The following AAE Acquisition Program Baseline, 4 Feb 91, elements were added: HOMS Critical Design Review Completed, HOMS Qualification Test Start and Completion and First Article Test (HOMS) Start and Completion. FY 90 Missile Contract Award, Apr 90, was changed to Mar 90 to reflect date of actual accomplishment. First Production Delivery (FY 90 Buy) current estimate was changed to Oct 91, which was 4 mos ahead of the contract schedule. Funding decisions caused changes to the acquisition strategy delaying FY 92 Missile Contract Award from Apr 92 to Jun 92 (2 mos) and slipped First Production Delivery (FY 92 Buy) from Sep 93 to Jun 94 (9 mos).

c. (U) Current Change Explanations --

(Ch-1) First Production Delivery (FY 90 Buy) Interim Warhead Missile, Oct 91 is changed to Sep 91 to reflect date of actual accomplishment.
(Ch-2) HOMS Qualification Test Completed, Apr 92, is slipped to May 92 due to technical problems, which have been resolved.

d. (U) References --

(U) Development Estimate:
DCP #118, 12 Nov 76.

(U) Approved Program:
AAE approved Acquisition Program Baseline dated 4 February 1991.

10. (U) **Performance Characteristics:**

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

10a. (U) **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Minimum Range, Direct				
(b)(1)				

[redacted] in accordance with SCG for production missile.
(1) Probability of hit is in the direct fire mode, given reliability.
(2) Demonstrated performance for reliability reflects performance of fly-to-buy missiles fired through 31 DEC 91.

b. (U) Previous Change Explanations --

The current estimate for missile weight for the original configuration was raised to 99.8 pounds when it became evident that the 95 pound weight requirement could not be achieved. The current estimate for minimum range was changed to 0.59 km and the current estimate for maximum range was changed to 7.0 km after completion of engineering development testing. DAE Baseline, Apr 89, added the element Missile Range Max (Indirect Fire). AAE Acquisition Program Baseline, 4 Feb 91, added elements for the Interim and Optimized Missile as follows: Minimum Missile Range (Direct Fire) and Missile Reliability (In-flight). To reflect a more representative estimate, the basis for the current estimate for missile reliability was

10b. (U) **Performance Characteristics (Cont'd):**
changed from performance based on the last 50 fly-to-buy (FTB) missiles fired to cumulative performance of all FTB missiles fired through the date indicated. Missile reliability previously reported, which used the prior basis, was .92 - .95; reliability using the current basis is .98.

c. (U) Current Change Explanations --

(Ch-1) Current estimate for Time of Flight, 3km, is changed from 13 seconds to 9.6 seconds to reflect demonstrated performance.

d. (U) References --

(U) Development Estimate:
DCP #118, 12 Nov 76.

(U) Approved Program:
AAE approved Acquisition Program Baseline dated 4 February 1991.

11. (U) **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	211.9	286.9	287.8
Procurement	276.7	700.4	723.1
Missile Bus	(143.1)		(700.3)
Laser Seeker	(109.4)		(0.0)
Total Flyaway	(252.5)		(700.3)
Other Wpn Sys Cost	(4.0)		(13.5)
Total Other Wpn Sys	(4.0)		(13.5)
Peculiar Support	(0.0)		(6.2)
Initial Spares	(20.2)		(3.1)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 75 Base-Year $	488.6	987.3	1010.9
Escalation	214.8	1343.4	1387.9
Development (RDT&E)	(54.3)	(160.8)	(163.1)
Procurement	(160.5)	(1182.6)	(1224.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	703.4	2330.7	2398.8

(1) Other weapon system cost includes data, training, support and test equipment.
(2) Missiles are being procured as all-up-rounds. Seekers were not procured as a GFE item after the second buy.

11a. (U) Total Program Cost and Quantity (Cont'd):

(3) Launcher procurement funds were transferred from missile procurement to aircraft procurement in FY 84.

(4) There are 333 R&D units being procured that are not considered fully configured end items.

(5) The Marine Corps is procuring 10,185 missiles which are not included above, also not included are 1,800 missiles being procured with Secretary Defense Acquisition Funds (SDAF).

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	24600	44051	46175
Total	24600	44051	46175

c. (U) Foreign Military Sales --

The following foreign military sales (FMS) cases have been implemented: Israel (IS-XZN), implemented 13 Mar 90 for $224.344M; Egypt (EG-ULB), implemented 24 Sep 90 for $435.387M; Saudi Arabia (SR-JBN), implemented 5 Feb 91 for $318.595M; Sweden, implemented 25 Apr 91 for $.242M; Taiwan (TW-JAL), implemented 31 Jul 91 for $158.519M; Taiwan (TW-JAR), implemented 30 Oct 91 for $5.088M; and Taiwan (TW-YQH), implemented 13 Nov 91 for $19.787M. Note estimated cost of case for Israel, Egypt, Saudi Arabia and Taiwan (TW-JAL) also include aircraft cost. A co-production agreement with the Government of Sweden was signed, Apr 87, for an estimated value of $60M.

d. (U) Nuclear Costs --

None.

e. (U) References --

(U) Development Estimate:
DCP #118, 12 Nov 76.

(U) Approved Program:
AAE approved Acquisition Program Baseline dated 4 February 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2398.8	2330.7	2398.8
(2) Quantity	46175	44051	46175
(3) Unit Cost	0.052	0.053	0.052

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	19.7	19.7	103.4
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	19.7	19.7	103.4
(2) Quantity	112	112	2158
(3) Unit Cost	0.176	0.176	0.048

13. (U) **Cost Variance Analysis**:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	266.2	437.2	0.0	703.4
Previous Changes:				
Economic	+9.4	+174.9	-0.4	+183.9
Quantity	-3.5	+535.4	-	+531.9
Schedule	+14.6	+328.0	+0.4	+343.0
Engineering	+150.3	+452.9	-	+603.2
Estimating	+6.6	-61.6	-	-55.0
Other	-	-	-	-
Support	+4.1	+16.2	-	+20.3
Subtotal	+181.5	+1445.8	-	+1627.3
Current Changes:				
Economic	-0.6	-41.4	-	-42.0
Quantity	-	-96.8	-	-96.8
Schedule	-	+310.2	-	+310.2
Engineering	-	+105.4	-	+105.4
Estimating	+0.8	-220.6	-	-219.8
Other	-	-	-	-
Support	+3.0	+8.1	-	+11.1
Subtotal	+3.2	+64.9	-	+68.1
Total Changes	+184.7	+1510.7	-	+1695.4
Current Estimate	450.9	1947.9	-	2398.8

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	211.9	276.7	0.0	488.6
Previous Changes:				
Quantity	-2.7	+180.9	-	+178.2
Schedule	+9.1	+23.1	-	+32.2
Engineering	+67.8	+164.8	-	+232.6
Estimating	-1.2	+58.9	-	+57.7
Other	-	-	-	-
Support	+2.0	-4.0	-	-2.0
Subtotal	+75.0	+423.7	-	+498.7
Current Changes:				
Quantity	-	-7.8	-	-7.8
Schedule	-	+71.5	-	+71.5
Engineering	-	+20.7	-	+20.7
Estimating	-0.3	-64.3	-	-64.6
Other	-	-	-	-
Support	+1.2	+2.6	-	+3.8
Subtotal	+0.9	+22.7	-	+23.6
Total Changes	+75.9	+446.4	-	+522.3
Current Estimate	287.8	723.1	-	1010.9

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Quantity: Decrease due to deletion of 12 practice missiles; changes in seeker quantity.

Schedule: Increase due to budget reduction in FY 78; slips in validation test.

Engineering: Increase due to addition of competitive low cost seeker program, autopilot improvements, and inclusion of improvement program.

Estimating: Increase due to exercise of the metric option in the contract, additional effort for shelf life surveillance, CM/CCM analysis, and hardware improvements. Decreases due to reduction of FY 81

13b. (U) Cost Variance Analysis (Cont'd):

RDTE funding, and FY 83 Congressional decrement to TRACE. Decrease in prior year program authority.

Support: Decrease due to reduction in missile test requirement and FY 78 budget adjustment. Increase due to addition of two Airborne Target Acquisition and Fire Control System (ATAFCS) for use in DT/OT with Cobra, requirement for battlefield obscuration test, and requirement for use of AN/USM-410 test set.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Addition of 32,116 missiles and reduction of 12,665 missiles.

Schedule: Prior to FY 82: Re-profiling of missile procurement schedule. Increase due to delays in start of production and impact of RDTE funding constraints. FY 85: Program stretchout resulting from zeroing FY 87 procurement funds precipitated by production delays. FY 87: Reprofiling of missile procurement schedule.

Engineering: Prior to FY 82: Increase due to requirement changes in missile bus, warhead and seeker. FY 84: Incorporation of minimum smoke motor. FY 85: Provision for hardware improvements planned for cut in during FY 90 and subsequent buys. FY 88: Change in improvement program to reflect optimized missile.

Estimating: FY 84: Change in estimating methodology. Revised production cost estimates. The major increases occurred prior to FY 84. FY 85: Cost estimates decreased with introduction of competitive procurement strategy in FY 84. Revised estimates for outyear production costs based on actuals to date. FY 88: Decrease due to Navy proration. Shortfall FY 92-96. FY 89: Prior year program authority adjustments. Shortfall FY 95-98. FY 90: Change in estimating methodology to not-to-exceed contract prices for all-up-rounds in FY 90.

Support: FY 82: Increase due to addition of training hardware, depot capital equipment, and changes in support hardware. Decreases due to reduction in test set quantity. FY 85: Addition of 10,000 deicing kits, 100 dummy missiles, and 30 training missiles to support APACHE program. Refinement of costs based on actuals. FY 86: Decrease in initial spares.

13b. (U) **Cost Variance Analysis (Cont'd):**

FY 87: Increase due to change in spares requirements. Increase in training equipment, de-icing kits, test program sets.
FY 88: Decrease for training equipment and de-icing kits. FY 89: Decrease in training equipment and de-icing kits. FY 90: Decrease in de-icing kits.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-0.6
Current & Prior Inflation Offset. (Estimating)	-0.2	0.4
Increase in Budget. (Estimating)	-0.1	0.4
Addition for Congressional Special Interest Item. (Support)	1.2	3.0
Total Changes	0.9	3.2

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices. (Economic)	N/A	-5.4
Economic adjustment for negative program change. (Economic)		-3.7
Addition of 2509 missiles. (Quantity)	19.0	65.0
Schedule change associated with quantity increase. (Schedule)	0.8	13.6
Engineering change associated with quantity increase. (Engineering)	5.7	18.8
Estimating change associated with quantity increase. (Estimating)	2.1	-2.5
Total Schedule Variance due to increase from 3002 to 5511 in FY 91 and decrease from 2543 to 2158 in FY 93. (Schedule)	--	-11.4
Current & Prior Inflation Offset (Estimating)	-0.4	-1.0
Estimating change applicable to 2509 additional missiles in FY 91. (Estimating)	-7.1	-16.6
Addition of 223 dummy and training missiles. (Support)	2.6	8.1
Correction of previous change categories.		
Adjustment for negative program change 90 SAR. (Economic)	N/A	-32.3
Correct 90 SAR. (Quantity)	-26.8	-161.8
Correct 89 SAR. (Schedule)	64.8	211.4
Correct 89 SAR. (Estimating)	-64.8	-211.4
Correct 90 SAR. (Schedule)	5.9	96.6
Correct 90 SAR. (Engineering)	15.0	86.6
Correct 90 SAR. (Estimating)	5.9	10.9
Total Changes	22.7	64.9

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.029	0.003	-0.004	0.014	0.015	-0.006	--	0.001	0.023	0.052

NOTES:
(1) Revision of HELLFIRE development estimate in the Jun 84 SAR transferring $31.7M previously in the HELLFIRE DE for the HELLFIRE launcher to the APACHE program.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) Optimized Missile - MMC:	Initial Contract Price		
	Target	Ceiling	Qty
Martin Marietta Corp, Orlando, FL DAAH01-90-C-0323, CPIF Award: March 2, 1990 Definitized: September 11, 1990	$40.6	$0.0	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$40.6	$0.0	0	$57.7	$58.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-3.3	$-1.3
Cumulative Variances To Date (10/27/91)	$-15.9	$-3.0
Net Change	$-12.6	$-1.7

Explanation of Change:

The primary reasons for the cost growth is a general underestimation of the cost of the program by the contractor and technical problems, now mostly resolved. The estimated price at completion is within the Project Manager's total allocated budget.

15. (U) **Contract Information:** Cont'd (Then-Year Dollars in Millions)

b. (U) Procurement --

(U) MSL 8TH PRODUCTION - RIC:	Initial Contract Price Target	Ceiling	Qty
ROCKWELL INTERNATIONAL, DULUTH, GA			
DAAH01-90-C-0161, FFP	$125.8	N/A	3766
Award: March 7, 1990			
Definitized: March 7, 1990			

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$306.4	N/A	8942	$306.4	$306.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

For FFP contracts, cost and schedule variance information is not required.

Quantity includes 2304 missiles for the FY 90 procurement, 1000 missiles deferred from the FY 88 procurement, 462 missiles deferred from the FY 89 procurement, 3002 missiles for the FY 91 procurement and 2174 missiles for the FY 91 supplemental.

The sixth and seventh missile procurement buys (DAAH01-88-C-0249, DAAH01-89-C-0147, and DAAH01-89- C-0478) have been completed and will no longer be reported.

16. (U) **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 80.8% (21 yrs/26 yrs)

(2) Percent Program Cost Appropriated: 88.8% ($2129.6 / $2398.8)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY72-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	422.0	20.7	5.0	3.2	450.9
Procurement	1667.2	19.7	103.4	157.6	1947.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	2089.2	40.4	108.4	160.8	2398.8

The Marine Corp is procuring 10,185 missiles and 1,800 missiles are being procured with Secretary Defense Acquisition Funds (SDAF) not included above.

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1972				5.9	4.9	4.9	4.9	4.6
1973				5.8	5.0	5.0	5.0	4.3
1974				6.5	6.1	6.1	6.1	8.0
1975				13.6	14.0	14.0	14.0	10.9
1976				3.7	4.0	4.0	4.0	6.6
197T				0.6	0.7	0.7	0.7	2.9

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)

Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)

1977				16.6	19.1	19.1	19.1	2.6
1978				41.4	51.4	51.4	51.4	6.8
1979				47.5	65.7	65.7	65.7	8.4
1980				38.2	57.5	57.5	57.5	10.6
1981				26.3	43.6	43.6	43.6	10.6
1982				11.3	20.0	20.0	20.0	7.6
1983				8.3	15.2	15.2	14.3	4.9
1984				0.8	1.5	1.5	1.5	3.8
1985				0.3	0.5	0.5	0.5	3.4
1986				2.3	4.7	4.7	4.6	2.8
1987				4.4	9.2	9.2	9.2	2.7
1988				9.8	21.1	21.1	21.1	3.0
1989				6.6	14.8	14.8	14.6	4.2
1990				12.3	28.6	28.6	24.1	4.0
1991				14.2	34.4	34.3	31.8	3.9
1992				8.3	20.7	8.3	1.0	3.1
1993				1.9	5.0			3.3
1994				1.2	3.2			3.3

16c. (U) **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
Subtot				287.8	450.9	430.2	414.7	
Appropriation: 2032 Missile Procurement, Army								
1981		10.8	0.9	11.7	23.3	25.0	25.0	11.6
1982	680	9.0	37.5	49.4	109.1	123.2	120.6	14.3
1983	3971		100.9	102.4	243.3	255.5	252.5	9.0
1984	4651		85.8	88.2	214.9	213.8	213.9	8.0
1985	5780		84.4	86.7	219.3	214.4	212.9	3.4
1986	6000		71.8	74.2	192.1	187.8	187.5	2.8
1987								2.7
1988	6000		68.9	68.9	192.0	192.7	190.1	3.0
1989	6000		66.1	68.5	198.7	198.7	197.5	4.2
1990	2304		25.8	27.4	81.9	69.0	44.2	4.0
1991	5511	1.3	60.6	62.3	192.6	141.7	6.6	3.9
1992	112	0.6	5.4	6.2	19.7			3.1
1993	2158		31.1	31.4	103.4			3.3
1994	2640		31.4	34.2	116.7			3.3
1995	368	1.3	6.7	11.3	39.6			3.3

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2032 Missile Procurement, Army (Cont'd)

1996				0.2	0.8			3.2
1997				0.1	0.5			3.2
Subtot	46175	23.0	677.3	723.1	1947.9	1621.8	1450.8	
Grand Total	46175	23.0	677.3	1010.9	2398.8	2052.0	1865.5	

(1) Subtotal for Missile Procurement does not include $33M FY 94, $154.3M FY 95, $169.6M FY 96, $148M FY 97, $1336M CTC for Longbow HELLFIRE (C70300). Longbow HELLFIRE is a separate SAR.
(2) For 1981 and 1982 entries, the following funds for HF launcher are contained in APACHE SAR - FY 81 $2.4M, FY 82 $12.8M.
(3) FY 83 includes local reprogramming of $13.1M for cost growth on contract (refers to Missile Procurement).

17. (U) **Production Rate Data**:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1980	346	0	0	0
1981	1050	0	0	0
1982	5225	680	680	680
1983	6000	3971	3971	3971
1984	6000	6218	4651	4651
1985	4462	5683	5780	5780
1986	0	6853	6000	6000
1987	0	6351	0	0
1988	0	6000	6000	6000
1989	0	0	6000	6000
1990	0	0	2304	2304
1991	0	0	5511	5511
1992	0	0	112	1434
1993	0	0	2158	4844
1994	0	0	2640	0
1995	0	0	368	0

NOTES:
(1) The funded delivery periods (current estimate) are: FY82 - 20 mos; 83 - 24 mos; 84 - 32 mos; 85 - 27 mos; 86 - 21 mos; 88 - 23 mos; 89 - 20 mos; 90 - 8 mos; 91 - 17 mos; 92 - 6 mos; 93 - 11 mos; FY 94-95 - 12 mos each. FY 84 - 89 contracts were dual source. Funded

17d. (U) Production Rate Data (Cont'd):
delivery period for FY 84 - 89 begins with start of earliest contractor delivery period and ends with last unit from contractor with latest delivery period. FY 90, FY 91 and FY 93 thru FY 95 is costed as a competed program, winner take all. FY 92 is costed as a sole source program. Schedule associated with maximum economic includes Navy quantities and cost assumes Navy shares support costs. (Refers to 17.a and 17.b)
(2) The production estimate tracks to the 31 Dec 81 SAR which was the first SAR after Milestone III production decision review. HELLFIRE launcher costs are excluded from the production estimate, because these costs were transferred to the APACHE program. Cost associated with maximum economic production assumes Navy participation. (Refers to 17.a and 17.b)
(3) FY 87 zero funding provided, max economic quantity, therefore assumed zero. FY 92 max economic based on configuration change from improved warhead to optimized missile configuration. FY 93 max economic includes participation of the navy requirement of 1,000 ea. (Refers to 17.a)

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	882.0	+128.9	1010.9	-3.2	1014.1
(TY $)	1953.4	+445.4	2398.8	-3.0	2401.8
PAUC Cost (BY $)	0.025	-0.003	0.022	0.000	0.022
(TY $)	0.055	-0.003	0.052	0.000	0.052

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	FEB 82	0	FEB 82	N/A	FEB 82
Duration (in MON)	103	85	188	17	171
End Date(MON YY)	SEP 90	85	OCT 97	N/A	MAY 96

17d. (U) **Production Rate Data (Cont'd)**:

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	297/289
Procurement	31620/33369

e. (U) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 24600 - @ Peak Rate: 500.0/mo			
FY 75 Base-Year $	10264.000	18680.000	0.000
Then Year $	16224.000	44249.000	0.000
@ Qty 6650 (1st three years) - @ Peak Rate: 500.0/mo			
FY 75 Base-Year $	12138.000	29754.000	0.000
Then Year $	17879.000	68794.000	0.000

18. (U) **Operating and Support Costs**:

a. (U) Assumptions and Ground Rules --

Assumptions and Ground Rules - Operation and support costs from the Jul 91 BCE for HELLFIRE are further categorized into fielding and sustainment costs. Fielding costs include second destination transportation and initial repair parts. Under the philosophy of a "certified round" concept, laser HELLFIRE sustainment costs should be minimum. The sustainment phase will continue 20 years beyond full deployment of Apache (thru FY 15). The following efforts are considered applicable:

- o Replenishment spares for training missile and support equipment.
- o Annual overhaul of laser HELLFIRE equipment - ten percent of missiles in storage will be checked annually. Of the items checked, those that fail will be shipped to the depot for overhaul and return. Costs are based on predicted failure rate and average cost to repair.
- o Transportation costs associated with annual overhaul.
- o Modification and material
- o System Project Management
- o Data - (Department of Army Technical Manuals, Depot Maintenance Workload Requirements, Maintenance and Engineering

18a. (U) Operating and Support Costs (Cont'd):
Publications, surveillance program software, etc.)

o Surveillance Program.

There is no antecedent system.

b. (U) Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Fielded Quantity	Avg Annual Cost Per Antecedent
Fielding	0.1	N/A
Sustainment	4.9	N/A
Total	5.0	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Depot Maintenance	0.1	---	---	---	0.1
Total	0.1	---	---	---	0.1

A-11 CH-47D

*** [redacted] ***

91-054

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: CH-47D CHINOOK

AS OF DATE: December 31, 1991

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1. Designation and Nomenclature (Popular Name):
CH-47D/Medium Lift Helicopter (CHINOOK)

2. DoD Component: Army

3. Responsible Office and Telephone Number:
PROJECT MGR'S OFC, CH-47 MOD PROGRAM COL RONALD N. WILLIAMS
ATTN: SFAE-AV-CH Assigned: August 3, 1987
4300 GOODFELLOW BLVD. AV 693-1411 COMM (314) 263-1411
ST. LOUIS, MO 63120-1798

4. Program Elements/Procurement Line Items:

RDT&E:
PE 64213 Project DC37
PROCUREMENT:
APPN 2031 ICN AA0250 (Army) Shared Funding
APPN 2031 ICN AA0251 (Army)
APPN 2031 ICN AA0252 (Army) Shared Funding
APPN 2031 ICN AA0960 (Army)

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AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

5. Related Programs:

None.

6. Mission and Description:
The CH-47 is a transport helicopter used for artillery movement, missile transport, personnel movement, aircraft recovery, medical

*** [redacted] ***

No SECURITY Objection to PUBLIC RELEASE
23 MAR 1992
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OASD(PA) DFOISR 92-T-0639

6. Mission and Description (Cont'd):

evacuation, transport of liquid and dry bulk cargo, etc. It has the capability of carrying cargo internally or externally depending on cargo configuration. Employment of 1950 technology and the age of current CH-47 fleet dictated modernization to sustain Army fleet capability. Modernization provides substantial improvements in reliability, availability and maintainability (RAM), productivity, flight safety and survivability. CH-47A, B and C model airframes are updated and improved with seven newly designed and developed components. These systems include the Fiberglass Rotor Blades, Drive System, Hydraulic System, Auxiliary Power Unit (APU), Electrical System, Advanced Flight Control System (AFCS), and the Multi-Cargo Hook Load Suspension System. The modernized aircraft have a lift capability of 15,000 lbs at design conditions of 4,000 feet/95 degrees F. Fleet compatibility is improved, logistics support enhanced, maintenance support simplified, and operational costs reduced. The modernized CH-47 replaces the current CH-47 fleet on a one-for-one basis.

7. Program Highlights:

a. Significant Historical Developments --
Army System Acquisition Review Council III (ASARC III), held on August 19, 1980, directed that the program enter production to modernize the current available fleet. The Council directed the aircraft be type [redacted] standard. The SECDEF Decision Memorandum (SDDM) was signed October 20, 1980.

The program has met or exceeded all key technical and operational characteristics, schedule milestones and cost parameters. All aircraft procured in the Multiyear I contract have been delivered. Remaining modernization production aircraft are included in the existing multiyear contract. The CH-47D Modernization Program is stable with predictable events.

b. Significant Developments Since Last Report --
The performance of the CH-47D Cargo Helicopter during Operation Desert Shield/Storm met all mission requirements in accordance with capability expectations. Its performance was measured as outstanding.

The multiyear contract modification to fund the remaining remanufacture year (FY 92) of the CH-47D Modernization Program was signed 29 November 1991.

Effort is underway to contract with Boeing Helicopters for procurement of two (2) new CH-47D aircraft in accordance with the FY 1992 Dire Emergency Supplemental Appropriations Act. Delivery of these aircraft is expected in the first quarter of FY 93.

7b. Program Highlights (Cont'd):

The CH-47D system satisfies the mission requirement.

c. Changes Since As Of Date --
None.

8. Threshold Breaches:
There are currently no breaches to the Acquisition Program Baseline (APB) (dated March 2, 1989) or Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone III	SEP 80	OCT 80	OCT 80
Initial Production Contract Award (single year)	SEP 80	OCT 80	OCT 80
Second Production Contract Award (single year)	N/A	DEC 81	DEC 81
Production Validation Testing			
Start	OCT 81	MAY 82	MAY 82
Complete	MAR 83	AUG 83	AUG 83
First Delivery, Initial Prod Contract	MAY 82	MAY 82	MAY 82
First Aircraft Deployed, FORSCOM	N/A	FEB 83	FEB 83
First Unit Equipped	N/A	FEB 83	FEB 83
First Delivery, Second Prod Contract	N/A	MAY 83	MAY 83
Third Production Contract Award (single year)	N/A	SEP 83	SEP 83
IOC (24th aircraft 1st unit)	AUG 83	FEB 84	FEB 84
Fourth Production Contract Award (single year)	N/A	MAR 84	MAR 84
First Delivery, Third Prod Contract	N/A	MAR 84	MAR 84
First Delivery, Fourth Prod Contract	N/A	JAN 85	JAN 85
Fifth Production Contract Award (multiyear)	N/A	APR 85	APR 85
First Delivery, Fifth Prod Contract	N/A	NOV 85	NOV 85
First Aircraft Deployed, Europe	N/A	OCT 87	OCT 87
First Aircraft Deployed, NGB	N/A	SEP 88	SEP 88
Sixth Production Contract Award (multiyear)	N/A	JAN 89	JAN 89
First Aircraft Deployed, Korea	N/A	JAN 89	FEB 89
First Aircraft Deployed, WESTCOM	N/A	JUL 90	MAY 90
First Delivery, Sixth Prod Contract	N/A	NOV 90	NOV 90

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
First Aircraft Deployed, SOUTHCOM	N/A	JAN 90	FEB 90
First Aircraft Deployed, USAR	N/A	JAN 91	JAN 91

b. Previous Change Explanations --

Initial Production Contract Award was changed to October 1980, because of ASARC III decision scheduled in late FY 80. The IOC slipped under the present production buildup due to the restructuring of company TOE from 16 to 24 aircraft as changed by Aviation Requirements for Combat Structure of the Army (ARCSA) III and initial allocation of four CH-47D aircraft to test and training base TDA requirement. Current estimate for DSARC III changed from September 1980, as the SECDEF Decision Memorandum (SDDM) was signed October 20, 1980. First Aircraft Deployed, Korea, changed to reflect schedule slipped from January 1989 to February 1989 resulting from scheduling problems with the C5A. The milestone for 1st Aircraft Deployed, WESTCOM was accelerated from July 1990 to May 1990 to utilize C-5 transport in a most cost effective manner. The milestone for 1st Aircraft Deployed SOUTHCOM slipped from January 1990 to February 1990 due to delays encountered in ferrying aircraft from the contractor's facility. The milestone for 1st Aircraft Deployed, USAR, accelerated from February 1991 to January 1991 due to change in Special Operations Aircraft (SOA) requirements.

c. Current Change Explanations --

None.

d. References --

Development Estimate:
DCP, Number 139, as revised 05 January 1977.

Approved Program:
AAE Approved Acquisition Program Baseline dated 02 March 1989.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Empty Weight (lbs)	N/A	23401	/ 23401	23401	23401
Mission 1 Payload 1/ (lbs)	15775	15775	/ 15000	15360	15360
Max Cruise Speed at Design Gross Wt (33000lbs) (knots)	155	162	/ 155	160	160
Service Ceiling at Design Gross Wt. (ft.) (one engine inoperative)	10000	13200	/ 10000	13400	13400
Hover-out-of-Ground Effect (lbs)	N/A	50000	/ 50000	50000	54000
Mission III Payload 2/ (lbs)					
Outboard	N/A	13000	/ 13000	13907	13907
Inboard	N/A	6500	/ 6500	6953	6953
System Operational Reliability (SOR) (MTBF) (hrs)					
DSARC III Objective	.96	.96	/ 1.10	1.38	1.33
Maturity Objective (100k hrs)	1.4	1.33	/ 1.33	2.1	2.1
Hardware System Reliability (HSR) (MTBF) (hrs)					
DSARC III Objective	2.06	2.06	/ 2.20	3.14	3.41
Maturity Objective (100k hrs)	3.0	3.00	/ 3.58	6.3	6.3
Maintenance Manhours/ Flight Hour	17.66	15.1	/ 16.24	9.73	9.73
Flight Performance (Primary Msn) 1/					
Vertical Rate of Climb (ft/min)	200	200	/ 200	200	200
Crashworthiness (Vert Impact Vel, Ft/sec)	N/A	8.2	/ 8.2	8.2	8.2
Engine Size, Intermediate Rated Power at Sea Level	N/A	3400	/ 3400	3400	3400
Mission Radius (NM)	30	30	/ 30	30	30
Self-Deployable (NM)	N/A	1260	/ 422	1058	1058

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Air Transportability in C-5 (time to Load/Unload) (hrs)	N/A	7.5 / 12	7.5	7.5

FOOTNOTES:

1. Demonstrated performance reflects production testing for DSARC III Objective, System Operational Reliability; Vertical Rate of Climb; Mission Radius; and Maximum Cruise Speed at Design Gross Wt.

2. Sample field data collection as of December 1990 for Maturity Objective, System Operational Reliability and Hardware System Reliability and for Maintenance Man-Hour/Flight Hour.

3. Demonstrated performance reflects prototype testing for DSARC III Objective, Hardware System Reliability.

4. Four-thousand feet pressure altitude, 95 degrees Fahrenheit for Mission Payload.

1/ 15000 lbs external cargo at 4000 feet, 95 deg F, hover out-of-ground effect with a 200-500 foot per minute vertical rate of climb at max power, fuel for 30 nm radius, combat equipment and a 30-min fuel reserve

2/ 13000 lbs external cargo at 4000 feet, 95 deg F, 100 nautical miles radius land and off-load and return with 6500 lbs of internal payload and land with 30-min of fuel reserve at 99% best range speed

b. Previous Change Explanations --

Reflects results of production testing vice prototype testing. Changes resulting from demonstrated performance, approved engineering changes, rating of transmission from 100 to 101 percent for true instrument reading of torque meter.

c. Current Change Explanations --

None.

10d. Performance Characteristics (Cont'd):

d. References --

Development Estimate:
DCP, Number 139, as revised 05 January 1977.

Approved Program:
AAE Approved Acquisition Program Baseline dated 02 March 1989.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	76.1	86.3	86.3
Procurement	806.4	1317.7	1317.3
Flyaway	(750.6)		(1208.8)
Total Flyaway	(750.6)		(1208.8)
Other Weapon Systems	(29.8)		(47.1)
Total Other Wpn Sys	(29.8)		(47.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(26.0)		(61.4)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 75 Base-Year $	882.5	1404.0	1403.6
Escalation	680.3	1917.8	1951.6
Development (RDT&E)	(22.5)	(27.2)	(27.2)
Procurement	(657.8)	(1890.6)	(1924.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1562.8	3321.8	3355.2

b. Quantity --			
Development (RDT&E)		N/A	0
Procurement	361	472	474
Total	361	472	474

Excludes three (3) RDT&E prototypes that are not considered fully configured end items.

Procurement quantity has been increased by two (2) as a result of the FY 1992 Dire Emergency Supplemental Appropriations Act.

c. Foreign Military Sales -- None.

11d. Total Program Cost and Quantity (Cont'd):

d. Nuclear Costs -- None.

e. References --

Development Estimate:
DCP, Number 139, as revised 05 January 1977.

Approved Program:
AAE Approved Acquisition Program Baseline dated 02 March 1989.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3355.2	3335.7	3355.2
(2) Quantity	474	472	474
(3) Unit Cost	7.078	7.067	7.078
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	254.0	254.0	13.7
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	93.0	93.0	0.0
Net Total	347.0	347.0	13.7
(2) Quantity	50	50	0
(3) Unit Cost	6.940	6.940	N/A

Two additional aircraft have been added in accordance with the FY 1992 Dire Emergency Supplemental Appropriations Act.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	98.6	1464.2	0.0	1562.8
Previous Changes:				
Economic	-	+219.4	-	+219.4
Quantity	-	+749.0	-	+749.0
Schedule	-	-7.6	-	-7.6
Engineering	-	-	-	-
Estimating	+14.9	+674.4	-	+689.3
Other	-	-	-	-
Support	-	+122.8	-	+122.8
Subtotal	+14.9	+1758.0	-	+1772.9
Current Changes:				
Economic	-	-5.5	-	-5.5
Quantity	-	+27.2	-	+27.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+6.2	-	+6.2
Other	-	-	-	-
Support	-	-8.4	-	-8.4
Subtotal	-	+19.5	-	+19.5
Total Changes	+14.9	+1777.5	-	+1792.4
Current Estimate	113.5	3241.7	-	3355.2

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	76.1	806.4	0.0	882.5
Previous Changes:				
Quantity	-	+226.3	-	+226.3
Schedule	-	+41.4	-	+41.4
Engineering	-	-	-	-
Estimating	+10.2	+177.3	-	+187.5
Other	-	-	-	-
Support	-	+57.4	-	+57.4
Subtotal	+10.2	+502.4	-	+512.6
Current Changes:				
Quantity	-	+9.3	-	+9.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+3.9	-	+3.9
Other	-	-	-	-
Support	-	-4.7	-	-4.7
Subtotal	-	+8.5	-	+8.5
Total Changes	+10.2	+510.9	-	+521.1
Current Estimate	86.3	1317.3	-	1403.6

b. Previous Change Explanations --

RDT&E
Estimating:
Reflects actual RDT&E program.

PROCUREMENT
Economic: Application of CH-47D historical and revised escalation indices.
Quantity: Program increased 111 aircraft from 361 to 472.
Schedule: Increase in production rate from 3 to 4 aircraft per month.
Estimating: Refinement of estimate for production costs. Elimination of multiyear contingency funds for EPA and airframe preparation/Materiel

13b. Cost Variance Analysis (Cont'd):

Requirements List; elimination of small business set aside and Engineering Changes. Increase in Long Lead Time Items for follow-on multiyear contract. Funding Reductions and redirection of funds to higher priority safety improvements have caused decreases to the program.

Support: Refinement of prior estimate. Revised spares policy definition. Inclusion of Total Package Fielding Cost and Project Management Administration Cost.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised escalation rates. (Economic)	N/A	-5.5
The FY 1992 Dire Emergency Supplemental Appropriations Act appropriated funds to procure two CH-47D aircraft. (Quantity)	9.3	27.2
Current Year & Prior Year Inflation Offset (Estimating)	2.5	4.5
Increased cost for aircraft being inducted due to corrosion, deferred maintenance & shortages of GFM. (Estimating)	1.4	1.7
Publication costs have been reduced by accomplishing inhouse in lieu of by contractor. (Support)	-3.0	-5.7
Trainer requirements have decreased with change in contractor. (Support)	-3.1	-5.9
Engineering Services Contract costs added. These were previously paid from O&M Appropriation. (Support)	0.5	1.6
Spares adjustment. (Support)	0.9	1.6
Total Changes	8.5	19.5

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes							PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
4.329	0.451	0.606	-0.016	--	1.467	--	0.241	2.749	7.078

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

AIRFRAME FY 90-2 MULTIYR:	Initial Contract Price		
	Target	Ceiling	Qty
BOEING HELICOPTERS, PHILADELPHIA, PA DAAJ09-89-C-A010, FFP Award: January 13, 1989 Definitized: January 1, 1989	$773.1	N/A	144

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$810.4	N/A	144	$822.9	$822.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/90)	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for this FFP Contract.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 89.5% (17 yrs/19 yrs)

(2) Percent Program Cost Appropriated: 99.1% ($3325.7 / $3355.2)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY76-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94)	Total
RDT&E	113.5	-	-	-	113.5
Procurement	2958.2	254.0	13.7	15.8	3241.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3071.7	254.0	13.7	15.8	3355.2

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army								
1976				10.1	11.3	11.3	11.3	8.7
197T				2.1	2.4	2.4	2.4	2.2
1977				19.9	25.8	25.8	25.8	8.1
1978				24.2	32.0	32.0	32.0	8.5
1979				13.9	19.1	19.1	19.1	7.7
1980				15.7	22.4	22.4	22.4	7.7
1981				0.4	0.5	0.5	0.5	7.7
Subtot				86.3	113.5	113.5	113.5	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2031 Aircraft Procurement, Army								
1980		6.3		15.5	28.6	28.6	28.6	13.4
1981	9	8.1	63.6	79.0	159.3	159.3	159.3	10.8
1982	19	1.6	91.9	104.2	219.0	219.0	219.0	7.9
1983	24	1.4	99.0	107.4	247.5	247.5	247.5	2.8
1984	36	1.3	129.0	137.7	320.1	320.1	320.1	3.4
1985	48	1.0	137.6	155.4	369.0	369.0	369.0	0.8
1986	48		113.0	114.8	273.3	273.3	273.3	
1987	48		96.5	102.6	247.8	247.8	247.8	0.8
1988	48		88.4	98.5	240.8	240.8	237.1	6.7
1989	48		92.6	107.1	288.8	288.8	270.9	4.2
1990	48		103.4	105.1	291.4	288.0	258.3	4.0
1991	48		93.3	94.9	272.6	269.5	148.3	4.4
1992	50		80.8	85.6	254.0	175.7	2.1	4.1
1993				4.5	13.7			3.7
1994				5.0	15.8			3.6
Subtot	474	19.7	1189.1	1317.3	3241.7	3127.4	2781.3	
Grand Total	474	19.7	1189.1	1403.6	3355.2	3240.9	2894.8	

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1980	N/A	N/A	0	N/A
1981	9	9	9	9
1982	19	19	19	19
1983	24	24	24	24
1984	36	36	36	36
1985	36	48	48	48
1986	36	48	48	60
1987	36	48	48	60
1988	36	48	48	60
1989	36	48	48	60
1990	36	48	48	60
1991	36	48	48	60
1992	21	12	50	0

17b. **Production Rate Data (Cont'd):**

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	1325.1	+78.5	1403.6	+43.8	1359.8
(TY $)	3224.4	+130.8	3355.2	+77.3	3277.9
PAUC Cost (BY $)	3.039	-0.078	2.961	0.092	2.869
(TY $)	7.395	-0.317	7.078	+0.163	6.915

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	OCT 81	0	OCT 81	N/A	OCT 81
Duration (in MON)	135	9	144	12	132
End Date(MON YY)	JAN 93	9	OCT 93	N/A	OCT 92

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	3/3
Procurement	384/383

e. Approved Design-to-Cost Objective -- N/A.

Design-to-Cost Goal for CH-47A, Quantity of 104, Development Estimate for FY 75 Base-Year is $2.8 and for Then-Year is $4.6. Peak Rate, Current Estimate and Latest Approved Threshold are not applicable.

Design-to-Cost Goal for CH-47B, Quantity of 74, Development Estimate of FY 75 Base-Year is $2.4 and for Then-Year is $4.2. Peak Rate, Current Estimate and Latest Approved Threshold are not applicable.

Design-to-Cost Goal for CH-47C, Quantity of 183, Development Estimate of FY 75 Base-Year is $1.6 and for Then-Year is $2.9. Peak Rate, Current Estimate and Latest Approved Threshold are not applicable.

Design-to-Cost Goal for CH-47D, Quantity of 436, Current Estimate of

17e. Production Rate Data (Cont'd):
FY 75 Base-Year is $2.5 and for Then-Year is $6.2, Latest Approved Threshold for FY 75 Base-Year is $2.6. Peak Rate and Development Estimate is not applicable.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

Sustainment costs are based on 472 CH-47D aircraft operating at a tempo of 180 peacetime flying hours per year with each aircarft operating 20 years. Replenishment costs include aircraft spares and repair parts. Depot maintenance includes the cost of labor, material and transportation for maintenance performed at the depot level. Military personnel includes costs for the aircraft flight crews, Aviation Unit Maintenance (AVUM) personnel, Aviation Intermediate Maintenance (AVIM) personnel and AVUM and AVIM indirect support personnel. Sustainment costs are based on the CH-47 Modernization Program Baseline Cost Estimate (BCE), August 1989. There is no antecedent system for CH-47D.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1975 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 1,000 Flying Hours	Avg Annual Cost Per Antecedent
Replenishment	0.3	N/A
Petro, Oil & Lub (POL)	0.1	N/A
Depot Maintenance	0.2	N/A
Field Maintenance <.1	0.0	N/A
Transportation <.1	0.0	N/A
System Specific Repl Trn	0.1	N/A
Military Personnel	1.0	N/A
System Project Mgmt <.1	0.0	N/A
Modification Kits	0.1	N/A
Other Sustainment	0.2	N/A
	0.0	N/A
Total	2.0	N/A

18c. Operating and Support Costs (Cont'd):

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Interim Contr Spt	---	---	---	---	---
Contr Logistics Spt	---	---	---	---	---
Sustaining Engrg	---	---	---	---	---
Depot Maintenance	---	---	---	---	---
Contr Eng/Tech Serv	---	---	---	---	---
Other	2.2	4.5	4.5	---	11.2
Total	2.2	4.5	4.5	---	11.2
Total	4.4	9.0	9.0	---	22.4

NOTE: The Average Cost Per Flying Hour is $2,047.00.

NOTE: Operating and Support Contract Costs headed FY 1991 and Prior are FY 1991 Actual only. "Other" is sample data collecting, flight safety parts, and corrosion prevention control. Variance between FY 91 and FY 92/93 is that deficiency report processing will be funded through DBOF.

N-9 C/MH-53E

91-12/18

*** UNCLASSIFIED ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: C/MH-53E

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. **Designation and Nomenclature (Popular Name):**
CH-53E (Super Stallion); MH-53E (Sea Dragon)

2. **DoD Component:** Navy

3. **Responsible Office and Telephone Number:**
H-53 PROGRAM OFFICE
NAVAL AIR SYSTEMS COMMAND
PMA 261
WASHINGTON, DC 20361-1261

COL WILLIAM WOLFE
Assigned: July 21, 1989
AV 222-3151 COMM (202) 692-3151

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604260N, 0604714N
PROCUREMENT:
APPN 1506 ICN 0148 (Navy)
APPN 0350 ICN ICN 1560 (DCA/DNA)
MILCON:
PE 0206496N

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92-C-0464
MAR 20 1992
Office of the Chief of
Naval Operations Dept. of the Navy

5. **Related Programs:**
SH-60B LAMPS MK III SEA HAWK; SH-60F CV HELO; ARMY UH-60A BLACK HAWK; AIR FORCE HH-60D NIGHT HAWK.

6. **Mission and Description:**
The CH-53E is a shipboard-compatible helicopter configured for the lift and movement of cargo and troops/passengers internally, the

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OASD(PA) DFOISR 92-T-0425

6. Mission and Description (Cont'd):

tactical recovery of downed or damaged aircraft, including self-retrieval and the lift of heavy bulky equipment and supplies by external suspension from the aircraft. The MH-53E helicopter is a CH-53E modified to perform the primary mission of Airborne Mine Countermeasures (AMCM). The AMCM mission includes minesweeping, mine neutralization, mine hunting, floating mine destruction, channel marking, and surface towing such as the towing of surface craft and ships. The CH/MH-53E is similar to the basic CH-53D with the following exceptions: three T-64-GE-416A turbine engines versus two T-64-GE-413 turbine engines; 79 ft. versus 72 ft. main rotor diameter; 7 titanium spar versus aluminum spar main rotor blades; 20 ft. versus 16 ft. tail rotor diameter and canted 20 degrees; 13,140 SHP versus 7,560 SHP main gearbox and 40 inch extension in the transition section of the fuselage. Full provisions (weight, space and plumbing) for external auxiliary fuel tanks, fuel jettison, air-to-air refueling, and ship-to-air refueling are included.

7. Program Highlights:

a. Significant Historical Developments --

Significant Historical Development -- SOR 14-20 of 1967 established the requirement for a heavy lift helicopter (HLH). In May 1973, a DSARC I decision approved the fabrication and test of two development prototypes (YCH-53E). First flight of the YCH-53E occurred in March 1974. DSARC IIA decision of 14 May 1975 approved the engineering development phase to include fabrication and test of two production prototypes and one static test article. First flight of the production prototype was in December 1975. A DSARC III was held in January 1978 which approved procurement of the first twenty-nine CH-53E production aircraft. The contract delivery schedule to provide the initial aircraft in May 1980 was not met; the Navy provisionally accepted the first production model in December 1980. The FY 82 President's Budget increased total procurement from 49 to 126 aircraft including seven CH-53E Airborne Mine Countermeasure capable aircraft that would replace the RH-53D losses. The FY 83 President's Budget increased production aircraft from 126 to 160 which included 25 additional AMCM capable aircraft designated MH-53E. Multiyear procurement for CH/MH-53E was approved for FY 86 through FY 89 in the FY 85 DOD Appropriations Act and included 56 CH/MH-53's. First flight of the MH-53E development prototype occurred in September 1983, DT-IIB testing was completed June 1984, and OT-IIA testing 1985. The MH-53E was approved for limited production (ALP) in November 1986. The CH/MH-53E multiyear procurement contract was definitized in September 1986 for the period FY 86 through FY 89. Estimated savings to the Government were $92.8M. On 24 October 1988 the MH-53E received Approval from Assistant Secretary of the Navy (Shipbuilding & Logistics) for Full Rate Production. On 1 August 1988 the west coast MH-53E squadron HM-15 stood up at NAS Alameda.

7a. Program Highlights (Cont'd):

RDT&E efforts during FY 89 included Helicopter Night Vision System development and development of an upgraded T-64-416 engine for the CH/MH-53. The FY 1991 procurement of CH-53E's was deleted by Congressional action and 12 MH-53E's were subsequently put into the FY 1991 budget using National Guard and Reserve Equipment funds.

b. Significant Developments Since Last Report --
(1) The FY 1992 procurement of MH-53E's was deleted for the active Navy by Congressional action and four (4) MH-53E's were subsequently inserted into the FY 1992 budget using National Guard and Reserve Equipment (NGRE) funds.

(2) The CH/MH-53 are expected to satisfy the mission requirements.

c. Changes Since As Of Date -- None.

8. Threshold Breaches:
There are currently no APB October 1990 breaches or Nunn McCurdy unit cost breaches.

9. Schedule:

a. Milestones --	Development Estimate	Approved Program	Current Estimate
CH-53E			
Milestone I (DSARC) (Concept Validation)	N/A	MAY 73	MAY 73
First Flight Development Prototype	MAR 74	N/A	MAR 74
Milestone II (DSARC) (FSED Decision)	OCT 74	APR 75	APR 75
IOT&E Complete	FEB 76	N/A	MAY 79
BIS Initial Report	MAR 76	N/A	JUL 77
Milestone III (DSARC) (Production Decision)	MAR 76	JAN 78	JAN 78
Approval for Service Use (ASU)	N/A	APR 80	APR 80
Acceptance 1st Production A/C	JUN 77	N/A	DEC 80
Fleet Introduction	JUL 77	N/A	JUN 81
IOC/First Detachment Deployable	N/A	JUN 82	JUN 82
Procurement Objective Obtained	SEP 90	N/A	SEP 94
MH-53E			
Milestone I DCP #94	N/A	FEB 78	FEB 78
Milestone II FSED	N/A	FEB 81	FEB 81
Milestone IIIA Limited Production	N/A	MAR 85	MAR 85
Milestone IIIB Continued Limited Production	N/A	NOV 87	NOV 87

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Milestone IIIC Full Scale Prod.	N/A	OCT 88	OCT 88
IOC	N/A	AUG 88	AUG 88
FOC	N/A	APR 89	APR 89
*Program Initiation (CH-53E)	N/A	N/A	JUN 69
*Navy Technical Evaluation (CH-53E)	N/A	N/A	JAN 78
*FOT&E (CH-53E)	N/A	N/A	APR 83
*BIS-FTP (CH-53E)	N/A	N/A	DEC 82
*Navy Support Data (CH-53E)	N/A	N/A	OCT 83
*First Flt Development Proto- (CH-53E)	N/A	N/A	SEP 83
*OPEVAL (MH-53E)	N/A	N/A	APR 86
*AFP (MH-53E)	N/A	N/A	OCT 88
*Acceptance 1st Production a/c (MH-53E)	N/A	N/A	JUN 86
*FOT&E (MH-53E)	N/A	N/A	DEC 87

*- Denotes Non-baseline Milestones

b. Previous Change Explanations --

DSARC II was delayed due to loss of one of the first two prototypes in ground accident. IOT&E, BIS Initial Report, and DSARC III were delayed due to restructured program to evaluate all RDT&E improvements and rescheduling testing. Naval Technical Evaluation was delayed due to change in completion. Approval for Service Use (ASU) was delayed due to additional testing requirements and a delay in administrative ASU processing. Acceptance First Production Aircraft and Fleet Introduction were initially delayed due to a change in aircraft procurement and delivery schedule. FOT&E was delayed due to various flight restrictions imposed on the aircraft which precluded testing. BIS-FTP was delayed due to change in completion date of a flight test expansion to resolve YAW oscillation anomaly. Acceptance of First Production Aircraft, Fleet Introduction, FOT&E, BIS-FTP, and IOC were further delayed based on a new production schedule reflecting a long-term labor strike in the aerospace bearing and forging industry and restructuring of initial aircraft utilization. OPEVAL extended because of weather, unplanned maintenance delays, and administrative problems with the contractor. Accepted aircraft 5 months early to reflect revised development schedule. Approval for Full Production was delayed because of extended OPEVAL. The program quantities were increased, extending the time the new procurement objective could be obtained.

9c. Schedule (Cont'd):

c. Current Change Explanations -- None.

d. References --

Development Estimate:
Development Concept Paper (DCP) #94, dated 25 April 1973, subject "CH-53E Prototype Development Approval" as amended by Decision Coordinating Paper (DCP) #94, dated 14 February 1978, subject "CH-53E Production Approval".

Approved Program:
NAE Approved Acquisition Program Baseline dated 17 October 1990.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Maximum Gross Wt. (GW) (lbs)					
Weight Empty	34000	33326	/ 33326	33226	33226
W/Ext. Payload HIGE SL/90 deg. F	73500	73500	/ 73500	73500	73500
Dimensions (Spread Configuration)					
Length	99.0	99.5	/ 99.5	99.5	99.5
Width	79.0	79.0	/ 79.0	79.0	79.0
Height	28.4	28.4	/ 28.4	28.4	28.4
Dimensions (Folded Configuration)					
Length	60.3	60.5	/ 60.5	60.5	60.5
Width	29.4	28.5	/ 28.5	28.5	28.5
Height	18.6	18.7	/ 18.7	18.7	18.7
Engine Maximum SHP, Sea Level Static (10 min)	4380	4380	/ 4380	4380	4380
Speed (KTS) Vmax (KTS Level FLT, MAX continuous power S.L.)					
46.5K lbs GW (Internal Load)	170	170	/ 170	170	170
56K lbs GW (Internal Load)	140	140	/ 140	140	140
70K lbs GW (External Load)	100	100	/ 100	100	100

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Rate of Climb (ft/min) One Engine Inop @ 69,750 lbs GW	150	200	/ 200	200	200
Range (NM)	550	500	/ 500	500	500
Internal Payload (1000 cu ft cargo, NTE gross weight limits) with full internal and full external aux fuel tanks (10% reserve); 500 MN Range 3000 MSL 91.5 F HOGE (lbs)	20000	16000	/ 16000	20000	20000
External Payload 50 MN radius S/L90 F, HIGE (20 min fuel reserve)	32000	32000	/ 32000	32000	32000
Reliability					
Mission Reliability (1 hr mission @ 90% confidence) (%)	0.93	0.93	/ 0.93	0.93	0.93
Aircraft MFHBA (1 hr mission)	13.7	13.8	/ 13.8	13.8	13.8
Aircraft MFHBF	0.77	0.70	/ 0.70	0.70	0.70
Maintainability Aircraft MMH/FH (org. corrective)	8.0	9.50	/ 9.50	7.72	9.5
Availability	0.85	0.93	/ 0.93	0.93	0.93
AMCM (MH-53E)					
Tow Tension (x 1000 lbs)	N/A	30.0	/ 30.0	30.0	30.0
Time on Station (hrs)	N/A	3.2	/ 3.2	3.2	3.2

b. Previous Change Explanations --

Based on demonstrated performance the following technical/operational characteristics have been changed: rate of climb, mission reliability, MFHBA, availability, and weight empty, tow tension and time on station. Demonstrated performance during DT-II A through D OT-IIB. Demonstrated Performance reflects current achievements to date. Payload internal from 16000 based on demonstrated performance.

10c. **Performance Characteristics (Cont'd):**

c. Current Change Explanations --

None

d. References --

Development Estimate:
Development Concept Paper (DCP) #94, dated 25 April 1973, subject "CH-53E Prototype Development Approval" as amended by Decision Coordinating Paper (DCP) #94, dated 14 February 1978, subject "CH-53E Production Approval".

Approved Program:
NAE Approved Acquisition Program Baseline dated 17 October 1990.

11. **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

	Development Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	93.3	182.4	195.5
Procurement	371.1	2434.9	1644.2
Airframe	(250.2)		(1084.1)
Engine	(46.9)		(169.2)
Avionics	(5.4)		(77.2)
Other GFE	(1.9)		(23.2)
Total Flyaway	(304.4)		(1353.7)
Other Weapon System	(29.4)		(94.3)
Total Other Wpn Sys	(29.4)		(94.3)
Peculiar Support	(0.0)		(96.1)
Initial Spares	(37.3)		(100.1)
Construction (MILCON)	0.0	2.8	2.8
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 73 Base-Year $	464.4	2620.1	1842.5
Escalation	114.0	5228.6	3226.5
Development (RDT&E)	(7.0)	(101.2)	(130.0)
Procurement	(107.0)	(5122.8)	(3091.9)
Construction (MILCON)	(0.0)	(4.6)	(4.6)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	578.4	7848.7	5069.0
b. Quantity --			
Development (RDT&E)	4	N/A	4
Procurement	70	377	228
Total	74	377	232

11c. Total Program Cost and Quantity (Cont'd):

c. Foreign Military Sales --
None

d. Nuclear Costs --
None

e. References --

Development Estimate:
Development Concept Paper (DCP) #94, dated 25 April 1973, subject "CH-53E Prototype Development Approval" as amended by Decision Coordinating Paper (DCP) #94, dated 14 February 1978, subject "CH-53E Production Approval".

Approved Program:
NAE Approved Acquisition Program Baseline dated 17 October 1990.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	5069.0	5109.1	5069.0
(2) Quantity	232	234	232
(3) Unit Cost	21.849	21.834	21.849
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	501.9	501.9	515.0
Less CY Adv Proc	32.0	32.0	48.6
Plus PY Adv Proc	84.4	84.4	32.0
Net Total	554.3	554.3	498.4
(2) Quantity	20	20	20
(3) Unit Cost	27.715	27.715	24.920

R&D units are fully configured and part of the inventory objective.

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	100.3	478.1	0.0	578.4
Previous Changes:				
Economic	+6.7	+167.3	-	+174.0
Quantity	-	+2888.3	-	+2888.3
Schedule	+1.5	+223.6	-	+225.1
Engineering	+162.7	+205.6	-	+368.3
Estimating	+36.1	+297.3	+0.2	+333.6
Other	+3.0	-	-	+3.0
Support	+18.6	+512.6	+7.2	+538.4
Subtotal	+228.6	+4294.7	+7.4	+4530.7
Current Changes:				
Economic	-1.1	-49.9	-0.2	-51.2
Quantity	-	-19.5	-	-19.5
Schedule	-	+1.5	-	+1.5
Engineering	-	-20.0	-	-20.0
Estimating	-2.3	-52.9	+0.2	-55.0
Other	-	-	-	-
Support	-	+104.1	-	+104.1
Subtotal	-3.4	-36.7	-	-40.1
Total Changes	+225.2	+4258.0	+7.4	+4490.6
Current Estimate	325.5	4736.1	7.4	5069.0

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1973 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	93.3	371.1	0.0	464.4
Previous Changes:				
Quantity	-	+999.3	-	+999.3
Schedule	+1.6	-17.2	-	-15.6
Engineering	+77.1	-123.6	-	-46.5
Estimating	+11.8	+212.7	+0.2	+224.7
Other	+2.4	-	-	+2.4
Support	+10.5	+199.0	+2.6	+212.1
Subtotal	+103.4	+1270.2	+2.8	+1376.4
Current Changes:				
Quantity	-	-4.9	-	-4.9
Schedule	-	-	-	-
Engineering	-	-7.0	-	-7.0
Estimating	-1.2	-10.0	-	-11.2
Other	-	-	-	-
Support	-	+24.8	-	+24.8
Subtotal	-1.2	+2.9	-	+1.7
Total Changes	+102.2	+1273.1	+2.8	+1378.1
Current Estimate	195.5	1644.2	2.8	1842.5

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Schedule: Extended RDT&E beyond FY 76 and restructured development effort.

Engineering: Increased requirement for Transmission Development Program, development of Digital Automatic Flight Control System, completion of developmental derived improvements, completion of design improvements, and design and development of AMCM configurations, development of all composite main rotor blades to replace titanium spar blades.

Estimating: Refinement of R&D estimates and revised estimates for development of Composite Main Rotor Blade and

13b. Cost Variance Analysis (Cont'd):

	configuration enhancements including system safety.
Other:	Cost overrun and award of contract incentive.
Support:	Increase in BIS and OPEVAL support, first article of OFT visual system and peculiar training equipment, and support of AMCM design, development, and test and evaluation.

PROCUREMENT

Economic:	Revised escalation indices. Adjustment for program change related escalation.
Quantity:	Reduction of 70 to 49 aircraft, increase from 49 to 126 aircraft, increase from 126 to 160 aircraft, decrease from 160 to 153 aircraft, decrease from 153 to 149 aircraft, increase from 149 to 152 aircraft, increase from 152 to 377 aircraft, adjustment of category costs, and decrease from 377 to 230 aircraft.
Schedule:	Production delay resulting from development stretchout and numerous production changes with net result of stretchout of procurement. Decrease costs due to program acceleration and revised schedule. Adjustment of costs for increases since the baseline associated with the quantity reduction.
Engineering:	Design changes in airframe, increase in production nonrecurring costs, AMCM configuration changes and tooling refurbishment, configuration change for Helicopter Night Vision Systems. Adjustment of costs associated with quantity reduction of 147 aircraft.
Estimating:	Revised production estimates based on past experience and new data from contractors, revised estimates in flyaway to reflect multiyear procurement, new vendor airframe estimates, and adjustments for changes in prior year escalation rates, as well as replacement and refurbishment of aircraft tooling. Adjustment for current and prior year offset and adjustment of non-recurring costs to decrease out-year requirements and add costs for additional tooling for production acceleration. Adjustment of costs associated with quantity reduction of 147 aircraft.
Support:	Increased support requirements for PGSE, training and other support and spares due to aircraft quantity changes, revised estimates in support and spares for Helicopter Night Vision Systems. Decreased requirements for support and spares associated with reduction of 147 aircraft.

13b. Cost Variance Analysis (Cont'd):

MILCON
Estimating: Adjustment for current and prior escalation indices.
Support: Construction of composite trainer buildings.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	-1.1
Adjustment for current and prior inflation offset (Estimating)	0.3	0.9
Reductions for escalation and realignment of requirements (Estimating)	-1.5	-3.2
Total Changes	-1.2	-3.4

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-43.1
Adjustment for program change related escalation for negative changes (Economic)	N/A	-6.8
Adjustment for current and prior inflation offset (Estimating)	5.2	21.8
Reduction of two aircraft (Quantity)	-4.9	-19.5
Allocation of cost increases since the baseline (Engineering)	-7.0	-20.0
Correction of previous categorization (Estimating)	-2.3	-6.9
(Support)	2.3	6.9
Additional requirement for non-recurring cost (Estimating)	1.6	5.4
Refinement of estimate to reflect change in program requirements (Estimating)	-14.5	-73.2
Delay of FY91 buy to FY92 (Schedule)	N/A	1.5
Increase estimate for peculiar support equipment and other weapon systems costs (Support)	22.5	97.2
Total Changes	2.9	-36.7
(3) MILCON		
Revised escalation indices (Economic)	N/A	-0.2
Adjustment for current and prior inflation offset (Estimating)	--	0.2
Total Changes	--	--

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
7.816	0.529	7.043	0.977	1.501	1.201	0.013	2.769	14.033	21.849

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

FY 90 AIRFRAME::

SIKORSKY AIRCRAFT, STRATFORD, CT
N00019-89-C-0203, FFP
Award: September 27, 1990
Definitized: January 16, 1991

Initial Contract Price		
Target	Ceiling	Qty
$164.0	$0.0	9

Current Contract Price		
Target	Ceiling	Qty
$164.0	$0.0	9

Estimated Price At Completion	
Contractor	Program Manager
$164.0	$164.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for this FFP contract.

ENGINES::

General Electric, West Lynn, MA
N00019-86-C-0214, FFP
Award: September 30, 1987
Definitized: September 30, 1987

Initial Contract Price		
Target	Ceiling	Qty
$72.3	$0.0	90

Current Contract Price		
Target	Ceiling	Qty
$72.3	$0.0	90

Estimated Price At Completion	
Contractor	Program Manager
$72.3	$72.3

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for this FFP contract.

This is the last time this contract will be reported. Contract 100% complete.

AIRFRAME:
UTC (SIKORSKY), STRATFORD, CT
N00019-90-C-0033, FFP
Award: February 6, 1991
Definitized: December 30, 1991

Initial Contract Price		
Target	Ceiling	Qty
$261.0	$261.0	14

Current Contract Price		
Target	Ceiling	Qty
$261.0	$261.0	14

Estimated Price At Completion	
Contractor	Program Manager
$261.0	$261.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required on this FFP contact.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 87.0% (20 yrs/23 yrs)

(2) Percent Program Cost Appropriated: 78.2% ($3966.2 / $5069.0)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY73-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-95)	Total
RDT&E	292.6	9.2	12.5	11.2	325.5
Procurement	3155.1	501.9	514.9	564.2	4736.1
MILCON	7.4	-	-	-	7.4
O&M	-	-	-	-	-
Total	3455.1	511.1	527.4	575.4	5069.0

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY73 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1973				14.0	14.6	14.6	14.6	4.3
1974				26.8	30.3	30.3	30.3	8.0
1975				38.2	47.0	47.0	47.0	10.9
1976				9.6	12.5	12.5	12.5	6.6
197T				16.0	21.7	21.7	21.7	2.9
1977				8.5	11.9	11.9	11.9	2.6
1978				13.6	20.4	20.4	20.4	6.8
1979				0.2	0.4	0.4	0.4	8.4

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY73 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1980				7.9	14.5	14.5	14.5	10.5
1981				4.0	8.0	8.0	8.0	10.6
1982				5.6	11.8	11.8	11.8	7.6
1983				6.7	14.7	14.7	14.7	4.9
1984				12.6	28.7	28.7	28.7	3.8
1985				4.9	11.5	11.5	11.5	3.4
1986				0.8	1.9	1.9	1.9	2.8
1987				1.4	3.6	3.6	3.6	2.7
1988				4.0	10.4	10.4	8.1	3.0
1989				2.2	5.9	5.9	3.9	4.2
1990				1.8	5.1	5.0	4.2	4.0
1991				6.1	17.7	17.7	8.4	3.9
1992				3.1	9.2	6.5	2.1	3.1
1993				4.1	12.5			3.3
1994				3.4	11.2			3.3
Subtot	4			195.5	325.5	299.0	280.2	

C/MH-53E, December 31, 1991

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY73 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1506 Aircraft Procurement, Navy								
1977	6	23.6	48.6	81.7	120.4	118.7	118.7	3.8
1978								
1979	14	1.9	76.2	104.2	188.3	188.3	188.3	8.7
1980	13		82.2	104.8	211.3	211.3	211.3	11.8
1981	14		80.5	99.1	222.5	222.6	222.6	11.6
1982	14		73.8	92.9	226.4	226.5	226.5	14.3
1983	11	5.3	56.3	85.3	221.2	221.2	221.2	9.0
1984	11	2.2	52.7	72.7	196.0	196.0	196.0	8.0
1985	10	11.9	58.3	89.7	249.0	249.0	249.0	3.4
1986	14	1.0	77.2	93.3	266.8	266.8	266.8	2.8
1987	14		65.0	77.2	228.5	228.6	228.6	2.7
1988	14	2.9	53.0	78.5	242.4	242.6	232.9	3.0
1989	14	0.7	59.5	72.4	232.4	231.0	212.5	4.2
1990	9		58.0	67.6	225.0	205.4	27.4	4.0
1991			12.2	12.5	43.0	43.0	19.0	3.9
1992	16		85.4	105.0	372.9	231.8	78.3	3.1
1993	20		135.7	140.4	514.9			3.3
1994	20		118.3	136.2	515.8			3.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY73 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
1995				12.4	48.4			3.3
Subtot	214	49.5	1192.9	1525.9	4325.2	3082.8	2699.1	
Total Then-Year Dollars reflect Amended Budget Submission								
Appropriation: 1205 Military Construction, Navy								
1983				0.4	0.8	0.8	0.8	4.9
1984								
1985								
1986				1.3	3.4	3.4	3.4	2.8
1987								
1988				1.1	3.2	3.2	3.2	3.0
Subtot				2.8	7.4	7.4	7.4	
Navy	218	49.5	1192.9	1724.2	4658.1	3389.2	2986.7	
Appropriation: 0350 National Guard & Reserve Equipm,Defense								
1991	10		80.2	82.0	281.9	7.7		3.9
1992	4		31.1	36.3	129.0			3.1
Subtot	14		111.3	118.3	410.9	7.7		

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY73 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 0350 National Guard & Reserve Equipm,Defense (Cont'd)								
DoD	14		111.3	118.3	410.9	7.7		
Grand Total	232	49.5	1304.2	1842.5	5069.0	3396.9	2986.7	

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1976	5	0	0	0
197T	0	0	0	0
1977	10	6	6	14
1978	18	0	0	24
1979	20	14	14	24
1980	17	15	13	24
1981	0	14	14	24
1982	0	0	14	24
1983	0	0	11	24
1984	0	0	11	24

17a. **Production Rate Data (Cont'd):**

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1985	0	0	10	24
1986	0	0	14	24
1987	0	0	14	0
1988	0	0	14	0
1989	0	0	14	0
1990	0	0	9	0
1991	0	0	10	0
1992	0	0	20	0
1993	0	0	20	0
1994	0	0	20	0

The attainment of the maximum economic rate is limited by other customer buys.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	476.0	+1366.5	1842.5	+79.5	1763.0
(TY $)	768.5	+4300.5	5069.0	+467.3	4601.7
PAUC Cost (BY $)	9.714	-1.772	7.942	+0.343	7.599
(TY $)	15.684	6.165	21.849	+2.014	19.835

17c. Production Rate Data (Cont'd):

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	FEB 78	0	FEB 78	N/A	FEB 78
Duration (in MON)	43	179	222	95	127
End Date(MON YY)	SEP 81	179	AUG 96	N/A	SEP 88

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	4/4
Procurement	155/155

e. Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 49 - @ Peak Rate: 2.0/mo			
FY 78 Base-Year $	8.400	6.600	9.300
Then Year $	9.900	17.700	0.000
@ Qty 0 (1st three years) - @ Peak Rate: 0.0/mo			
FY 78 Base-Year $	0.000	0.000	0.000
Then Year $	0.000	0.000	0.000

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The concept of operation is a 16 heavy lift helicopter squadron flying each helicopter 420 hours per year. The costs are the direct costs to support the primary personnel and to operate the aircraft. The depot cost is a summary cost which includes airframe and engine overhaul and component maintenance and repair. The sustaining investment consists primarily of replenishment spares and repair parts. Indirect costs consists of personnel support and the acquisition and training of program personnel. No antecedent system exists for use in comparing O&S costs.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1973 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per CH/MH-53E SQUADRON	Avg Annual Cost Per (Antecedent)
PERSONNEL	4.0	N/A
O&S CONSUMABLES	0.9	N/A
DEPOT MAINTENANCE	1.5	N/A
SUSTAINING INVESTMENT	0.5	N/A
INDIRECT COSTS	0.8	N/A
Total	7.7	N/A

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&MN	30.8	3.6	3.8	---	38.2
DBOF	0.8	0.1	0.1	---	1.0
Total	31.6	3.7	3.9	---	39.2

18b. Estimates revised 20 March 1991 for CH-53 aircraft and 10 Jul 91 for the MH-53.

18c. FY 1991 and Prior (O&MN) reflects a correction of December 1991 SAR data.

N-18 F-14D

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91-1318

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: F-14D TOMCAT

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
   F-14D TOMCAT

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**
   F-14 PROGRAM OFFICE (PMA-241) — CAPT R.D. EVERT
   TACTICAL AIRCRAFT PROGRAM — Assigned: May 2, 1991
   WASHINGTON, DC 20361-1241 — AV 222-8284 COMM (703) 692-8284

4. (U) **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 0205667N Project W1408
   PROCUREMENT:
   APPN 1506 ICN 0140 (Navy)
   APPN 1506 ICN 0141 (Navy)
   MILCON:
   PE 0204144N

AS AMENDED
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5. (U) **Related Programs**:
F-14A, A-6, EA-6B, E-2C, C-2 (All Grumman Aero Corp produced aircraft), ASPJ, JTIDS and AIM-54A/C PHOENIX Missile.

6. (U) **Mission and Description**:
The F-14D is a twin-engine, two place, tandem seat variable-sweep wing, supersonic fighter capable of engaging multiple targets simultaneously from sea level to over 80,000 feet. The F-14D will have an effective air-to-ground capability with the addition of MK-80 series bombs and HARM missiles. The F-14D includes the same B upgraded engines (F110-GE-400) plus digital radar (APG-71), and digital avionics systems incorporating commonality with F/A-18, AV-8B and other Navy and Air Force platforms. The F-14D/PHOENIX weapon system with its long range, simultaneous multiple target engagement capability provides unequalled capabilities to perform the maritime air superiority mission. The F-14D will have superior beyond visual range kill capability and superior close-in visual dogfighter. The F-14D presently carries PHOENIX, SPARROW and SIDEWINDER missiles, (AMRAAM and AAAM are follow-on's) as well as 20mm M-61A1 cannon and MK-80 series bombs. The incorporation of the Infrared Search and Track (IRST) and the Television Camera Set (TCS) will provide the needed passive air-to-air capabilities. In addition, the F-14D will incorporate the latest communications and electronic warfare capabilities including ASPJ, JTIDS, and Have Quick II.

7. (U) **Program Highlights**:
a. (U) Significant Historical Developments --
On December 9,1982, the Navy Decision Resource Board (DRB) determined an upgrade to the F-14A, later designated the F-14D, to be the most cost effective solution for the Navy's anti-air warfare operational requirement. The decision was confirmed by a SECNAV memorandum of July 6, 1983, which delineated required capabilities for the upgraded F-14. The full scale development effort, which began on 31 July 1984, was conducted under a firm-fixed price contract with Grumman Corporation. This program called for production to commence on the F-14D in late FY88. On 17 September 1986 the Secretary of the Navy directed that the procurement of new production F-14D's would be supplemented with F-14A's remanufactured into F-14D's. The current program procures 37 new production F-14D's and 18 remanufactured F-14D's. The remanufacture program will have multiple sources with effort competed between Grumman and the Naval Aviation Depot. Avionics and radar development operational testing began in August 1987. The TA-3B/APG-71 radar test bed concluded Navy "Quicklook" evaluation on 12 December 1987. The first F-14D prototype aircraft was delivered to the Navy 23 November 1987 and completed 12 test flights assessing the avionics systems. Results of T&E were favorable. The Navy and Grumman definitized the settlement of Grumman's request for equitable adjustment on 01 February 1988. A Navy decision to proceed into FY-88 production was made at the Navy

7a. (U) **Program Highlights (Cont'd)**:

Program Decision Meeting (NPDM) in March of 1988. Pre-deployment Update (PDU) was initiated and contracted for in 1988. PDU includes integration of AMRAAM, air-to-ground bombs, fighter-to-fighter data link and radar improvements coincident with the first F-14D deployment. A second NPDM was held in October 1988. FY-89 production, long lead authorization for FY-90 and the continuation of Infrared Search and Track (IRST) full scale development was approved. Developmental and operational tests (DT-IIA, OT-IIA, DT-IIB, OT-IIB, and DT-IIC) were successfully conducted. The results of the tests were favorable and OPTEVFOR recommended approval of limited rate production. In accordance with Congressional direction, the F-14D new production after the FY90 procurement. In February 1991 the Assistant Secretary of the Navy (Research, Development, & Acquisition) with concurrence of the Secretary of the Navy directed the termination of the F-14D(R) program. On 5 March 1991 Congress adopted an amendment for emergency supplemental appropriation. Included in the language were funds for Desert Storm and in section 202, direction was given to obligate the funds appropriated for 12 F-14D(R) aircraft in FY91 no later than 30 days after enactment of this bill. OPEVAL was concluded 14 December 1990. The FY92/93 President's Budget contains no funding for either F-14D new or remanufactured aircraft. The FY91 and FY92 budget contains funds for production line shutdown and support closeout costs. The December 1990 SAR reflected a Program Acquisition Unit Cost (PAUC) breach of 125.11% due to termination of the F-14D program after 1990. The June 1991 SAR reflected a Current Procurement Unit Cost (CPUC) increase of 22.9% and a six month slip in Full Production Approval (NPDM IIIB).

b. (U) Significant Developments Since Last Report -- Full Production Approval (NPDM IIIB) was deleted from the F-14D program milestones and replaced with Limited Production Approval (NPDM IIIA-3). The final procurement of F-14D(R) aircraft was approved 2 December 1991 at NPDM IIIA-3.

The F-14D is expected to satisfy the mission requirement.

c. (U) Changes Since As Of Date -- None.

8. (U) **Threshold Breaches**:
There are no APB October 1991 breaches or Nunn McCurdy unit cost breaches.

9. ([redacted]) **Schedule:**

a. ([redacted]) Milestones --

	Production Estimate	Approved Program	Current Estimate
SECNAV Direction for F-14D	N/A	JUL 83	JUL 83
FSD Contract Award	JUL 84	JUL 84	JUL 84
DNSARC Review Milestone II	MAR 85	MAR 85	MAR 85
Critical Design Review (Hardware)	JUN 85	JUN 85	JUN 85
Critical Design Review (Software)	AUG 85	AUG 85	AUG 85
First F110 Test Flight	AUG 86	AUG 86	AUG 86 (Ch-1)
F-14D Advance Acquisition Contract Award	DEC 86	DEC 86	DEC 86 (Ch-1)
Pilot Production Long Lead Funding Approval	N/A	MAR 87	MAR 87
First Avionics/Radar Flight	MAR 87	JAN 88	JAN 88
NPDM (Pilot Production Approval)	FEB 88	MAR 88	MAR 88
NPDM IIIA-1 (Limited Production Approval)	MAR 89	MAR 89	MAR 89
NPDM IIIA-2 (Limited Production Approval)	MAR 90	MAR 90	MAR 90 (Ch-1)
Deliver First Production F-14D	MAR 90	MAR 90	MAR 90
TECHEVAL	APR 90	APR 90	APR 90 (Ch-1)
OPEVAL	JUN 90	JUN 90	JUN 90 (Ch-1)
BIS 1/	SEP 90	N/A	N/A
NPDM IIIB (Full Production Approval)	OCT 90	N/A	N/A (Ch-2)
NPDM IIIA-3 (Limited Production Approval)		DEC 91	DEC 91 (Ch-2)

(b)(1)

[redacted]

([redacted]) NPDM IIIB date changed from Oct 89 to Jan 90 due to Congressional changes made to production plans. NPDM IIIB name changed to NPDM IIIA2. OPEVAL commencement delayed one month to accomodate aircraft preparation for OPEVAL subsequent to TECHEVAL. NPDM IIIC milestone name changed to NPDM IIIB. IOC changed back to original date due to Congressional increase to production quantity and resulting aircraft availability.

(b)(1)

(U) NPDM IIIA (Limited Production Approval) delay from Oct 88 to Mar 89 in order to incorporate engine gearbox restraint and to insure it was qualified for carrier operations.

(U) TECHEVAL delayed in order to correct a software discrepancy identified late in the flight test program.

(U) OPEVAL delayed as a result of delayed TECHEVAL and additional time required to complete TECHEVAL.

(U) NPDM IIIB delayed awaiting OPEVAL results.

(U) NPDM IIIB date changed from Mar 91 to Sep 91 due to Congressional changes made to production plans.

(U) Board of Inspection and Survey (BIS) has not indicated the necessity for a BIS test.

c. (U) Current Change Explanations --

ch-1 Changes based on Approved Acquisition Program Baseline dated 23 October 1991.

ch-2 NPDM IIIB (Full Production Approval) was deleted from the F-14D program milestones and replaced with NPDM IIIA-3 (Limited Production Approval). The final procurement of F-14D(R) aircraft was approved 2 December 1991 at NPDM IIIA-3.

d. (U) References --

(U) Production Estimate:
NDCP was approved by the Assistant Secretary of the Navy (RE&S), 13 Jan 1989.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 23 October 1991.

10. (U) **Performance Characteristics**:

a. (U) Performance --

	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Weight (lbs)				
Empty No Stores	41977	41700 / 41977	41865	41865
Max Takeoff	73234	72935 / 73234	73122	73122
Length (ft)	62	62 / 62	62	62

10a. [redacted] **Performance Characteristics (Cont'd):**

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Height (ft)	16	16	/ 16	16	16
Span (ft)	64.1	64.1	/ 64.1	64.1	64.1
Spotting Factor (A7=1.0)	1.55	1.55	/ 1.55	1.55	1.55
Direct Maintenance Manhours per flight hour (unscheduled 0-level)	6.4	6.4	/ 6.4	N/A	6.4
SDLM Cycle (months)	44	44	/ 44	N/A	44
MFHBF (Total Weapon	1.8	1.8	/ 1.8	N/A	1.8

(b)(1)

[redacted]

10b. [redacted] Performance Characteristics (Cont'd):

b. [redacted] Previous Change Explanations --

Changes are a result of projections based on flight test data. Estimates revised to reflect demonstrated performance.

c. [redacted] Current Change Explanations --

ch-1 Changes are based on flight test data. Estimates have been revised to reflect demonstrated performance. These values will be used in NATOPS performance.

d. [redacted] References --

([redacted]) Production Estimate:
NDCP was approved by the Assistant Secretary of the Navy (RE&S), 13 Jan 1989.

([redacted]) Approved Program:
NAE Approved Acquisition Program Baseline dated 23 October 1991.

11. ([redacted]) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. [redacted] Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	1864.9	1803.6	1836.5
Procurement	19664.7	4251.8	4308.7
Airframe	(7702.7)		(1702.9)
Engine	(2929.6)		(332.4)
Avionics	(2216.6)		(183.1)
Other Hardware	(2536.2)		(932.0)
Adv Proc Adj			(12.7)
Total Flyaway	(15385.1)		(3163.1)
Other Weapon Systems Cost	(3039.6)		(799.4)
Total Other Wpn Sys	(3039.6)		(799.4)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(1240.0)		(346.2)
Construction (MILCON)	13.9	20.3	15.5
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	21543.5	6075.7	6160.7

11a. (U) **Total Program Cost and Quantity (Cont'd):**

	Production Estimate	Approved Program	Current Estimate
Escalation	3478.4	474.1	414.1
Development (RDT&E)	(-20.8)	(-6.5)	(-6.6)
Procurement	(3498.0)	(478.5)	(420.0)
Construction (MILCON)	(1.2)	(2.1)	(0.7)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	25021.9	6549.8	6574.8

b. (U) Quantity --

Development (RDT&E)	0	N/A	0
Procurement	527	55	55
Total	527	55	55

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Production Estimate:
NDCP was approved by the Assistant Secretary of the Navy (RE&S), 13 Jan 1989.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 23 October 1991.

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(JUN 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6574.8	6597.1	6574.8
(2) Quantity	55	55	55
(3) Unit Cost	119.54	119.95	119.54

12. [redacted] **Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	202.0	202.0	143.1
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	202.0	202.0	143.1
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis**:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	1844.1	23162.7	15.1	25021.9
Previous Changes:				
Economic	+25.7	+86.3	+0.6	+112.6
Quantity	-	-12956.7	-	-12956.7
Schedule	-	-123.1	-	-123.1
Engineering	-	+1.4	-	+1.4
Estimating	-22.8	-1539.5	+4.1	-1558.2
Other	-	-	-	-
Support	-	-3900.8	-	-3900.8
Subtotal	+2.9	-18432.4	+4.7	-18424.8
Current Changes:				
Economic	-8.4	-45.7	-0.2	-54.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-8.7	-23.7	-3.4	-35.8
Other	-	-	-	-
Support	-	+67.8	-	+67.8
Subtotal	-17.1	-1.6	-3.6	-22.3
Total Changes	-14.2	-18434.0	+1.1	-18447.1
Current Estimate	1829.9	4728.7	16.2	6574.8

13a. ([redacted]) Cost Variance Analysis (Cont'd):

a. ([redacted]) Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	1864.9	19664.7	13.9	21543.5
Previous Changes:				
Quantity	-	-10528.7	-	-10528.7
Schedule	-	-99.2	-	-99.2
Engineering	-	+1.3	-	+1.3
Estimating	-22.1	-1593.4	+4.4	-1611.1
Other	-	-	-	-
Support	-	-3192.9	-	-3192.9
Subtotal	-22.1	-15412.9	+4.4	-15430.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-6.3	-1.9	-2.8	-11.0
Other	-	-	-	-
Support	-	+58.8	-	+58.8
Subtotal	-6.3	+56.9	-2.8	+47.8
Total Changes	-28.4	-15356.0	+1.6	-15382.8
Current Estimate	1836.5	4308.7	15.5	6160.7

b. ([redacted]) Previous Change Explanations --

RDT&E
Economic: Changes due to revised economic escalation rates.
Estimating: Increase due to program restructure.
Increase is a result of procurement of laboratory equipment

PROCUREMENT
Economic: Revised escalation rates.
Quantity: Decrease in number of F-14D aircraft to be procured from 527 to 419 in FY-89. Increase in FY-90 due to increase in number of F-14D aircraft to be procured from 419 to 437.
Decrease due to deletion of 394 aircraft from 437

13b. [redacted] Cost Variance Analysis (Cont'd):

to 43 and program termination in FY91.
Increase due to aircraft quantity change from 43 to 55.

Schedule: Decrease due to reduction in number of F-14D new production aircraft to be delivered to the fleet and earlier deliveries of aircraft beginning in FY-90.
Decrease is due to deletion of 394 aircraft from 437 to 43 and program termination in FY91

Engineering: Increase for engineering changes for OPEVAL deficiencies.
Decrease is a result of a kroma display engineering change.

Estimating: Increase is due to production shutdown costs, increased radar cost resulting from the nullification of the negotiated contract price, sunk costs resulting from the discontinuation of the advance acquisition contract and increased GFE costs. Additionally, there was an increase in labor and overhead rates and CFE costs. Decrease is due to the deletion of 394 aircraft from 437 to 43 and program termination in FY91. Increase is due to aircraft quantity change from 43 to 55.
Increase is the result of shutdown costs. Decrease is due to correction of previous variances to reconcile flyaway costs.

Support: Decrease reflects budget decrease to partially fund cost associated with cancellation of F-14D new production and reduction in outyear support requirements.
Decrease is due to deletion of 394 aircraft from 437 to 43 and program termination in FY91.
Increase is due to aircraft quantity change from 43 to 55 and correction of previous variances to reconcile support costs.

MILCON

Economic: Increase due to revised escalation rates.

Estimating: Decrease due to refinement of estimate.
Increase due to refinement of estimate at Oceana and Miramar.
Decrease is due to deletion of FY94 funds for the Fleet Replacement Air Maintenance Personnel (FRAMP) at Oceana.

13c. ([redacted]) Cost Variance Analysis (Cont'd):

c. ([redacted]) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Decrease is due to revised ecomonic escalation rates. (Economic)	N/A	-8.4
Decrease is due to savings resulting from the Defense Management Review (DMR). (Estimating)	-6.3	-8.7
Total Changes	-6.3	-17.1
(2) PROCUREMENT		
Decrease is due to revised economic escalation rates. (Economic)	N/A	-45.7
Decrease is due to refinement of program shutdown costs (Estimating)	-1.9	-23.7
Increase is due to payback of Iranian assets (spare engines) and additional procurement of GFE spares. (Support)	58.8	67.8
Total Changes	56.9	-1.6
(3) MILCON		
Decrease is due to revised economic escalation rates. (Economic)	N/A	-0.2
Decrease is due to deletion of FY93 funds for an addition to Weapon System Trainer Building at Oceana. (Estimating)	-2.8	-3.4
Total Changes	-2.8	-3.6

14. ([redacted]) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. ([redacted]) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Prod Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
63.22	-0.53	-8.61	-1.53	0.44	-8.88	--	3.37	-15.74	47.48

14. [redacted] **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions) (Cont'd)

b. [redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Prod Est)	Changes							PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
47.48	1.06	171.89	-2.24	0.03	-28.98	--	-69.69	72.07	119.54

15. [redacted] **Contract Information:** (Then-Year Dollars in Millions)

a. [redacted] Procurement --

[redacted] FY89 F-14D PRODUCTION:

	Initial Contract Price		
	Target	Ceiling	Qty
GRUMMAN AEROSPACE CORP, BETHPAGE, NY N00019-88-C-0025, FFP Award: May 1, 1988 Definitized: October 1, 1989	$504.3	N/A	12

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$504.3	N/A	12	$504.3	$504.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

CPR information is not required for this FFP contract.

[redacted] FY-90 F-14D/D(R) PROD:

	Initial Contract Price		
	Target	Ceiling	Qty
GRUMMAN AEROSPACE CORP, BETHPAGE, NY N00019-88-C-0276, FFP Award: January 1, 1989 Definitized: July 9, 1990	$1064.3	N/A	24

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1064.3	N/A	24	$1064.3	$1064.3

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

CPR information is not required for this FFP contract.

[redacted] FY-90 F-14D ENGINE:

	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL ELECTRIC, CINCINNATI,, OH F33657-84-C-2011, FFP Award: February 28, 1989 Definitized: April 30, 1990	$162.9	N/A	48

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$162.9	N/A	48	$162.9	$162.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

CPR information is not required for this FFP contract.

[redacted] FY-91 F-14D AIRFRAME AAC:

	Initial Contract Price		
	Target	Ceiling	Qty
GRUMMAN AEROSPACE CORP, BETHPAGE, NY N00019-90-C-0009, AAC Award: June 7, 1990 Definitized: N/A	$265.0	$0.0	12

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$265.0	$0.0	12	$265.0	$265.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)
THIS IS AN ADVANCED ACQUISITION CONTRACT (AAC). CONTRACT HAS NOT BEEN DEFINITIZED AT THIS TIME.

[redacted] FY-88 F-14D PRODUCTION:
Grumman Aerospace Corp, BETHPAGE, NY, NY
N00019-87-C-0131, FFP
Award: November 1, 1987
Definitized: September 30, 1988

Initial Contract Price		
Target	Ceiling	Qty
$431.0	$0.0	7

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$431.0	$0.0	7	$431.0	$431.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

CPR information is not required for this FFP contract.

[redacted] FY 91 F-14D Engine:
General Electric, Cincinnati, OH
N00019-89-C-0251, FFP
Award: June 7, 1990
Definitized: December 31, 1991

Initial Contract Price		
Target	Ceiling	Qty
$79.8	$0.0	24

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$79.8	$0.0	24	$79.8	$79.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for this FFP contract.

NOTE: The FY89 Engine, General Electric Corporation, F33657-84-C-2011, contract that was shown in the June 1991 SAR is no longer a major contract and has been deleted from the December 1991 SAR.

16. [redacted] **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. ([redacted]) Program Status --

(1) Percent Program Completed: 62.5% (10 yrs/16 yrs)

(2) Percent Program Cost Appropriated: 94.0% ($6182.1 / $6574.8)

b. ([redacted]) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	1491.6	115.3	101.2	121.8	1829.9
Procurement	4357.0	202.0	143.1	26.6	4728.7
MILCON	16.2	-	-	-	16.2
O&M	-	-	-	-	-
Total	5864.8	317.3	244.3	148.4	6574.8

c. ([redacted]) Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1983				7.7	6.5	6.5	6.5	4.9
1984				46.8	40.7	40.7	40.0	3.8
1985				308.6	276.7	276.7	270.2	3.4
1986				377.7	348.4	348.4	346.1	2.8
1987				275.6	261.8	261.9	259.8	2.7

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1988				170.9	167.8	167.8	161.1	3.0
1989				148.7	152.1	152.0	132.3	4.2
1990				110.7	117.8	117.5	97.4	4.0
1991				108.7	119.8	119.5	93.9	3.9
1992				101.4	115.3	61.9	1.9	3.1
1993				86.2	101.2			3.3
1994				17.3	21.0			3.3
1995				16.5	20.7			3.3
1996				15.4	19.9			3.2
1997				18.8	25.1			3.2
1998				25.5	35.1			3.2
Subtot				1836.5	1829.9	1552.9	1409.2	
Appropriation: 1506 Aircraft Procurement, Navy								
1987		131.5		133.2	131.0	131.0	131.0	2.7
1988	7	120.9	323.9	598.5	613.9	553.9	516.1	3.0
1989	12	67.2	586.1	900.4	960.5	909.4	801.4	4.2
1990	24	216.3	985.8	1389.6	1535.9	1398.5	904.4	4.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
1991	12	291.3	289.8	977.0	1115.7	513.9	124.3	3.9
1992		101.7		171.3	202.0	9.5		3.1
1993		27.4		117.5	143.1			3.3
1994		21.2		21.2	26.6			3.3
Subtot	55	977.5	2185.6	4308.7	4728.7	3516.2	2477.2	
Appropriation: 1205 Military Construction, Navy								
1988				10.8	11.0	10.6	10.6	3.0
1990				1.4	1.5	0.8	0.8	4.0
1991				3.3	3.7	0.3	0.3	3.9
Subtot				15.5	16.2	11.7	11.7	
Grand Total	55	977.5	2185.6	6160.7	6574.8	5080.8	3898.1	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1988	N/A	7	7	7
1989	N/A	12	12	12
1990	N/A	18	24	24
1991	N/A	24	12	12
1992	N/A	36	0	0
1993	N/A	60	0	0
1994	N/A	72	0	0
1995	N/A	72	0	0
1996	N/A	72	0	0
1997	N/A	77	0	0
1998	N/A	77	0	0

The F-14D program is currently at its Maximum Economic Rate.

b. [redacted] Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	21543.5	-15382.8	6160.7	0.0	6160.7
(TY $)	25021.9	-18447.1	6574.8	0.0	6574.8
PAUC Cost (BY $)	40.880	71.133	112.013	0.000	112.013
(TY $)	47.480	72.062	119.542	0.000	119.542

17c. (U) **Production Rate Data (Cont'd)**:

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (MON YY)	APR 87	0	APR 87	N/A	APR 87
Duration (in MON)	155	-93	62	0	62
End Date (MON YY)	MAR 00	-93	JUN 92	N/A	JUN 92

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	29/29

e. (U) Approved Design-to-Cost Objective -- N/A.

N/A.

18. (U) **Operating and Support Costs**:

a. (U) Assumptions and Ground Rules --

1.	System life	20 Years
2.	Utilization Rate	300 FH/YR
3.	# of Aircraft/Squadron	10
4.	Fuel $/Gallon	$1.06
5.	Gallons/FH	1297.37
6.	SDLM Interval	54.9 Months
7.	Officers/Squadron	39
8.	Enlisted/Squadron	249
9.	Antecedent Aircraft	F-14A
10.	O&S estimate date	Oct 91

18b. ([redacted]) Operating and Support Costs (Cont'd):

b. ([redacted]) Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per F-14D Squadron	Avg Annual Cost Per F-14A Squadron
PERSONNEL	8.7	10.4
O & I CONSUMABLES	7.3	6.1
DIRECT DEPOT MAINTENANCE	6.2	6.1
SUSTAINING INVESTMENT	2.4	1.8
OTHER DIRECT COSTS	0.5	0.5
INDIRECT COSTS	0.0	0.0
Total	25.1	24.9

c. ([redacted]) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&MN	16.6	8.7	4.2	---	29.5
INDUSTRIAL FUND	12.3	2.2	4.9	---	19.4
Total	28.9	10.9	9.1	---	48.9

AF-10 F-16

UNCLASSIFIED

91-102

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: F-16 FIGHTING FALCON

AS OF DATE: December 31, 1991

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1. Designation and Nomenclature (Popular Name):
F-16 Multimission Fighter (Fighting Falcon)

2. DoD Component: USAF

3. Responsible Office and Telephone Number:
AERONAUTICAL SYSTEMS DIVISION
F-16 SYSTEM PROGRAM OFFICE
WRIGHT-PATTERSON AFB
DAYTON, OH 45433-5000
BGEN RALPH H. GRAHAM
Assigned: July 1, 1989
AV 785-6151 COMM (513)255-6151

4. Program Elements/Procurement Line Items:

RDT&E:
PE 0207133F
PROCUREMENT:
APPN 3010 ICN F016AD (Air Force)

5. Related Programs:
Advanced Medium Range Air-to Air Missile (AMRAAM), Low Altitude Navigation and Targeting Infrared for Night (LANTIRN), Global Positioning System(GPS), 30MM Gun Pod (GPU 5/A), F-16 Mid-Life Update, Improved Data Modem (IDM), Seek Eagle, High Speed Antiradiation Missile (HARM), Advanced Tactical Air Reconnaissance System (ATARS), Increased Performance Engine (IPE), Night Attack, F-16 Close Air Support (CAS) Retrofit, Positive Pressure Breathing (PPB) and AN/ALR 56 Advanced Radar Warning Receiver (ARWR).

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6. Mission and Description:

The F-16 Multimission Fighter is a single engine, lightweight, high performance aircraft, powered by a 25,000 pound thrust class augmented turbofan engine. It is a tactical fighter aircraft with an air-to-air and air-to-surface, multi-role capability that can be deployed from the continental U.S. to any possible trouble area of the world with minimum enroute support and with high reliability and simplified maintenance procedures to assure successful operation under austere conditions. The F-16 Program is part of the continuing modernization of U.S. tactical fighters to reverse the upward trend in higher total investment and operating and support costs. The F-16 provides a modern, low cost addition to both active and reserve tactical fighter forces. The F-16 is employed in a complementary role to the F-15 in counter air missions, and to supplement the surface attack capabilities of the F-15E, F-117, F-111 and A-10.

7. Program Highlights:

a. Significant Historical Developments --

The F-16 received Secretary of Defense approval for program initiation in August 1971. DSARC I approval occurred in December 1974 and the full scale development contract was awarded in January 1975. The United States and four European countries (Belgium, Denmark, The Netherlands, and Norway) signed a memorandum of understanding for F-16 co-production in June 1975. Approval for long lead procurement was given at DSARC III A in January 1977 and production approval was given at DSARC III B in October 1977. The first aircraft delivery to Tactical Air Command occurred in September 1978 and Hill AFB activated the first F-16 squadron in February 1979. The USAF initial operational capability was reached in October 1980. In March 1985, the last of 785 F-16 A/B aircraft were delivered to the USAF. Program management responsibility transfer (PMRT) from Air Force Systems Command to Air Force Logistics Command, for the F-16A/B aircraft, occurred on 1 October 1985. Air Force Systems Command retains responsibility for the continuing F-16C/D program. The 2000th F-16 was delivered to the Republic of Singapore Air Force in February 1988. We formally surpassed the three-digit radar reliability threshold in terms of Mean Flight Time Between Maintenance Actions in September 1988 with a three month moving average of 103 hours. The USAF F-16 world wide fleet surpasses 2.4M flying hours and remains the safest single engine fighter in USAF history. Both the F-16A/B as well as the C/D series continue to meet or exceed operational and supportability requirements. The High-Speed Antiradiation Missile (HARM) completed phase II flight test program for the integration of HARM onto the Block 30 aircraft. The 30MM gunpod (GPU-5A) accelerated program was completed in June 1989. Integration was accomplished at the 174th TFW at Syracuse, New York, where all their F-16s are fully capable of employing the GPU-5A weapon.

7a. Program Highlights (Cont'd):

On 26 November 1990, the Defense Acquisition Board (DAB) conducted a Milestone IV review to consider the USAF request to proceed with procurement of an F-16 variant to fulfill the Close Air Support (CAS) and Battlefield Air Interdiction (BAI) missions. Based on the USAF's recommendation, the DAB decided that the F-16 C/D Block 30 aircraft will be upgraded to a CAS/BAI configuration by retrofit modifications. The planned Block 30 CAS/BAI configuration includes Improved Jam-Resistant Radio, Pave Penny Pod, Improved Data Modem, and 30MM Gun Pod. As a result of the FY91 Defense Authorization and Appropriation Acts, 1991 marked the first year in the history of the program that the heretofore stable production of the F-16 was reduced.

b. Significant Developments Since Last Report --
A total of 141 F-16C/D aircraft were delivered to the USAF during Calendar Year 1991. Pursuant to the FY92 Defense Authorization and Appropriation Acts, we are in the process of redirecting General Dynamics in regard to production rates. The F-16 production rate, previously set contractually (Multiyear III) at 402 aircraft for Fiscal Year (FY) 1990 through 1993, will be set at 330 aircraft for that period. Plans are under review to divert the 72 additional shipsets. Efficiencies previously determined for multiyear III are invalid; therefore, Multiyear efforts will be converted to annual procurement buys. The first delivery of aircraft from the Multiyear III contract began in Jun 91. Successful operational deployment of Low Altitude Night Targeting Infrared Radar Navigation (LANTIRN) pods began in Oct 91. Improved Data Modem and other Block 50 subsystems began deliveries of Engineering and Manufacturing Development units. First delivery of a Block 50 configured aircraft occurred in Oct 91 as scheduled.

The F-16 program office has implemented a single manager organization as a selected program under the Integrated Weapon System Management (IWSM) program initiative. The F-16 IWSM Concept of Operation (CONOPS) was approved by SAF/AQ on 21 Oct 91. As of this date, the F-16 program office has management responsibility for the total F-16 program, including the F-16 A/B program which was previously transferred to Ogden Air Logistics Center (Air Force Logistics Command) Hill Air Force Base UT. The F-16 System Support Director at Ogden Air Logistics Center is directly responsible to the F-16 System Program Director for overall acquisition logistics planning and sustaining system support.

The F-16 continues to meet its current mission requirements.

7c. **Program Highlights (Cont'd):**

c. Changes Since As Of Date --
The F-16 Production Contract for FY90/91 was awarded on 17 Jan 92, and the Long Lead Continuation Contract for FY92/93 was awarded on 31 Jan 92.

8. **Threshold Breaches:**
Although not a part of the F-16 APB, Multirole Fighter funds ($625M RDT&E then-year) are included in the current estimate and cause a 29.4% RDT&E APB breach. There are no Nunn-McCurdy unit cost breaches.

9. **Schedule:**

a. Milestones --

	Development Estimate	Approved Program	Current Estimate
Complete Competitive Flight Test	DEC 74	DEC 74	DEC 74
Award Development Contract	JAN 75	N/A	JAN 75
Milestone II (DSARC)	MAR 75	APR 75	APR 75
Radar Contractor Selection	JAN 76	N/A	NOV 75
First Full Scale Development Flight	DEC 76	N/A	DEC 76
Milestone IIIA (DSARC)	JAN 77	JAN 77	JAN 77
Milestone IIIB (DSARC)	SEP 77	OCT 77	OCT 77
First Flight, Production Aircraft	AUG 78	N/A	AUG 78
First F-16 A/B Delivery to TAF	SEP 78	SEP 78	SEP 78
Deliver 100th Production Aircraft to USAF	MAY 80	N/A	MAY 80
First F-16 C/D Delivery to TAF	DEC 84	DEC 84	DEC 84
F-16 A/B Program Management Responsibility Transfer (PMRT) to AFLC	N/A	OCT 85	OCT 85
First Delivery Block 40	DEC 88	DEC 88	DEC 88
Multiyear III Contract (long lead)	N/A	JUN 89	JUN 89
F-16 C/D Organic Avionics Integrated Support Facility (AISF) Capability (First 10%)	N/A	SEP 89	SEP 89
Begin MSIP I (Block 15)	FEB 80	N/A	FEB 80
Program Direction -- MSIP II	DEC 80	N/A	DEC 80
Begin MSIP II (Block 25/30)	MAY 81	N/A	MAY 81
MSIP I First Delivery	NOV 81	N/A	NOV 81
Deliver First F-16C to USAF	JUL 84	N/A	JUL 84
LANTIRN Navigation Pod Install	OCT 89	N/A	OCT 89
LANTIRN Target Pod Install	OCT 90	N/A	OCT 90
LANTIRN Navigation Pod Ready for Training	N/A	JAN 90	JAN 90

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
LANTIRN Target Pod Ready for Training	N/A	JAN 91	JAN 91
First Delivery Block 50	OCT 91	OCT 91	OCT 91
Improved Data Modem (IDM)	N/A	OCT 92	FEB 93(Ch-1)
Final Block 40	N/A	NOV 92	JUL 92
Multiyear IV Contract (long lead)	N/A	NOV 92	N/A
Last Presently Programmed F-16 C/D Delivery	N/A	SEP 99	OCT 94

NOTE: Due to program changes, there will be no Multiyear IV (Long Lead) contract.

b. Previous Change Explanations --

F-16A/B Program Management Responsibility Transfer (PMRT) date.

F-16C/D Integration of F-16C/D MSIP milestones into the December 1988 SAR.
First Delivery Block 40
LANTIRN Nav Pod Inst
LANTIRN Tgt Pod Inst
First Block 50 delivery

New milestones as reflected in the 23 Oct 89 APB.

FY89 Defense Authorization Act, specifically contained language approving the F-16 Multiyear III procurement request.

c. Current Change Explanations --

(Ch-1): Automatic Target Handoff Datalink System has been renamed Improved Data Modem (IDM).

d. References --

Development Estimate:
President's FY77 Budget dated 19 January, 1976 and DCP #143 dated 10 March 1975 (For Coordination).

Approved Program:
DAE Approved Acquisition Program Baseline dated 23 October 1989.

10. Performance Characteristics:

a. Performance --		DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
F-16 C/D						
Sustained Turn Rate, Air-to-Air Loading, 30000 ft, Max power 1/						
Mach 1.2 (deg/sec)						
Block 25/30/32	4/	5.1	5.1	/ 5.1	5.4	5.4
Block 40/42	5/	N/A	4.5	/ 4.5	N/A	N/A
Block 50/52	6/	N/A	5.1	/ 5.1	N/A	N/A
Mach 0.9 (deg/sec)						
Block 25/30/32	4/	7.3	7.3	/ 7.3	7.3	7.3
Block 40/42	5/	N/A	6.5	/ 6.5	N/A	N/A
Block 50/52	6/	N/A	6.7	/ 6.7	N/A	N/A
Sustained Turn Rate, Air-to-Ground Loading, 200 ft, MIL power 2/						
500 KCAS (deg/sec)						
Block 25/30/32	4/	6.6	6.6	/ 6.6	7.1	7.1
Block 40/42	5/	N/A	5.5	/ 5.5	N/A	N/A
Block 50/52	6/	N/A	7.5	/ 7.5	N/A	N/A
Total Mission Radius (NM)						
Air-to-Air Loading 3/						
Block 25/30/32	4/	420	480	/ 480	491	491
Block 40/42	5/	N/A	310	/ 310	N/A	N/A
Block 50/52	6/	N/A	345	/ 345	N/A	N/A
Air-to-Ground Loading Hi-Lo-Lo-Hi 2/						
Block 25/30/32	4/	465	465	/ 465	476	476
Block 40/42	5/	N/A	385	/ 385	N/A	N/A
Block 50/52	6/	N/A	385	/ 385	N/A	N/A
Air-to-Ground Loading Lo-Lo-Lo-Lo 2/						
Block 25/30/32	4/	295	295	/ 295	318	318
Block 40/42	5/	N/A	270	/ 270	N/A	N/A
Block 50/52	6/	N/A	260	/ 260	N/A	N/A
Max Speed, Air-to-Ground Loading, 200 ft, MIL power 2/						

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
With Weapons (KCAS)					
Block 25/30/32 4/	565	565	/ 565	568	568
Block 40/42 5/	N/A	555	/ 555	N/A	N/A
Block 50/52 6/	N/A	590	/ 590	N/A	N/A
Without Weapons (KCAS)					
Block 25/30/32 4/	580	580	/ 580	592	592
Block 40/42 5/	N/A	575	/ 575	N/A	N/A
Block 50/52 6/	N/A	600	/ 600	N/A	N/A
Combat Reliability Rate (Sorties flown divided by Ground aborts + Code 3 in-flight breaks)	N/A	7.5	/ 6.3	6.7	6.7
Fix Rate (Percentage of breaks repaired within 8 hrs)	N/A	90	/ 85	86	86
Mobility Requirement (C-141 equivalent loads to deploy one squadron)	N/A	12	/ 14	14	14
Manpower Requirement (manpower authorizations per aircraft)	N/A	19	/ 21.6	21	21
System Availability (measured by meeting or exceeding TAC standards as follows:) 7/					
Mission Reliability (%)	85	N/A	/ N/A	89	89
Mission Capable (MC) (%)	N/A	85	/ 85	89	90
Not Mission Capable/ Maintenance (NMCM) (%)	N/A	8	/ 8	6.4	6.4
Not Mission Capable/ Supply (NMCS) (%)	N/A	7	/ 7	6	6
Abort Rate (%)	N/A	5	/ 5	N/A	N/A

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Mean Flight Time Between Maintenance Actions (MFTBMA) (hrs)	3.0	N/A	/ N/A	3.5	3.5
Air-to-Air Mission 8/					
No./Wt. per Missile	2/195	N/A	/ N/A	2/195	2/195
No./Wt. of Ammo	500/280	N/A	/ N/A	500/280	500/280
Air-to-Air Mission 9/					
No./wt. per AIM-9L	2/195	N/A	/ N/A	2/195	2/195
No./wt. of AMRAAM	2/328	N/A	/ N/A	N/A	2/345
No./wt. of Ammo	500/280	N/A	/ N/A	500/280	500/280
Air-to-Ground Mission 10/					
No./wt. of Weapon	2/1980	N/A	/ N/A	2/1980	2/1980
No./wt. per Missile	2/195	N/A	/ N/A	2/195	2/195
No./wt. of Ammo	500/280	N/A	/ N/A	500/280	500/280
Air-to-Ground Mission 11/					
No./wt. of Weapon	4/1856	N/A	/ N/A	4/1856	4/1856
No./wt. per Missile	2/195	N/A	/ N/A	2/195	2/195
No./wt. of Ammo	500/280	N/A	/ N/A	500/280	500/280
F-16 A/B					
Sustained Turn Rate, Air-to-Air, 30,000 ft Max Power. 1/					
Mach 1.2					
Degrees per second	6.5	N/A	/ N/A	6.4	6.0
(Max Attainable Gs)	4.3	N/A	/ N/A	4.3	4.0
Mach 0.9					
Degrees per second	8.7	N/A	/ N/A	8.1	8.1
(Max Attainable Gs)	4.3	N/A	/ N/A	4.1	4.1
Mission Reliability (%)	85	N/A	/ N/A	87	87
Mean Flight Time Between Maintenance Action (MFTBMA) (hrs)	1.75	N/A	/ N/A	3.05	3.50
Air-to-Air Mission					
No./wt. per Missile	2/169	N/A	/ N/A	2/195	2/195

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
No./wt. per Ammo Air-to-Ground Mission	500/280	N/A	/ N/A	500/280	500/280
No./wt. of Weapon	2/2000	N/A	/ N/A	2/1970	2/1970
No./wt. of ECM Pod	1/392	N/A	/ N/A	1/675	1/675
Max Sustained Speed Sea Level, Air-to-Air (Mach)	1.2	N/A	/ N/A	1.2	1.2
Max Sustained Speed Altitude, Air-to-Air (Mach)	2.0	N/A	/ N/A	2.0	2.0
Design Mission Combat Radius					
Air-to-Air (NM)	600	N/A	/ N/A	655	655
Air-to-Ground (NM)	550	N/A	/ N/A	666	666

The following footnotes supplement the acronym and footnotes 1-6 listed below:

7/ Measured by meeting or exceeding TAC standards

8/ Air-to-Air Loading 1: 2 AIM-9L, 500 Rounds Ammo, 2 370 Gal Tanks

9/ Air-to-Air Loading 2: 2 AIM-9L, 500 Rounds Ammo, 2 370 Gal Tanks, 2 AMRAAM

10/ Air-to-Ground Loading 1: 2 AIM-9L, 500 Rounds Ammo, 2 370 Gal Tanks, 2 Mk-84, 1 ALQ-131

11/ Air-to-Ground Loading 2: 2 AIM-9L, 500 Rounds Ammo, 2 370 Gal Tanks 4 AGM-65/TRL, LANTIRN Pods

Acronym:

KCAS - knots calibrated air speed

1/ Full ammo,(2) AIM-9L

2/ Full ammo,(2) AIM-9L, (2) 370 Gal Tanks, (2) MK-84, (1) ALQ-131

3/ Full ammo,(2) AIM-9L, (2) 370 Gal Tanks

4/ External tank limit is 600 Knots Calibrated air Speed (KCAS)

5/ These goals reflect an additional 2770 lbs basic flight design gross weight.

6/ These goals reflect an increased thrust from the increased performance engine (IPE).

b. Previous Change Explanations --

F-16 A/B

10b. Performance Characteristics (Cont'd):

(1) Sustained turn rates changed due to increased maximum Take Off Gross Weight (TOGW) to accommodate an increase in payload requirements.

(2) Mission Reliability changed to reflect decrease in average mission duration from 3.3 hours to 2.3 hours.

(3) Mean Flight Time Between Maintenance Actions (MFTBMA) changed to reflect improved hardware reliability from active program to minimize number of parts. Current estimate changed to reflect maintenance man hour data.

(4) Air-to-Air mission was based on Development Estimate of missile weight of AIM-9J; current estimate based on AIM-9L.

(5) Air-to-Ground mission was based on Development Estimate of weapon weight; current estimate reflects measured weight. Development estimate of pod weight based on ALQ-119-3; current estimate based on ALQ-131.

(6) Design Mission Combat Radius exceed DCP goals for both Air-to-Air and Air-to-Ground in the Current Estimate and Demonstrated Performance.

(7) MFTBMA changed as Reliability performance continues to improve.

(8) Design Mission Combat Radius was inadvertently placed in the F-16C/D section in the December 31, 1986 SAR; it pertains to the F-16A/B.

F-16C/D

(1) Air-to-Air mission AMRAAM weight changed to 345 for current estimate.
(2) Mission Reliability performance continues to improve.
(3) Air-to-Ground mission improved relative to earlier analysis results.
(4) MFTBMA improvement based on DO-56/MODAS failure and maintenance manhour data.
(5) Sustained Turn Rate, Mission Reliability, Total Mission Radius, and Max Speed Air-to-Ground values resulted from completion of F-16 C/D performance flight test and analysis.
(6) Mission Reliability Data added to allow comparison with F-16 A/B.
(7) Air-to-Air total mission radius development estimate and approved program goal/threshold were changed to correct a typographical error in the DAE Baseline of 17 February 1988.
(8) New performance characteristics as reflected in the 23 Oct 89

10b. **Performance Characteristics (Cont'd):**
APB.

c. Current Change Explanations -- None.

d. References --

Development Estimate:
President's FY77 Budget dated 19 Jan 76 and DCP #143 dated 10 Mar 75 (For Coordination).

Approved Program:
DAE Approved Acquisition Program Baseline dated 23 October 1989.

11. **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

	Development Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	578.6	1078.1	1395.4
Procurement	3798.2	19556.0	14401.1
Airframe	(1375.4)		(4700.5)
Engine	(911.3)		(2676.3)
Electronics	(539.6)		(2534.4)
Armament	(171.6)		(475.2)
Sys/Proj Mgt	(33.8)		(508.3)
Total Flyaway	(3031.7)		(10894.7)
			(118.9)
Total Other Wpn Sys	(0.0)		(118.9)
Peculiar Support	(435.2)		(2163.7)
Initial Spares	(331.3)		(1223.8)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 75 Base-Year $	4376.8	20634.1	15796.5
Escalation	1677.7	31744.0	21814.7
Development (RDT&E)	(80.5)	(643.5)	(1284.0)
Procurement	(1597.2)	(31100.5)	(20530.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	6054.5	52378.1	37611.2
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	650	2999	2189
Total	650	2999	2189

Excludes eight (8) RDT&E aircraft that are not fully configured end items.

11c. Total Program Cost and Quantity (Cont'd):

c. Foreign Military Sales --
(1) *348 for European Governments (EPG) Program for a total cost of $5,351.9M (Then Year) which includes 116 @ $1,612.7M for Belgium, 58 @ $851.0M for Denmark, 102 @ $1,614.2M for the Netherlands, and 72 @ $1,274.0M for Norway.

(2) *44 follow-on aircraft @ $851.7M (Then Year) for Belgium.

(3) * 12 follow-on aircraft @ $150.1M (Then Year) for Denmark.

(4) * 111 follow-on aircraft @ $1,434.3M (Then Year) for the Netherlands.

(5) * 2 follow-on aircraft @ $25.5M (Then Year) for Norway.

(6) 174 @ $4,415.9M (Then Year) for Egypt.

(7) 210 @ $4,282.1M (Then Year) for Israel.

(8) 160 @ $757.8M (Then Year) for Korea.

(9) 120 @ $2,088.1M (Then Year) for Korean Fighter Program (KFP).

(10) 111 @ $2,441.2M (Then Year) for Pakistan.

(11) 160 @ $3,573.9M (Then Year) for Turkey.

(12) 24 @ $445.2M (Then Year) for Venezuela.

(13) 8 @ $219.8M (Then Year) for Singapore.

(14) 36 @ $786.3M (Then Year) for Thailand.

(15) 12 @ $282.0M (Then Year) for Indonesia.

(16) 12 @ $369.9M (Then Year) for Bahrain.

(17) 20 @ $385.6M (Then Year) for Portugal.

* EPG procurements are technically not Foreign Military Sales, but constitute international cooperative program with the U.S. Government.

d. Nuclear Costs --
None

11e. Total Program Cost and Quantity (Cont'd):

e. References —

Development Estimate:
President's FY77 Budget dated 19 January, 1976 and DCP #143 dated 10 March 1975 (For Coordination).

Approved Program:
DAE Approved Acquisition Program Baseline dated 23 October 1989.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	37611.2	37566.4	37611.2
(2) Quantity	2189	2189	2189
(3) Unit Cost	17.182	17.161	17.182
b. Current Procurement —	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	1243.6	1243.6	717.1
Less CY Adv Proc	78.1	78.1	0.0
Plus PY Adv Proc	201.8	201.8	125.0
Net Total	1367.3	1367.3	842.1
(2) Quantity	48	48	24
(3) Unit Cost	28.485	28.485	35.088

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	659.1	5395.4	0.0	6054.5
Previous Changes:				
Economic	+71.5	+118.2	-	+189.7
Quantity	-	+13958.8	-	+13958.8
Schedule	+0.1	+2305.4	-	+2305.5
Engineering	+1589.1	+8246.4	-	+9835.5
Estimating	+105.6	-2101.2	-	-1995.6
Other	+20.6	+35.8	-	+56.4
Support	+154.9	+7006.7	-	+7161.6
Subtotal	+1941.8	+29570.1	-	+31511.9
Current Changes:				
Economic	-27.1	-161.6	-	-188.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+105.6	+119.0	-	+224.6
Other	-	-	-	-
Support	-	+8.9	-	+8.9
Subtotal	+78.5	-33.7	-	+44.8
Total Changes	+2020.3	+29536.4	-	+31556.7
Current Estimate	2679.4	34931.8	-	37611.2

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	578.6	3798.2	0.0	4376.8
Previous Changes:				
Quantity	-	+5706.3	-	+5706.3
Schedule	-	+200.7	-	+200.7
Engineering	+646.3	+2813.0	-	+3459.3
Estimating	+15.8	-924.4	-	-908.6
Other	+15.5	+24.6	-	+40.1
Support	+101.0	+2739.8	-	+2840.8
Subtotal	+778.6	+10560.0	-	+11338.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+38.2	+42.8	-	+81.0
Other	-	-	-	-
Support	-	+0.1	-	+0.1
Subtotal	+38.2	+42.9	-	+81.1
Total Changes	+816.8	+10602.9	-	+11419.7
Current Estimate	1395.4	14401.1	-	15796.5

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Schedule: Change Schedule.

Engineering: Added capability (Improved radar, Advanced IFF, AMRAAM integration) and development of F-16 A/B Mid-life Update (MLU), F-16 C/D CAS Retrofit Kits, F-16 Core Upgrades, follow-on multirole fighter, probe and drogue aerial refueling capability, and a Close Air Support/Battlefield Air Interdiction (CAS/BAI) retrofit kit.

Estimating: Refinement of estimates.

Other: Congressional action on ICS, CIP, and FOT&E Funding.

13b. Cost Variance Analysis (Cont'd):

Support: Development of AIS.

PROCUREMENT

Economic: Revised escalation indices and economic impact of quantity reductions.

Quantity: Addition of 1539 aircraft.

Schedule: Stretchout of FY82-85 and FY91-93 procurement and associated impact of quantity changes.

Engineering: Production incorporation of added capabilities (AMRAAM, LANTIRN, Improved RWR) and associated impact of quantity changes.

Estimating: Flyaway cost re-estimates; three multiyear procurements and associated impact of quantity changes; re-estimate of Block 40 tasks; Costs of restructure of FY90-93 contract to reflect 270 aircraft quantity reduction; Grassroots re-estimate of airframe cost, and adjustment for prior year escalation.

Other: Potential contract award fees.

Support: Increased support for added aircraft and capability enhancements; adjustment for prior year escalation for support elements, increased weapons system training equipment requirements, refinement of other peculiar support cost and re-estimate of initial spares requirements.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices. (Economic)	N/A	-27.1
Re-estimate of F-16 Core Upgrades. (Estimating)	42.5	117.5
Re-estimate for development of multirole follow-on fighter. (Estimating)	-7.4	-22.2
Refinement of F-16 A/B Mid-Life Update (MLU) retrofit kit development estimate. (Estimating)	1.0	4.4
Re-estimate of test and mission requirements. (Estimating)	0.8	2.6
Adjustment for current and prior year escalation. (Estimating)	1.3	3.3
Total Changes	38.2	78.5

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised economic escalation indices. (Economic)	N/A	-161.6
Grassroots re-estimate of flyaway cost. (Estimating)	6.2	9.6
Adjustment for current and prior year escalation for flyaway elements. (Estimating)	36.6	109.4
Adjustment for current and prior year escalation for support elements. (Support)	10.1	30.5
Transfer of Interim Contractor Support (ICS) costs from O&M to reflect total weapon system support cost. (Support)	16.2	48.8
Refinement of peculiar support costs. (Support)	-35.7	-100.7
Re-estimate of initial spares requirements. (Support)	9.5	30.3
Total Changes	42.9	-33.7

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
9.315	--	-0.172	1.053	4.493	-0.809	0.026	3.276	7.867	17.182

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

AIS MULTIYEAR II:	Initial Contract Price Target	Ceiling	Qty
General Dynamics Corp., Fort Worth, TX F33657-84-C-0247, FPI Award: N/A Definitized: September 1, 1987	$440.3	$482.4	29

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$950.0	$1040.1	29	$956.4	$973.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-11.7	$-8.5
Cumulative Variances To Date (10/27/91)	$-34.1	$-13.3
Net Change	$-22.4	$-4.8

Explanation of Change:

This is the FPI portion of Contract F33657-84-C-0247 for procurement of the 29.5 Avionics Intermediate Shop (AIS) to support the aircraft buys on the FFP contract. The increase in target price (+$10.7M) and ceiling (+$17.6M) was due to the authorization/repricing of nine (9) CCPS/ECPS. The CCPS/ECPS for incorporation of block 40 initiatives, Westinghouse/Litton Special Repair Activity (SRA) for MYIII, Organizational & Intermediate (O&I) and depot support equipment accounted for a majority of the change. The unfavorable cost variance increase of $22.4M was due to greater than anticipated complexity in the structure test WBS element, incorporation of block 40 initiatives, increased expenditures by General Dynamics Electronics in the production support for kitting and factory control systems tasks, and the depot support equipment WBS element. In addition, several problems were experienced in the mission planning system. Also the unsteady transonic wind tunnel tests on the F-16 semi-span wing model contributed as well. The unfavorable schedule variance increase of $4.8M was due to behind schedule requisitioning of equipment from inventory in the O&I kits WBS element and delayed issuance of parts at GD/Electronics. Schedule recovery has begun and no schedule impact to the program is anticipated. The increase in the estimated price at completion (+$34.9M contractor/+$42.5 program manager) was due to the authorization/repricing of the above ECPS/CCPS, increases associated with the above cost variance problem areas, and a revision of General Dynamics' overall use of management reserve for the remainder of the contract. The program manager's estimate at completion assumes a continuation of the current level of performance efficiency over the remainder of the contract. This contract is budgeted to program manager's estimate at completion.

b. Procurement —

F110 ENGINES:	Initial Contract Price		
	Target	Ceiling	Qty
General Electric Corp., Evendale, OH F33657-84-C-2011, FFP Award: February 3, 1984 Definitized: February 3, 1984	$485.7	N/A	126

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$2775.0	N/A	849	$2775.0	$2775.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

This report reflects total USAF contract. Initial contract price includes the first option only. Current contract price includes first option plus four additional options. This is a Fixed Price contract and no CPR reporting is required. The Definitized date was erroneously reported in the previous SAR. The previously reported date referred to a particular option. The new definitized date (basic contract) is February 3, 1984.

FY89 MULTIYEAR II:	Initial Contract Price		
	Target	Ceiling	Qty
General Dynamics Corp., Fort Worth, Tx F33657-84-C-0247, FFP Award: November 1, 1984 Definitized: January 1, 1989	$1261.2	N/A	180

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1249.9	N/A	180	$1249.9	$1249.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

This is an FFP contract and no CPR reporting is required. This contract is over 90% complete and will not be reported in future SARs.

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

F110 IP ENGINES:	Initial Contract Price Target	Ceiling	Qty
General Electric Corp, Evendale, OH F33657-88-C-2189, FFP Award: February 27, 1989 Definitized: February 27, 1989	$96.9	N/A	8

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$810.4	N/A	185	$810.4	$810.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

This is the first submission of this contract in the SAR, since in prior SARs it was not one of the top six active contracts. This report reflects total USAF contract. Initial contract price includes basic contract only. Current contract price includes basic contract plus 3 options. This is a Firm Fixed Price contract and no CPR reporting is required.

BLOCK 50 INTEGRATION:	Initial Contract Price Target	Ceiling	Qty
General Dynamics Corp, Fort Worth, TX F33657-89-C-0009, FPI Award: December 1, 1988 Definitized: September 1, 1990	$76.4	$80.0	N/A

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$204.0	$218.2	N/A	$203.5	$209.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-7.8	$-1.8
Cumulative Variances To Date (10/27/91)	$-13.0	$-4.6
Net Change	$-5.2	$-2.8

Explanation of Change:

The increase in target price (+$41.3M) and ceiling ($44.5M) was due to the authorization/repricing of eleven(11) OCPs. The OCPs for the development of redirected Upgraded Programmable Display Generator, system design development F-16C/D Block 50 production tape 2, and a

15. Contract Information: Cont'd (Then-Year Dollars in Millions) classified task accounted for a majority of the change. The unfavorable cost variance increase of $5.2M was due to increased use of Data Systems Division personnel to work a backlog of requested design changes and anomalies of the test stations. Loss of engineering personnel has required an increase in Data System Division support to accomplish the required tasks. In addition, higher than anticipated actual costs for proposal preparation for Modular Mission Computer and Night Attack Program Development contributed to the increase. The unfavorable schedule variance increase of $2.8M was due to the Upgraded Programmable Display Generator Preproduction hardware failing to perform to GD inspection standards. Also, problems with software and automated test procedures related to the Redirected Upgraded Programmable Display Generator hardware contributed to the increases. GD and the F-16 SPO are working with Honeywell to resolve these problems. Honeywell anticipates schedule recovery by the first quarter of calendar year 1992. In addition, in System Test and Evaluation, there are insufficient personnel for Block 50D System Integration Laboratory testing support for several key tasks. Additional personnel are to be moved to meet schedule requirements, and no impact to the total program schedule is anticipated. The increase in the estimated price at completion (+$39.9M contractor/+$44.0M program manager) was driven by the authorization/repricing of the above CCPs. The program manager's estimate discounts General Dynamics' forecasts of improved efficiency by the engineering functions for the remainder of the contract effort. This contract is budgeted to program manager's estimate at completion.

	Initial Contract Price		
FY90/91 PRODUCTION:	Target	Ceiling	Qty
General Dynamics Corp, Fort Worth, TX F33657-88-C-0037, FPIF Award: June 21, 1989 Definitized: January 17, 1992	$2068.8	$2273.3	258

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$2068.8	$2273.3	258	$2068.8	$2068.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

This is the first submission of this contract in the SAR. Contract performance data will be reported in future SARs. The contract

15. Contract Information: Cont'd (Then-Year Dollars in Millions) information represents the FY90/91 Production buy only. 21 Jun 89 represents the award date for the basic contract. The date of 17 Jan 92 represents an official change to the basic contract (P00150).

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 78.3% (18 yrs/23 yrs)

(2) Percent Program Cost Appropriated: 94.6% ($35582.6 / $37611.2)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY75-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	1413.4	158.3	183.8	923.9	2679.4
Procurement	32767.3	1243.6	717.1	203.8	34931.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	34180.7	1401.9	900.9	1127.7	37611.2

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1975				31.2	32.0	32.0	32.0	
1976				187.2	214.7	214.7	214.7	11.0
197T				57.7	69.0	69.0	69.0	5.4

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1977				211.9	256.4	256.4	256.4	2.1
1978				121.3	162.3	162.3	162.3	5.9
1979				65.8	93.6	93.6	93.6	8.4
1980				17.4	27.6	27.6	27.6	9.4
1981				24.6	43.1	43.1	43.1	11.9
1982				30.9	57.9	57.9	57.9	9.2
1983				36.2	70.9	70.9	70.9	4.9
1984				45.7	93.1	93.1	93.1	3.8
1985				43.0	90.6	90.6	90.6	3.4
1986				28.3	61.1	61.1	61.1	2.8
1987				23.3	52.0	52.0	52.0	2.7
1988				9.4	21.7	21.7	19.7	3.0
1989				10.2	24.4	24.4	23.8	4.2
1990				6.7	16.6	16.6	15.6	4.0
1991				10.2	26.4	25.1	11.3	3.9
1992				59.5	158.3	1.8	0.8	3.1
1993				66.8	183.8			3.3
1994				75.2	213.7			3.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1995				52.2	153.2			3.3
1996				75.1	227.2			3.2
1997				105.6	329.8			3.2
Subtot				1395.4	2679.4	1413.9	1395.5	
Appropriation: 3010 Aircraft Procurement, Air Force								
197T								
1977				182.2	257.6	257.6	257.6	6.2
1978	105	61.0	523.6	889.5	1385.9	1385.9	1385.9	6.6
1979	145	30.0	550.3	852.8	1434.4	1434.4	1434.4	8.7
1980	175	50.4	676.7	872.0	1641.9	1641.9	1641.9	9.7
1981	180	43.0	705.0	935.2	1918.0	1918.0	1918.0	11.9
1982	120	52.6	488.6	1021.7	2205.9	2205.9	2205.9	9.6
1983	120	187.1	527.0	895.3	2048.4	2048.4	2048.4	9.0
1984	144	69.3	644.6	969.3	2312.8	2312.8	2312.8	8.0
1985	150	141.2	695.9	1064.1	2620.8	2620.8	2620.8	3.4
1986	180	136.1	745.1	1128.1	2877.7	2877.7	2877.7	2.8
1987	180	97.0	761.5	1099.2	2912.8	2912.8	2825.7	2.7

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
1988	180	48.7	758.1	963.4	2677.2	2677.2	2493.6	3.0
1989	180	121.8	793.1	1107.2	3187.5	3187.5	2823.1	4.2
1990	150	54.5	707.6	1062.4	3157.6	3023.6	1538.5	4.0
1991	108	133.5	572.6	691.2	2128.8	1968.6	93.2	3.9
1992	48	15.6	303.2	390.9	1243.6	10.0		3.1
1993	24	20.9	179.1	218.3	717.1			3.3
1994				14.6	49.4			3.3
1995				35.1	122.8			3.3
1996				5.5	19.9			3.2
1997				3.1	11.7			3.2
Subtot	2189	1262.7	9632.0	14401.1	34931.8	32483.1	28477.5	
Grand Total	2189	1262.7	9632.0	15796.5	37611.2	33897.0	29873.0	

Obligations and expenditures reflect program office records as of 31 December 1991.

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1978	0	0	105	0
1979	0	0	145	0
1980	0	0	175	0
1981	0	0	180	0
1982	0	0	120	0
1983	0	0	120	0
1984	0	0	144	0
1985	0	0	150	0
1986	N/A	180	180	180
1987	N/A	216	180	180
1988	N/A	216	180	180
1989	N/A	216	180	180
1990	N/A	216	150	150
1991	N/A	216	108	108
1992	N/A	216	48	48
1993	N/A	216	24	24
1994	N/A	216	0	N/A
1995	N/A	0	0	N/A
1996	N/A	0	0	N/A
1997	N/A	0	0	N/A

17d. **Production Rate Data (Cont'd):**
The funded delivery period for the FY90 buy is Jun 91-Sep 92; FY91 buy is Sep 92-Jun 93; FY92 buy is Jul 93-Apr 94; and FY 93 buy is May 94-Oct 94.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	15796.5	0.0	15796.5
(TY $)	N/A	N/A	37611.2	0.0	37611.2
PAUC Cost (BY $)	N/A	N/A	7.216	0.000	7.216
(TY $)	N/A	N/A	17.182	0.000	17.182

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	FEB 87	0	FEB 87	N/A	FEB 87
Duration (in MON)	111	-19	92	0	92
End Date(MON YY)	MAY 96	-19	OCT 94	N/A	OCT 94

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	8/8
Procurement	1935/1924

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules --

The concept of operations is a 24 aircraft squadron operating at a 20 year steady state at 366 flying hours per aircraft per year. Personnel costs include personnel pay and support. Operational and support (O&S) consumables costs consist of aviation petroleum, oil and lubricants (POL). Sustaining investment costs include

18a. Operating and Support Costs (Cont'd):
replenishment spares and support/modifications. Other direct costs consist of munitions and missiles. Indirect costs are personnel acquisition training. The F-16C/D estimate is based on a Block 25B baseline. This O&S estimate was approved as part of the F-16 Annual Estimate briefed to the Aeronautical Systems Division (ASD) Deputy Chief of Staff, Financial Management and Comptroller on November 25, 1991.

b. Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per F-16 C/D Squadron	Avg Annual Cost Per F-16 A/B Squadron (Antecedent)
Personnel	31.6	31.6
O&S Consumables	8.5	8.3
Organic Depot Maintenanc	9.7	9.7
Sustaining Investment	17.5	17.5
Other Direct Costs	2.3	2.3
Indirect Costs	6.3	6.3
Total	75.9	75.7

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M (AF)	90.8	40.9	30.8	---	162.5
INDUSTRIAL FUND	1.3	0.1	11.2	---	12.6
Total	92.1	41.0	42.0	---	175.1

UNCLASSIFIED

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N-19 F/A-18 C/D

91-133 [illegible]

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: F/A-18 C/D

AS OF DATE: December 31, 1991

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AS AMENDED
FOR OPEN PUBLICATION
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. ([redacted]) Designation and Nomenclature (Popular Name):
F/A-18 Naval Strike Fighter (HORNET)

2. ([redacted]) DoD Component: Navy

3. ([redacted]) Responsible Office and Telephone Number:

F/A-18 PROGRAM OFFICE	CAPT CRAIG STEIDLE
TACTICAL AIRCRAFT PROGRAM	Assigned: June 11, 1990
WASHINGTON, DC 20361-1265	AV 222-7954 COMM (202) 692-7954

4. ([redacted]) Program Elements/Procurement Line Items:

RDT&E:
PE 0604263N, 0204136N
PROCUREMENT:
APPN 1506 ICN 0144 (Navy)
APPN 1506 ICN 0525 (Navy)
MILCON:
PE 0206496M, 0204611N

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M. Newell
Office of the Chief of
Naval Operations Dept. of the Navy

~~Classified by: OPNAVINST C5513.2B~~
~~Declassify on: OADR~~
~~Downgrade Instructions:~~

(THIS PAGE IS [redacted])

[redacted]

OASD(PA) DFOISR 92-T-0622

5. [redacted] Related Programs:
AMRAAM, ASPJ, ALR-67, LASER & IR Maverick, NACES (Ejection Seat), ALQ-126B, HARM, HARPOON, SPARROW/SIDEWINDER, SLAM, RECCE(ATARS), AV-8B, F-15, F404 Engine, Oxygen Generating System, AYK-14 (XN-6), ASN-130/139, ARC-182/210, BRU-32, and Deployable Flight Incident Recorder (DFIR).

6. [redacted] Mission and Description:
The F/A-18 Naval Strike Fighter is a twin engine, mid-wing, multi-mission tactical aircraft. The F/A-18A and C are single seat aircraft. The F/A-18B and D are dual seat. The F/A-18B is used primarily for training, but the F/A-18D replaces the USMC A-6E, OA-4, TA-4, and RF-4 aircraft in Attack, TAC, FAC, and Reconnaissance squadrons. All F/A-18s are missionized for traditional fighter and attack roles through selected use of external equipment to accomplish specific missions. Any aircraft can be quickly configured to perform either fighter or attack missions, or both, offering the operational commander more flexibility in employing his tactical aircraft in a changing scenario. The fighter missions are primarily fighter escort and fleet air defense; the attack missions are interdiction and close air support.

The Enhanced Performance Engine (EPE) will begin deliveries in 1992. In 1994, 51 two-seat USMC F/A-18s will have the provisions to accept the Advanced Tactical Air Reconnaissance System (ATARS) with the installation of a sensor pallet in place of the gun system. The ATARS suites will be delivered in 1996 and 1997, with each Marine All Weather Attack squadron (six total) receiving four ATARS suites. In the near future, the airplane's APG-65 radar will be upgraded with improved ECCM capabilities and additional new modes. The Radar Upgrade (RUG) program will begin deliveries in 1994.

7. [redacted] Program Highlights:
a. [redacted] Significant Historical Developments --
In 1975, the Navy selected a carrier capable variant of the Northrop YF-17 to satisfy its multimission strike fighter requirement. Full scale development contracts were awarded to McDonnell Douglas (MCAIR) (with Northrop as principal subcontractor) for the airframe and to General Electric for the engine. First flight occurred in November 1978. The first fleet readiness squadron (VFA-125) commenced operations two years later and the first two tactical squadrons achieved initial operational capability (IOC) in March 1983.

In February 1985, Carrier Air Wing 14 (CVW-14) on board USS Constellation (CV-64) deployed to the Western Pacific with two F/A-18 squadrons; since then the carriers Coral Sea (CV-43), Midway (CV-41), Forrestal (CV-59), Saratoga (CV-60), Independence (CV-62), Kitty Hawk (CV-63), Constellation (CV-64), America (CV-66), John F. Kennedy (CV-67), Nimitz (CVN-68), Dwight D. Eisenhower (CVN-69), Theodore

7a. [redacted] Program Highlights (Cont'd):

Roosevelt (CVN-71) and Abraham Lincoln (CVN-72) have been configured to operate the F/A-18. In 1990, the Coral Sea (CV-43) was deactivated. In 1991, the Midway (CV-41) was deactivated.

Canada, Australia, and Spain have contracted for and received a total of 285 F/A-18s. Kuwait has contracted for 40 aircraft with production underway. Switzerland has selected the F/A-18 for a 34 aircraft purchase; a letter of intent is estimated for March 1992, and a letter of offer and acceptance for June 1992.

The first major upgrade of the F/A-18, the F/A-18C (single seat) and F/A-18D (dual seat) began delivery in October 1987. This aircraft contains provisions for the Airborne Self-Protection Jammer (ASPJ), the Advanced Medium Range Air-to-Air Missile (AIM-120 AMRAAM) and the Infrared Imaging Maverick Air-to-Ground Missile (AGM-65F). The F/A-18 C/D aircraft delivered in October 1989 and subsequently are configured with an improved night attack capability featuring a Navigation Forward-Looking Infrared (NAVFLIR) pod, a raster head-up display, special cockpit lighting compatible with night vision devices, a digital color moving map and an independent multipurpose color display.

b. [redacted] Significant Developments Since Last Report -- The F/A-18 E/F program is addressed in a separate SAR.

During Operation Desert Storm four aircraft carriers (Midway, Saratoga, America and Theodore Roosevelt) and 16 Navy and Marine Corps squadrons were equipped with the F/A-18. These operations were highly successful, with the Hornets flying 10,000 sorties and 25,000 flight hours over heavily defended territory while losing only one aircraft in combat. F/A-18s shot down two MiG-21 jets and then proceeded to deliver their 8,000 pound bombloads on an enemy airfield, demonstrating the versatile capability of the strike fighter. The F/A-18 established new records in reliability, maintainability, and survivability with full mission capable rates in excess of 90%. Four Hornets were hit by surface-to-air missiles, yet all four were flying again within 36 hours.

Seven-hundred seventy-four F/A-18s had been delivered to the USN/USMC as of 31 December 1991. These include the 11 Full Scale Development (FSD) aircraft plus one replacement.

The F/A-18 continues to establish records in safety and readiness. Operational squadrons consistently maintain mission capable rates in excess of 80%.

The F/A-18 is expected to meet all mission requirements.

7b. ([redacted]) Program Highlights (Cont'd):

c. ([redacted]) Changes Since As Of Date -- None.

8. [redacted] Threshold Breaches:
There is a 7.7% procurement cost breach of the Acquisition Program Baseline (APB) dated 22 November 1991.

9. [redacted] Schedule:

a. [redacted] Milestones --

	Development Estimate	Approved Program	Current Estimate
Release of RFP	OCT 74	OCT 74	OCT 74
Award Adv. Engineer. Contracts			
General Electric (Engine)	MAY 75	MAY 75	MAY 75
McDonnell Douglas (Airframe)	MAY 75	MAY 75	MAY 75
Award Full Scale Dev. Contract General Electric (Engine)	NOV 75	NOV 75	NOV 75
Milestone II (DSARC)	DEC 75	DEC 75	DEC 75
Award Full Scale Dev. Contract McDonnell Douglas (Airframe)	JAN 76	JAN 76	JAN 76
First Flight	JUL 78	NOV 78	NOV 78
OSD Review - DSARC Principals	N/A	APR 80	APR 80
Fighter Missions IOT&E	OCT 80	FEB 81	FEB 81
Milestone III (DSARC) Fighter	N/A	JUN 81	JUN 81
OSD Limited Program Review	N/A	JUN 81	JUN 81
Begin Fighter Board of Inspections Survey Trials	NOV 80	MAR 82	MAR 82
OPEVAL Completion	DEC 81	OCT 82	OCT 82
Milestone III (DSARC) Attack	N/A	DEC 82	DEC 82
End Fighter Board of Inspections Survey Trials	MAY 82	FEB 83	FEB 83
IOC, First F/A-18 Squadron	SEP 82	MAR 83	MAR 83
Navy Support Date	N/A	OCT 83	OCT 83
DSARC Principals Review	N/A	MAR 85	MAR 85
RADAR UPGRADE (RUG)	N/A		
Milestone II	N/A	JUL 89	JUL 89
Milestone IIIA1	N/A	JUN 91	JUN 91(Ch-1)
Milestone IIIA2	N/A	MAR 93	MAR 93(Ch-1)
Milestone III	N/A	JUN 94	MAR 94(Ch-1)
Milestone IIIB2	N/A	N/A	MAR 95(Ch-1)

b. [redacted] Previous Change Explanations --

First Flight: Was rescheduled from Jul 78 to Sep 78 in accordance with contract definitization. First flight date was delayed from Sep 78 to Nov 78 to permit thorough evaluation of the digital fly-by-wire

9b. [redacted] Schedule (Cont'd):
flight control system.

Milestone III (DSARC IIIA): Redesignated program review - DSARC IIIA changed to OSD program review for DSARC principals.

Milestone III (DSARC IIIB): DSARC IIIB redesignated DSARC III (Fighter) and rescheduled for SEP 80 with a limited program review scheduled for Feb 81 upon completion of IOT&E. DSARC III (Attack) was scheduled for Sep 82 upon completion of OPEVAL. Changes were made based upon Program Review (April 80) and OSD Program Guidance (May 80). Decision Memorandum (17 Dec 80) established February 1981 to be the date for a Limited Program Review, which combined with the Nov 80 Program Review, constituted DSARC III (Fighter). The Limited Program Review was held in Mar 81. DSARC III (Fighter) completed as stated in 29 Jun 81 Decision Memorandum. DSARC III (Attack) was set for Fall 82 by Decision Memorandum (29 Jun 81) and completed in Dec 82.

OPEVAL Completion: Concurrent fighter and attack systems OPEVALs rescheduled for the period Sep 81 - Feb 82, to accommodate delays in contractor and DON DT&E. Results contribute to OSD Program Review scheduled for Apr 82. OPEVAL completion slipped until Aug 82, on the flight test schedule. Carrier portions of OPEVAL slipped to Oct due to availability of carrier.

End Board of Inspection and Survey Trials: Combined Fighter and Attack BIS completed in Aug 82. BIS consolidated into the minimum number of flights. Navy Technical Evaluation conducted in Mar/Apr in lieu of Initial BIS Trials. Final phase of Service Acceptance Test completed 2nd quarter, FY 83, using production aircraft.

IOC, First F/A-18 Squadron: Six month slip due to FY 79 budget decision on procurement schedule. Congressional direction to purchase additional FY 80 aircraft permitted moving Mar 83 IOC date to Sep 82. Change to Dec 82, in accordance with Weapon System Planning document of Jun 80. Aircraft delivery locations were rearranged so that 11 VMFA-314 aircraft in latest configuration would be coming off production line.

Review for DSARC Principals: OSD Program Review, scheduled for Oct 84, occurred in Mar 85, and included data on initial F/A-18 aircraft carrier workups. Operational testing results were presented to OUSDR&E in Mar 85; all requirements were met.

Radar Upgrade (RUG) milestones: As reflected in the FY 1992/93 R&D Descriptive Summary. Dec 90 SAR is the first time these milestones were reported.

9c. ([redacted]) Schedule (Cont'd):

c. ([redacted]) Current Change Explanations --

(Ch-1): Milestone IIIA1 NPDM dated June 1991.

d. ([redacted]) References --

([redacted]) Development Estimate:
DCP #141 dated 18 November 1976; OSD Program Review Memorandum, 17 March 1983

([redacted]) Approved Program:
NAE Approved Acquisition Program Baseline dated 3 July 1990.

10. ([redacted]) Performance Characteristics:

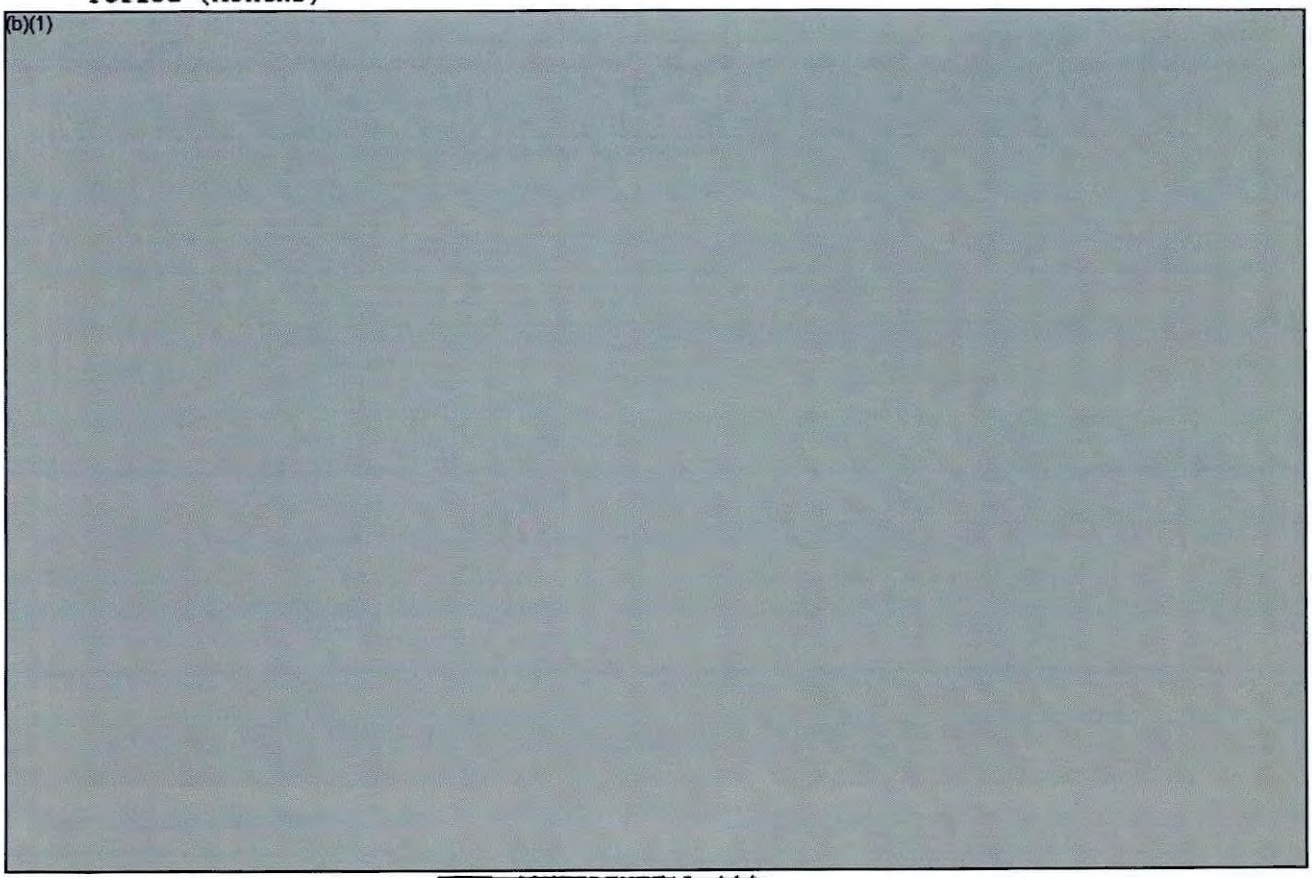
a. ([redacted]) Performance --

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Weight (lbs)						
Empty VF	21649	23951	/ 23951	23951	23951	
Empty VA	21720	23951	/ 23951	23951	23951	
(b)(1) [redacted]						
Length	56	56	/ 56	56	56	
Height	15.3	15.3	/ 15.3	15.3	15.3	
Wing Span	37.5	37.5	/ 37.5	37.5	37.5	
Spotting Factor, A-7 Equivalent	1.2	1.2	/ 1.2	1.2	1.2	
Speed At Altitude, Combat Weight (Mach)	1.7	1.7	/ 1.7	1.7	1.7	
Radius (NM)						
Fighter Escort, Internal Fuel	400	338	/ 338	338	338	
Strike Mission	550	533	/ 533	533	483/ (533)*	(CH-1)
Combat Ceiling VF (ft)						
(b)(1) [redacted]						
Military Thrust	48100	46000	/ 46000	46000	46000	
Mission Reliability VF @2500 hours	0.7	0.93	/ 0.93	.89	.93	

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
System Maintenance, VF Mean Flight Hours Between Failure, Fighter Configuration @ 2500 hours	1.4	2.0	/ 2.0	2.1	2.1
Unscheduled Direct Organizational Level Maintenance Manhours per Flight Hour, VF @ 2500 hours	8.0	5.8	/ 5.8	4.8	4.8
Maintenance Operating Men/Aircraft BIT	12	12	/ 12		12
BIT Development Completion (%)	N/A	100	/ 100	100	100
BIT False Indication Rate (%)	N/A	28	/ 28	39	28
Operating Service Period (Months)	48	48	/ 48	48	48

(b)(1)



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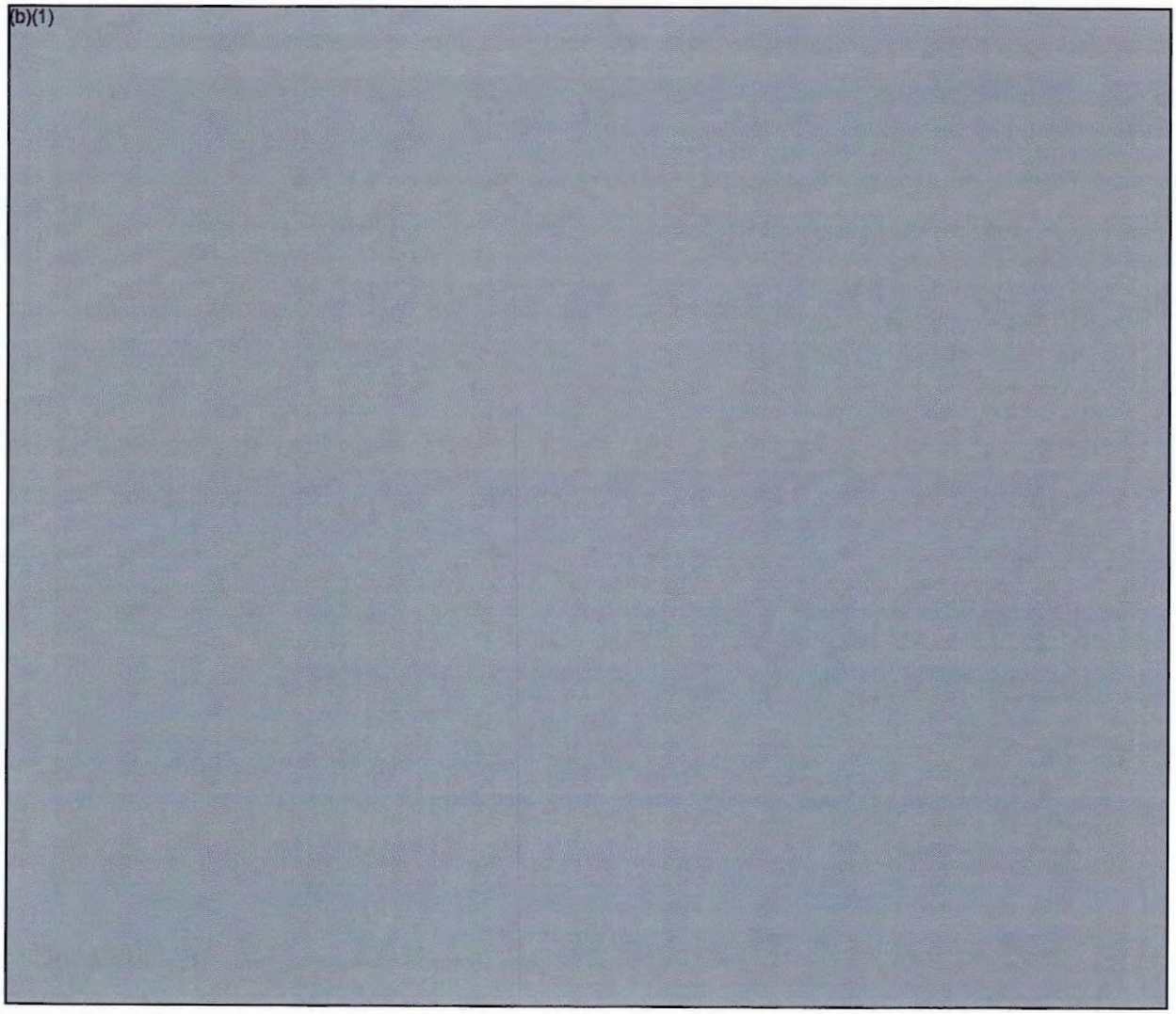

c. (U) Current Change Explanations --

(Ch-1): The current estimate of 483 is based upon "Drop tanks will be jettisoned when empty" and "No FLIR/LST Pods". The estimate of 533 includes "retaining the drop tanks" and "with FLIR/LST pods".

d. (U) References --

(U) Development Estimate:
DCP #141 dated 18 November 1976; OSD Program Review Memorandum, 17 March 1983

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 3 July 1990.

11. ([redacted]) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. ([redacted]) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	1437.7	1652.3	1720.0
Procurement	6560.9	12572.3	13542.3
Airframe	(3599.6)		(7217.7)
Engines	(1059.7)		(1584.7)
Avionics	(198.8)		(378.5)
Arms/Other GFE	(61.3)		(1616.1)
Total Flyaway	(4919.4)		(10797.0)
Total Other Wpn Sys	(517.5)		(965.0)
Total Other Wpn Sys	(517.5)		(965.0)
Peculiar Support	(610.3)		(1120.2)
Initial Spares	(513.7)		(660.1)
Construction (MILCON)	18.0	21.6	21.1
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 75 Base-Year $	8016.6	14246.2	15283.4
Escalation	4858.7	23363.4	27111.5
Development (RDT&E)	(396.7)	(751.3)	(870.5)
Procurement	(4451.7)	(22592.6)	(26223.4)
Construction (MILCON)	(10.3)	(19.5)	(17.6)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	12875.3	37609.6	42394.9

b. ([redacted]) Quantity --			
Development (RDT&E)	11	N/A	11
Procurement	800	1157	1157
Total	811	1157	1168

c. ([redacted]) Foreign Military Sales --

	Aircraft Qty	Program Cost
Spain	72	$2.339B
Australia	75	$2.803B
Kuwait	40	$1.754B

d. ([redacted]) Nuclear Costs -- None.

e. ([redacted]) References --

([redacted]) Development Estimate:
DCP #141 dated 18 November 1976; OSD Program Review Memorandum, 17 March 1983

([redacted]) Approved Program:
NAE Approved Acquisition Program Baseline dated 3 July 1990.

11e. ([redacted]) Total Program Cost and Quantity (Cont'd):

12. ([redacted]) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. [redacted] Program Acquisition	(Dec 91 SAR)	(MAR 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	42394.9	55631.6	42394.9
(2) Quantity	1168	1168	1168
(3) Unit Cost	36.297	47.630	36.297
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	2244.4	2244.4	1895.9
Less CY Adv Proc	149.5	149.5	150.3
Plus PY Adv Proc	153.3	153.3	149.5
Net Total	2248.2	2248.2	1895.1
(2) Quantity	48	48	48
(3) Unit Cost	46.838	46.838	39.481

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1834.4	11012.6	28.3	12875.3
Previous Changes:				
Economic	+190.7	+6589.0	-	+6779.7
Quantity	-	+2471.7	-	+2471.7
Schedule	+14.6	+8590.4	-0.6	+8604.4
Engineering	+255.6	+2973.6	-	+3229.2
Estimating	+291.4	+5532.4	+10.6	+5834.4
Other	+6.5	-	-	+6.5
Support	+3.0	+5859.5	-1.4	+5861.1
Subtotal	+761.8	+32016.6	+8.6	+32787.0
Current Changes:				
Economic	-2.6	-1033.2	-	-1035.8
Quantity	-	-	-	-
Schedule	-	-834.2	-	-834.2
Engineering	-	-3.1	+1.7	-1.4
Estimating	-3.1	+206.5	+0.1	+203.5
Other	-	-	-	-
Support	-	-1599.5	-	-1599.5
Subtotal	-5.7	-3263.5	+1.8	-3267.4
Total Changes	+756.1	+28753.1	+10.4	+29519.6
Current Estimate	2590.5	39765.7	38.7	42394.9

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1437.7	6560.9	18.0	8016.6
Previous Changes:				
Quantity	-	+1768.1	-	+1768.1
Schedule	+9.4	+1186.7	-0.9	+1195.2
Engineering	+110.8	+912.3	-	+1023.1
Estimating	+157.3	+2005.8	+3.8	+2166.9
Other	+4.5	-	-	+4.5
Support	+1.5	+1552.2	-0.5	+1553.2
Subtotal	+283.5	+7425.1	+2.4	+7711.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-111.7	-	-111.7
Engineering	-	-0.3	-	-0.3
Estimating	-1.2	+116.6	+0.7	+116.1
Other	-	-	-	-
Support	-	-448.3	-	-448.3
Subtotal	-1.2	-443.7	+0.7	-444.2
Total Changes	+282.3	+6981.4	+3.1	+7266.8
Current Estimate	1720.0	13542.3	21.1	15283.4

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation rates.

Schedule: Lower production build-up and extension of the radar test bed aircraft usage.

Engineering: Commonality of fighter and attack aircraft; extended testing requirements. Development and testing for the Radar Upgrade (RUG) program. Trasfer of the F/A-18 E/F program to a separate SAR.

Estimating: Revisions for budget changes, flight test costs, equipment price analysis, and reprogramming of unobligated balances. Revised to reflect prior year actuals.

13b. [redacted] Cost Variance Analysis (Cont'd):

Other: Court ruling on previous year's allowable cost to the government.

Support: Additional operational test time support.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: 566 additional aircraft; change in annual procurement. Reduction from 1366 to 1157.

Schedule: Fluctuations in production rates and final production year. Rephase and accelerate program (+57 in FY 87-90). Program stretchout (208 procured in FY 93-95). Increase FY 89 quantity by 12 and decrease FY 95 quantity by 12. Decreased FY 90-94 (from 72 to 66), increased FY 95 (from 52 to 60) and FY 96 (from 0 to 22). Aircraft procurement rephased thru FY01: FY91 from 66 to 48; FY92 from 66 to 36; FY93 from 66 to 20; FY94 from 66 to 20; FY95 from 60 to 20; FY96 from 22 to 12; FY97 from 0 to 30; FY98 thru FY00 from 0 to 48; FY01 from 0 to 16.

Engineering: Commonality, additional equipment and correction of defects, changes in procurement of two-seaters, refinements to ECP-178, reduction in two-seaters, changes in configuration (ECP-87 & GPS). Upgrade systems by replacing ASN-130 with ASN-139, ARC-182 with ARC-210, ALE-39 with the ALE-47 and replace KAPTON wire. Add weapons capability (ECP-290), Advanced Tactical Air Reconnaissance System, Deployable Flight Incident Recorder, Enhanced Performance Engine, and Integrated Night Vision System. Configuration of the F/A-18 E/F variant and implementation of RUG and the AN/AYK-14 mission computer upgrade.

Estimating: Revised procurement strategy and program estimates based on more current information, reduced profit in outyears, removal of multi-year pricing assumptions, demonstrated contract performance, 5-yr Budget Plan, FY 88 contract settlement, reflect impact of increase to subcontractor overhead rates (above previous should cost estimates). Change in acquisition strategy from multi-year procurement to annual procurement accompanied by a loss of the projected multi-year savings. Changes in rates and overhead due to configuration changes, loss of Switzerland as a FMS customer, and McDonnell Douglas' decreased business base.

Support: Changes in projected sites, aircraft distribution,

13b. [redacted] Cost Variance Analysis (Cont'd):

increased aircraft quantity, decreased spares, adjusted allocation of support due to change in aircraft procurement schedule. Reduction in support due to some decreased requirements and a challenge to reduce costs. Increase in spares funding due to configuration changes and to maintain readiness objectives. Increase in support due to standup of a newly identified site (Cherry Point), increased support configuration changes and to maintain readiness objectives. Spares and equipment changes for new configuration items and aircraft procurement rephasing.

MILCON

Economic: Revised escalation rates.

Schedule: Facility restructuring to meet changed deliveries.

Estimating: Redistribution of requirements, updated estimates. Reduced estimate to absorb increases resulting from revised economic escalation. Update of prior years to reflect actuals.

Support: Realignment of facilities; changes in program allocation of MILCON funds.

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-2.6
Revised to reflect prior year actuals and the current Radar Upgrade (RUG) program. (Estimating)	-1.2	-3.1
Total Changes	-1.2	-5.7

13c. [redacted] Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices. (Economic)	N/A	-1033.2
Aircraft procurement rephased through FY98 instead of through FY01. (Schedule)	-111.7	-834.2
Incorporation of VECP-381 Laser Spot Tracker. (Engineering)	25.0	86.9
Deletion of LDT/SC. (Engineering)	-25.3	-90.0
Changes in rates and overhead. (Estimating)	116.6	206.5
Spares and Equipment for new configuration items and aircraft procurement rephasing. (Support)	-448.3	-1599.5
Total Changes	-443.7	-3263.5
(3) MILCON		
Rinse Unit at MCAS Kaneohe Bay, Hawaii. (Engineering)	0.7	1.7
Revised to reflect prior year actuals. (Estimating)	--	0.1
Total Changes	0.7	1.8

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
15.876	4.918	-2.738	6.653	2.764	5.169	0.006	3.649	20.421	36.297

15. [redacted] Contract Information: (Then-Year Dollars in Millions)

a.([redacted]) RDT&E --

[redacted] RADAR UPGRADE (RUG):	Initial Contract Price Target	Ceiling	Qty
MCDONNEL DOUGLAS, ST LOUIS, MO N00019-89-C-0130, FPI Award: April 30, 1990 Definitized: September 5, 1991	$223.0	$229.0	5

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$223.0	$229.0	5	$200.5	$215.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-11.4	$-7.4
Cumulative Variances To Date (11/30/91)	$-2.3	$-1.1
Net Change	$9.1	$6.3

Explanation of Change:

The November CPR analysis conducted by the NAVAIR (AIR-52433) cost analyst continues to show cost and schedule improvements. Leading unfavorable cost and schedule drivers are the Radar Receiver and the Radar Data Processor under a firm fixed price subcontract with Hughes. Continued improvement in cost/schedule performance would support a lower AIR-5243 Estimate at Completion (EAC) (currently at $215M). DPRO-MCAIR's latest surveillance report indicates a range of EACs from $204.8M to $209.6M based on October 1991 data.

b.([redacted]) Procurement --

([redacted]) FY88-95 PROD ENGINES:

	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL ELECTRIC COMPANY, LYNN, MA N00019-86-C-0247, FFP Award: April 17, 1987 Definitized: September 30, 1991	$226.8	N/A	141

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1681.8	N/A	902	$1681.8	$1681.8

CPR information is not a requirement on this FFP contract.

[redacted] FY 89 PROD AIRFRAMES:

	Initial Contract Price		
	Target	Ceiling	Qty
MCDONNELL DOUGLAS, ST LOUIS, MO N00019-88-C-0069, FFP Award: May 31, 1988 Definitized: September 28, 1989	$1521.0	N/A	84

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1557.3	N/A	84	$1557.3	$1557.3

CPR information is not a requirement on this FFP contract.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)
Increase in target due to mods added for NAVFLIR/LDTSC.

THIS IS THE FINAL REPORT, CONTRACT IS MORE THAN 90% COMPLETE.

	Initial Contract Price		
(U) FY 90 PROD AIRFRAMES:	Target	Ceiling	Qty
MCDONNELL DOUGLAS, ST LOUIS, MO N00019-88-C-0289, FFP Award: August 25, 1989 Definitized: June 29, 1990	$1383.0	N/A	66

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1383.0	N/A	66	$1383.0	$1383.0

CPR information is not a requirement on this FFP contract.

	Initial Contract Price		
(U) FY91 PROD AIRFRAMES:	Target	Ceiling	Qty
MCDONNELL DOUGLAS, ST LOUIS, MO N00019-90-C-0010, FFP Award: January 1, 1990 Definitized: September 30, 1991	$1047.8	N/A	48

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1047.8	N/A	48	$1047.8	$1047.8

CPR information is not a requirement on this FFP contract.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 75.0% (18 yrs/24 yrs)

(2) Percent Program Cost Appropriated: 74.5% ($31582.0 / $42394.9)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY75-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	2479.7	49.6	39.9	21.3	2590.5
Procurement	26769.6	2244.4	1895.9	8855.8	39765.7
MILCON	38.7	-	-	-	38.7
O&M	-	-	-	-	-
Total	29288.0	2294.0	1935.8	8877.1	42394.9

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1975				19.5	20.0	20.0	20.0	10.9
1976				100.1	110.4	110.4	110.4	6.6
197T				18.9	22.2	22.2	22.2	2.9
1977				271.3	341.9	341.9	341.9	2.6
1978				462.8	626.8	626.8	626.8	6.8
1979				336.3	496.1	496.1	496.1	8.4
1980				192.8	314.8	314.8	314.8	10.6
1981				93.9	168.4	168.4	168.1	10.6

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1982				99.7	189.8	189.8	186.3	7.6
1983				51.7	103.4	103.4	102.2	4.9
1984								
1985								
1986								
1987								
1988								
1989								
1990				8.5	21.5	21.5	21.5	4.0
1991				24.5	64.4	64.4	64.4	3.9
1992				18.3	49.6	1.6		3.1
1993				14.3	39.9			3.3
1994				7.4	21.3			3.3
Subtot	11			1720.0	2590.5	2481.3	2474.7	
Appropriation: 1506 Aircraft Procurement, Navy								
1978			21.9	21.9	34.1	34.1	34.1	6.8
1979	9		250.6	346.8	598.6	598.6	598.6	8.7

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
1980	25		467.8	602.3	1181.3	1181.3	1181.3	11.8
1981	60		657.9	932.6	2028.5	2028.5	2028.5	11.6
1982	63	41.9	630.5	1027.7	2431.1	2431.1	2431.1	14.3
1983	84	92.0	731.3	1021.0	2569.2	2569.2	2569.2	9.0
1984	84	48.2	620.2	910.4	2383.1	2383.1	2383.1	8.0
1985	84	146.3	567.4	883.9	2380.5	2380.5	2380.5	3.4
1986	84	89.9	544.4	772.1	2142.8	2142.8	2142.8	2.8
1987	84	118.2	524.5	794.8	2282.9	2282.9	2282.9	2.7
1988	84	122.5	546.8	813.5	2437.8	2437.8	2437.8	3.0
1989	84	115.4	543.2	797.9	2486.5	2486.5	2486.5	4.2
1990	66	88.8	430.6	618.6	1997.6	1924.4	1924.4	4.0
1991	48	87.6	345.6	544.2	1815.6	1462.1	280.0	3.9
1992	48	168.3	390.8	651.5	2244.4	156.1	12.3	3.1
1993	48	69.7	400.5	532.9	1895.9			3.3
1994	39	77.8	330.0	485.3	1782.9			3.3
1995	45	65.7	362.4	462.6	1754.2			3.3
1996	48	37.8	377.5	494.5	1934.9			3.2
1997	54	38.7	369.2	509.2	2056.2			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
1998	16	125.3	149.8	318.6	1327.6			3.2
Subtot	1157	1534.1	9262.9	13542.3	39765.7	26499.0	25173.1	
Appropriation: 1205 Military Construction, Navy								
1977				0.8	1.0	1.0	1.0	2.8
1978								7.7
1979								9.3
1980				4.3	6.9	6.9	6.9	10.6
1981				0.2	0.4	0.4	0.4	10.6
1982				5.8	10.3	10.3	10.3	7.6
1983				2.7	5.0	5.0	5.0	4.9
1984				3.9	7.4	7.4	7.4	3.8
1985				0.6	1.1	1.1	1.1	3.4
1986				0.4	0.9	0.9	0.9	2.8
1987								2.7
1988								3.0
1989								4.2
1990				1.7	4.0	4.0		4.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1205 Military Construction, Navy (Cont'd)								
1991				0.7	1.7	1.7		3.9
Subtot				21.1	38.7	38.7	33.0	
Grand Total	1168	1534.1	9262.9	15283.4	42394.9	29019.0	27680.8	

17. [redacted] Production Rate Data:

a. [redacted] Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1979	5	9	9	9
1980	15	25	25	25
1981	48	60	60	60
1982	96	63	63	76
1983	108	84	84	103
1984	132	84	84	94
1985	132	92	84	83
1986	132	106	84	90
1987	132	127	84	120

17a. [redacted] Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1988	0	153	84	137
1989	0	200	84	145
1990	0	200	66	145
1991	0	163	48	70
1992	0	0	48	0
1993	0	0	48	0
1994	0	0	39	0
1995	0	0	45	0
1996	0	0	48	0
1997	0	0	54	0
1998	0	0	16	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	0	0

17b. ([redacted]) Production Rate Data (Cont'd):

b. ([redacted]) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (GE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	14063.3	+1220.1	15283.4	+1594.8	13688.6
(TY $)	39827.2	+2567.7	42394.9	+7659.1	34735.8
PAUC Cost (BY $)	12.040	1.045	13.085	+1.365	11.720
(TY $)	34.099	2.198	36.297	+6.557	29.740

c. ([redacted]) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	NOV 78	0	NOV 78	N/A	NOV 78
Duration (in MON)	180	84	264	84	180
End Date(MON YY)	NOV 93	84	NOV 00	N/A	NOV 93

Production estimate has been revised to reflect values as of Dec 82 SAR instead of the Development estimate used previously.

d. ([redacted]) Deliveries (Plan/Actual) --

	To Date
RDT&E	11/11
Procurement	774/774

e. ([redacted]) Approved Design-to-Cost Objective -- N/A.

18. ([redacted]) Operating and Support Costs:

a. ([redacted]) Assumptions and Ground Rules --

Current Program: F/A-18C
Flight hours per aircraft per month: 36
Number of aircraft per squadron: 12
Consumption rate, gallons per hour: 1073.9 POL cost, JP-5, per barrel, FY91: 44.52

18a. [redacted] Operating and Support Costs (Cont'd):

Antecedent Program: F/A-18A
Flight hours per aircraft per month: 32
Number of aircraft per squadron: 10
Consumption rate, gallons per hour: 1117
POL cost, JP-5, per barrel, FY91: 44.52

Date of estimate: December 1991

b. [redacted] Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per F/A-18C Squadron	Avg Annual Cost Per F/A-18A Squadron
Personnel	8.9	9.2
Consumables	10.3	7.8
Depot Maintenance	6.0	4.5
Sustaining Investment	2.3	1.7
Indirect cost	0.5	0.4
Total	28.0	23.6

c. [redacted] Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	60.3	12.6	8.5	---	81.4
Industrial Fund	0.1	---	---	---	0.1
Total	60.4	12.6	8.5	---	81.5

91-053

A-10. BRADLEY FVS

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: BRADLEY FVS (M2/M3)

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
M2/M2A1,M2A2,Infantry Fighting Veh; M3/M3A1/M3A2,Cavalry Fighting Veh (BFVS)

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
U.S. Army Tank-Automotive Command — COL Dennis C. Deming
PM, Bradley Fighting Vehicle Systems — Assigned: December 26, 1991
ATTN: SFAE-ASM-BV — AV 786-5630 COMM (313) 574-5630
Warren, MI 48397-5000

CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 23625 Project DH65
PE 23735 Project D332
PE 64616 Project D258, D460
PE 64617 Project D340

Concur in Classification as marked
23 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

Classified By: [redacted] SCG MSG 01880220
Declassify on: Originating Agency Determination Required (OADR)
Downgrade Instructions: Regraded as Unclas when Separated from Classified Encl

(THIS PAGE IS [redacted])

*** [redacted] ***

OASD(PA) DPOISR 92-T-0665

4. [redacted] **Program Elements/Procurement Line Items (Cont'd):**

PROCUREMENT:
APPN 2033 ICN G15100 (Army)
APPN 2033 ICN G20900 (Army)
APPN 2033 ICN G21100 (Army)
APPN 2033 ICN G80702 (Army)
APPN 2033 ICN GA0153 (Army)
APPN 2033 ICN GA7000 (Army)
MILCON:
PE 22393, 84731, 85796

5. [redacted] **Related Programs:**
M790 Family of 25mm Ammunition; BFVS Improvement Program; Multiple Launch Rocket System (MLRS); TOW-2 Subsystem; Armored Systems Modernization.

6. [redacted] **Mission and Description:**
The Bradley Fighting Vehicle Systems (BFVS) family consists of the M2/M2A1/M2A2 Infantry Fighting Vehicle (IFV) and the M3/M3A1/M3A2 Cavalry Fighting Vehicle (CFV). The IFV and CFV are fully tracked, lightly armored fighting vehicles which provide protected cross-country mobility and vehicular-mounted firepower to infantry/cavalry units. The IFV/CFV have swimming capability, are air transportable, and in the combined arms task force the IFV/CFV meet requirements for a companion vehicle to the Abrams Tank. Vehicle armament consists of a fully stabilized, dual-feed, externally powered M242 25mm automatic gun, a TOW missile system, and a coaxially-mounted 7.62mm machinegun. Supplementary armament for the IFV is the M231 firing port weapon. The product-improved IFV/CFV versions incorporate improvements in missile performance, operations in a Nuclear Biological Chemical environment, fightability, survivability, and in other functions. The M2A2/M3A2 vehicles retain much of the same cross country mobility and major performance characteristics as the basic and A1 vehicles. They also incorporate improved armor protection, spall protection liners, and minor mods such as restowages. The IFV/CFV introduces a formidable fighting force into the Army that causes a concomitant re-distribution of some M113 Armored Personnel Carriers.

7. [redacted] **Program Highlights:**
a. [redacted] Significant Historical Developments --
The BFVS is an outgrowth of the plan to develop and test the predecessor Mechanized Infantry Combat Vehicle (MICV). The MICV entered engineering development in September 1972. Special studies requested by Congress and OSD were conducted which resulted in termination of the MICV/20mm but which supported the requirement for an IFV/CFV 25mm/TOW program. Secretary of Defense Decision Memorandum (SDDM) dated February 1, 1980, approved full production of

7a. [redacted] **Program Highlights (Cont'd):**

the M2/M3, with basic TOW. The initial production contract was awarded to FMC Corporation in February 1980. In October 1980, OSD approved the start of a TOW 2 development program. The Government accepted the first production IFV on May 8, 1981. IFV/CFV fielding to FORSCOM units began in March 1983. A comprehensive Block I modification program (A1) was initiated in July 1983. The Army approved M2A1/M3A1 vehicle production in May 1985. The A1 performance and reliability was significantly improved by the addition of the TOW 2 Subsystem. A Block 2 development program was initiated in October 1985 to provide increased survivability changes and improvements into production vehicles. On September 10, 1987, DA approved incorporating surviviablity improvements into the BFVS acquisition program. The first A2 production vehicle was delivered in May 1988, and the first A2 vehicle with 30mm HS protection was delivered in September 1988. In November 1988, DA approved a development program to increase engine horsepower from 500 to 600. Bradley A1 vehicle fielding was completed in April 1989, with handoffs to the 3AD. The first production A2 vehicles with 600HP powertrain were delivered in May 1989 and began fielding in January 1990. An initial FMS sale of 200 M2A2 IFV's to the Kingdom of Saudi Arabia was signed in December 1988. Portions of the Bradley production line at FMC were shut down and vehicle shipping activities were curtailed as a result of the October 17, 1989 earthquake and numerous aftershocks. At 1989 year end, FMC was 52 IFVs/CFVs behind the contract delivery schedule, but recovery operation were begun which enabled FMC to resume production on November 27, 1989. In April 1990, HQDA directed that fielding of the M3A2 would no longer be required. Therefore, the last USA M3A2 was produced in August 1990. Also, based on projected force reductions, the total remaining Bradley requirement was reduced from 3000 vehicles to 2442 vehicles, and again to 1200 vehicles. In April 1990, the AAE approved an acquisition strategy of procuring the last 1200 Bradleys with FY90/91 funds with deliveries over 42 months forcing a complete restructuring of the FY90/91 acquisition. The TOW2 Subsystem (FY90/91) contract was competitively awarded to Hughes Aircraft Corp (HAC) in December 1990, and represented total known BFVS Army requirements and the first FMS buy. BFVS supported Operation Desert Storm (ODS) with new production vehicles being shipped to Southwest Asia (SWA) and at Mainz Army Depot (MZAD) where assets were upgraded with all the latest modifications. In December 1990, a follow-on buy was signed with the Kingdom of Saudi Arabia for an additional purchase of 200 M2A2 IFVs.

b. [redacted] Significant Developments Since Last Report --
A total of 570 vehicles were shipped from FMC to SWA in support of Operation Desert Shield/Storm. Assessments of battlefield damage to the BFVS in SWA indicated minimal damage. The Bradley had excellent

7b. (U) Program Highlights (Cont'd):

operational readiness rates with no unexpected problems or maintenance conditions in the desert environment. The 25mm gun exceeded our expectations. The BFVS RDT&E budget lines were zeroed for FY92 and beyond in the FY92/93 President's Budget. The FY90/91 BFVS/MLRS production contract was awarded to FMC in May 1991. The contract also contained FY92/93 MLRS and FMS requirements. The M242 25mm gun barrel redesign has improved the gun's accuracy with tighter dispersion. This barrel has been incorporated into the M242 25mm gun's technical data package via Engineering Change Proposal and thus has been made part of both the spare part barrel and gun procurement solicitations. This redesigned barrel is referred to as the heavy or ribbed barrel weighing 107 pounds in lieu of the standard 89 pounds and also incorporates a change to the muzzle brake. As a follow-up to ODS, a procurement for 400 barrels incorporating dust, sand and high temperature modifications will be consummated in FY92 with initial deliveries to follow shortly thereafter. The FY92 BFVS Modification Line was reduced $75M in the Appropriations Bill which added one year to the A1-A2 conversion completion delay.

This system will satisfy mission requirements.

c. (U) Changes Since As Of Date -- None.

8. (U) Threshold Breaches:
There is currently a schedule breach and a potential performance breach to the AAE Acquisition Program Baseline (APB), dated February 4, 1991.

The schedule breach for the "complete CONUS retrofit A1 to A2" milestone is due to the pending closure of Mainz Army Depot (MZAD) and the $75M Congressional reduction to the FY92 BFVS Modification Line, this milestone is now projected for April 1998.

The potential performance breach is due to the vehicle weight increase with armor tile.

There are currently no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

9a. ([redacted]) Schedule (Cont'd):

a. ([redacted]) Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone III (DA IPR - High Survivability) Program Initiated	N/A	SEP 87	SEP 87
HS Production Contract Modification Award	N/A	OCT 87	OCT 87
2nd A2 Vehicle Production Contract Award (FY88 Buy)	N/A	JUN 88	JUN 88
First A2 Vehicle Production Delivery w/30 mm HS Protection)	N/A	SEP 88	SEP 88
Initial Production Test 500 HP Engine			
Start	N/A	JUN 88	JUN 88
Complete	N/A	JUN 89	JUN 89
Initial Production Test 600 HP Engine			
Start	N/A	JUN 89	JUN 89
Complete		JUN 90	JUN 90
Instructor & Key Personnel Training Completed	N/A	SEP 88	SEP 88
600 HP Engine IPR Decision	N/A	NOV 88	NOV 88
First Comparison Prod Testing w/500 HP Engine			
Start	N/A	MAR 89	MAR 89
Complete	N/A	JUL 89	JUL 89
2nd A2 Vehicle Production Delivery w/600HP Engine (FY88 Buy)	N/A	MAY 89	MAY 89
3rd A2 Vehicle Production Contract Award(FY 89 Buy)	N/A	JUN 89	JUL 89
Initial Operational Capability (IOC)	N/A	AUG 89	AUG 89
Vehicle Retrofit - A1 to A2:			
OCONUS			
Start	N/A	JUN 90	JUN 90
Complete	N/A	FEB 94	SEP 92(Ch-1)
CONUS			
Start	N/A	OCT 92	APR 92(Ch-2)
Complete	N/A	JAN 96	APR 98(Ch-3)
4th A2 Vehicle Production Contract (MYP FY 90-94) Award	N/A	FEB 91	MAY 91(Ch-4)
MICV			
QMR Approved, MICV 20mm	OCT 68	N/A	OCT 68
Concept Formulation Complete	APR 72	N/A	APR 72
Milestone II (DSARC)	MAR 79	N/A	APR 75
Engineering Dev Contract Award	NOV 72	N/A	NOV 76

9a. ([redacted]) Schedule (Cont'd):

([redacted]) Milestones (Cont'd) --

	Development Estimate	Approved Program	Current Estimate
Terminate MICV 20 mm Program M2/M3	MAR 77	N/A	MAR 77
Milestone III (DSARC)	JAN 80	N/A	JAN 80
Low Rate Initial Production Contract Awarded	FEB 80	N/A	FEB 80
First Production Delivery	MAY 81	N/A	MAY 81
Complete Initial Production Test	APR 83	N/A	MAY 83
Initial Operating Capability M2A1/M3A1	DEC 83	N/A	DEC 83
IPR Approval of M2A1/M3A1 Production	MAY 85	N/A	MAY 85
First A1 Production Contract Award	JUL 85	N/A	JUL 85
First Production Delivery M2A1/M3A1	MAY 86	N/A	MAY 86
Complete Initial Production Test	JUL 87	N/A	SEP 87
Initial Operating Capability	NOV 88	N/A	NOV 88
Vehicle Hatch Upgrade Production Breakpoint	N/A	DEC 92	DEC 92
3rd A2 Vehicle Production Delivery (FY 89 Buy)	N/A	MAY 90	JUN 90
4th A2 Vehicle 1st Prod Delivery for MYP Contract	N/A	MAY 91	JUN 91
First Unit Equipped - A2 Vehicle			
Europe	N/A	APR 89	APR 89
CONUS	N/A	NOV 93	DEC 90(Ch-5)

b. ([redacted]) Previous Change Explanations --

Engineering development, PQT-G, Operational Test II, initial production contract award, type classification standard, and first production delivery all were delayed due to DA's decision to terminate the MICV program and begin the IFV/CFV program development. Development estimate for the IOC was based on the MICV program. Actual IOC occurred later due to Army's redefinition of IOC. The Commander FORSCOM determined that the IOC for the M2/M3 occurred in Dec 83. Subsequent to these changes, the Milestone Schedule for the Bradley Program was restructured in Dec 87 to show the most significant milestones for the MICV, M2/M3, M2A1/M3A1, and M2A2/M3A2. The Milestone Schedule for the A2 Program was revised in Dec 88 to reflect the DAE Program Baseline, approved 26 Feb 88. IPT (600 HP) completion date was changed from Apr 89 to Jun 89 to coincide with test priorities. First A2 Vehicle Production Delivery with 30mm HS protection was changed from Jul 88 to Sep 88 due to nonavailability of complete sets of A2 armor. IPT Start 600 HP Engine changed from Sep 89 to Jun 89 to reflect the of test schedule. 4th A2 Vehicle

9b. (U) Schedule (Cont'd):
Production Contract Award FY90-94 Buy changed from Jun 90 to Aug 90, because of change in vehicle procurement quantity. Start of OCONUS vehicle retrofit changed from Sep 90 to Jun 90 due to early availability of revised Technical Data Package. Start of CONUS vehicle retrofit changed from Jan 92 to Oct 92 due to the DA withdrawal of $45.1M from the FY90 BFVS modification line. FUE CONUS changed from Feb 94 to Sep 92 based upon a revised BFVS Fielding Plan. 4th A2 Vehicle Production Contract Award FY90-94 Buy was changed from Aug 90 to Feb 91 due to revised vehicle quantity requirements which delayed the procurement. 4th A2 Vehicle 1st Production Delivery for MY Contract was changed from May 91 to Jun 91 due to an extension of FY89 production caused by the Oct 89 earthquake in California.

c. (U) Current Change Explanations --

(Ch-1) Vehicle Retrofit A1 to A2 Complete OCONUS changed from Feb 94 to Sep 92 due to the forecasted closure of Mainz Army Depot (MZAD) and other program reductions.

(Ch-2) Vehicle Retrofit A1 to A2 Start CONUS changed from Oct 92 to Apr 92 due to the forecasted closure of MZAD and the corresponding transfer of workload earlier than forecast.

(Ch-3) Vehicle Retrotit A1 to A2 Complete CONUS changed from Jan 96 to Apr 98 due to the forecasted closure of MZAD and other program reductions including the reduction of $75M to the FY92 BFVS modification line.

(Ch-4) 4th A2 Vehicle Production Contract (MYP FY90-94) Award changed from Feb 91 to May 91 which represents actual contract award.

(Ch-5) First Unit Equipped (FUE) CONUS changed from Sep 92 to Dec 90 when units received A2 vehicles in SWA. These units have returned to CONUS with A2 vehicles.

d. (U) References --

(U) Development Estimate:
Development Concept Paper (DCP) No. 30, April 1972, with Cover Sheet Revision, September 1972. Decision Coordination Paper for M2E1/M3E1, November 30, 1984; Decision Coordination Paper for M2A1E1/M3A1E1 High Survivability BFVS, October 5, 1987; HQDA Message, DAMA-ZA/DAMO-FDZ, 1614452 July 1984, Subject: High Survivability Program.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 4 February 1991.

10. ([redacted]) Performance Characteristics:

a. ([redacted]) Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
M2A2/M3A2						
Length (inches)	N/A	258	/ 258	257.6	258	
Height (inches)	N/A	119	/ 119	116.6	119	
Weight (Combat Loaded) (lbs)	N/A	65600	/ 67000	66120	69600	(CH-1)
(b)(1) [redacted]						
Vehicle Survivability: Hand Held Anti-Tank Threat: (%) Reduction in K-Kill probability	N/A	25	/ 25	25	25	
Ground Pressure (p.s.i.)	N/A	10.4	/ 10.7	7.8	7.8	
Mobility:						
Range (miles):						
w/500 HP Engine	N/A	260	/ 240	314	240	
w/600 HP Engine	N/A	260	/ 250	329.6	260-275	

10a. **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Maximum Speed (mph):					
Land:					
w/500 HP Engine	N/A	40	/ 36	39.4	36
w/600 HP Engine	N/A	40	/ 38	40.8	38-40
Water:					
w/500 HP Engine	N/A	4.0	/ 4.0	4.6	4.0
w/600 HP Engine	N/A	4.0	/ 4.0	5.6	4.0
Acceleration 0-30 mph (sec)					
w/500 HP Engine	N/A	18	/ 30	21.6	30
w/600 HP Engine	N/A	18	/ 22	18	17-22
Firepower:					
25 mm Gun:			S		
(b)(1) [redacted]					
Dispersion (hardstand)					
HE (mils; 200 rds/min)	N/A	.97	/ .97	.97	.97
AP (mils; 100 rds/min)	N/A	.59	/ .59	.59	.59
Receiver Life (rds)	N/A	25000	/ 25000	30000	30000
Barrel Life (rds)	N/A	13000	/ 4000	13000	13000
TOW:					
Hit Probability			C		
(b)(1) [redacted]					

10a. (U) **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
System (MMBF)	N/A	545	/ 240	750	624
25mm Gun (MRBS)	N/A	6000	/ 2000	9021	9021
Maintenance Ratio (manhrs/oper. hrs)	N/A	.60	/ .60	.47	.60
MICV/M2/M3 Transportability	N/A	C-141	/ C-141	C-141	C-141
(b)(1) [redacted]					
Single Shot Accuracy to 1000m (rd. to rd. std. dev.; stat; mils; AP)	.50	N/A	/ N/A	.50	.50
Dispersion (hardstand)					
HE (mils; 200 rds/min)	.97	N/A	/ N/A	.97	.97
AP (mils; 100 rds/min)	.59	N/A	/ N/A	.59	.59
Receiver Life (rds)	25000	N/A	/ N/A	30000	30000
Barrel Life (rds)	3750	N/A	/ N/A	13000	13000
TOW:					
(b)(1) [redacted]					
Reliability:					

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
System (MMBF)	330	N/A	/ N/A	580	580
25mm Gun (MRBS)	2000	N/A	/ N/A	9021	9021
Maximum Speed (MPH)		N/A	/ N/A		
Land	40-45	N/A	/ N/A	42.0	42.0
Water	3.6	N/A	/ N/A	4.5	4.5
Acceleration 0-30 MPH (sec.)	18-22	N/A	/ N/A	18.5	18.5
Ground Pressure (psi)	7.0	N/A	/ N/A	7.8	7.8
Maintenance Ratio (manhrs/oper. hrs)	.60	N/A	/ N/A	.40	.60
M2A1/M3A1		N/A	/ N/A		
Configuration 500HP Engine Weight (combat loaded) (lbs)	50404	N/A	/ N/A	50404	50404
Firepower:		N/A	/ N/A		
25mm Gun Barrel Life (rds)	4000	N/A	/ N/A	13000	13000
TOW (unchanged for M2A1/M3A1)	N/A	N/A	/ N/A		
Reliability System (MMBF)	580	N/A	/ N/A	841	841
Maximum Speed (mph)		N/A	/ N/A		
Land	38	N/A	/ N/A	38	38
Water	4.5	N/A	/ N/A	4.5	4.5
Ground Pressure (psi)	7.8	N/A	/ N/A	7.8	7.8
Maintenance Ratio (manhrs/oper. hrs)	.60	N/A	/ N/A	.46	.46

MICV/M2/M3 Weight classification should be [redacted]

b. [redacted] Previous Change Explanations --

MICV/M2/M3: Vehicular data in column 1, Development Estimate, reflects the 20mm MICV which was terminated prior to production. Armament data for DE shows the 25mm VRFWS-program, whereas the armament data for Approved Program is based upon the QMR for 25mm weapon system. Operational Characteristics for the Bradley changed in both demonstrated performance and current estimate as follows: Based upon the M2/M3 Materiel Need and system specification requirement, the M242 production gun single shot accuracy changed to .50 (rd. to rd. std. dev) (AP), HE dispersion changed to .97 (mils), and AP dispersion data changed to .59 (mils); reliability (MMBF) for

10b. [redacted] **Performance Characteristics (Cont'd):**
the basic vehicle changed to 580, based upon Production Reliability Verification Test (PRVT) final scoring; gun reliability (MRBS) threshold changed to 2000 to reflect the QMR, maximum land speed changed to 42.0 MPH; acceleration changed to 18.5 seconds, both based on average test results of PRVT test vehicles; and maximum water speed demonstrated performance and current estimate changed from 4.4 MPH to 4.5 MPH, respectively. As the transportability requirement is separately identified, the vehicle width had been deleted from the APB.

M2A2/M3A2: Average vehicle weight increased from 65,600 lbs to 67,000 lbs based on weigh in of PQT-G test vehicles with full armor packages. 600 HP vehicle test results changed from 250 to an estimated 260-275; land speed from 38 MPH to a range of 38-40 MPH; and acceleration from 22 seconds to a range of 17-22 seconds; 500 HP vehicle reliability increased from 550 to 624 MMBF, based on final scored results from A2 500 HP IPT. Vehicle ground pressure was changed from 10.7 p.s.i. to 10.4 - 10.7 p.s.i., based upon weigh in of test vehicles with full armor package. Vehicle ground pressure was changed again from 10.4 - 10.7 p.s.i. to 7.8 p.s.i. based on the BFVS A2 FAT/IPT test results.

(b)(1)

[redacted]

d. [redacted] References --

[redacted] **Development Estimate:**
Development Concept Paper (DCP) No. 30, April 1972, with Cover Sheet Revision, September 1972. Decision Coordination Paper for M2E1/M3E1, November 30, 1984; Decision Coordination Paper for M2A1E1/M3A1E1 High

10d. ([redacted]) **Performance Characteristics (Cont'd):**
Survivability BFVS, October 5, 1987; HQDA Message, DAMA-ZA/DAMO-FDZ, 1614452 July 1984, Subject: High Survivability Program.

([redacted]) **Approved Program:**
AAE Approved Acquisition Program Baseline dated 4 February 1991.

11. ([redacted]) **Total Program Cost and Quantity:** **(Current Estimate in Millions of Dollars)**

	Development Estimate	Approved Program	Current Estimate
a. [redacted] Cost --			
Development (RDT&E)	98.3	374.4	374.4
Procurement	227.3	2904.1	2909.1
Vehicle Rollaway	(139.5)		(2390.9)
FPW	(0.0)		(8.9)
25mm Weapon	(54.2)		(106.6)
Total Rollaway	(193.7)		(2506.4)
FPW NON-ROLLAWAY			(0.2)
TRAINING DEVICES			(69.0)
OTHER SUPPORT			(16.4)
Total Other Wpn Sys	(0.0)		(85.6)
Peculiar Support	(31.1)		(175.8)
Initial Spares	(2.5)		(141.3)
Construction (MILCON)	0.0	11.1	11.1
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 72 Base-Year $	325.6	3289.6	3294.6
Escalation	111.3	6729.9	6721.6
Development (RDT&E)	(23.8)	(310.5)	(310.3)
Procurement	(87.5)	(6401.2)	(6393.1)
Construction (MILCON)	(0.0)	(18.2)	(18.2)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	436.9	10019.5	10016.2
b. [redacted] Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	1190	6724	6724
Total	1190	6724	6724

There are 21 RDT&E prototypes which are not considered to be fully configured end items.

c. [redacted] Foreign Military Sales --

Our first FMS case has been implemented with Saudi Arabia for a quantity of 200 M2A2 vehicles. The total estimated price is $550.0M. A second Saudi FMS case for 200 additional M2A2 vehicles, for $800.0M was signed in December 90. Funding for this buy was received in

11c. (U) Total Program Cost and Quantity (Cont'd):
February 91. Contract was awarded in May 91.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
Development Concept Paper (DCP) No. 30, April 1972, with Cover Sheet Revision, September 1972. Decision Coordination Paper for M2E1/M3E1, November 30, 1984; Decision Coordination Paper for M2A1E1/M3A1E1 High Survivability BFVS, October 5, 1987; HQDA Message, DAMA-ZA/DAMO-FDZ, 1614452 July 1984, Subject: High Survivability Program.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 4 February 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	10016.2	10019.5	10016.2
(2) Quantity	6724	6724	6724
(3) Unit Cost	1.490	1.490	1.490
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	108.6	108.6	112.9
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	108.6	108.6	112.9
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	122.1	314.8	0.0	436.9
Previous Changes:				
Economic	-0.4	-184.6	-0.9	-185.9
Quantity	+18.0	+2652.8	-	+2670.8
Schedule	+22.1	+739.9	-	+762.0
Engineering	+382.9	+1472.8	+29.9	+1885.6
Estimating	-13.3	+3100.3	+0.3	+3087.3
Other	+17.9	-	-	+17.9
Support	+135.6	+1209.3	-	+1344.9
Subtotal	+562.8	+8990.5	+29.3	+9582.6
Current Changes:				
Economic	+0.2	-24.5	+0.2	-24.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-5.5	-	-5.5
Estimating	-0.4	-11.2	-0.2	-11.8
Other	-	-	-	-
Support	-	+38.1	-	+38.1
Subtotal	-0.2	-3.1	-	-3.3
Total Changes	+562.6	+8987.4	+29.3	+9579.3
Current Estimate	684.7	9302.2	29.3	10016.2

13a. ([redacted]) Cost Variance Analysis (Cont'd):

a. ([redacted]) Summary -- (FY 1972 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	98.3	227.3	0.0	325.6
Previous Changes:				
Quantity	+11.1	+873.4	-	+884.5
Schedule	+13.8	+79.1	-	+92.9
Engineering	+162.9	+472.3	+9.0	+644.2
Estimating	+12.2	+892.0	+2.1	+906.3
Other	+11.0	-	-	+11.0
Support	+65.1	+360.0	-	+425.1
Subtotal	+276.1	+2676.8	+11.1	+2964.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-1.4	-	-1.4
Estimating	-	-2.6	-	-2.6
Other	-	-	-	-
Support	-	+9.0	-	+9.0
Subtotal	-	+5.0	-	+5.0
Total Changes	+276.1	+2681.8	+11.1	+2969.0
Current Estimate	374.4	2909.1	11.1	3294.6

b. [redacted] Previous Change Explanations --

RDT&E

Economic: Revised escalation indices

Quantity: Revised escalation indices

Schedule: Delays due to redirection of program from one-man weapon station with 20mm Gun/25mm Gun and TOW system.

Engineering: Design effort associated with redirection of program to IFV/CFV configuration; additional design effort of A1 configuration; incorporation of vehicle/modification costs (project D332) into the SAR reporting.

Estimating: Revised estimate for government and contractor engineering; prior year program adjustments; AMC

13b. [redacted] Cost Variance Analysis (Cont'd):

decisions to withdraw funds; OSD inflation cut; congressional action; and elimination of RDT&E program from FY 92 and out

Other: Engineering contractor cost growth.

Support: Revised requirements for TMDE and "New Look" manuals.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Additions to vehicle quantities to a total of 8,811 and associated increase in gun quantity; subsequent decrease in vehicle quantities to a new total of 6724

Schedule: Production delay due to extension of R&D effort and stretch-out of production to permit delivery of additional vehicles; reschedule of production during FY88 thru FY95; schedule changes applicable to increase in vehicle quantity.

Engineering: Design changed to IFV/CFV, A1 and A2 configurations; Addition of high survivability requirements; Engineering improvements to optics, fire extinguisher, and track; incorporation of Enhanced Position Locating Reporting System (EPLRS), electronic vs. mechanical transmission controller, Digital Turret Distribution Box (DTDB), and P-900 armor; subsequent elimination of EPLRS electronic transmission controller and DTDB; elimination of armor tiles

Estimating: Revised production cost estimates based on more current data; application of revised historical escalation indices; revision of acquisition plan to include competition and multiyear procurement; estimating changes applicable to increase in vehicle quantity; delay in armor tile procurement from FY87 to FY91.

Support: Changes in initial spares, peculiar support equipment, TMDE requirements, classroom spares; incorporation of BFVS training devices in SAR reporting structure; increases in spares, training devices and TMDE requirements to support increased quantities.

MILCON

Economic: Revised escalation indices.

Engineering: Storage facilities for A2 tiles.

Estimating: MILCON changes to cover BFVS unique sites.

13c. (4) Cost Variance Analysis (Cont'd):

c. (4) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	0.2
Current & Prior year inflation offset (Estimating)	--	-0.2
Prior year obligation adjustments (Estimating)	--	-0.2
Total Changes	--	-0.2
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-24.9
PCR adjustment (Economic)	N/A	0.4
Current & Prior Year Inflation Offset. (Estimating)	4.9	19.5
Elimination of P-900 armor (Engineering)	-1.4	-5.4
PCR adjustment (Engineering)		-0.1
Prior year obligation adjustments (Estimating)	-2.8	-8.3
Program shortfall funded by reprogramming from mod line (Estimating)	5.1	19.8
Adjustment to program (Estimating)	-1.6	-7.1
Re-allocated from rollaway to TMDE and fielding (Estimating)	-6.7	-29.1
Decrease in quantity of 25mm guns from 611 to 130 (Estimating)	-1.5	-5.7
PCR adjustment (Estimating)		-0.3
Increase to Training Devices (Support)	0.5	2.4
Increase in TMDE requirements (Support)	4.1	17.8
Decrease to Spares (Support)	-0.6	-2.9
Increase to Fielding (Support)	5.0	20.8
Total Changes	5.0	-3.1
(3) MILCON		
Revised Escalation Indices (Economic)	N/A	0.2
Current & Prior year inflation offset (Estimating)	--	-0.2
Total Changes	--	--

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. [redacted] Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.204	0.094	--	--	0.069	--	--	--	0.163	0.367

b. [redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.367	-0.031	0.095	0.113	0.280	0.457	0.003	0.206	1.123	1.490

15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a. ([redacted]) Procurement --

[redacted] FY86-90 GUN PRODUCTION:

McDonnell Douglas Hlcptr, Mesa, AZ
DAAA09-86-C-0438, FFP
Award: February 13, 1986
Definitized: December 11, 1986

Initial Contract Price		
Target	Ceiling	Qty
$29.5	N/A	761

Current Contract Price		
Target	Ceiling	Qty
$142.0	N/A	4081

Estimated Price At Completion	
Contractor	Program Manager
$142.0	$142.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variance information is not required for this FFP contract.

Total contract price of $142.0M includes $132.7M for BFVS quantity of 3832 and $9.3M for Navy quantity of 249.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

([redacted]) FY88-91 TURRET DR PROD:
General Electric Co., Pittsfield, MA
DAAA09-88-C-0190, FFP
Award: February 28, 1988
Definitized: April 28, 1989

Initial Contract Price		
Target	Ceiling	Qty
$84.5	N/A	1079

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$171.3	N/A	2278	$171.3	$171.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variance information is not required for this FFP contract.

Current contract price of $171.3M includes $159.7 for BFVS quantity of 2078 and $11.6M for FMS quantity of 200.

(b)(1) [redacted]

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variance information is not required for this FFP contract.

Total contract price of $363.7 includes $167.6 for BFVS quantity of 1852, and $196.1M for MLRS, FMS, Other Customers and Spares.

[redacted]

(b)(1)

[redacted]

	Initial Contract Price		
[redacted] FY 90-91 TOW PROD:	Target	Ceiling	Qty
Hughes Aircraft Co., El Segundo, CA			
DAAH01-90-C-0369, FFP	$77.8	N/A	698
Award: April 24, 1987			
Definitized: September 28, 1990			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$92.5	N/A	1200	$92.5	$92.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variance information is not required for this FFP contract.

	Initial Contract Price		
[redacted] FY90/91 M2 VEH PROD:	Target	Ceiling	Qty
FMC Corporation, San Jose, CA			
DAAE07-90-C-A011, FFP	$1184.9	N/A	1738
Award: May 17, 1991			
Definitized: May 17, 1991			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1184.9	N/A	1738	$1184.9	$1184.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variance information is not required for this FFP contract.

Total contract price of $1184.9M includes $79.2M for BFVS quantity of 1202, $312.5M for Saudi FMS quantity of 398 and $103.2 for other customers quantity of 138.

[redacted]

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

([redacted]) FY90-93 MLRS CHASSIS PRD:	Initial Contract Price Target	Ceiling	Qty
FMC Corporation, San Jose, CA DAAE07-90-C-A001, FFP Award: May 17, 1991 Definitized: May 17, 1991	$63.6	N/A	131

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$83.8	N/A	175	$114.0	$114.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variance information is not required for this FFP contract.

16. ([redacted]) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. ([redacted]) Program Status --

(1) Percent Program Completed: 84.4% (27 yrs/32 yrs)

(2) Percent Program Cost Appropriated: 97.7% ($9781.1 / $10016.2)

b. ([redacted]) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY66-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	684.7	-	-	-	684.7
Procurement	8958.5	108.6	112.9	122.2	9302.2
MILCON	29.3	-	-	-	29.3
O&M	-	-	-	-	-
Total	9672.5	108.6	112.9	122.2	10016.2

16c. (U) **Program Funding Summary (Cont'd):**

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY72 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1966				1.5	1.2	1.2	1.2	2.7
1967				6.5	5.3	5.3	5.3	3.2
1968				2.8	2.4	2.4	2.4	3.6
1969				5.4	4.8	4.8	4.8	4.7
1970				1.9	1.8	1.8	1.8	5.5
1971				5.3	5.2	5.2	5.2	5.1
1972				2.1	2.2	2.2	2.2	4.6
1973				9.4	10.1	10.1	10.1	4.3
1974				17.2	20.1	20.1	20.1	8.0
1975				12.9	16.6	16.6	16.6	10.9
1976				24.0	32.8	32.8	32.8	6.6
197T				5.8	8.2	8.2	8.2	2.9
1977				39.9	57.5	57.5	57.5	2.6
1978				32.2	49.9	49.9	49.9	6.8
1979				25.2	43.5	43.5	43.5	8.4
1980				20.6	38.7	38.7	38.7	10.6
1981				20.0	41.5	41.5	41.5	10.6

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY72 Dollars Nonrec	Flyaway FY72 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1982				41.8	92.2	92.2	92.2	7.6
1983				22.8	52.4	52.4	52.4	4.9
1984				12.6	30.1	30.1	30.1	3.8
1985				19.2	47.1	47.1	47.1	3.4
1986				7.9	19.9	19.9	18.1	2.8
1987				17.5	45.6	45.6	45.5	2.7
1988				8.0	21.5	21.5	21.3	3.0
1989				7.4	20.7	20.7	12.7	4.2
1990				2.2	6.3	6.3	5.9	4.0
1991				2.3	7.1	7.0	3.0	3.9
Subtot				374.4	684.7	684.6	670.1	
Appropriation: 2033 Proc of Weapons & Tracked Combat Veh								
1969		0.4		0.4	0.4	0.4	0.4	2.7
1979		16.2	2.7	18.9	39.2	39.2	39.2	9.0
1980	100	18.6	98.2	125.2	276.7	276.7	276.4	11.8
1981	400	10.3	216.2	264.5	681.4	681.4	677.3	11.6
1982	600	1.4	282.9	316.8	882.3	882.3	880.9	14.3

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY72 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2033 Proc of Weapons & Tracked Combat Veh (Cont'd)								
1983	600		214.7	276.0	830.1	830.1	823.6	9.0
1984	600	12.1	220.5	299.6	928.9	928.9	926.2	8.0
1985	655	0.6	241.3	289.2	919.0	919.0	912.8	3.4
1986	716	3.8	216.0	251.0	823.9	823.9	822.7	2.8
1987	662	1.5	231.8	258.5	873.6	873.6	857.5	2.7
1988	550	1.4	186.8	208.0	735.2	735.2	688.7	3.0
1989	641	0.4	185.0	194.3	715.4	715.1	671.1	4.2
1990	600		150.7	152.0	576.2	552.0	303.8	4.0
1991	600		192.9	172.7	676.2	613.0	58.2	3.9
1992				26.8	108.6	9.1	0.6	3.1
1993				27.0	112.9			3.3
1994				26.6	114.9			3.3
1995				0.9	4.0			3.3
1996				0.3	1.5			3.2
1997				0.4	1.8			3.2
Subtot	6724	66.7	2439.7	2909.1	9302.2	8879.9	7939.4	

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY72 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2050 Military Construction, Army								
1983				3.7	9.4	9.4	9.4	4.9
1984				2.1	5.5	5.5	5.5	3.8
1985				4.1	11.0	11.0	11.0	3.4
1988				1.2	3.4	3.4	3.4	3.0
Subtot				11.1	29.3	29.3	29.3	
Grand Total	6724	66.7	2439.7	3294.6	10016.2	9593.8	8638.8	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1977	59	0	0	0
1978	79	0	0	0
1979	465	0	0	0
1980	587	100	100	100
1981	0	400	400	500
1982	0	600	600	720
1983	0	617	600	720
1984	0	1006	600	720
1985	0	1080	655	750
1986	0	1080	716	792
1987	0	1080	662	792
1988	0	919	550	792
1989	0	0	641	792
1990	0	0	600	0
1991	0	0	600	0

The current estimate for 1980 reflects a funded delivery period of 15 months, 1981 represents a 9 month period and 1989 represents a 13 month period. The current estimate for 1990 and 1991 represents deliveries over a 42 month period; this permits a business like phase down of production to support limited but future Bradley deviations and FMS.

17b. ([redacted]) Production Rate Data (Cont'd):

b. ([redacted]) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2475.8	+818.8	3294.6	+9.2	3285.4
(TY $)	7682.0	+2334.2	10016.2	+22.9	9993.3
PAUC Cost (BY $)	0.360	0.130	0.490	0.001	0.489
(TY $)	1.116	0.374	1.490	0.003	1.486

c. [redacted] Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	FEB 80	0	FEB 80	N/A	FEB 80
Duration (in MON)	130	46	176	0	176
End Date(MON YY)	DEC 90	46	OCT 94	N/A	OCT 94

d. ([redacted]) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	5788/5788

e. ([redacted]) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 6882 - @ Peak Rate: 60/mo			
FY 72 Base-Year $	0.5	0.0	0.6
Then Year $	0.8	0.0	0.9
@ Qty 6724 (1st three years) - @ Peak Rate: 72/mo			
FY 72 Base-Year $	0.0	0.0	0.0
Then Year $	0.0	0.0	0.0

18. ([redacted]) Operating and Support Costs:

a. ([redacted]) Assumptions and Ground Rules --

Operating and support costs reflect world wide regular Army activity and are presented as average annual cost per fielded M2A2 and M3A2. These costs assume an average operating tempo of 850 miles per year. The source for the cost estimate is the BFVS Baseline Cost Estimated (BCE), dated August 1989. There is no antecedent.

b. [redacted] Costs -- (FY 1972 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Reg Army M2A2/M3A2	Avg Annual Cost Per (Antecedent)
Spares	0.0	N/A
Ammunition/Missiles	0.0	N/A
Depot Maintenance	0.0	N/A
Replacement Training	0.0	N/A
Military Personnel	0.1	N/A
Modifications/Kits	0.0	N/A
Other Sustainment	0.0	N/A
Total	0.1	N/A

18c. ([redacted]) Operating and Support Costs (Cont'd):

c. ([redacted]) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Logistics Support	11.9	---	---	---	11.9
Depot Maintenance	10.3	0.2	---	---	10.5
Engineering/Tech	14.6	4.7	3.9	---	23.2
OTHER	2.1	0.3	1.5	---	3.9
Total	38.9	5.2	5.4	---	49.5

Footnote to paragraph 18b:
All cost elements had values under $.1M. Only the Military Personnel cost element had values sufficient to round to $.1M.

91-073

A-25 MLRS

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: MLRS (Rocket Sys)

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
Launcher: M270 Multiple Launch Rocket System (MLRS)

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:
PROGRAM EXECUTIVE OFFICE
FIRE SUPPORT
ATTN: SFAE-FS-ML
RSA, AL 35898-5700

COL. WILLIAM S. TAYLOR
Assigned: May 10, 1991
AV 746-1195 COMM (205) 876-1195

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 64314A Project D564
PE 23802A Project D050
PROCUREMENT:
APPN 2032 ICN C65400 (Army)
APPN 2032 ICN CA0257 (Army)
APPN 2032 ICN C65900 (Army)

CLEARED
FOR OPEN PUBLICATION
AMENDED
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

Concur in Classification as marked
23 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

[redacted]

Classified by: Basic MLRS (M77 Warhead) SCG, dated 30 Oct 90
Declassify on: OADR
Downgrade Instructions: Regarded Unclass. When Separated From Class. Encl/Page

(THIS PAGE IS [redacted])

[redacted]

92-F-0668

4. (U) Program Elements/Procurement Line Items (Cont'd):

MILCON:
PE 00000445, 00000446, 00000447, 00000448, 00000763

5. (U) Related Programs:

M77 Munitions, Bradley Fighting Vehicle, TACFIRE, 10-Ton Truck/Trailer, Scatterable Mine Warhead (German Development), Terminal Guidance Warhead, Field Artillery Meteorological Data System, Test Set AN/USM-410, Sense and Destroy Armor, Army Tactical Missile System and Advanced Field Artillery Tactical Data System

6. (U) Mission and Description:

(U) The MLRS is a Multiple Launch Rocket System designed to supplement cannon weapons available to U.S. Division and Corps Commanders for the delivery of a large volume of firepower in a very short time against critical, time sensitive targets. The MLRS Launcher firing both a dual-purpose improved Conventional Submunition Warhead on the M77 Rocket and an improved Conventional Submunition Warhead on the Army TACMS Missile will provide an all-weather, indirect fire capability both at midrange and at depth to attack the enemy's indirect fire weapons, Air Defense Systems, and Light Materiel and Personnel Targets in sufficient quantities and density to saturate available cannon weapon fire support. The system has the growth potential to adapt Follow-on Warheads such as Terminal Homing Munitions, Scatterable Antitank Mines, and Chemical, to be fired on Rockets, Ballistic Missiles and Cruise Missiles.

(U) The system consists of an MLRS Launcher, two disposable pods containing either six rockets or one Army TACMS Missile each, a Fire Control System, and an Azimuth Position Reference Unit.. The carrier is a derivative of the Bradley/Fighting Vehicle (BFV) which used the same engine, transmission, and other mechanical systems. The carrier, when configured for MLRS, is designated M993. The rockets/missiles are loaded in the launch pods at the factory, shipped and stored in the pods, and fired from the pods. Fuze settings are accomplished automatically by the Fire Control System.

(b)(1) [redacted]

7. (U) Program Highlights:

a. (U) Significant Historical Developments —
The Department Of The Army (DA) approved a Letter Of Agreement (LOA)

7a. [redacted] **Program Highlights (Cont'd):**

for MLRS in September 1975. In January 1977, the Defense System Acquisition Review Council I (DSARC I) approved MLRS to enter validation with two competitive contractors and an option to later enter Maturation/Low Rate Production (LRP) with either one or two primes. In September 1977 Boeing, Seattle and Vought, Dallas were awarded the Competitive Validation Contract for a period of 29 months which was later extended to a 32-month effort for incorporation of design changes to satisfy the German requirement for a Scatterable Mine Warhead. In July 1979, a Memorandum Of Understanding (MOU) on a Cooperative Program was signed by France, Germany, United Kingdom, and the United States. In 1982, Italy was admitted as an associate member of the Basic MLRS Program. The Validation Phase of the program was successfully completed on schedule, within cost, and within DCP Development Test (DT)/Operational Test (OT) thresholds. The DSARC III held in May 1980 gave approval for MLRS to proceed into maturation, LRP, and initial production facilitization with a Full-Scale Production decision in March 1983. The Terminal Guidance Warhead was initiated with approval of an LOA in October 1980.

[redacted] A General Officer Program Review (GOPR) conducted in March 1983 led to a full-scale production decision in April 1983. MLRS was also type [redacted] standard in April 1983. The Initial Operational Capability (IOC) MLRS Battery was fielded in March 1983 at Fort Riley, KS. The first overseas unit was deployed to Europe in September 1983 at Baumholder, Germany. The first multiyear contract was awarded in September 1983 to LTV Aerospace and Defense Company (LTVAD) to cover a 5-year firm fixed price contract with Economic Price Adjustment Clause with a negotiated two-year option. (FY88/FY89). The second multiyear procurement contract was awarded 30 June 1989 for a 5-year period (FY89-FY93).

[redacted] MLRS performed extremely well in Operation Desert Storm (ODS) when significant numbers of MLRS Launchers were deployed. All operational requirements were met, and in most cases exceeded for readiness, reliability, accuracy and maintainability. MLRS units from other coalition members were also involved in ODS and proved the value of the successful operation of this multi-national system. The new upgraded MLRS (Deep Attack Launcher) also demonstrated its enormous capability during first operational firing of the longer range Army Tactical Missile System (ATACMS). The FY91 Congressional Supplemental of $151.9M to replace assets used in ODS also allowed the preservation of the FY92 portion of the Multiyear Procurement (MYP) contract thus, maintaining the economies of rocket production. The 500th MLRS production launcher rolled out in February 1991.

7b. ([redacted]) **Program Highlights (Cont'd):**

b. ([redacted]) Significant Developments Since Last Report --
All MICOM specification review actions have been completed for the European MLRS Second Source Qualification. The European MLRS Project Bureau (EMPB) has requested the four nations to provide their concurrence for acceptance of the successful qualification of the European Production Line. This is expected in January 1992.

[redacted] The first firing of a prototype Extended Range Rocket (ERR) was conducted on November 21, 1991 at WSMR. The achieved range was 48.5 Km. Experiments in the use of more realtime metrological updates were used to ensure that accuracy and effectiveness are maintained at the extended range. This prototype ERR was developed and funded by LTV.

[redacted] MLRS is expected to satisfy mission requirements.

c. ([redacted]) Changes Since As Of Date -- None.

8. [redacted] **Threshold Breaches:**
[redacted] There is an RDT&E cost breach to the approved Acquisition Program Baseline (APB) dated February 26, 1990. A Program Deviation Report and an APB change have been submitted as required. There are no Nunn-McCurdy unit cost breaches.

9. [redacted] **Schedule:**

a. [redacted] Milestones --

	Planning Estimate	Approved Program	Current Estimate
Milestone I	JAN 77	N/A	JAN 77
Validation Contract Award	SEP 77	N/A	SEP 77
Development Test/Operational Test I (Government)		N/A	
Start	NOV 79	N/A	NOV 79
Complete	FEB 80	N/A	FEB 80
Milestone IIIA	MAY 80	N/A	MAY 80
Initial Production Delivery-Rckt	JAN 82	N/A	MAY 82
Initial Production Delivery-Lnchr	FEB 82	N/A	SEP 82
Operational Test III Start	JUN 82	N/A	OCT 82
Operational Test III Complete	SEP 82	N/A	MAR 83
Milestone IIIB	N/A	MAR 83	MAR 83
IOC	NOV 82	MAR 83	MAR 83
First Unit Equipped (FUE)			
USAREUR	N/A	AUG 83	AUG 83

9a. [redacted] Schedule (Cont'd):

[redacted] Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate
USACEGE	N/A	MAR 86	MAR 86
FORSCOM	N/A	MAR 83	MAR 83
EUSA	N/A	JUN 84	JUN 84
TRADOC	N/A	FEB 83	FEB 83
ARNG	N/A	SEP 89	SEP 89
Full-Scale Prod Contr Award (MYP I/FY83-89)	N/A	SEP 83	SEP 83
MYP I Option III Award	N/A	DEC 87	DEC 87
MYP I Option IV Award	N/A	NOV 88	NOV 88
First Delivery MYP I	N/A	FEB 85	FEB 85
MYP I Option III	N/A	JUN 89	JUN 89
Full-Scale Prod Contr Award (MYP II/FY89-94)	N/A	JUN 89	JUN 89
MYP II PY1 Award	N/A	JUN 89	JUN 89
MYP II PY2 Award	N/A	DEC 89	DEC 89
First Delivery MYP-I Option III	N/A	N/A	JUN 89
MYP II PY3 Award	N/A	OCT 90	DEC 90
MYP II PY4 Award	N/A	OCT 91	NOV 91
MYP II PY5 Award	N/A	OCT 92	NOV 92
First Delivery MYP II			
MYP II PY1	N/A	DEC 90	NOV 90
MYP II PY2	N/A	APR 91	APR 91
MYP II PY3	N/A	APR 92	MAY 92
MYP II PY4	N/A	APR 93	FEB 93
MYP II PY5	N/A	APR 94	FEB 94
Improved Fire Control System (IFCS)			
PEO In-Process Review	N/A	N/S	N/A
MILESTONE II	N/A	N/S	N/A
Development Contract Award	N/A	N/S	N/A
PDR Complete	N/A	N/S	N/A
CDR Complete	N/A	N/S	N/A
DT&E			
Start	N/A	N/S	N/A
Complete	N/A	N/S	N/A
IOT&E			
Start	N/A	N/S	N/A
Complete	N/A	N/S	N/A

ACRONYMS:

AVRML = armored vehicle mounted rocket launcher
RPC = rocket pod container

9b. ([redacted] Schedule (Cont'd):

b. ([redacted]) Previous Change Explanations --

(1) The schedule variances for milestone Initial Production Delivery through IOC are due to the FMC strike which resulted in a four month slip in the MLRS program schedule. ASARC IIIB was downgraded to a General Officer Program Review(GOPR) by the Army which satisfied Milestone IIIB requirements.

(2) Delay in Multiyear II contract award (from March 1989 to June 1989) was due to change in requirements, quantity increases, and difficulty encountered with finalization of contract negotiations.

(3) MYP-II Program Year 4 and Program Year 5 Awards changed from October 1991 and October 1992 as reflected in the SAE Approved Program Baseline, dated February 26, 1990 to November 91 and November 92, respectively, to reflect a more realistic estimate of contract awards based on fund availability.

(4) MYP-II Program Year 3 Award changed from November 90 to December 90 and MYP-II PY1 changed from December 90 to November 90 to reflect actual award and start of deliveries.

(5) First Delivery MYP-II PY3 changed from April 92 to May 92, First Delivery MYP-II PY4 changed from April 93 to February 93 and First Delivery MYP-II PY5 changed from April 94 to February 94 to reflect actual contract definitization which occurred on September 30, 1991. DA directed additional quantities be added to the contract. These additional quantities must be delivered with the appropriate program year. The contractor has increased production to his maximum rate; therefore, the follow-on program years must be extended to allow insertion of additional quantities.

c. ([redacted]) Current Change Explanations -- None.

d. ([redacted]) References --

([redacted]) Planning Estimate:
DCP Number 165, dated May 15, 1979.

([redacted]) Approved Program:
AAE Approved Acquisition Program Baseline dated February 26, 1990.

10. [redacted] Performance Characteristics:

a. (b)(1) Performance --	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Technical Development Characteristics Technical				
(b)(1)				
Maximum Range (km)	35	N/A / N/A	31.8	31.8
Reliability		N/A / N/A		
Rocket Preflight, Launch, & In-flight	0.97	N/A / N/A	.94	.96
Launcher Reliability	0.92	N/A / N/A	.87	.87
Launcher Mean Time to Repair (hrs)				
Organizational	1.0	1.0 / 2.3	2.3	2.3
Direct Spt/General Spt	4.0	4.0 / 2.4	2.4	2.4
Availability				
(b)(1)				
Production Hardware Charateristics: Acceptable Criteria				
Rockets Fly-to-Buy 1/ See Footnote 1/				
(b)(1)				

10a. [redacted] Performance Characteristics (Cont'd):

	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
AVMRL Production Reliability Acceptance Test (PRAT) (fire missions w/o failure) 3/ See Footnote 3/	N/A	40 / 40		40
**********				
Technical Development Characteristics: Operational				
Reaction Times (min)				

(b)(1) [redacted]

b. ([redacted]) Previous Change Explanations --

(1) ([redacted]) Maximum range decrease of 3km (35km to 31.8km) meets the system threshold. It is not cost effective to go from 32km to 35km because 16.5% of the munitions must be given up to reach only 1.9% more targets.

(b)(1) [redacted]

c. ([redacted]) Current Change Explanations --

None.

d. ([redacted]) References --

([redacted]) Planning Estimate:
DCP Number 165, dated May 15, 1979.

10d. ([redacted]) Performance Characteristics (Cont'd):

([redacted]) Approved Program:
AAE Approved Acquisition Program Baseline dated February 26, 1990.

11. ([redacted]) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. [redacted] Cost --	Planning Estimate	Approved Program	Current Estimate
Development (RDT&E)	261.0	267.6	312.0
Procurement	1971.3	2703.1	2776.1
M77	(1624.6)		(1456.4)
Practice Rounds	(97.9)		(105.6)
Launchers	(118.9)		(1060.2)
Total Flyaway	(1841.4)		(2622.2)
Other Wpn Sys	(123.0)		(22.9)
Total Other Wpn Sys	(123.0)		(22.9)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(6.9)		(131.0)
Construction (MILCON)	0.0	44.7	52.7
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 78 Base-Year $	2232.3	3015.4	3140.8
Escalation	1221.7	3312.9	3502.4
Development (RDT&E)	(39.2)	(66.7)	(123.3)
Procurement	(1182.5)	(3205.4)	(3344.4)
Construction (MILCON)	(0.0)	(40.8)	(34.7)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	3454.0	6328.3	6643.2

b. [redacted] Quantity --			
Development (RDT&E)	10	N/A	10
Procurement	173	840	819
Total	183	840	829

c. [redacted] Foreign Military Sales --

Foreign Military Sales to date to codevelopment partners, Netherlands, Turkey, Bahrain, NATO Maintenance and Supply Agency (NAMSA) and Special Defense Acquisition Fund (SDAF) equal $361.5M. The decrease of $21.7M from $383.2M (reported in the 30 September 1991 SAR) to $361.5M is a result of close-out of FMS cases with France, Germany and the United Kingdom.

d. [redacted] Nuclear Costs -- None.

11e. ([redacted]) Total Program Cost and Quantity (Cont'd):

e. ([redacted]) References --

[redacted] Planning Estimate:
DCP Number 165, dated May 15, 1979.

[redacted] Approved Program:
AAE Approved Acquisition Program Baseline dated February 26, 1990.

12. [redacted] Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. [redacted] Program Acquisition	(Dec 91 SAR)	(SEP 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6643.2	6699.5	6643.2
(2) Quantity	829	843	829
(3) Unit Cost	8.014	7.947	8.014
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	198.3	198.3	219.5
Less CY Adv Proc	3.0	3.0	0.0
Plus PY Adv Proc	37.9	37.9	37.6
Net Total	233.2	233.2	257.1
(2) Quantity	44	44	44
(3) Unit Cost	5.300	5.300	5.843

The advanced materials money allocated for FY92 and FY93 will be required to cover termination liability in the event the multiyear contract is terminated.

13. ([redacted]) **Cost Variance Analysis:**

a. ([redacted]) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	300.2	3153.8	0.0	3454.0
Previous Changes:				
Economic	+18.2	+861.8	-9.8	+870.2
Quantity	-	+1808.4	-	+1808.4
Schedule	-	+19.3	-	+19.3
Engineering	+103.4	-	-	+103.4
Estimating	+6.4	+131.0	+97.2	+234.6
Other	+9.5	+9.1	-	+18.6
Support	-	+191.0	-	+191.0
Subtotal	+137.5	+3020.6	+87.4	+3245.5
Current Changes:				
Economic	-2.2	-64.5	+0.2	-66.5
Quantity	-	-9.4	-	-9.4
Schedule	-	-1.3	-	-1.3
Engineering	-	-	-	-
Estimating	-0.2	+76.3	-0.2	+75.9
Other	-	-	-	-
Support	-	-55.0	-	-55.0
Subtotal	-2.4	-53.9	-	-56.3
Total Changes	+135.1	+2966.7	+87.4	+3189.2
Current Estimate	435.3	6120.5	87.4	6643.2

13a. ([redacted]) Cost Variance Analysis (Cont'd):

a. ([redacted]) Summary -- (FY 1978 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	261.0	1971.3	0.0	2232.3
Previous Changes:				
Quantity	-	+786.7	-	+786.7
Schedule	-	-27.5	-	-27.5
Engineering	+44.5	-	-	+44.5
Estimating	+3.2	-8.1	+52.8	+47.9
Other	+3.5	+6.5	-	+10.0
Support	-	+45.8	-	+45.8
Subtotal	+51.2	+803.4	+52.8	+907.4
Current Changes:				
Quantity	-	-0.6	-	-0.6
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.2	+23.8	-0.1	+23.5
Other	-	-	-	-
Support	-	-21.8	-	-21.8
Subtotal	-0.2	+1.4	-0.1	+1.1
Total Changes	+51.0	+804.8	+52.7	+908.5
Current Estimate	312.0	2776.1	52.7	3140.8

b. ([redacted]) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Engineering: New RDTE effort for Improved Fire Control System.

Estimating: Increase in cost based on validation phase (VP) program; deletion of RDTE effort funded by MOU contribution; adjustment in prior year escalation and deletion of anticipated reprogramming. Residual RDTE requirements resulting from operational testing and development of program sets for system automatic test equipment. Conversion of prior base year dollars to then year and cost growth on finalization of R&D contract.

Other: 11-week strike at FMC resulting in a 4-month slip

13b. [redacted] Cost Variance Analysis (Cont'd):
in the program schedule.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Changes in the originally approved MLRS force structure planning estimate of 183 launchers are an additional 667 launchers, 154,278 tactical rockets, and 22,770 practice rockets. Additional changes resulted from a reduction of the total program of 7 launchers, 60,000 tactical and 16,776 practice rockets. Increase of 20,286 tactical rockets in FY91 to replace assets used in Operation Desert Storm.

Schedule: Restoration of production rate.

Estimating: Revised round and launcher cost based on VP program. Revised cost estimate for maturation phase changes to Low Rate Production hardware. Adjustment in prior year escalation; deletion of anticipated reprogramming. Increase in base year dollars; realignment of advanced materials funding. Estimate associated with quantity changes and reduction of administrative services; reduction in cost of submunitions and revised Economic Price Adjustment forecast multiyear contract. Additional funds for competition-quantity. Expanded MLRS force structure. Variance between actual cost and baseline cost of additional launchers. The overall decrease in production quantities resulted in production and overhead inefficiencies. Increase production and overhead cost resulting from the increase of 20,286 tactical rockets. Correction of prior SAR variances to reconcile Flyaway and Support.

Other: Eleven-week strike at FMC resulting in a four month slip in the program schedule. Funding for Payroll, Travel, Contracts, Total Package Fielding, New Equipment Training, an First Destination Transportation for FY92-FY97 changed from OMA to MIPA funding.

Support: Refinement of funding requirement for initial spares. Additional spares required to support expanded force structure. Initial spares in FY91 and FY92 were purchased with Army Stock Fund. Support requirements extended three years. Correction of prior SAR variances to reconcile Flyaway and Support.

13b. [redacted] Cost Variance Analysis (Cont'd):

MILCON
Economic: Revised escalation indices.
Estimating: Addition of MILCON funding requirements to SAR reporting; revised estimate, increase in construction requirements. Refinement of MILCON requirements. Historically MIPA indices had been used to calculate these values, however; MILCON indices were used this year to make proper adjustments. Additional funding in FY91 of $1.9M.

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Escalation Indices. (Economic)	N/A	-2.2
Current & Prior Inflation Offset (Estimating)	--	0.1
Decrease in the estimate for the Improved Fire Control System. (Estimating)	-0.2	-0.3
Total Changes	-0.2	-2.4

13c. [redacted] Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised Escalation Indices. (Economic)	N/A	-51.8
Economic adjustment for negative program change. (Economic)	N/A	-12.7
Current & Prior Inflation Offset (Estimating)	8.4	20.5
Increase of 3714 in Tactical Rockets. (Quantity)	12.3	31.2
Increase of 5592 Practice Rockets. (Quantity)	11.6	29.4
Decrease of 14 Launchers. (Quantity)	-24.5	-70.0
Cost savings associated with decrease in procurement buys for launchers. (Schedule)	--	-1.3
Increased cost due to shut down of Bradley line in FY94. (Estimating)	9.0	33.8
Increased cost due to lower launcher production rates in FY 94-97. (Estimating)	3.6	10.4
Revised estimate due to rocket production termination in FY93. (Estimating)	3.3	10.5
Revised estimate of initial spares costs. (Support)	-22.3	-53.9
Correction of prior variances to reconcile flyaway and support costs. (Support)	0.5	1.1
Correction of prior variances to reconcile flyaway and support costs. (Estimating)	-0.5	-1.1
Total Changes	1.4	-53.9
(3) MILCON		
Revised Escalation Indices. (Economic)	N/A	0.2
Current and Prior Inflation Off-set. (Estimating)	-0.1	-0.2
Total Changes	-0.1	--

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
18.87	0.97	-12.54	0.02	0.13	0.38	0.02	0.16	-10.86	8.01

15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a.([redacted]) Procurement --

[redacted] LAUNCHER MYII:

	Initial Contract Price		
	Target	Ceiling	Qty
LTVAD, DALLAS, TX DAAH01-89-C-0336, FFP/EPA Award: June 1, 1989 Definitized: June 1, 1989	$942.0	N/A	235

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1176.2	N/A	284	$1176.2	$1176.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

The reporting of cost and schedule variances are not required for this contract.

The above contract values represent a five year multiyear acquisition. Details by year are as follows.

Initial Contract Price ($M).

	FFP	Quantity Launcher/Tactical/Practice
MYP-1	$176.2	62/17,490/570
MYP-2	$198.7	41/24,000/120
MYP-3	$210.6	44/24,000/1,878
MYP-4	$174.0	44/24,000/5,592
MYP-5	$182.5	44/24,000/5,592

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price ($M).

	FFP	Quantity Launcher/Tactical/Practice
MYP-1	$175.8	Same as initial
MYP-2	$205.7*	Same as initial
MYP-2-OPT	$126.7*	27/16,788/3,756
MYP-3	$212.2	Same as initial
MYP-3-OPT	$ 95.0	22/24,000/ 0
MYP-4	$176.1	Same as initial
MYP-5	$184.7	Same as initial

*--Increase in MYP-2 due to unobligated NTE funding for ECP incorporation.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status --

(1) Percent Program Completed: 77.3% (17 yrs/22 yrs)

(2) Percent Program Cost Appropriated: 81.7% ($5425.4 / $6643.2)

b. [redacted] Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY76-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	334.3	8.2	11.4	81.4	435.3
Procurement	4797.2	198.3	219.4	905.6	6120.5
MILCON	87.4	-	-	-	87.4
O&M	-	-	-	-	-
Total	5218.9	206.5	230.8	987.0	6643.2

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2040 Research Development Test + Eval, Army

1976				1.1	1.0	1.0	1.0	6.9
197T				0.4	0.4	0.4	0.4	2.9
1977				7.2	6.9	6.9	6.9	2.6
1978				44.9	46.4	46.4	46.4	7.0
1979				61.7	70.9	70.9	70.9	8.4
1980				54.2	67.8	67.8	67.8	9.4
1981				50.8	70.0	70.0	70.0	11.9
1982				27.3	40.0	40.0	39.9	7.6
1983				16.9	25.9	25.9	25.4	4.9
1984				2.0	3.2	3.2	3.2	3.8
1985				1.1	1.8	1.8	1.4	3.4
1986								
1987								
1988								
1989								
1990								
1991								

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1992				3.9	8.2			3.1
1993				5.3	11.4			3.3
1994				8.3	18.4			3.3
1995				16.0	36.8			3.3
1996				7.3	17.3			3.2
1997				3.6	8.9			3.2
Subtot	10			312.0	435.3	334.3	333.3	
Appropriation: 2032 Missile Procurement, Army								
1980	12	14.7	33.2	49.1	67.0	65.4	65.3	9.7
1981	32	15.7	56.6	74.2	117.8	114.1	113.6	11.9
1982	68	10.0	90.1	112.4	197.1	171.8	170.8	14.2
1983	72	11.6	201.6	235.0	443.5	420.1	417.3	9.0
1984	76		264.4	275.8	533.8	509.9	508.6	8.0
1985	44		243.1	255.9	514.0	487.0	483.9	3.4
1986	44		226.9	227.9	468.9	468.0	467.0	2.8
1987	44		203.4	210.2	449.5	440.6	438.5	2.7
1988	24		178.8	189.3	419.2	398.4	393.7	3.1

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2032 Missile Procurement, Army (Cont'd)								
1989	62		186.1	197.8	455.7	428.1	403.2	4.2
1990	68		212.5	217.8	516.8	492.8	262.9	4.0
1991	66		249.3	250.1	613.9	557.6	58.9	3.9
1992	44		77.5	78.2	198.3	66.3	0.3	3.1
1993	44		75.3	83.8	219.4			3.3
1994	20		52.0	65.0	175.6			3.3
1995	35		79.3	91.0	254.0			3.3
1996	30		65.9	76.2	219.3			3.2
1997	34		74.2	86.4	256.7			3.2
Subtot	819	52.0	2570.2	2776.1	6120.5	4620.1	3784.0	
Appropriation: 2050 Military Construction, Army								
1982				10.4	16.4	16.4	16.4	7.6
1983				16.3	26.4	26.4	26.4	4.9
1984				11.3	18.5	18.5	18.5	3.8
1985				5.5	9.4	9.4	9.4	3.4
1986				6.4	11.1	11.1	11.1	2.8
1987								

16c. [redacted] **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	

Appropriation: 2050 Military Construction, Army (Cont'd)

1988								
1989				1.9	3.7	3.7	3.7	4.2
1990								
1991				0.9	1.9	1.9		3.9
Subtot				52.7	87.4	87.4	85.5	
Grand Total	829	52.0	2570.2	3140.8	6643.2	5041.8	4202.8	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1980	36	12	12	12
1981	48	32	32	32
1982	68	68	68	68
1983	72	72	72	72
1984	76	76	76	76
1985	48	44	44	76
1986	70	29	44	76
1987	0	0	44	76
1988	0	33	24	76
1989	0	27	62	76
1990	0	0	68	76
1991	0	0	66	76
1992	0	0	44	27
1993	0	0	44	0
1994	0	0	20	0
1995	0	0	35	0
1996	0	0	30	0
1997	0	0	34	0

17d. [redacted] Production Rate Data (Cont'd):

Annual Production Rates (M77 Rounds)

	Development Estimate	Production Estimate	Current Estimate	Maximum Economic
1980	1832	1374	1374	1374
1981	2552	2340	2340	2340
1982	3328	2496	2496	2496
1983	31821	23640	23640	23940
1984	33230	36000	36000	36000
1985	50472	50472	50472	50472
1986	72000	72000	72000	72000
1987	72000	72000	72000	72000
1988	72000	72000	72000	72000
1989	61020	30510	48000	72000
1990			40788	72000
1991			56286	17844
1992			3714	0
1993			0	0
1994			0	0
1995			0	0
1996			0	0
1997			0	0

b. [redacted] Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2216.0	+924.8	3140.8	+524.5	2616.3
(TY $)	4302.7	+2340.5	6643.2	+1093.3	5549.9
PAUC Cost (BY $)	5.639	-1.850	3.789	+0.633	3.156
(TY $)	10.948	-2.934	8.014	+1.319	6.695

17c. ([redacted]) Production Rate Data (Cont'd):

c. ([redacted]) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	APR 80	0	APR 80	N/A	APR 80
Duration (in MON)	140	90	230	63	167
End Date(MON YY)	DEC 91	90	JUN 99	N/A	MAR 94

d. ([redacted]) Deliveries (Plan/Actual) --

		To Date
	RDT&E	10/10
	Procurement	564/568

		Plan	Actual
RDT&E	Rockets	504	470
PROCUREMENT	Tactical Rockets	425052	431886
	Practice Rockets	31248	29928
	Launcher	564	568

e. ([redacted]) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 393 - @ Peak Rate: 10.0/mo			
FY 80 Base-Year $	1.200	1.200	1.500
Then Year $	2.000	2.000	0.000
@ Qty 0 (1st three years) - @ Peak Rate: 0.0/mo			
FY 80 Base-Year $	0.000	0.000	0.000
Then Year $	0.000	0.000	0.000

	TACTICAL	PRACTICE	LAUNCHER
M77 Rounds Qty. Totals:	481110	39234	819
Peak Rates:	6000	330	10

17e. [redacted] Production Rate Data (Cont'd):

	APPROVED PROGRAM	CURRENT ESTIMATE	THRESHOLD
M77 Rounds			
Constant FY80$:	.004	.004	.007
Then-Year $:	.008	.007	
Practice Rounds:			
Constant FY80$:	.003	.003	
Then-Year $:	.005	.006	
Launcher			
Constant FY80$:	1.249	1.578	1.499
Then-Year $:	1.980	2.976	

18. ([redacted]) Operating and Support Costs:

a. ([redacted]) Assumptions and Ground Rules --

The unit for tracking O&S costs is a firing battery. The O&S costs are estimated in an annual Baseline Cost Estimate (BCE) (Latest validation Dec 89) update. The BCE updates operating tempo, reliability/maintainability, maintenance concept, manning and logistics policies. This BCE information is integrated into the annual update of the MLRS O&S Cost Reduction Program and provides the methodology to portray the O&S costs per battery. A typical operating year is selected from the annual BCE update and divided by the number of MLRS batteries deployed to give an O&S cost per battery. This typical operating year is a point in time after the completion of fielding, when the operating and support costs are neither increasing nor decreasing in magnitude due to fielding changes. There is no antecedent program for MLRS.

18b. ([redacted]) Operating and Support Costs (Cont'd):

b. ([redacted]) Costs -- (FY 1978 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Firing Battery	Avg Annual Cost Per (Antecedent)
Depot Maintenance	3.0	N/A
Total	3.0	N/A

c. ([redacted]) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	0.7	---	---	---	0.7
Industrial Fund	9.7	0.2	---	---	9.9
Total	10.4	0.2	---	---	10.6

Depot Maintenance (FY91 actual 0.6): Provide for overhaul, repair, and modification of equipment at Mainz Army Depot.
Other (FY91 actual 0.1): Provide maintenance of the hardware on which all changes will be tested. Inoperable hardware would leave no vehicle on which to run the tests.

N-22 HARM

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: HARM (AGM-88A/B/C)

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
HARM (AGM-88A/B/C)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
DEFENSE SUPPRESSION SYSTEMS PROGRAM
PMA-242
NAVAL AIR SYSTEMS COMMAND
WASHINGTON, DC 20361-1242

CAPT LARRY D. PFITZENMAIER
Assigned: March 17, 1989
AV 222-7563 COMM (703) 692-7563

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OASD(PA) DFOISR 92-T-0617

4. [redacted] Program Elements/Procurement Line Items:

RDT&E:
PE 0205601N Project W1780 (Shared)
PE 0207162F Project 642330
PE 0603303N Project W1807 (Shared)
PE 0603313N Project W1188
PE 0603320F Project 643327
PE 0603320N Project W1807
PE 0603363N Project WSH07 (Shared)
PE 0604360N Project W0553
PROCUREMENT:
APPN 1507 ICN 302227 (Navy)
APPN 3020 ICN M88AAG (Air Force)

5. [redacted] Related Programs:
None.

6. [redacted] Mission and Description:
HARM is a tactical air-to-surface missile designed to supress or destroy land and sea based radars which direct enemy air defense systems. HARM is a design evolution of other ARM weapons (SHRIKE and STANDARD ARM) and is replacing them in the Navy and Air Force inventory. HARM is fully operational on the A-7E, EA-6B, F/A-18, A-6E and F-4G aircraft, and is being integrated on the F-16C/D and F-14 aircraft. Performance characteristics include: high speed, large footprint, high sensitivity to weak signals, and threat reactive software reprogrammability. HARM weighs 807 lbs., is 164 inches long and 10 inches in diameter.

7. [redacted] Program Highlights:
a. [redacted] Significant Historical Developments --
[redacted] DCP 93, July 1972, recommended development of the HARM Weapon System. DSARC I Management Review, October 1972, authorized Advanced Development. May 1974, Texas Instruments (TI), won a competitive source selection for integration of the weapon system. DSARC IIA, February 1978, directed the HARM program to proceed to Full Scale Engineering Development with the EXCAP version.

[redacted] DSARC III was on 30 March 1983. The Secretary of Defense on 20 April 1983 approved full-scale production. FY 84 Congressional action directed the initiation of the HARM Low Cost Seeker (LCS) program.

[redacted] HARM missiles were first used in combat against Libya in March/April 1986. A total of 40 HARMS were fired with very successful results.

[redacted] A HARM Improvement Plan (HIP) to expand the anti-radiation

7a. (U) Program Highlights (Cont'd):

industrial base and provide improved missile performance to meet new surface-to-air threats in the 1990's was forwarded to Congress in 1987. HIP used two competing guidance section designs - Block IV and Low Cost Seeker (LCS) (designated the AGM-88C1 and C2 respectfully). The HARM Block IV is a TI upgrade to the existing guidance section. Per congressional language, TI is paying the development costs with the government providing support funding and government furnished equipment. The Low Cost Seeker is a new design for the guidance section that originated at NAVWPNCEN, using microwave and signal processing technology. FY87 Congressional language directed that NAVAIRSYSCOM assume program management of LCS.

b. (U) Significant Developments Since Last Report --
(U) LCS milestone schedule has slipped due to contractor delays in delivering test seekers.

(U) HARM missiles were used extensively in the Persian Gulf conflict of January - March 1991. Their deployment brought about a dramatic decrease in Iraqi radar emissions in the initial stages of hostilities. The effectiveness of HARM in its defense suppression mission greatly diminished the ground based threat to coalition air operations, thereby increasing their rate of success and hastening air superiority.

(U) Congress included $4.0 M of RDT&E funds for LCS in the FY92 appropriation. However, these funds are on the OSD deferral list and have not been released to the program office. This funding is needed to complete the required testing in order to reach Milestone IIIA decision forum.

(U) This system will satisfy mission requirements.

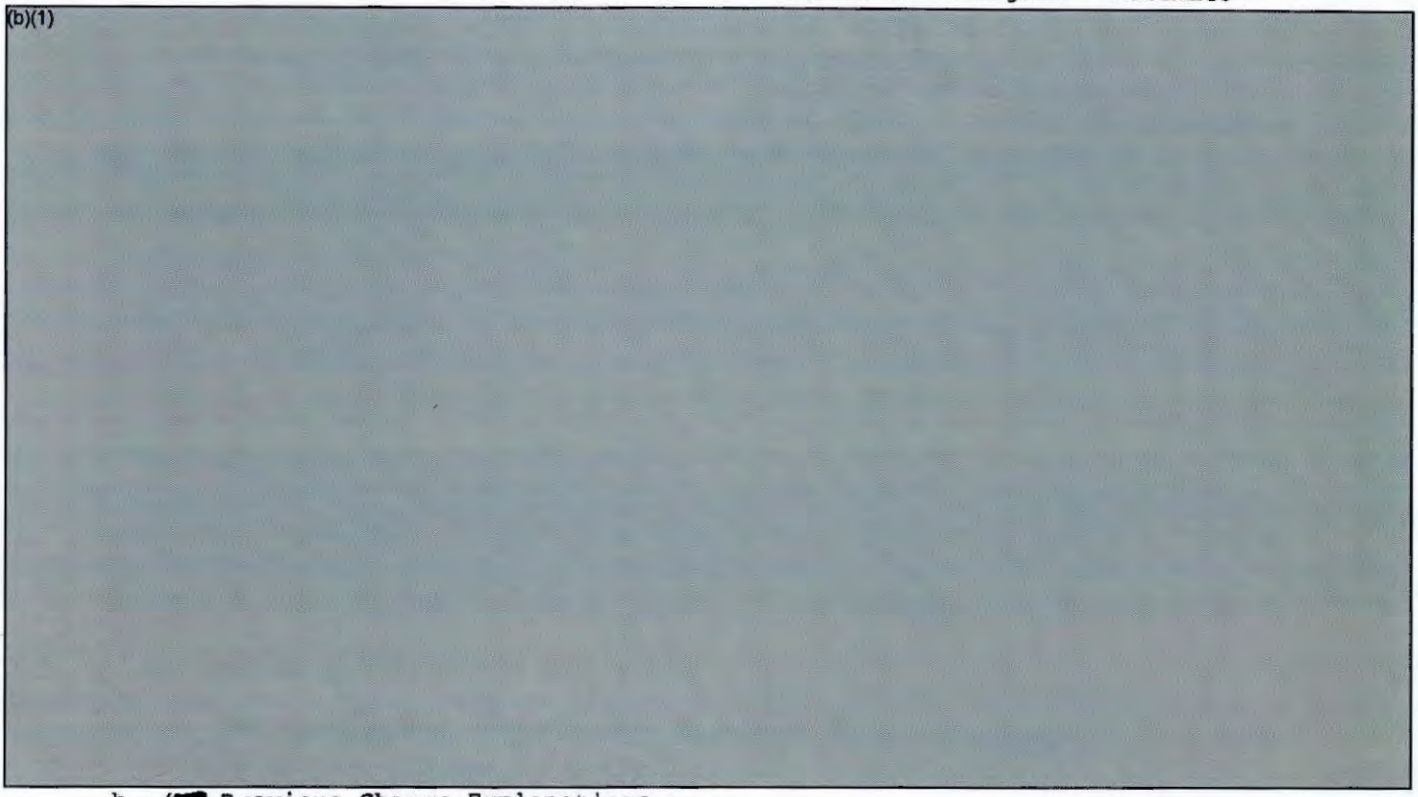
c. (U) Changes Since As Of Date --
FY91 LCS RDT&E funding of $10.4M which was placed on rescission has been released to the program office. This funding will allow LCS to complete the required testing in order to reach a milestone IIIA decision forum.

8. (U) Threshold Breaches:
There is no current APB baseline (dated 17 Dec 1991) breach. There is no Nunn-McCurdy breach.

9. (U) Schedule:

a. (U) Milestones --

(b)(1)



b. (U) Previous Change Explanations --

(U) The Navy Test Evaluation schedule changes were the result of contractor delay in delivering missiles for TECHEVAL and additional delays required to validate new software. Changes in the Joint Navy OPEVAL/Air Force IOT&E date were caused by: contractor's late delivery of TECHEVAL missiles; adverse weather and certain hardware shortages to support NTE; completion of corrective action for problems discovered early in OPEVAL; interfacing problems with the A-7 avionics; and correction of missile technical problems. The DSARC III delays were caused by efforts to resolve OPEVAL/IOT&E testing, and extension of operational testing. The Navy IOC (A-7E) was delayed because of difficulties in reaching a contract agreement for the FY81 production program, and the extension of operational testing. The Air Force IOC (F-4G) change reflects revised production rates and delivery schedule. The new milestone entries reflect the addition of Low Cost Seeker to the program. LCS NPDM IIIA/B revised

9b. [redacted] Schedule (Cont'd):
due to FSED hardware delivery schedule and time required for operational testing. NPDM IIIA (LCS) rescheduled to support LRIP milestone. IOC (LCS) revised due to reduced quantity approved for pilot production and quantity required for both OT-IIB and IOC. NPDM IIIA (LCS) of January 1992, NPDM IIIB of February 1993, and IOC (LCS) of April 1994 deleted due to LCS program funding termination.

c. [redacted] Current Change Explanations --

[redacted] Change 1 - Current Estimate of NPDM IIIA (LCS) has been changed from N/A to March 1993 due to return of FY91 RDT&E funding previously on recission.

[redacted] Change 2 - HARM program is not funded for these milestones.

d. [redacted] References --

([redacted]) Development Estimate:
DCP 93A dated 10 July 1978. NDCP dated 6 August 1987.

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated 17 December 1991.

10. ([redacted]) Performance Characteristics:

a. [redacted] Performance --

	Approved Program	Demonstrated	Current
(b)(1)	[redacted]		

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

b. ([redacted]) Previous Change Explanations --

([redacted]) Weight (lbs), Current Estimate: Change 780 to 807. Incorporation of hardware to facilitate DSARC II direction to expand capability (EXCAP) in frequency and aerodynamic maneuverability.

(b)(1)

[redacted] Reliability: Missile captive carry MTBF, Current Estimate: revised on basis of inventory usage data through September 1987.

[redacted] Maintainability, Mean time to fault locate using BIT (sec), Current Estimate: Change 20 to 14. Results of operational testing.

[redacted] Maintainability, Mean time to repair (min), Avionics "O" level, Current Estimate: Change 55 to 30. Results of operational testing.

[redacted] Maintainability, Mean time to repair (min), Missile "I" level, Current Estimate: Change 60 to 55. Results of operational testing.

c. ([redacted]) Current Change Explanations -- None.

d. ([redacted]) References --

([redacted]) Development Estimate:
DCP 93A dated 10 July 1978. NDCP dated 6 August 1987.

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated 17 December 1991.

11. ([redacted]) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars

a. ([redacted]) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	226.8	478.1	468.9
Procurement	1455.0	3082.4	2596.7
Hardware	(1064.7)		(2115.2)
Production Support	(220.9)		(259.5)
Total Flyaway	(1285.6)		(2374.7)
Other Weapon Systems Cost	(80.5)		(152.0)
Total Other Wpn Sys	(80.5)		(152.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(88.9)		(70.0)
Construction (MILCON)	0.0	4.3	3.1
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 78 Base-Year $	1681.8	3564.8	3068.7
Escalation	728.1	4143.5	3181.4
Development (RDT&E)	(12.1)	(185.3)	(176.2)
Procurement	(716.0)	(3954.0)	(3002.3)
Construction (MILCON)	(0.0)	(4.2)	(2.9)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2409.9	7708.3	6250.1
b. [redacted] Quantity --			
Development (RDT&E)	99	N/A	99
Procurement	13754	24710	19508
Total	13853	24710	19607

c. [redacted] Foreign Military Sales --

Federal Republic of Germany:

Letters of Offer and Acceptance (LOA): FMS Case GY-P-AHD was accepted on 6 December 1985 for 368 tactical missiles. Amendment no. 1 to the LOA signed 11 November 1986 provides for an additional 576 tactical missiles. Estimated total FMS cost is $270,400,000. FMS Case GY-P-AJP, accepted on 30 April 1987, provides for additional spare components and support equipment items. Case value is $550,608. FMS Case GY-P-BNV, accepted on 27 November 1987, provides for the procurement of HARM telemetry sections. Case value is $3,200,000.

Italy:

Letter of Offer and Acceptance (LOA): FMS Case IT-P-AJS was signed on 2 December 1991 for the purchase of 114 tactical missiles. Case value $33,369,386.

11c. (U) Total Program Cost and Quantity (Cont'd):

South Korea:

Letter of Offer and Acceptance (LOA): FMS case KS-P-AFK was signed on 2 January 1991 for the purchase of 40 tactical missiles. Case value is $26,439,963.

Spain:

Letter of Offer and Acceptance (LOA): FMS Case SP-P-AKM was signed on 28 December 1989 for the purchase of 80 tactical missiles. Case value value is $34,466,394.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
DCP 93A dated 10 July 1978. NDCP dated 6 August 1987.

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 17 December 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6250.1	7252.7	6250.0
(2) Quantity	19607	22669	19607
(3) Unit Cost	0.319	0.320	0.319
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	336.1	336.0	261.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	336.1	336.0	261.0
(2) Quantity	1214	1214	846
(3) Unit Cost	0.277	0.277	0.309

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	238.9	2171.0	0.0	2409.9
Previous Changes:				
Economic	-5.6	+494.7	+0.2	+489.3
Quantity	-	+1677.5	-	+1677.5
Schedule	+28.5	+1761.6	-	+1790.1
Engineering	+250.6	+13.9	-	+264.5
Estimating	+118.3	+336.2	+5.8	+460.3
Other	-	-	-	-
Support	-	+161.1	-	+161.1
Subtotal	+391.8	+4445.0	+6.0	+4842.8
Current Changes:				
Economic	+0.4	-141.7	-	-141.3
Quantity	-	-763.5	-	-763.5
Schedule	-	+94.5	-	+94.5
Engineering	-	+0.2	-	+0.2
Estimating	+14.0	-174.4	-	-160.4
Other	-	-	-	-
Support	-	-32.1	-	-32.1
Subtotal	+14.4	-1017.0	-	-1002.6
Total Changes	+406.2	+3428.0	+6.0	+3840.2
Current Estimate	645.1	5599.0	6.0	6250.1

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1978 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	226.8	1455.0	0.0	1681.8
Previous Changes:				
Quantity	-	+712.3	-	+712.3
Schedule	+20.0	+524.9	-	+544.9
Engineering	+148.9	+7.0	-	+155.9
Estimating	+66.0	+148.9	+3.1	+218.0
Other	-	-	-	-
Support	-	+65.1	-	+65.1
Subtotal	+234.9	+1458.2	+3.1	+1696.2
Current Changes:				
Quantity	-	-255.8	-	-255.8
Schedule	-	+30.0	-	+30.0
Engineering	-	-0.3	-	-0.3
Estimating	+7.2	-77.9	-	-70.7
Other	-	-	-	-
Support	-	-12.5	-	-12.5
Subtotal	+7.2	-316.5	-	-309.3
Total Changes	+242.1	+1141.7	+3.1	+1386.9
Current Estimate	468.9	2596.7	3.1	3068.7

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Schedule: Increase in initial manufacturing cost due to delay in prototype effort; increased hardware lead times, and delay of A-6E/HARM integration by one year.

Engineering: FY 80 thru FY 82 cost increase for A-6E/HARM integration and FY 80 cost increase for HARM design improvements and addition of HARM C (Block IV/LCS) program.

Estimating: Increased contractor costs for prototype development; deletion of FY 80 Initial Production funds; increased cost for 45 pilot production

13b. [redacted] Cost Variance Analysis (Cont'd):

missiles; Congressional addition to start second source development; funding of operational deficiencies in FY 84 thru FY 86; transfer of Project W1240 (A-6E) FY 83 program to airframe program manager; Congressional adjustments and escalation reductions; additional funds for deficiency corrections through FYDP transfer of project W1780 ($47.2M) to Low Cost Seeker program; correction to the base year $ calculation of prior year's SAR baseline; elimination of RDT&E funds from FY 88 through FY 91 reduction of FY 87 funds to address Low Cost Seeker development and revision of program estimate through adaption of Navy escalation indices for combined SAR. Increased funding for LCS and HIP (Block IV). Decreased Low Cost Seeker (LCS) funding of $16.6M due to deletion of FY91 thru 94 RDT&E.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Changes to program objective: FY 81/FY 82, -463 missiles; FY 83, +1782 missiles; FY 84, -1002 missiles; FY 86, +551 missiles; FY 87, -68 missiles; FY 88, -181 missiles. Addition of HARM C program, 7620 missiles; FY 89, +599 USAF missiles. Deletion of 87 missiles from 22,657 to 22,570 due to a change in FY90-95 procurement.

Schedule: One-year delay in initial production; stretchout of Navy procurement offset by approval of second source allowing larger annual procurement quantities, and one year less stretch in program; and Congressional action on FY 83 appropriations; program rephasing in January FY 85 FYDP; decrease in rate tooling. Addition of HARM C program; FY 89, stretch out quantities from FY 93/94 into FY 95.

Engineering: Procurement of Improved HARM Warhead FY 90-FY 94.

Estimating: Increases in estimate to adjust for actual cost data derived from contract negotiations; funds for second source development; 1982 cost study revised estimate; deletion of second source fund coincident with Congressional direction to continue as sole source program; decrease in unit cost trend attributable to credible threat of competition (dual source initiative) and other cost reduction initiatives; multiyear procurement savings; higher cost estimates due to reductions of Air Force quantities; adaption of Navy escalation factors

13b. [redacted] Cost Variance Analysis (Cont'd):

for combined SAR. Addition of HARM C program. Lower cost estimates due to successful contract negotiations. Higher cost estimates due to lower procurement levels for the remainder of the program.

Support: Decrease in PGSE and ILS requirements associated with decrease in 1002 missiles and implementation of a comprehensive warranty; increase in spares and fleet support in FY 87 through FY 91 for depot initiatives.

MILCON

Economic: Revised escalation indices.

Estimating: Increase in storage requirements; revised estimate

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation rates (Economic)	N/A	0.4
Increased funding for LCS (Estimating)	7.2	14.0
Total Changes	7.2	14.4
(2) PROCUREMENT		
Revised escalation rates (Economic)	N/A	-140.4
Deletion of 3062 missiles from 22,570 to 19,508	-289.0	-739.4
(Quantity)	-255.3	-763.6
(Schedule)	-25.2	19.4
(Engineering)	-0.3	0.2
(Estimating)	-8.2	4.6
Revised procurement schedule (Schedule)	55.2	75.4
Lower overall cost due to earlier than expected program termination (Estimating)	-90.7	-225.3
Increase in fleet support and spares (Support)	8.0	12.7
Correction to prior variances to reconcile Flyaway and Support costs		
(Support)	-20.8	-44.8
(Estimating)	+20.8	+44.8
Total Changes	-316.5	-1017.0

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes Econ	Qty	Sch	Eng	Est	Other	Spt	Total	PAUC (Current Est)
0.174	0.018	-0.005	0.096	0.014	0.015	--	0.007	0.145	0.319

15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a. ([redacted]) Procurement --

[redacted] HARM FY89/90 PRODUCTION:
TEXAS INSTRUMENTS, LEWISVILLE, TX
N00019-88-C-0156, FFP
Award: January 1, 1989
Definitized: January 1, 1989

	Initial Contract Price Target	Ceiling	Qty
	$424.2	N/A	2257

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$775.0	N/A	4064	$850.2	$850.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required for this FFP contract.

[redacted] HARM FY91 PRODUCTION:
TEXAS INSTRUMENTS, LEWISVILLE, TX
N00019-91-C-0003, FFP
Award: January 29, 1991
Definitized: January 29, 1991

	Initial Contract Price Target	Ceiling	Qty
	$262.8	N/A	1440

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$604.1	N/A	3524	$680.8	$680.8

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required for this FFP contract.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status --

(1) Percent Program Completed: 95.5% (21 yrs/22 yrs)

(2) Percent Program Cost Appropriated: 95.8% ($5989.1 / $6250.1)

b. [redacted] Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY72-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	641.1	4.0	-	-	645.1
Procurement	5001.9	336.1	261.0	-	5599.0
MILCON	6.0	-	-	-	6.0
O&M	-	-	-	-	-
Total	5649.0	340.1	261.0	-	6250.1

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY78 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1972				2.1	2.1	2.1	2.1	4.6
1973				6.7	6.7	6.7	6.7	4.4
1974				9.7	9.7	9.7	9.7	8.0
1975				14.3	14.3	14.3	14.3	10.9
1976				27.4	27.4	27.4	27.4	6.6
197T				3.9	3.9	3.9	3.9	2.9
1977				31.4	31.4	31.4	31.4	2.6
1978				28.5	29.7	29.7	29.7	6.8
1979				38.7	44.6	44.6	44.6	8.4
1980				50.1	63.8	63.8	63.8	10.6
1981				52.3	72.6	72.6	72.6	10.6
1982				15.2	22.2	22.2	22.2	7.6
1983				3.7	5.6	5.6	5.6	4.9
1984				24.5	38.7	38.7	38.7	3.8
1985				19.4	31.6	31.6	31.6	3.4
1986				13.0	21.9	21.9	21.9	2.8
1987				24.2	41.8	41.8	37.8	2.7
1988				8.8	15.8	15.8	13.4	3.0
1989				5.8	10.8	10.8	10.5	4.2
1990				8.2	15.8	15.6	15.0	4.0
1991				5.2	10.4	10.4	3.5	3.9
1992				1.9	4.0			3.1
Subtot	99			395.0	524.8	520.6	506.4	
Appropriation: 1507 Weapons Procurement, Navy								
1981	80	8.7	56.6	74.9	120.2	120.2	120.2	11.6
1982	118	11.2	40.9	64.8	113.0	113.0	113.0	14.3
1983	160	0.4	44.6	47.7	88.0	88.0	88.0	9.0
1984	318	18.6	63.7	102.1	195.9	195.9	195.9	8.0
1985	813	10.8	123.5	144.9	286.1	286.1	286.1	3.4
1986	767	1.0	99.9	105.3	215.1	215.2	213.2	2.8
1987	994	0.7	109.4	117.2	247.9	247.9	240.8	2.7
1988	766	0.3	81.2	88.7	195.0	195.0	185.4	3.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1507 Weapons Procurement, Navy (Cont'd)								
1989	1307	0.8	122.5	130.6	298.3	298.4	287.7	4.2
1990	1262	5.5	115.7	129.6	306.7	304.1	160.4	4.0
1991	2261	0.6	187.4	216.3	528.7	458.4	34.5	3.9
1992	749	0.5	71.1	86.2	217.7			3.1
1993				12.2	31.7			3.3
1994								3.3
1995								3.3
1996								3.2
1997								3.2
Subtot	9595	59.1	1116.5	1320.5	2844.3	2522.2	1925.2	
Appropriation: 1205 Military Construction, Navy								
1989				1.6	3.1			4.2
1990				1.5	2.9			4.0
Subtot				3.1	6.0			
Navy	9694	59.1	1116.5	1718.6	3375.1	3042.8	2431.6	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1977				0.5	0.5	0.5	0.5	2.6
1978				3.8	4.0	4.2	4.2	6.8
1979				2.0	2.3	2.3	2.3	8.4
1980				1.5	1.9	1.8	1.7	10.6
1981				7.0	9.7	8.5	8.5	10.6
1982				2.9	4.3	1.8	1.8	7.6
1983				3.1	4.7	4.2	4.1	4.9
1984				6.1	9.6	9.3	9.2	3.8
1985				2.9	4.7	4.7	4.6	3.4
1986				10.4	17.5	16.8	16.8	2.8
1987				10.9	18.8	19.3	18.6	2.7
1988				8.6	15.4	15.3	14.9	3.0
1989				8.8	16.3	15.5	11.5	4.2
1990				5.2	10.1	7.8	4.2	4.0
1991				0.2	0.5	0.4	0.2	3.9

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
Subtot				73.9	120.3	112.4	103.1	
Appropriation: 3020 Missile Procurement, Air Force								
1982	118	9.5	40.3	57.3	99.8	100.8	99.1	14.3
1983	123	3.0	31.8	41.1	75.7	74.1	73.3	9.0
1984	317	16.8	64.9	91.0	174.6	174.5	173.9	8.0
1985	871	13.0	131.6	154.6	305.1	304.8	303.0	3.4
1986	1384	9.4	178.7	195.2	398.6	398.3	395.7	2.8
1987	1510	1.0	164.7	175.8	371.9	371.9	371.8	2.7
1988	1590	0.7	162.4	168.0	369.3	369.3	362.3	3.0
1989	893	3.2	83.9	95.8	218.8	218.7	179.8	4.2
1990	576	1.2	52.8	56.8	134.5	134.4	20.2	4.0
1991	1220	1.3	99.7	105.8	258.7	217.3	4.0	3.9
1992	465	1.1	42.9	46.9	118.4	91.9		3.1
1993	846	1.3	83.9	87.9	229.3			3.3
1994								3.3
1995								3.3
1996								3.2
1997								3.2
Subtot	9913	61.5	1137.6	1276.2	2754.7	2456.0	1983.1	
USAF	9913	61.5	1137.6	1350.1	2875.0	2568.4	2086.2	
Grand Total	19607	120.6	2254.1	3068.7	6250.1	5611.2	4517.8	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1981	0	80	80	80
1982	0	236	236	236
1983	0	289	283	283
1984	0	722	635	635
1985	0	1674	1684	1684
1986	0	2461	2151	2700
1987	0	3275	2504	2700
1988	0	3761	2356	2700
1989	0	3084	2200	2700
1990	0	1847	1838	2700
1991	0	0	3481	2700
1992	0	0	1214	390
1993	0	0	846	0

Note: The maximum economic production rate shown is not currently attainable due to the participation of other customers in program production.

17b. ([redacted]) Production Rate Data (Cont'd):

b. ([redacted]) Cost Variance -- Dollars in Millions

Item		Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost	(BY $)	3211.1	-142.4	3068.7	+192.2	2876.5
	(TY $)	6363.4	-113.3	6250.1	+297.3	5952.8
PAUC Cost	(BY $)	0.165	-0.008	0.157	0.010	0.147
	(TY $)	0.326	-0.007	0.319	0.015	0.304

c. ([redacted]) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (MON YY)	DEC 81	0	DEC 81	N/A	DEC 81
Duration (in MON)	143	24	167	26	141
End Date (MON YY)	NOV 93	24	NOV 95	N/A	SEP 93

d. ([redacted]) Deliveries (Plan/Actual) --

	To Date
RDT&E	99/99
Procurement	12465/12465

e. ([redacted]) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 5000 - @ Peak Rate: 185/mo			
FY 78 Base-Year $	93.3	193.1	200.0
Then Year $	127.8	363.4	375.2
@ Qty 0 (1st three years) - @ Peak Rate: 0/mo			
FY 78 Base-Year $	0.0	0.0	0.0
Then Year $	0.0	0.0	0.0

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

- 20 Year period
- All costs in FY90 constant dollars
- O&S cost structure in accordance with OSD WBS guide for missiles
- There are no antecedent systems for HARM

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element (6/30/90)	Avg Annual Cost Per Missile	Avg Annual Cost Per (Antecedent)
Operations and Support	665.0	N/A
Below Depot Maintenance	776.0	N/A
Depot Maintenance	407.0	N/A
Depot Supply & Tech. Sup	628.0	N/A
Second Destination Trans	37.0	N/A
Sustaining Investments	1183.0	N/A
Total	3696.0	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	4.1	1.8	0.6	---	6.5
Total	4.1	1.8	0.6	---	6.5

N-23 HARPOON

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(O&A)823)
PROGRAM: HARPOON (A/R/UGM-84)

AS OF DATE: December 31, 1991

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AS AMENDED

MAR 24 1992

1. ([redacted]) Designation and Nomenclature (Popular Name):
AGM-84A,C,D,E / RGM-84A,C,D / UGM-84A,C,D / HARPOON

2. ([redacted]) DoD Component: Navy

3. ([redacted]) Responsible Office and Telephone Number:
PEO, Cruise Missiles Project and Unmanned Aerial Vehicles Joint Project (PMA-258)
WASHINGTON, DC 20361-1014

CAPT GUY HIGGINS
Assigned: July 26, 1990
AV 222-3340 COMM (202) 692-3399

4. [redacted] Program Elements/Procurement Line Items:

RDT&E:
PE 0205603N
PE 0603306N Project 1958 (Shared)
PE 0604364N
PROCUREMENT:
APPN 1507 ICN 2224 (Navy)

92-C-0499
M. Neal

~~Classified by: OPNAVINST S5513.2B(31)~~
~~Declassify on: [illegible]~~
~~Downgrade Instructions:~~

No Security Office [illegible] Publication
(AS AMENDED)

MAR 24 1992

Office of the Chief of
Naval Operations Dept. of the Navy

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OASD(PA) DFOISR 92 -T- 0688

[redacted]

4. (U) Program Elements/Procurement Line Items (Cont'd):

MILCON:
PE 0702096N

5. (U) Related Programs:
TOMAHAWK

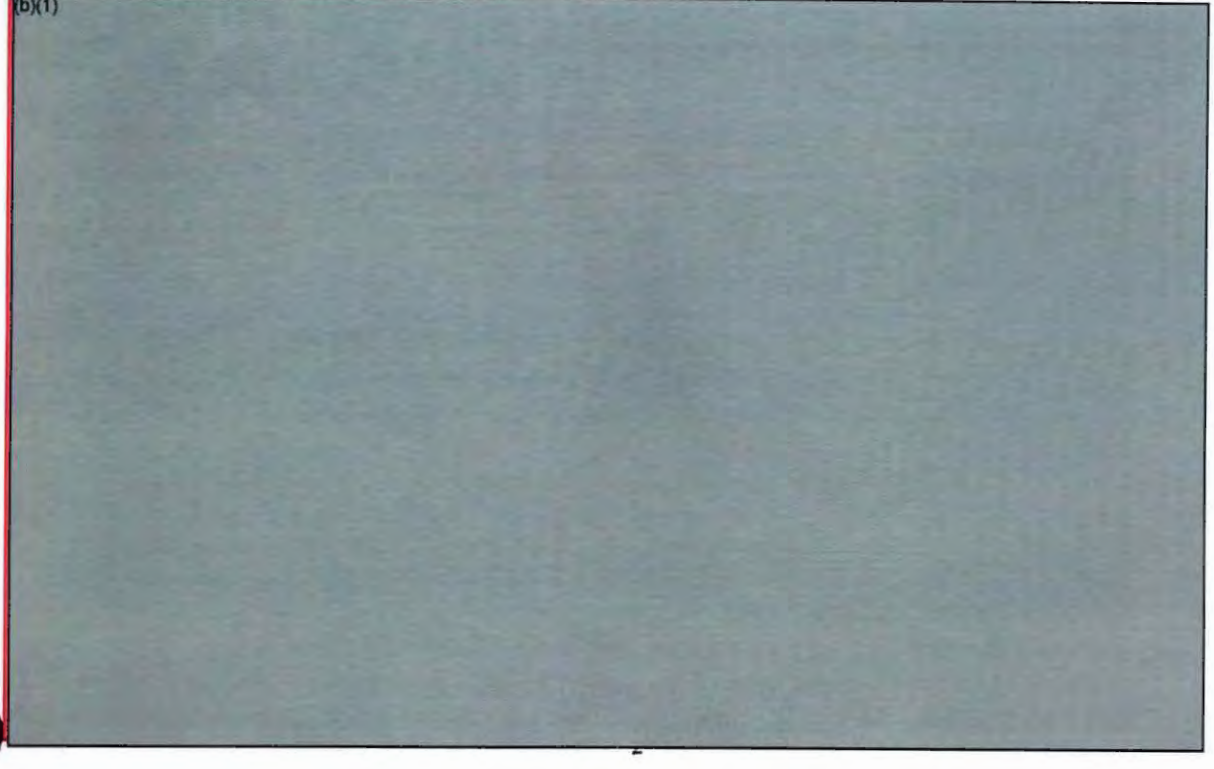
6. (U) Mission and Description:
Ship/Air/Submarine launched all-weather anti-ship missile effective against enemy destroyers, light cruisers, surfaced submarines, patrol craft and other (e.g., merchant, surveillance, etc.) enemy shipping. The Standoff Land Attack Missile (SLAM) variant is effective against fixed targets and ships in harbors.

(U) The Harpoon utilizes attitude reference mid-course guidance with an active or passive seeker for target acquisition and terminal guidance. Missile shall be capable of being launched from the following platforms:

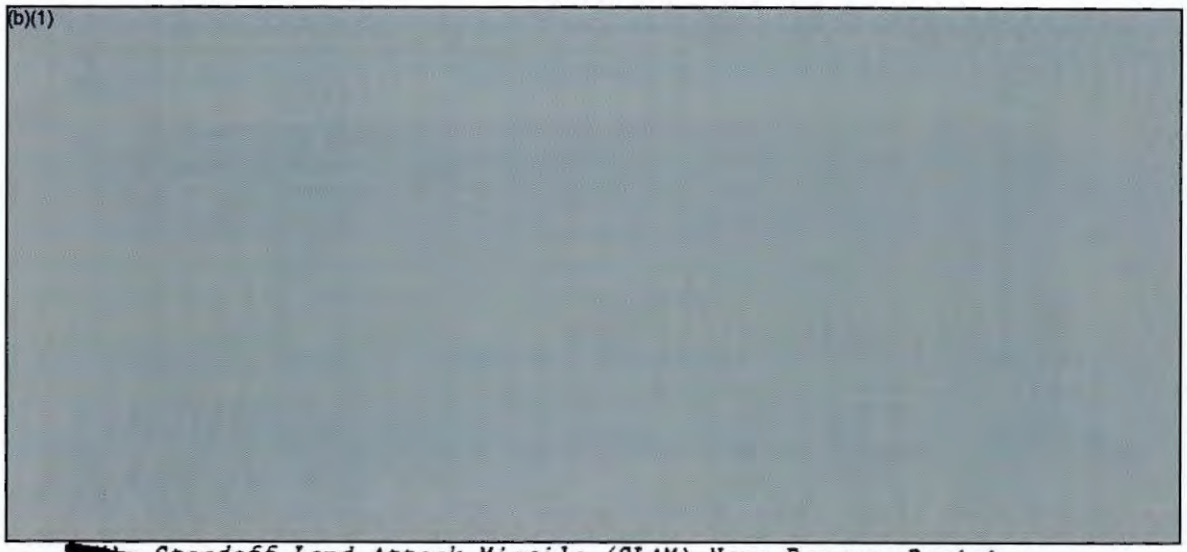
Ships:	FF-1052, DDG, CG, CGN, PHM, DD-963, FFG-7, BB
Air:	P-3, A-6, F-18, S-3, B-52 (USAF)
Submarine:	SSN-594/637/688 Class

7. (U) Program Highlights:

(b)(1)



(b)(1)



[redacted] Standoff Land Attack Missile (SLAM) Navy Program Decision Memorandum (NPDM) (May 1988) received FY 88 ALP. SLAM missile Technical Evaluation (TECHEVAL) was completed on the AWW-13 Advanced Data Link (ADL) Pod. Improved Harpoon Program Management Proposal approved by the Undersecretary of the Navy 25 November 1988.

[redacted] First Harpoon 3700-4 Seeker deliveries began March 1989. SLAM successfully completed TECHEVAL December 1989. Block 1D Harpoon development contract awarded September 1989. Ship launch SLAM demonstration contract awarded September 1989.

[redacted] The FY 90 contract for 125 SLAM missiles was signed 3 October 1990. Due to the unanticipated cancellation of the HARPOON and SLAM production beginning in FY 92, a decision was made to procure all SLAMs versus a mix of Harpoon and SLAM. The planned buy was for 190 (142 Harpoons and 48 SLAMs). SLAMs have a greater cost than HARPOON, therefore fewer missiles (125) were procured.

[redacted] SLAM OPEVAL commenced in October 1990.

b. [redacted] Significant Developments Since Last Report --

[redacted] SLAM OPEVAL was completed 26 February 1991, Authority for Full Rate Production was granted on 28 June 1991 after a 24 May Navy Program Decision Meeting. The FY 91 production contract for 167 SLAM (160 annual production and 7 Desert Storm supplemental missiles) was awarded 6 July 1991.

(b)(1)



7b. (U) Program Highlights (Cont'd):

(U) Successful developmental test of a Harpoon Block 1D reattack missile launched from both a ship and an A-6E aircraft was completed. Harpoon Block 1D OT&E flight testing was completed on 4 February and COMOPTEVFOR will be releasing a final Operational Test report in May 1992.

(U) This system will satisfy mission requirements.

(U) Since deliveries exceed 90%, we intend this to be the final report.

c. (U) Changes Since As Of Date --

The Program Management Plan on the 2.41 SLAM software update was signed on 31 January 1992.

The appropriated funds for procurement of 150 SLAM missiles in 1992 contract has been placed on the OSD recision list. The amended FY 92-93 President's Budget provides for the procurement of 50 exercise sections. Awaiting final budget decision from Congress.

8. (U) Threshold Breaches:
There are no breaches to the Acquisition Program Baseline dated 9 October 1991 and no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Milestone I Initiate Development (Validation Phase)	MAR 70	MAR 70	MAR 70
Milestone IIA Weapon System Development Approval	JUN 73	JUN 73	JUN 73
Milestone IIIA Pilot Line Production Approval	JUN 74	JUL 74	JUL 74
DSARC IIIA Production Approval	N/A	JUN 75	JUN 75
Approval for Service Use	DEC 75	FEB 81	FEB 81
First Delivery to the fleet	DEC 75	JUL 77	JUL 77
IOC (FF-1052)	JUL 76	JUL 77	JUL 77
IOC (P-3 Aircraft)	JUN 76	AUG 79	AUG 79
IOC (A-6 Aircraft)	OCT 81	OCT 81	OCT 81
Block 1C Missile - AFP	JUN 87	SEP 87	AUG 88

9a. [redacted] Schedule (Cont'd):

[redacted] Milestones (Cont'd) --

	Development Estimate	Approved Program	Current Estimate
Milestone II SLAM	N/A	JUN 87	JUN 87(Ch-1)
Milestone III SLAM	N/A	JUN 91	JUN 91(Ch-2)
Last Delivery SLAM	N/A	JUN 94	JUN 94(Ch-3)
Award Design Phase Contract	JUN 71	N/A	JUN 71
Complete 4 successful guidance test vehicle launches	MAR 73	N/A	MAR 73
First Prototype Msl Launch	FEB 74	N/A	FEB 74
Start Navy Technical Evaluation	DEC 74	N/A	DEC 74
OPEVAL			
Start	JUL 75	N/A	AUG 85
Complete	DEC 75	N/A	MAR 77
Definitized 1st Prod Contract	MAR 76	N/A	NOV 76
IOC (Submarine)	APR 76	N/A	JUL 77
Block 1C Msl (SLAM) - ALP	NOV 82	N/A	JUN 83
2nd Block 1C - ALP	JUN 84	N/A	SEP 84
3rd Block 1C - ALP	JUN 87	N/A	NOV 87

b. [redacted] Previous Change Explanations --

Integration testing at the section and assembly level required more time than planned. Incorporation of design improvements for the engine, fuel control and electrical power delayed sustainer delivery. The 3rd ALP granted by NPDM 11/87 and AFP rescheduled to 8/88. Incorporated milestones for SLAM program. Data for SLAM Milestone II corrected. ALP received 5/88. Milestone slip does not affect IOC date for the SLAM. Milestone IIIC AFRP was delayed due to software problems, ALRIP was granted 1/89. ALRIP was granted for SLAM 7/90.

c. [redacted] Current Change Explanations --

Changes 1 thru 3 were the result of delays in the test program. These dates are reflected in the current approved baseline.

d. [redacted] References --

([redacted]) Development Estimate:
Decision Coordinating Paper (DCP) No. 77 of May 16, 1973 amended by DSARC IIB, June 25, 1974 and DSARC IIIB, September 1977.

[redacted] Approved Program:
NAE Approved Acquisition Program Baseline dated 9 October 1991.

10. (U) Performance Characteristics:

a. (U) Performance --	Approved Program	Demonstrated	Current
(b)(1)	[redacted]		

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

b. [redacted] Previous Change Explanations --

Variances have been due to results of the Captive-Carry Program, OPTEVFOR test results, and improved missile performance.

c. [redacted] Current Change Explanations --

(b)(1)

[redacted] Change 2 was the result of administrative error based on erroneous data.

[redacted] Change 3 was the result of identification of high failure rate items and replacement of same.

d. [redacted] References --

[redacted] Development Estimate:
Decision Coordinating Paper (DCP) No. 77 of May 16, 1973 amended by DSARC IIB, June 25, 1974 and DSARC IIIB, September 1977.

[redacted] Approved Program:
NAE Approved Acquisition Program Baseline dated 9 October 1991.

11. ([redacted]) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. ([redacted]) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	272.0	287.8	281.6
Procurement	523.0	1429.6	1249.4
Flyaway	(457.6)		(1047.4)
Total Flyaway	(457.6)		(1047.4)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(65.4)		(202.0)
Construction (MILCON)	0.0	2.5	0.3
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 70 Base-Year $	795.0	1719.9	1531.3
Escalation	236.8	2719.6	2213.7
Development (RDT&E)	(43.9)	(105.7)	(121.0)
Procurement	(192.9)	(2607.6)	(2092.3)
Construction (MILCON)	(0.0)	(6.3)	(0.4)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1031.8	4439.5	3745.0
b. ([redacted]) Quantity --			
Development (RDT&E)	52	0	52
Procurement	2870	4397	3653
Total	2922	4397	3705

(b)(1) [redacted]

d. ([redacted]) Nuclear Costs --

None

e. ([redacted]) References --

([redacted]) Development Estimate:

Decision Coordinating Paper (DCP) No. 77 of May 16, 1973 amended by DSARC IIB, June 25, 1974 and DSARC IIIB, September 1977.

11e. ([redacted]) Total Program Cost and Quantity (Cont'd):

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 9 October 1991.

12. ([redacted]) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. ([redacted]) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3745.0	3745.3	3745.0
(2) Quantity	3705	3698	3705
(3) Unit Cost	1.011	1.013	1.011
b. ([redacted]) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	37.2	37.2	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	37.2	37.2	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	315.9	715.9	0.0	1031.8
Previous Changes:				
Economic	+8.0	+277.2	+0.2	+285.4
Quantity	-	-137.5	-	-137.5
Schedule	+2.1	+420.4	-	+422.5
Engineering	+68.7	+38.5	-	+107.2
Estimating	+7.9	+1558.9	-	+1566.8
Other	-	-	-	-
Support	-	+461.7	+7.4	+469.1
Subtotal	+86.7	+2619.2	+7.6	+2713.5
Current Changes:				
Economic	-	-7.2	-	-7.2
Quantity	-	+5.3	-	+5.3
Schedule	-	+6.9	-	+6.9
Engineering	-	-	-	-
Estimating	-	+10.2	-	+10.2
Other	-	-	-	-
Support	-	-8.6	-6.9	-15.5
Subtotal	-	+6.6	-6.9	-0.3
Total Changes	+86.7	+2625.8	+0.7	+2713.2
Current Estimate	402.6	3341.7	0.7	3745.0

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1970 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	272.0	523.0	0.0	795.0
Previous Changes:				
Quantity	-	-36.5	-	-36.5
Schedule	+0.6	+89.1	-	+89.7
Engineering	+45.1	+10.4	-	+55.5
Estimating	-36.1	+520.8	-	+484.7
Other	-	-	-	-
Support	-	+139.0	+1.9	+140.9
Subtotal	+9.6	+722.8	+1.9	+734.3
Current Changes:				
Quantity	-	+1.4	-	+1.4
Schedule	-	+1.9	-	+1.9
Engineering	-	-	-	-
Estimating	-	+2.7	-	+2.7
Other	-	-	-	-
Support	-	-2.4	-1.6	-4.0
Subtotal	-	+3.6	-1.6	+2.0
Total Changes	+9.6	+726.4	+0.3	+736.3
Current Estimate	281.6	1249.4	0.3	1531.3

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation rates.

Schedule: Software problems delayed schedule.

Engineering: Correction of errors in prior SARs.

Estimating: Prior year funding adjustments. Revision of T&E program. Increased SLAM testing costs. Correction of errors in prior SARs.

PROCUREMENT

Economic: Revised escalation rates indices. Correction of errors in prior SARs.

Quantity: Addition of 754 missiles. Addition of 426 missiles due to increased inventory objective. Decrease in

13b. [redacted] (U) Cost Variance Analysis (Cont'd):

total procurement by 631 missiles. Correction of errors in prior SARs. Additional decrease of 120 missiles.

Schedule: Revision of procurement to earlier FY. Reduced missile quantity FY 88 (15) due to missile unit cost increase. Change of SLAM schedule to 4 vice 1 year. Reduced FY89 (19) to fund Improved Harpoon startup costs. Increase in FY91 procurement by 31 missiles from FY92. Correction of errors in prior SARs. Production rate changes due to decrease in procurements.

Engineering: Added Reliability/Quality Assurance Requirements. Increased Seeker Improvement. Implemented Product Improvements. Incorporation of -4 Seeker ECP (PMP #84-1). Improved Harpoon program engineering changes. Correction of errors in prior SARs. Allocation due to quantity changes.

Estimating: Increased due to under estimation of Rate Tooling. Increase in Government In-House and Government Testing costs. Prior year funding adjustments. Revision of cost. (Congressional Budget for 1986 SAR based on multi-year procurement. Congressional disapproval required repricing of 1986 SAR.) Underestimation of SLAM engineering costs. Underestimation of ECP costs. Underestimation of ECP costs. Procurement of all SLAMs in FY90 and FY91. Correction of errors in prior SARs.

Support: Spares/fleet support changes due to quantity change of missiles. Program stretched two years. Logistic Audit Review citing areas of support underfunded. PMA increased costs to fully fund LFRPs. Increased spares due to increased requirements (missile quantity). Support requirements decrease caused by reduction in total procurement of 631 missiles. Mix of SLAM/Harpoon has changed. Support costs for SLAM are greater than those costs for Harpoon.

MILCON

Economic: Prior year escalation rates.

Support: Building modification at NWS, Concord in FY79. Congressional denial of funds for FY93.

13c. ([redacted]) Cost Variance Analysis (Cont'd):

c. ([redacted]) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised Escalation Rates (Economic)	--	-7.2
Increase of 7 missiles for Desert Storm. (Quantity)	1.4	5.3
SLAM award for expedited deliveries. (Schedule)	1.9	6.9
Revised production cost based on actuals. (Estimating)	0.4	1.8
Revised cost due for field station oversight required for last year of production. (Support)	-0.1	-0.2
Correction of prior variances to reconcile flyaway and support costs (Estimating)	2.3	8.4
Correction of prior variances to reconcile flyaway and support costs (Support)	-2.3	-8.4
Total Changes	3.6	6.6
(2) MILCON		
Due to reduction in MILCON requirements. (Economic)	-1.6	-6.9
Total Changes	-1.6	-6.9

14. ([redacted]) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

([redacted]) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.353	0.075	-0.110	0.116	0.029	0.426	--	0.122	0.658	1.011

15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a.([redacted]) Procurement --

([redacted]) SLAM:

McDONNELL DOUGLAS, ST. CHARLES, MO
N00019-87-C-0020, FFP
Award: February 2, 1987
Definitized: June 7, 1990

Initial Contract Price		
Target	Ceiling	Qty
$33.4	N/A	14

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$318.1	N/A	237	$318.1	$318.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variances are not required on this FFP contract.

([redacted]) HARPOON:

McDONNELL DOUGLAS, ST. CHARLES, MO
N00019-91-C-0047, FFP
Award: July 8, 1991
Definitized: July 8, 1991

Initial Contract Price		
Target	Ceiling	Qty
$192.0	N/A	167

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$190.8	N/A	167	$192.0	$192.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule varinces are not required on this FFP contract.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status --

(1) Percent Program Completed: 100.0% (23 yrs/23 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($3745.0 / $3745.0)

b. [redacted] Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY70-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	402.6	-	-	-	402.6
Procurement	3304.5	37.2	-	-	3341.7
MILCON	0.7	-	-	-	0.7
O&M	-	-	-	-	-
Total	3707.8	37.2	-	-	3745.0

c. [redacted] Annual Summary --

Fiscal Year	Qty	Flyaway FY70 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1970				4.9	5.1	5.1	5.1	5.5
1971				17.8	19.2	19.2	19.2	5.1
1972				37.5	42.3	42.3	42.3	4.6
1973				60.2	71.8	71.8	71.8	4.4
1974				70.9	92.0	92.0	92.0	8.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY70 Dollars Nonrec	Flyaway FY70 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1975				48.9	69.1	69.1	69.1	10.9
1976				13.2	19.7	19.7	19.7	6.6
1979				0.8	1.5	1.5	1.5	8.4
1987				6.5	18.7	18.7	18.1	2.7
1988				10.7	31.5	31.5	30.0	3.0
1989				8.4	25.9	25.9	21.5	4.2
1990				1.2	3.7	3.7	3.4	4.0
1991				0.6	2.1	2.1	1.7	3.9
Subtot	52			281.6	402.6	402.6	395.4	
Appropriation: 1507 Weapons Procurement, Navy								
1975	100	7.0	47.8	57.8	81.7	81.7	81.6	8.8
1976	170	7.4	73.4	88.6	134.8	134.8	131.5	6.6
197T	66	1.0	23.2	27.4	43.6	43.6	43.6	3.6
1977	220		78.4	89.2	150.6	150.6	148.3	3.8
1978	234		63.6	73.5	138.8	138.8	133.4	6.8
1979	240		59.4	65.9	137.0	137.0	135.7	8.7
1980	240		56.2	63.9	146.5	146.5	146.6	11.8

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY70 Dollars Nonrec	Flyaway FY70 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1507 Weapons Procurement, Navy (Cont'd)								
1981	240		61.0	82.9	211.8	211.8	205.1	11.6
1982	240		67.7	81.5	226.2	226.2	224.4	14.3
1983	223		60.7	77.0	225.9	225.9	211.7	9.0
1984	315		77.8	94.3	287.8	287.8	281.0	8.0
1985	354		78.7	94.0	295.5	295.5	289.8	3.4
1986	395	6.1	77.2	92.2	299.8	299.8	293.2	2.8
1987	96	3.9	24.3	38.2	128.7	128.7	122.9	2.7
1988	109	3.2	31.6	42.7	149.5	149.5	138.8	3.0
1989	119	6.8	32.2	47.9	174.2	174.2	155.1	4.2
1990	125	3.1	38.7	58.6	220.9	218.0	140.8	4.0
1991	167	3.5	47.3	64.5	251.2	233.0	39.3	3.9
1992			6.2	9.3	37.2	4.1		3.1
Subtot	3653	42.0	1005.4	1249.4	3341.7	3287.5	2922.8	
Appropriation: 1205 Military Construction, Navy								
1979				0.3	0.7	0.7	0.7	9.3
Subtot				0.3	0.7	0.7	0.7	
Grand								

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY70 Dollars Nonrec	Flyaway FY70 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1205 Military Construction, Navy (Cont'd)								
Total	3705	42.0	1005.4	1531.3	3745.0	3690.8	3318.9	

17. [redacted] Production Rate Data:

a. [redacted] Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1975	N/A	150	100	100
1976	N/A	270	170	170
197T	0	0	66	66
1977	N/A	380	220	220
1978	N/A	550	234	234
1979	N/A	550	240	240
1980	N/A	550	240	240
1981	N/A	420	240	240
1982	0	0	240	240
1983	0	0	223	223
1984	0	0	315	315
1985	0	0	354	354

17a. [redacted] Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1986	0	0	395	395
1987	0	0	96	360
1988	0	0	109	256
1989	0	0	119	0
1990	0	0	125	0
1991	0	0	167	0

b. [redacted] Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	795.0	+736.3	1531.3	+2.0	1529.3
(TY $)	1031.8	+2713.2	3745.0	-0.3	3745.3
PAUC Cost (BY $)	0.277	0.136	0.413	0.001	0.413
(TY $)	0.360	0.651	1.011	0.000	1.011

c. [redacted] Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JUL 74	17	DEC 75	N/A	DEC 75
Duration (in MON)	113	100	213	36	177
End Date(MON YY)	DEC 83	117	SEP 93	N/A	SEP 90

17d. (U) Production Rate Data (Cont'd):

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	52/52
Procurement	3380/3387

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

No O&S costs available.

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&MN	30.5	6.5	8.7	---	45.7
Industrial Fund	0.6	0.4	0.3	---	1.3
Total	31.1	6.9	9.0	---	47.0
Total	62.2	13.8	18.0	---	94.0

N-24 LAMPS MK III

91-140

~~CONFIDENTIAL~~

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LAMPS MK III

AS OF DATE: December 31, 1991

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AS AMENDED
FOR OPEN PUBLICATION
MAR 20 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD (PA)) DEPARTMENT OF DEFENSE

2

1. (U) Designation and Nomenclature (Popular Name):
   Light Airborne Multi-Purpose System (LAMPS MK III)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

Air ASW, Assault and Special Mission Programs (PMA-266)	CAPT B. D. STRONG
JEFFERSON PLAZA 1, RM 720	Assigned: August 8, 1988
WASHINGTON, DC 20361-1266	AV 286-1534 COMM 703-746-1534

4. ~~(U)~~ Program Elements/Procurement Line Items:

   RDT&E:
   PE 0604212N Project W1707
   PROCUREMENT:
   APPN 1506 ICN 0180 (Navy)
   APPN 1810 ICN 4255 (Navy)

No Security Objection to Open Publication
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92-C-0449
MAR 20 1992
Office of the Chief of
Naval Operations Dept. of the Navy

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~~Downgrade Instructions: Not Subject to Automatic Downgrade~~

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5. (U) Related Programs:

Army: UH-60A BLACK HAWK, EH-60A Quickfix.

Air Force: HH-60D NIGHT HAWK, MH-60G PAVE HAWK, MH-60K Special Operations Helicopter.

Navy: Kidd Class Guided Missile Destroyer (DDG-993 Class), Arleigh Burke Class Guided Missile Destroyer (DDG-51 Class), Perry Class Guided Missile Frigate (FFG-7 Class), Spruance Class Destroyer (DD-963 Class), Ticonderoga Class Aegis Cruiser (CG-47), Shipboard Sonar System AN/SQQ-89, Penguin Missile, Aircraft Carrier Inner Zone Anti-Submarine Warfare Helo (SH-60F), Helicopter Combat Support Aircraft (HH-60H), Airborne Low Frequency Sonar (ALFS).
Coast Guard: Medium Range Recover Helicopter (HH-60J).

6. (U) Mission and Description:
The Light Airborne Multi-Purpose System (LAMPS MK III) is a computer integrated ship/helicopter system that increases the effectiveness of surface combatants. It is their main battery and is optimized for Anti-Submarine Warfare (ASW) and Anti-Surface Warfare (ASUW). Secondary missions include Search and Rescue (SAR), Medical Evacuation (MEDEVAC), Vertical Replenishment (VERTREP), and Communications Relay (COMREL). The ship provides sensor processing, command and control, integrates LAMPS MK III information gained with other sensors and provides the landing and traversing system, visual landing aids, and maintenance and support facilities for the aircraft. The helicopter provides a remote platform for deployment of sonobuoys and torpedoes, processing of acoustic and Magnetic Anomaly Detection (MAD) sensor information and an elevated platform for radar and Electronic Warfare Support Measures (ESM). LAMPS MK III supplements but does not replace any existing defense systems.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
LAMPS development was initiated in 1969 with the requirement for a manned helicopter aboard destroyer-class ships to enhance ASW and Anti-Ship Surveillance and Targeting (ASST). Validation Phase was completed in December 1976. Full Scale Development authorization (DSARC IIC) was granted in February 1978. First flight occurred in December 1979 followed by a successful total weapon system demonstration in May 1980. Weapon System testing at sea was successfully conducted after installation of LAMPS MK III ship equipments in USS MCINERNEY (FFG-8). Provisional Approval for Service Use (PASU) was granted in September 1981 following successful OPEVAL of the Helicopter Landing System (HLS) and exercise of entire weapon system in various operational scenarios. A November 1981 Secretary of Defense Decision Memorandum (SDDM) granted approval for limited

7a. (U) Program Highlights (Cont'd):

production. Approval for Service Use (ASU) for the Helicopter Landing System (HLS) and Sonar Signal Processing System (AN/SQQ-28) was granted in June 1982. A SDDM was issued in December 1982, following DSARC III in June, granting approval for production.

The baseline program planned procurement of 204 aircraft over a four year period and 110 ship systems. The December 1982 SAR estimate extended the aircraft procurement to eleven years and reduced ship systems to 94. The December 1983 SAR estimate increased ship systems to 97. With the addition of the reserve FFG-7 class ships and the DDG-51 class ships the total number of ship systems to be procured is 142.

The first production aircraft was delivered in September 1983, one month ahead of schedule. The first LAMPS MK III training squadron was established at Naval Air Station, North Island in January 1983. Initial Operating Capability was achieved in July 1984.

A Chief of Naval Operations Executive Board (CEB) decision in April 1984 added an ASUW capability to the LAMPS MK III weapon system by incorporating the Norwegian manufactured PENGUIN anti-ship missile.

In June 1987, in response to Persian Gulf initiatives, CNO authorized 25 SH-60B aircraft to be modified for the Middle East Force with the following self-protection equipment: ARC-182 UHF/VHF radio, M-60 machine guns, ALE-39 Chaff/Flare dispenser and ALQ-144(VP) dual phase jammer. Self-protection for the SH-60B, commencing with FY 1988 production aircraft, was directed by Congress in December 1987. For SAR reporting purposes, the Shipboard Radio Terminal Set (SRQ-4) and Sonar Signal Processing System (SQQ-28) were transferred to Surface Ship ASW Combat System Program Office (PMS-411) in December 1986 in accordance with NAVCOMPT letter dated 18 November 1986. Twelve aircraft were configured with ALQ-156 Pulse Doppler Radar in December 1988.

The Block I Upgrade began with FY90 procurement of Lot IX aircraft. Mission area improvements to the SH-60B aircraft for the Block I Upgrade are the incorporation of a Global Positioning System (GPS), 99 channel sonobuoy receiver, MK-50 torpedo capability and an enhanced survivability protection system. Additionally, 28 kits are being procured with the Block I Upgrade to modify the existing LAMPS MK III avionics system to provide for the capability to carry and launch the Penguin anti-ship missile. Other features of the Block I Upgrade include engineering reliability and maintainability improvements.

In response to an urgent CINC request for near term LAMPS Forward

7a. (U) Program Highlights (Cont'd):

Looking Infrared Radar (FLIR) capability to support Desert Shield/Desert Storm, a contract with IBM was signed 28 Dec 90 to deliver and integrate 5 AN/AAQ-16 FLIRs. Four of the FLIRs were installed by 30 Jan 91 on SH-60B helicopters embarked on board USS NICHOLAS (FFG-47), USS CURTS (FFG-38) and USS JARRETT (FFG-33). The fifth FLIR Kit was installed on NATC aircraft for test and evaluation.

A contract was signed 31 Dec 1990 for Phase I of the LAMPS MK III Block II Upgrade. Phase I consists of the generation and delivery of specifications and documentation required to complete Block II effort.

Penguin missile operational testing resulted in 4 successful launches in 4 attempts.

b. (U) Significant Developments Since Last Report --
As of December 31, 1991, the Navy has accepted a total of 141 production airframes, 139 full avionics populated SEAHAWKS, and 94 HLSs for ship installation.

In support of extended deployment operations, including Desert Shield and Desert Storm, a new total flying hour record of 3547 hours was set in January 1991. Mission capability rate continued to exceed CNO goals.

On 6 Feb 1991, the revised baseline was approved, which increased the procurement objective from 204 to 260 aircraft.

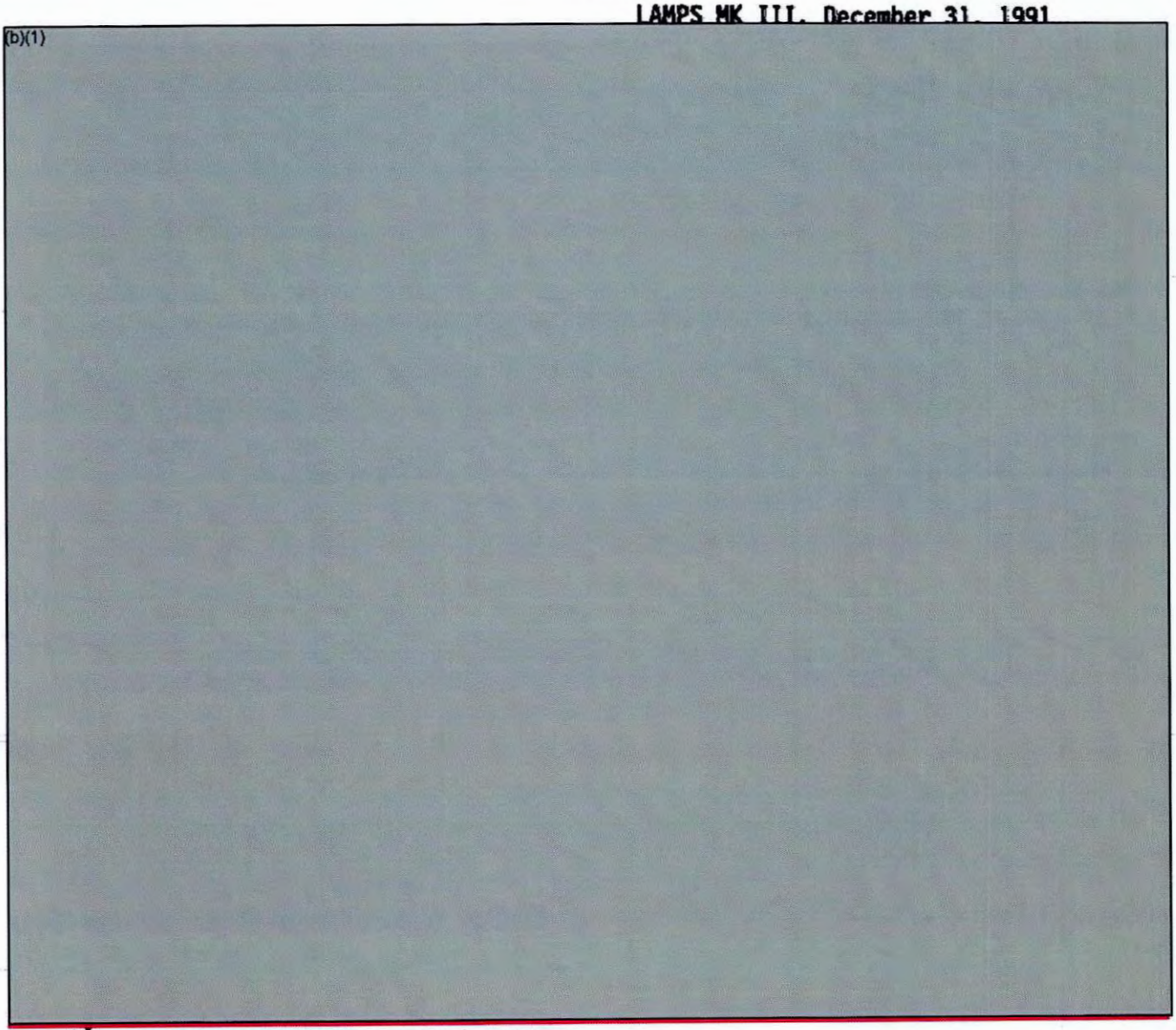
The LAMPS MK III system is expected to meet all mission requirements.

c. (U) Changes Since As Of Date -- None.

8. (U) Threshold Breaches:
There are currently no breaches of the 6 February 1991 MAE Approved Acquisition Program Baseline. There are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

(b)(1)



b. (U) Previous Change Explanations --

On September 22, 1981, a Program Review versus the planned DSARC IIIA was conducted on the LAMPS MK III Weapon System by the Under Secretary of Defense for Research and Engineering. Board of Inspection and Survey Initial Trials were delayed due to non-availability of aircraft and OPEVAL concurrency. Scope was reduced to eliminate duplications of test effort. DSARC III was completed on June 29, 1982.

c. (U) Current Change Explanations -- None.

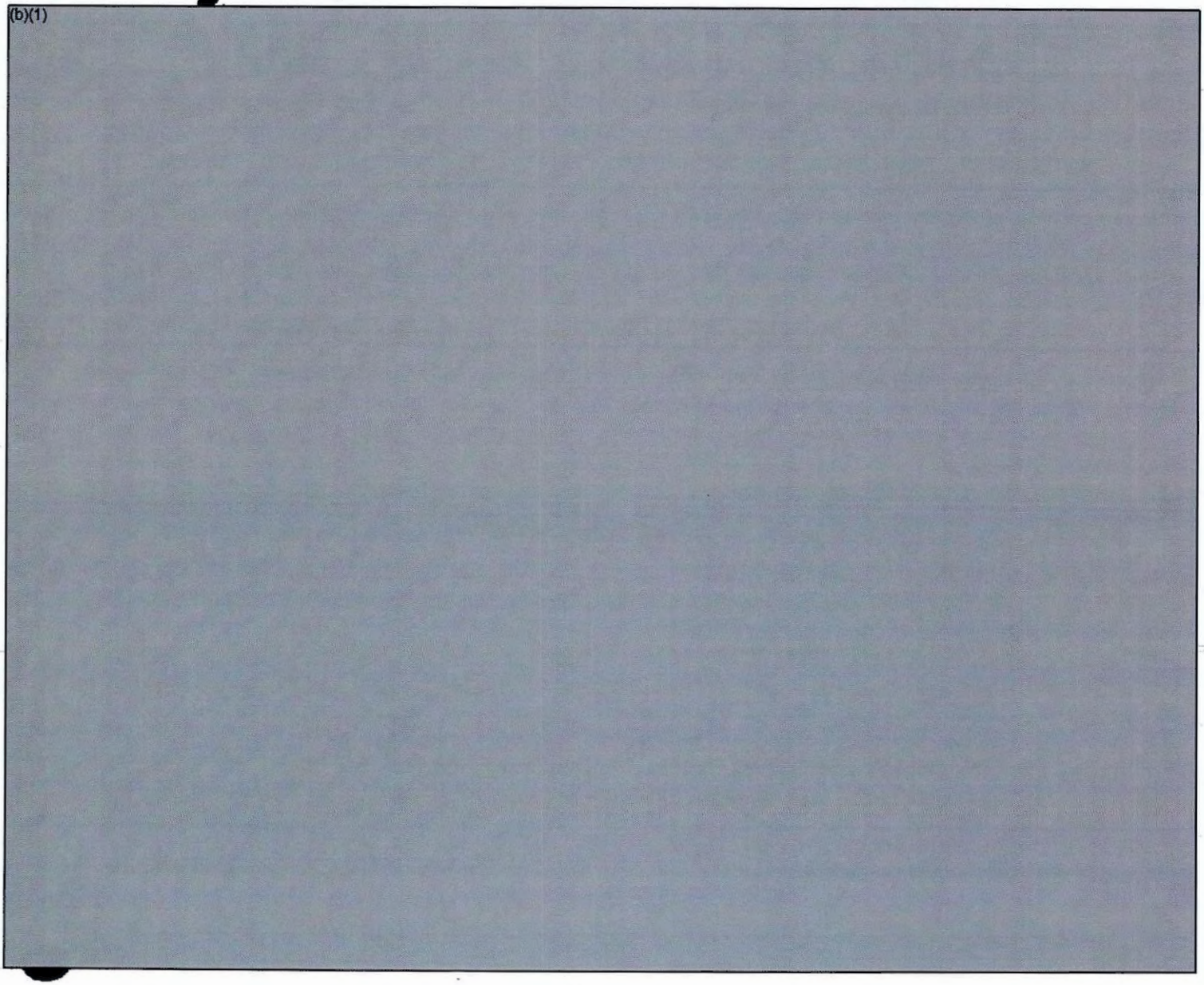
9d. (U) Schedule (Cont'd):

d. (U) References --

(U) Development Estimate:
DCP No. 85 dated March 5, 1979.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 6 February 1991.

(b)(1)



10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

b. (U) Previous Change Explanations --

The increase in aircraft maximum gross weight is the result of incorporating approved Engineering Change Proposals. The decrease in MFHBF SH-60B SEAHAWK is the result of a broader statistical base and correction of calculation from previous reports. The changes in DMMH/FH SH-60B SEAHAWK and MTTR Air Vehicle are derived from maintenance statistics and indicate performance less than prior estimates. Changes to MFHBF SH-60B SEAHAWK Air Vehicle & Minimum Avionics, DMMH/FH SH-60B SEAHAWK (O-Level Repair) and Operational Availablilty are based upon current 3-M data. The MTTR (Air Vehicle) changed based upon current 3-M data. MFHBF SH-60B SEAHAWK changed based on current 3-M data.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
DCP No. 85 dated March 5, 1979.

10d. (U) Performance Characteristics (Cont'd):

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 6 February 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	579.7	615.7	666.0
Procurement	1683.5	2694.3	2638.4
Airframe & Changes	(342.1)		(865.8)
Engine	(67.9)		(112.8)
Electronics & Comm	(399.6)		(163.0)
Armament & Other GFE	(18.1)		(19.7)
Weapons System Integration	(62.2)		(587.9)
Total Flyaway	(889.9)		(1749.2)
Other Support	(269.6)		(258.6)
OP,N Sailaway	(124.4)		(0.0)
OP,N Support	(40.3)		(156.0)
OP,N Spares	(36.0)		(2.7)
Total Other Wpn Sys	(470.3)		(417.3)
Peculiar Support	(169.9)		(287.7)
Initial Spares	(153.4)		(184.2)
Construction (MILCON)	9.0	12.3	12.2
Ops. and Maint. (O&M)	124.5	N/A	45.9
Total FY 76 Base-Year $	2396.7	3322.3	3362.5
Escalation	1510.9	4629.3	4506.2
Development (RDT&E)	(142.1)	(242.1)	(291.9)
Procurement	(1248.1)	(4378.0)	(4154.9)
Construction (MILCON)	(6.4)	(9.2)	(9.3)
Ops. and Maint. (O&M)	(114.3)	(N/A)	(50.1)
Total Then-Year $	3907.6	7951.6	7868.7

Total Procurement in Section 11a. consists of both Aircraft Procurement, Navy (AP,N) and Other Procurement, Navy (OP,N) funds.

b. (U) Quantity --			
Development (RDT&E)	5	5	5
Procurement	204	260	261
Total	209	265	266

c. (U) Foreign Military Sales --
A Spanish Letter of Offer and Acceptance was signed January 15, 1985 for an estimated total cost of $177.1M for the purchase of 6 LAMPS MK III helicopters and associated spares, support equipment, training and services. Four Helicopter Landing Systems (HLS) at approximately

11c. (U) Total Program Cost and Quantity (Cont'd):
$6.5M are being purchased under a separate Spanish FMS case. The Australian government has purchased 6 HLS at approximately $9.1M through FMS.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
DCP No. 85 dated March 5, 1979.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 6 February 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	7868.7	8058.6	7868.7
(2) Quantity	266	265	266
(3) Unit Cost	29.582	30.410	29.582
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	271.1	271.1	279.2
Less CY Adv Proc	38.5	38.5	45.9
Plus PY Adv Proc	44.4	44.4	40.5
Net Total	277.0	277.0	273.8
(2) Quantity	13	13	12
(3) Unit Cost	21.308	21.308	22.817

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	721.8	2931.6	15.4	238.8	3907.6
Previous Changes:					
Economic	+30.2	-136.9	+1.1	-26.9	-132.5
Quantity	-	+938.2	-	-	+938.2
Schedule	-	+1534.5	-	-	+1534.5
Engineering	+92.3	+314.3	-	-	+406.6
Estimating	+129.4	+725.6	+5.0	-	+860.0
Other	-	-	-	-	-
Support	+1.6	+658.5	-	-115.9	+544.2
Subtotal	+253.5	+4034.2	+6.1	-142.8	+4151.0
Current Changes:					
Economic	-5.0	-85.9	-	-	-90.9
Quantity	-	+13.0	-	-	+13.0
Schedule	-	-5.6	-	-	-5.6
Engineering	-	+3.4	-	-	+3.4
Estimating	-12.4	-46.8	-	-	-59.2
Other	-	-	-	-	-
Support	-	-50.6	-	-	-50.6
Subtotal	-17.4	-172.5	-	-	-189.9
Total Changes	+236.1	+3861.7	+6.1	-142.8	+3961.1
Current Estimate	957.9	6793.3	21.5	96.0	7868.7

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1976 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	579.7	1683.5	9.0	124.5	2396.7
Previous Changes:					
Quantity	-	+174.8	-	-	+174.8
Schedule	-	+181.6	-	-	+181.6
Engineering	+44.0	+104.1	-	-	+148.1
Estimating	+46.4	+409.7	+3.3	-	+459.4
Other	-	-	-	-	-
Support	+1.2	+104.5	-	-78.7	+27.0
Subtotal	+91.6	+974.7	+3.3	-78.7	+990.9
Current Changes:					
Quantity	-	+3.5	-	-	+3.5
Schedule	-	-1.2	-	-	-1.2
Engineering	-	+1.0	-	-	+1.0
Estimating	-5.3	-14.2	-0.1	+0.1	-19.5
Other	-	-	-	-	-
Support	-	-8.9	-	-	-8.9
Subtotal	-5.3	-19.8	-0.1	+0.1	-25.1
Total Changes	+86.3	+954.9	+3.2	-78.6	+965.8
Current Estimate	666.0	2638.4	12.2	45.9	3362.5

Procurement variance contained AP,N, OP,N & O&M,N in SAR submissions prior to 31 December 1990. Procurement variance now contains only AP,N and OP,N.

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Engineering: Increased cost due to addition of Advance Signal Processor 64K Random Memory Module; validation of OPEVAL corrections and addition of Pre-Planned Product Improvement (P3I) program.
Estimating: Refinement of prior estimates; reconfiguration of test and evaluation ship; addition and refinement of Preplanned Product Improvement (P3I) Program;

13b. (U) Cost Variance Analysis (Cont'd):

addition of Block II Upgrade funding; inclusion of Block II Upgrade outyear funding; correction of FY81 and FY82 funding reportable to LAMPS Program and correction of errors in previous SARs.

Support: Cost change to fund tasks directed by Office of the Secretary of Defense relating to availability.

PROCUREMENT

Economic: Revised escalation indices; renegotiated labor rates.

Quantity: Deletion of 14 FFG Class ships from LAMPS MK III backfit program and increase of procurement objective from 204 to 260 aircraft.

Schedule: Revised aircraft procurement schedule and ship installation schedules; SQQ-28 slipped buy; SRQ-4 accelerated buy; HLS accelerated buy; revised aircraft procurement schedule in outyears.

Engineering: Design engineering for production tooling; engineering testing; production impact of development derived improvements to aircraft, avionics, and engines; incorporation of an approved ECP matrix; ECPs required to revise Block II Upgrade; Mid-East Force ECP for electronics, armament and installation; incorporation of E-1 Harness and Solid Shaft ECPs.

Estimating: Impact of projected change in Army's Black Hawk procurement plan; refinement of prior estimates to reflect contract actuals and additional procurement data; impact of six Spanish FMS aircraft; refinement of estimates based on multi-year procurement; an increase in negotiated overhead rates of major contractor and refinement of prior estimates based on additional procurement data; refinement of ship electronics and HLS procurement; loss of cost savings due to cancellation of multiyear procurement and return to single year buys; refinement of Block II procurement estimates; increased cost due to loss of business base of contractor program and increased overhead rates of prime contractor; refinement of estimate for integration costs in IBM follow-on multiyear; correction of variance categorization from previous SARs.

Support: Refinement of support requirements, equipment and spares to support revised aircraft procurement schedules based on more accurate cost history and procurement data; refinement of estimates for pubs/ technical data; reprogramming of support and

13b. (U) Cost Variance Analysis (Cont'd):
spares; transfer of SQQ-28 and SRQ-4 to PMS-411 for SAR reporting responsibilities; correction of variance categorization from previous SAR; inclusion of O&MN installation funds in the OP,N appropriations as support and spares; increased support and initial spares to support increased procurement objectives.

MILCON
Economic: Revised escalation indices.
Estimating: Refinement of requirements for Applied Instruction Building and Operational/Maintenance Trainer Building; transfer of ship related MILCON cost to PMS-411; transfer of LAMPS ship related costs to PMA-266.

O & M
Economic: Revised escalation indices.
Quantity: Deletion of 14 FFG class ship from LAMPS MK III backfit program; correction of variance categorization errors in previous SARs.
Schedule: Revised installation schedules for ship equipments; slipped SQQ-28 buy; SRQ-4 accelerated buy; HLS accelerated buy; correction of various categorization errors in previous SARs.
Estimating: Refinement of ship electronics and HLS installation costs; realignment of ship installations; correction of variance categorization errors in previous SARs.
Support: Correction of various categorization errors in previous SARs.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-5.0
Revised cost estimates for Block II Upgrade. (Estimating)	-5.3	-12.4
Total Changes	-5.3	-17.4

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-85.9
Additional aircraft procurement to replace Desert Storm loss. (Quantity)	3.5	13.0
Revised procurement schedule due to procurement of additional aircraft. (Schedule)	-1.2	-5.6
Incorporation of Alternate Source Auxiliary Power Unit and ALFS realignment. (Engineering)	1.0	3.4
Cost savings realized from multi-model and BLACKHAWK information. (Estimating)	-14.2	-46.8
Support funding reductions due to Defense Management Review direction. (Support)	-26.1	-88.1
Revised Other Procurement, Navy support requirements. (Support)	17.2	37.5
Total Changes	-19.8	-172.5
(3) MILCON		
Prior and current year inflation offset. (Estimating)	-0.1	
Total Changes	-0.1	--
(4) O & M		
Prior and current year inflation offset. (Estimating)	0.1	--
Total Changes	0.1	--

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions) (Cont'd)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
18.697	-0.840	-0.431	5.748	1.541	3.011	--	1.856	10.885	29.582

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) Procurement --

(U) LAMPS MK III:	Initial Contract Price		
	Target	Ceiling	Qty
SIKORSKY, STRATFORD, CT N00019-87-C-0340, FFP Award: March 31, 1988 Definitized: November 28, 1989	$115.9	N/A	12

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$115.9	N/A	12	$115.9	$115.9

CPR information is not a requirement on this FFP contract.

Contract N00019-87-C-0340 is a firm fixed price contract with options for Lots VIII and IX aircraft. Both options have been definitized.

(U) LAMPS MK III:	Initial Contract Price		
	Target	Ceiling	Qty
IBM, OWEGO, NY N00019-89-D-0027, FFP Award: December 16, 1988 Definitized: June 22, 1990	$239.8	N/A	36

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$239.8	N/A	36	$239.8	$239.8

CPR information is not a requirement on this FFP contract.

Contract N00019-89-D-0027 is a fixed price contract with options for Lots IX, X, XI and XII avionics integration. Lots IX and X have been definitized. Options for Lots XI and XII are for FY 92 and 93 procurements respectively.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Initial Contract Price		
(U) LAMPS MK III - AIRFRAME:	Target	Ceiling	Qty
SIKORSKY AIRCRAFT DIV., STRATFORD, CT			
N00019-89-C-0153, FFP	$169.3	N/A	18
Award: June 19, 1990			
Definitized: January 24, 1992			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$169.3	N/A	18	$169.3	$169.3

CPR information is not a requirement on this FFP contract.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 70.6% (24 yrs/34 yrs)

(2) Percent Program Cost Appropriated: 63.2% ($4972.5 / $7868.7)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY69-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2002)	Total
RDT&E	732.3	30.1	31.8	163.7	957.9
Procurement	3821.5	271.1	279.2	2421.5	6793.3
MILCON	21.5	-	-	-	21.5
O&M	96.0	-	-	-	96.0
Total	4671.3	301.2	311.0	2585.2	7868.7

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY76 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1969				1.2	0.8	0.8	0.8	4.7
1970				4.3	3.0	3.0	3.0	5.5
1971				4.6	3.4	3.4	3.4	5.1
1972				29.5	22.7	22.7	22.7	4.6
1973				22.8	18.6	18.6	18.6	4.4
1974				10.7	9.5	9.5	9.5	8.0
1975				16.7	16.1	16.1	16.1	10.9
1976				20.5	20.9	20.9	20.9	6.6
197T				3.1	3.3	3.3	3.3	2.9
1977				60.6	66.1	66.1	66.1	2.6
1978				106.3	124.9	124.9	124.9	6.8
1979				67.0	87.0	87.0	87.0	8.4
1980				113.9	163.4	163.4	163.4	10.6
1981				58.6	91.8	91.8	91.8	10.6
1982				39.6	65.3	65.3	65.3	7.6
1983				4.8	8.3	8.3	8.3	4.9
1984				0.8	1.4	1.4	1.4	3.8
1985								3.4
1986				0.9	1.7	1.7	1.7	2.8
1987				1.0	1.9	1.9	1.9	2.7
1988				1.7	3.5	3.5	3.3	3.0
1989				0.9	1.9	1.9	1.8	4.2
1990				0.1	0.2	0.2	0.2	4.0
1991				7.3	16.6	12.8	11.9	4.4
1992				12.9	30.1	5.3		3.9
1993				13.2	31.8			3.1
1994				19.3	48.1			3.3
1995				16.0	41.1			3.3
1996				16.4	43.6			3.2
1997				11.3	30.9			
Subtot	5			666.0	957.9	733.8	727.3	

RDT&E,N excludes costs for Penguin missile, SRQ-4 and SQQ-28. Includes 5 aircraft and 3 ship systems which were incrementally funded with no annual procurement quantities identified.

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY76 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy								
1981			58.8	58.8	107.6	104.4	104.4	11.6
1982	18	41.0	215.7	354.8	705.1	703.9	703.9	14.3
1983	27	8.7	147.9	347.8	735.3	735.3	735.3	9.0
1984	21		103.1	223.8	492.2	491.4	491.4	8.0
1985	24	8.0	120.8	179.2	405.6	405.6	405.6	3.4
1986	18	2.1	83.8	112.2	261.6	262.3	262.3	2.8
1987	17	0.8	73.8	93.7	226.1	226.1	214.3	2.7
1988	6	0.9	33.2	51.4	129.4	129.4	122.1	3.0
1989	6	0.6	30.8	42.1	110.2	110.2	103.0	4.2
1990	6	10.3	38.2	73.6	199.6	197.7	123.8	4.0
1991	6	3.4	40.6	63.1	177.0	138.9	45.3	3.9
1992	13	0.8	69.2	92.3	267.1	56.9	15.5	3.1
1993	12	2.2	69.4	89.0	266.1			3.3
1994	12	10.5	79.3	105.2	324.7			3.3
1995	12	3.8	73.9	85.0	270.7			3.3
1996	12	3.4	74.1	86.5	284.4			3.2
1997	12	3.4	73.2	85.9	291.6			3.2
1998	12	19.3	82.1	124.1	434.4			2.2
1999	12		81.7	97.6	352.7			
2000	15		80.4	95.4	355.7			
2001				10.9	42.1			
2002				7.3	29.0			
Subtot	261	119.2	1630.0	2479.7	6468.2	3562.1	3326.9	
Appropriation: 1810 Other Procurement, Navy								
1982				16.7	29.5	29.5	29.5	7.6
1983				27.0	49.4	49.4	49.4	4.9
1984				23.0	43.3	43.3	43.3	3.8
1985				22.6	43.8	43.5	41.7	3.4
1986				16.8	33.7	33.7	31.8	2.8
1987				11.1	23.1	23.1	19.4	2.7
1988				10.1	22.0	22.0	21.2	3.0
1989				3.5	7.9	7.9	7.2	4.2
1990				5.6	13.1	13.1	4.6	4.0

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY76 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1810 Other Procurement, Navy (Cont'd)								
1991				2.5	6.0	5.4	0.8	3.9
1992				1.6	4.0			3.1
1993				5.1	13.1			3.3
1994				5.9	15.8			3.3
1995				2.4	6.7			3.3
1996				2.4	6.8			3.2
1997				2.4	6.9			3.2
Subtot				158.7	325.1	270.9	248.9	
Appropriation: 1205 Military Construction, Navy								
1982				7.2	12.5	12.5	12.5	7.6
1983				5.0	9.0	9.0	9.0	4.9
Subtot				12.2	21.5	21.5	21.5	
MILCON excludes costs for SRQ-4 and SQQ-28.								
Appropriation: 1804 Operation and Maintenance, Navy								
1985				4.3	8.1			3.4
1986				3.1	6.0			2.8
1987				16.7	33.6			2.7
1988				1.4	2.9			3.0
1989				7.2	15.6			4.2
1990				13.2	29.8			4.0
Subtot				45.9	96.0			
Grand Total	266	119.2	1630.0	3362.5	7868.7	4588.3	4324.6	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1982	16	18	18	60
1983	48	48	27	60
1984	48	64	21	60
1985	48	74	24	60
1986	44	0	18	20
1987	0	0	17	0
1988	0	0	6	0
1989	0	0	6	0
1990	0	0	6	0
1991	0	0	6	0
1992	0	0	13	0
1993	0	0	12	0
1994	0	0	12	0
1995	0	0	12	0
1996	0	0	12	0
1997	0	0	12	0
1998	0	0	12	0
1999	0	0	12	0
2000	0	0	15	0

17b. ([redacted]) Production Rate Data (Cont'd):

b. ([redacted]) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	3290.6	+71.9	3362.5	+982.5	2380.0
(TY $)	6745.6	+1123.1	7868.7	+1786.0	6082.7
PAUC Cost (BY $)	15.744	-3.103	12.641	+3.694	8.947
(TY $)	32.276	-2.694	29.582	+6.714	22.867

c. ([redacted]) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	OCT 81	0	OCT 81	N/A	OCT 81
Duration (in MON)	68	183	251	188	63
End Date(MON YY)	JUN 87	183	SEP 02	N/A	JAN 87

Maximum economic cost profile is for aircraft only, current estimates are for aircraft and ship systems (total program acquisition).

d. ([redacted]) Deliveries (Plan/Actual) --

	To Date
RDT&E	5/5
Procurement	139/139

e. ([redacted]) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 260 - @ Peak Rate: 5/mo			
FY 76 Base-Year $	4.4	6.8	0.0
Then Year $	7.6	18.4	0.0
@ Qty 0 (1st three years) - @ Peak Rate: 0/mo			
FY 76 Base-Year $	0.0	0.0	0.0
Then Year $	0.0	0.0	0.0

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

SH-60B operating and support costs are calculated based on a squadron consisting of thirteen aircraft with each aircraft flying 51.9 hours per month.

There is no antecedent system.

b. (U) Costs -- (FY 1976 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SH-60B SQUADRON	Avg Annual Cost Per N/A
Personnel	6.3	N/A
O&S Consumables	1.4	N/A
Direct Depot Maintenance	2.3	N/A
Sustaining Investment	0.8	N/A
Indirect Costs	0.2	N/A
Total	11.0	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M,N	9.8	0.4	0.5	---	10.7
NIF	0.6	---	---	---	0.6
Total	10.4	0.4	0.5	---	11.3

Source: Naval Air Systems Command Cost Analysis Division Operating and Support Cost Estimates for SH-60B dated 8 February 1991.

AF-12 IR MAVERICK

UNCLASSIFIED

91-1045

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: IR MAVERICK

AS OF DATE: December 31, 1991

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1. Designation and Nomenclature (Popular Name):
AGM-65 D/G IR Maverick

2. DoD Component: USAF

3. Responsible Office and Telephone Number:
DIRECTORATE OF COMMODITIES — GM-15 RAMONA J. ALLISON
ARMAMENT DIVISION — Assigned: October 1, 1991
HILL AFB, UT 84056-5990 — AV 458-5432 COMM (801) 777-5432

4. Program Elements/Procurement Line Items:

RDT&E:
PE 0604608F Project N/A
PROCUREMENT:
APPN 3020 ICN M65DAG (Air Force)

SAF/PAS DFOISR 92-T-0381

5. Related Programs:
IR GBU-15 (V)/B Cruciform Wing Weapon, F-4D/E, A-7D, A-10A, F-16, F-15E, F-4G, Navy IR Maverick (AGM-65F), USMC Laser Maverick (AGM-65E), SLAM (AGM-84E)

6. Mission and Description:
The AGM-65D is an air-to-surface imaging infrared guided missile for tactical aircraft, used against a broad spectrum of armor and ground targets. The Maverick is effective for day, night, and adverse weather operations. There are three different versions of the

SAF/PAS
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6. Mission and Description (Cont'd):

Maverick: AGM-65D (125 lb warhead), AGM-65G (300 lb warhead), and the Navy version AGM-65F (300 lb warhead). The Maverick does not replace any current system.

7. Program Highlights:

a. Significant Historical Developments —

The Preliminary Design Review was in June 1979 and the Critical Design Review was conducted in June 1980. Developmental Test and Evaluation/Initial Operational Test and Evaluation (DT&E/IOT&E) for the AGM-65D was conducted from late 1980 to August 1982 and consisted of 334 captive flight missions and 20 direct hits of 26 actual launches. AFOTEC IOT&E reported Operational Suitability as deficient at the 1982 AFSARC/OSD review. OSD directed the production of 200 missiles with FY82 funds and subsequently approved the FY83 buy of 900 missiles during the April 1983 review; the missile's reliability had shown favorable improvements.

The AGM-65D Final Operational Test and Evaluation (FOT&E) was conducted from 1984 to 1985 and consisted of over 432 captive carry hours and 42 launches from various tactical systems at an array of targets. The AGM-65G flight test program was completed in 1988 with four out of five direct hits.

After completing AGM-65D qualification tests, Raytheon was awarded the production option for 800 missiles that were delivered on schedule between May 87 and Nov 88. The Qualification Test and Evaluation (QT&E) results were 8 of 10 hits and was completed on 5 Dec 1985. Qualification Operational Test and Evaluation (QOT&E) of the AGM-65G was completed in 1990 and resulted in 9 of 10 successful launches and direct hits on targets.

Initial Operation Capability (IOC) was attained in Feb 86, followed by a Mar 86 DSARC review that gave the Maverick program a decision for full production.

The Department of Defense reduced the procurement program from 60,664 weapons through FY97 to 23,496 weapons through FY92.

The FY91 Amended President's Budget eliminated IR Maverick procurement for FY91 and FY92. This, along with small adjustments to the FY88 and FY90 procurement programs, resulted in total USAF Maverick production of 19,659. FY91 Congressional action added 600 missiles in FY91 for a new program total of 20,259.

b. Significant Developments Since Last Report —

As of 31 Dec 91, delivery quantities are as follows:

7b. Program Highlights (Cont'd):

	AGM-65D	AGM-65G	TGM (D/G)	GCS (Spares)
Hughes	9542	1949	773/61	507
Raytheon	5218	0	0/0	161

NOTE: TGM=Training Guided Missiles; GCS=Guidance and Control Section

The FY92 Supplemental President's Budget directed a FY91 buy of 5,255 missiles to replace assets fired in Desert Storm. Consequently, the requirement for 600 missiles added in FY91 was deleted; however, Congress has not withdrawn the dollars or the 600 missile quantity. These actions resulted in total USAF Maverick production of 24,914 missiles.

IR Maverick continues to satisfy mission requirements.

c. Changes Since As Of Date -- None.

8. Threshold Breaches:
There are currently no breaches to the Approved Program Baseline (APB) dated 16 Sep 91. There are no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --	Development Estimate	Approved Program	Current Estimate	
DSARC II (JRMB)	SEP 76	SEP 76	SEP 76	
Eng Dev Contract Award	APR 77	OCT 78	OCT 78	
DT&E/IOT&E Flight Tests Start	NOV 78	JUN 80	JUN 80	
Demonstration Milestone	MAY 79	N/A	N/A	
DSARC IIIA (JRMB)(Pilot Production)(Partial Release)	JUN 79	MAR 82	MAR 82	
Complete DT&E/IOT&E	JAN 80	AUG 82	AUG 82	
DSARC IIIB (JRMB)(Pilot Production Full Go-Ahead)	MAR 80	SEP 82	SEP 82	
Initial Operational Capability	JUN 81	FEB 86	FEB 86	
OSD Review (Rel/Maint Review)	N/A	APR 83	APR 83	
OSD Review (Full Production Go-Ahead)	N/A	MAR 86	MAR 86	
PMRT	N/A	N/A	N/A	(Ch-1)
Last Delivery (FOC)	N/A	APR 94	AUG 94	(Ch-2)

b. Previous Change Explanations --

A budget cut of $16.2M in FY78 RDT&E funds, Congressional action to delete all FY78 funds, and additional IR centroid tracker advanced development and testing caused the following schedule milestone changes: Engineering Development Contract Award to Oct 78, DT&E/IOT&E

9b. Schedule (Cont'd):
Flight Test Start Date to Apr 79, Demonstration Milestones to Dec 80, and DSARC IIIA to Jan 81, DT&E/IOT&E Complete to Jul 81, and IOC to Mar 83.

Late missile deliveries impacted DT&E completion; unusually warm weather in winter 81 delayed winter site tests for one year. Based on a revised DT&E/IOT&E completion forecast date of Mar 82, Production Decision Milestones were restructured to allow a pilot production start decision in Jan 82 and a follow-on full scale pilot production decision in May 82.

Demonstration Milestones were deleted when the DSARC III (JRMB) milestone was created. Further, the need for the DSARC III milestone was satisfied by holding DSARC IIIA (2 Mar 82) and DSARC IIIB (21 Sep 82). Limited test resources further delayed DT&E/IOT&E completion until Aug 82.

IOC similarly slipped with the delays in DT&E/IOT&E. A plant shutdown to review quality assurance caused hardware delivery delays and thus further moved IOC out from Apr 85 to Sep 85 and then again to Feb 86.

The Reliability and Maintainability Review was held in Apr 83. A decision of this review was that the next one should not occur until FOT&E completion. Because of the delays previously mentioned, full production go-ahead slipped from Aug 85 to Mar 86.

Program Management Responsibility Transfer (PMRT) was added as a major milestone that has been established since the 31 Dec 90 SAR.

Last Delivery/Full Operational Capability was added as a major milestone that has been established since the 31 Dec 90 SAR. Current estimate date has slipped from Nov 92 in the APB to Nov 93.

c. Current Change Explanations --

(Ch-1) PMRT (Program Management Responsibility Transfer) was deleted as a baseline milestone since Maverick was chosen to implement the Integrated Weapon System Management (IWSM) concept. PMRT will not be reported in future SARs.

(Ch-2) Date of Last Delivery/Full Operational Capability (FOC) was changed in the APB from Dec 92 to Apr 94 as the result of a directed FY91 Supplemental buy of 5,255. The current estimate date has slipped to Aug 94 due to a four month stop work order on the FY91 contract. The stop work order was issued because of two protests being filed with the GAO by the losing contractor. Both protests were denied and the stop work order was rescinded on 13 Nov 1991.

9d. Schedule (Cont'd):

d. References --

Development Estimate:
DCP 154, dated September 20, 1976, subject "Imaging Infrared Maverick Missile System".

Approved Program:
AFAE approved Acquisition Program Baseline dated November 21, 1991.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Minimum Trackable Temp. (MTT) (Delta)						
1/4 milliradian (mr) max target	10	10	/ 10	1.64	1.64	
1/2 milliradian (mr) target	2.5	2.5	/ 2.5	.40	.40	
Minimum Resolvable Temp. (MRT) (Delta)						
1.5 degrees field of view	.77	.77	/ .77	.77	.77	
3.0 degrees field of view	N/A	.77	/ .77	.77	.77	
Minimum Launch Range (ft) (0.2 Mach, 15 degree offset)	2500	4000	/ 4000	3500	3500	
Maximum Launch Range (ft) (1.2 Mach, 0 degree offset)	85000	65000	/ 65000	73000	73000	
Launch Range (ft) (exercised tank target, forward hemisphere 5KM visibility, 400 ft/nm, Abs humidity, night)	22000-30000	22000	/ 22000	22300	22300	
Probability of Hit	.87	.75	/ .75	.85	.87	
Mission Success Probability	.80	.80	/ .69	.83	.80	
Incoming Reliability (missile)	N/A	.95	/ .95	.97	.97	(CH-1)

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Guidance Section Mean Time Between Failure (hrs)	N/A	36	/ 36	137	137
Boresight Accuracy (mr)	4.0	N/A	/ N/A	4.0	4.0
Lookdown Offset (degrees below LOS)	15	N/A	/ N/A	15	15

b. Previous Change Explanations —

Change in the Demonstrated Performance of Mission Success Probability from .77 to .83 reflects cumulative results through completion of FOT&E.

Change in the Current Estimate of Probability of Hit from .86 to .87 is attributable to FOT&E results.

Minimum Trackable Temperature (MTT)(Delta) for 1/4 milliradian (mr) Target changed from 3.5 to 1.64. Minimum Trackable Temperature (MTT) (Delta) for 1/2 milliradian (mr) changed from 1.6 to .40. Both parameters changed because the seeker has demonstrated capabilities exceeding the performance parameters previously reported.

The units of measurement for Minimum Resolvable Temperature (MRT) (Delta) were changed from 1/4 milliradian spatial half period to 1.5 degrees field of view and 3.0 degrees field of view for ease of comprehension.

Change in the current estimate for Minimum Launch Range (ft) (0.2 Mach, 15 degree offset) reflects updated data from FOT&E.

Maximum Launch Range, ft (1.2 Mach, 0 degree offset) current estimate changed from 85,000 to 73,000 due to updated data from FOT&E.

Lookdown Offset (Degrees below LOS) was deleted from the APB; however, it is considered an important performance indicator and will be continued to be tracked by the Program Office.

Launch Range (ft)(exercised tank target, forward hemishpere 5KM visibility, 400 ft/nm Abs humidity, Night) changed from 30,000 to 22,300 due to updated data from FOT&E.

Incoming Reliability (Missile) and Guidance Section Mean Time Between

10b. Performance Characteristics (Cont'd):
Failure (hours) are important weapon system parameters which were added because they are included in the APB.

Program Management Responsibility Transfer, PMRT, was added as a major program milestone that has been added since the 31 Dec 90 SAR.

Last Delivery/Full Operational Capability was added as a major program milestone that has been established since the 31 Dec 90 SAR. Current estimate date has slipped from Nov 92 in the APB to Nov 93.

c. Current Change Explanations --

(Ch-1) Incoming Reliability (missile) changed from .995 to .97 to reflect actuals.

d. References --

Development Estimate:
DCP 154, dated September 20, 1976, subject "Imaging Infrared Maverick Missile System".

Approved Program:
AFAE approved Acquisition Program Baseline dated November 21, 1991.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost —	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	100.0	106.7	106.7
Procurement	895.1	1197.4	1179.6
Total Flyaway	(792.1)		(1036.3)
Total Flyaway	(792.1)		(1036.3)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(99.1)		(125.8)
Initial Spares	(3.9)		(17.5)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 75 Base-Year $	995.1	1304.1	1286.3
Escalation	597.8	1921.9	1874.3
Development (RDT&E)	(34.4)	(61.3)	(61.3)
Procurement	(563.4)	(1860.6)	(1813.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1592.9	3226.0	3160.6

11a. Total Program Cost and Quantity (Cont'd):

NOTE: Peculiar Support includes $57.8M in recurring flyaway for 891 training missiles.

b. Quantity --

Development (RDT&E)	0	N/A	0
Procurement	31078	24914	25514
Total	31078	24914	25514

Excludes 35 from the DE and 33 RDT&E units from the APB and CE that are not fully configured end items.

c. Foreign Military Sales --

25 AGM-65D missiles and related support equipment to the Government of Bahrain for a total of $7.9 million.

40 AGM-65G missiles to the Government of Bahrain for a total of $4.9 million (supplied from the Special Defense Acquisition Fund (SDAF)).

150 AGM-65G missiles and related support equipment to the Government of Denmark for a total of $19.4 million (SDAF).

Support equipment to the Government of Denmark for a total of $1.7 million.

144 AGM-65D missiles and related support equipment to the Government of Egypt for a total of $21.4 million.

50 AGM-65G missiles to the Government of Egypt for a total of $6.1 million (SDAF).

Support equipment to the Government of Korea for a total of $0.2 million.

300 AGM-65G missiles and related support equipment to the Government of Kuwait for a total of $50.7 million.

Support equipment to the Government of New Zealand for a total of $.978 million.

20 AGM-65G missiles and related support equipment to the Government of New Zealand for a total of $3.1 million (SDAF).

5 AGM-65D missiles, 2 TGM-65D missiles, and related support equipment to the Government of Portugal for a total of $1.3 million.

2 AGM-65G missiles and 2 TGM-65G missiles to the Government of Singapore for a total of $0.5 million (SDAF).

11c. Total Program Cost and Quantity (Cont'd):

250 AGM-65G missiles and related support equipment to the Government of Spain for a total of $29.9 million.

3 AGM-65D missiles and 5 AGM-65G missiles to the Government of Switzerland for a total of $1.2 million.

96 AGM-65G missiles and related support equipment to the Government of Korea for a total of $12.7 million.

d. Nuclear Costs -- None.

e. References --

Development Estimate:
DCP 154, dated September 20,1976, subject "Imaging Infrared Maverick Missile System".

Approved Program:
AFAE approved Acquisition Program Baseline dated November 21, 1991.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3160.6	2837.1	3160.6
(2) Quantity	25514	20259	25514
(3) Unit Cost	0.124	0.140	0.124
b. Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	5.5	5.5	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	5.5	5.5	0.0
(2) Quantity	0	0	N/A
(3) Unit Cost	N/A	N/A	N/A

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	134.4	1458.5	0.0	1592.9
Previous Changes:				
Economic	+10.4	-159.0	-	-148.6
Quantity	-1.1	-986.7	-	-987.8
Schedule	+18.6	+1798.4	-	+1817.0
Engineering	-	+32.0	-	+32.0
Estimating	-0.2	+390.3	-	+390.1
Other	-	-	-	-
Support	+5.9	+135.6	-	+141.5
Subtotal	+33.6	+1210.6	-	+1244.2
Current Changes:				
Economic	-	-6.7	-	-6.7
Quantity	-	+640.3	-	+640.3
Schedule	-	+55.2	-	+55.2
Engineering	-	-	-	-
Estimating	-	-373.0	-	-373.0
Other	-	-	-	-
Support	-	+7.7	-	+7.7
Subtotal	-	+323.5	-	+323.5
Total Changes	+33.6	+1534.1	-	+1567.7
Current Estimate	168.0	2992.6	-	3160.6

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	100.0	895.1	0.0	995.1
Previous Changes:				
Quantity	-0.7	-305.1	-	-305.8
Schedule	+6.4	+257.9	-	+264.3
Engineering	-	+12.0	-	+12.0
Estimating	-2.5	+172.2	-	+169.7
Other	-	-	-	-
Support	+3.5	+37.5	-	+41.0
Subtotal	+6.7	+174.5	-	+181.2
Current Changes:				
Quantity	-	+214.4	-	+214.4
Schedule	-	+18.5	-	+18.5
Engineering	-	-	-	-
Estimating	-	-125.7	-	-125.7
Other	-	-	-	-
Support	-	+2.8	-	+2.8
Subtotal	-	+110.0	-	+110.0
Total Changes	+6.7	+284.5	-	+291.2
Current Estimate	106.7	1179.6	-	1286.3

b. Previous Change Explanations --

RDT&E

Economic: Revised Economic Escalation indices

Quantity: RDT&E change from 35 to missiles 33.

Schedule: Budget changes, cancellation of FY78 funds.

Estimating: Definitization of FSD Contract, restoration of IR test and second source, prior year inflation adjustment, prior year program amounts aligned to actual obligations, and completion of Rapid Fire II effort

Support: Addition of initial support items.

13b. Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic: Revised Economic Escalation Indices.

Quantity: Procurement change from 60,664 to 23,496 missiles. Procurement change from 23,496 to 19,733 missles. Procurement change from 19,733 to 20,259 missiles.

Schedule: Budget changes, cancellation of FY78 funds, realignment and reduction of buy quantites, production start changed from FY81 to FY82, loss in production efficiency due to rescheduling units to FY90, program schedule extended due to amendments to FY85 PB, procurement delay due to out-year budget cuts, created a four year extension to the program. Increase in buy quantities due to procurement of additional 230 missiles with FY88 funds. Revised annual buy quantities in FY88 and FY90.

Engineering: Engineering change on 1800 units to modify them to AGM-65Gs, addition of VECP 718, rate of acceleration meter (ROAM) resulted in savings in hardware costs. Reduced engineering costs associated with reduction of 3763 missiles. Adjusted engineering costs associated with incorporation of VECP 638.

Estimating: Revised estimate from definitization of Segment I and from DSARC III ICA, recategorization of containers from Support to Flyaway, and 300 unit increase in Raytheon pilot production for FY86. Estimate updated using contract data and Hughes productivity plan, adjustment for prior year escalation, one-time change resulting from correction to methodology for computing inflation on advance procurement funding, cost impact to unit prices and fixed costs caused by schedule delays and budgeting reductions. Re-estimates based on changing acquisition strategies i.e., split annual buys vs single source multiyear. Revised estimate for current and prior year inflation offset. Incorporation of competitive price data resulting in revised estimate. Corrections to prior year SAR by refining and recategorizing flyaway costs to support costs in prior years. Revised estimating cost associated with all program changes. Incorporation of competitive pricing data. Adjustment for current and prior year escalation offset.

Support: Deletion of FDT, addition of initial spares and support items, recategorization of containers from

13b. Cost Variance Analysis (Cont'd):

Support to Flyaway, Plant 44 environmental clean-up, reduction of initial spares due to funding cuts and quantity reductions. Estimate updates based on contract data, additional peculiar support equipment for missile inventory build-up in FY88, additional data for second source, change in reporting of initial spares requirements to include replenishment spares, additional data needed due to extension of the program, impact of prior year inflation adjustment and spares schedule changes. Adjustment and refinement of flyaway costs in prior years. Recategorization of outyear funds to provide for costs associated with close-out of the program. Refinement and recategorization of flyaway costs to prior years. Revised support and spares to adjust for prior year actuals.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised Jan 91 economic escalation rates. (Economic)	N/A	-6.7
Revised quantity due to increase in authorization from 20,259 missiles to 25,514 missiles. (Quantity)	214.4	640.3
Schedule change associated with increase in quantity. (Schedule)	18.5	55.2
Revised estimating costs associated with program changes. (Estimating)	-177.4	-442.7
Estimating change associated with increased quantity (Estimating)	51.7	69.7
Revised support and spares associated with revised quantities. (Support)	2.8	7.7
Total Changes	110.0	323.5

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.051	-0.006	-0.002	0.073	0.001	0.001	--	0.006	0.073	0.124

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

HUGHES SEGMENT VIII:	Initial Contract Price Target	Ceiling	Qty
HUGHES AIRCRAFT COMPANY, CANOGA PARK, CA F33657-89-C-0003, FFP Award: April 10, 1989 Definitized: April 1, 1989	$170.9	N/A	1692

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$204.4	N/A	1692	$204.4	$204.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

Contract price includes $37.1M in Navy funds, $23.0M in FMS funds, $24.6M in SDAF funds, and $1.6M in AFLC funds.

This contract's deliveries are over 90% complete and will be deleted from future SARs.

RAYTHEON SEGMENT IV:	Initial Contract Price Target	Ceiling	Qty
RAYTHEON COMPANY, BRISTOL, TN F33657-89-C-0004, FFP Award: April 10, 1989 Definitized: April 1, 1989	$134.8	N/A	1078

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$161.9	N/A	1078	$161.9	$161.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

Contract price increased by $.6M due to the inclusion of FY91 production baseline requirements.

Contract price includes $31.5M in Navy funds, $19.9M in SDAF funds, $18.8M in FMS funds, and $6.2M in AFLC funds.

This contract's deliveries are over 90% complete and will be deleted from future SARs.

HUGHES SEGMENT IX:
HUGHES GEORGIA, INC, LaGRANGE, GA
F33657-90-C-0020, FFP
Award: May 31, 1990
Definitized: May 11, 1990

Initial Contract Price		
Target	Ceiling	Qty
$194.0	N/A	2196

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$208.1	N/A	2196	$208.1	$208.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

Contract price increased by $13.3M to include the addition of value engineering changes and weapon system support costs.

Contract price includes $17.0M in FMS funds, $42.9M in Navy funds, $0.7M in AFLC funds, and $2.4M of SDAF funds.

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

RAYTHEON SEGMENT III:
Raytheon, Bristol, TN
F33657-88-C-0033, FFP
Award: May 5, 1988
Definitized: May 1, 1988

Initial Contract Price		
Target	Ceiling	Qty
$150.2	N/A	1871

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$198.8	N/A	2137	$198.8	$198.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

Contract price decreased by $.3M due to the implementation of equivalent missile credit.

Contract price includes $1.4M in FMS funds, and $27.2M in Navy funds.

This contract's deliveries are over 90% complete and will be deleted from future SARs.

RAYTHEON SEGMENT V:
Raytheon Company, Bristol, TN
F33657-91-C-0044, FFP
Award: July 1, 1991
Definitized: July 17, 1991

Initial Contract Price		
Target	Ceiling	Qty
$264.8	N/A	5255

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$264.8	N/A	5255	$264.8	$264.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

15. **Contract Information:** Cont'd (Then-Year Dollars in Millions)
Contract price includes $2.2M in Navy funds and $2.7M in AFLC funds.

16. **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 100.0% (18 yrs/18 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($3160.6 / $3160.6)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY75-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	168.0	-	-	-	168.0
Procurement	2987.1	5.5	-	-	2992.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3155.1	5.5	-	-	3160.6

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1975			3.6	3.6	3.9	3.9	3.9	9.6
1976			3.7	3.7	4.3	4.3	4.3	9.6
197T								
1977			8.2	8.2	10.2	10.2	10.2	9.9

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1978								7.4
1979			29.8	29.8	43.4	43.4	43.4	8.4
1980			30.6	30.6	49.5	49.5	49.5	9.4
1981			21.9	21.9	39.3	39.3	39.3	11.9
1982			6.1	6.1	11.6	11.6	11.6	9.4
1983			2.0	2.0	4.1	4.1	4.1	4.9
1984			0.8	0.8	1.7	1.7	1.7	3.8
Subtot			106.7	106.7	168.0	168.0	168.0	
Appropriation: 3020 Missile Procurement, Air Force								
1982	200	14.3	60.9	103.4	218.2	218.2	215.7	9.6
1983	900	30.3	58.5	110.1	246.1	246.1	238.3	9.0
1984	1980	6.5	99.2	128.7	300.1	300.1	298.5	8.0
1985	2600	0.4	123.4	157.0	376.7	376.7	366.0	3.4
1986	2837	8.0	142.7	165.5	415.5	415.5	404.8	2.8
1987	3224		131.8	137.3	358.5	358.5	355.5	2.7
1988	3299		104.5	107.9	292.9	292.9	287.9	3.0
1989	2540	2.1	82.3	91.2	256.1	248.1	220.0	4.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3020 Missile Procurement, Air Force (Cont'd)								
1990	2079		46.8	48.6	140.8	134.1	45.3	4.0
1991	5855		124.3	128.1	382.2	278.4	5.1	3.9
1992				1.8	5.5			3.1
Subtot	25514	61.6	974.4	1179.6	2992.6	2868.6	2437.1	
Grand Total	25514	61.6	1081.1	1286.3	3160.6	3036.6	2605.1	

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1979	240	0	0	0
1980	3100	0	0	0
1981	5400	0	0	0
1982	6000	114	200	1800
1983	6000	1080	900	4200
1984	6000	2376	1980	4200
1985	4338	2600	2600	4200
1986	0	1642	2837	4200
1987	0	4700	3224	4200
1988	0	7000	3299	2714
1989	0	7000	2540	0
1990	0	7000	2079	0
1991	0	7000	5855	0
1992	0	10000	0	0

The funded delivery period is 21 months for FY82, 10 months for FY83 and FY84. For FY86 the delivery period is 19 months due to the introduction of the second source.

17b. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	1820.5	-534.2	1286.3	+534.2	752.1
(TY $)	4940.8	-1780.2	3160.6	+1490.8	1669.8
PAUC Cost (BY $)	0.030	0.020	0.050	0.021	0.029
(TY $)	0.081	0.043	0.124	0.058	0.065

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	NOV 81	13	DEC 82	N/A	DEC 82
Duration (in MON)	145	-5	140	56	84
End Date(MON YY)	DEC 93	8	AUG 94	N/A	DEC 89

Current Estimate and Maximum Economic Duration have been updated to reflect the FY91 Maverick production buy.

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	33/33
Procurement	17543/17543

e. Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 14740 - @ Peak Rate: 500.0/mo			
FY 75 Base-Year $	0.032	0.045	0.032
Then Year $	0.050	0.112	0.050
@ Qty 380 (1st three years) - @ Peak Rate: 230.0/mo			
FY 75 Base-Year $	0.036	0.054	0.032
Then Year $	0.048	0.121	0.050

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The IR Maverick D & G model missiles will be supported by a three-level maintenance concept. The O&S costs collected were those required to operate, support, and maintain the AGM-65 D&G models of Maverick missile family. This included the O&S costs of both the Tactical Guided Missile (AGM) & Training Guided Missile (TGM). O&S costs included organizational level inspection of the All-Up-Round. It included fault isolation to the Shop Replaceable Unit (SRU) and separation of the failed SRU at the Intermediate Maintenance Facility. The O&S costs also included depot repair of the SRU; transportation to and from the depot/organization; organizational and depot training; maintenance of organizational and depot support equipment; management of new parts entered into the support system; maintenance and reproduction of technical orders; maintenance of real property; maintenance/update of software; and replenishment spares and consumables.

Costs were obtained using the Maverick Cost of Ownership Model dated 17 December 1991.

There is no antecedent system.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 20 years	Avg Annual Cost Per Antecedant
Personnel	2.9	N/A
Organization Support	1.5	N/A
Depot Maintenance	4.0	N/A
Depot Supply	2.3	N/A
Transportation	0.0	N/A
Training	0.0	N/A
Sustaining Investment	2.4	N/A
Total	13.1	N/A

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	1.1	0.8	0.9	—	2.8
Industrial Fund	0.1	0.1	0.1	—	0.3
Total	1.2	0.9	1.0	—	3.1

W-30 MK 48 ADCAP

91-145

*** [redacted] ***

SECRET

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: MK 48 ADCAP (MYP)

AS OF DATE: December 31, 1991

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AS AMENDED

CLEARED FOR OPEN PUBLICATION
MAR 24 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (WHS/DSD-PA) DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
MK 48 ADCAP (MYP)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
TORPEDO MK 48 ADCAP WEAPON SYSTEMS PROGRAM PEO
SUBMARINE COMBAT & WEAPONS SYSTEMS
WASHINGTON, DC 20361-5103
CAPT. DENNIS WITZENBURG
Assigned: December 15, 1989
AV 332-0616 COMM (202) 602-0616

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 63691N Project F0366
PROCUREMENT:
APPN 1507 ICN 311100 (Navy)
MILCON:
PE 242896N

No Security Objection to Open Publication
AS AMENDED
92-0474
MAR 23 1992
Office of the Chief of
Naval Operations Dept. of the Navy

Classified by: NAVSEA LTR 5511/C SER09B21/C2B OF MAR 87
Declassify on: Originating Agency Determination Required (OADR)
Downgrade Instructions: Not subject to Automatic Downgrade

(THIS PAGE IS [redacted])

*** [redacted] ***

SECRET

OASD(PA) DFOISR 92-T-0658

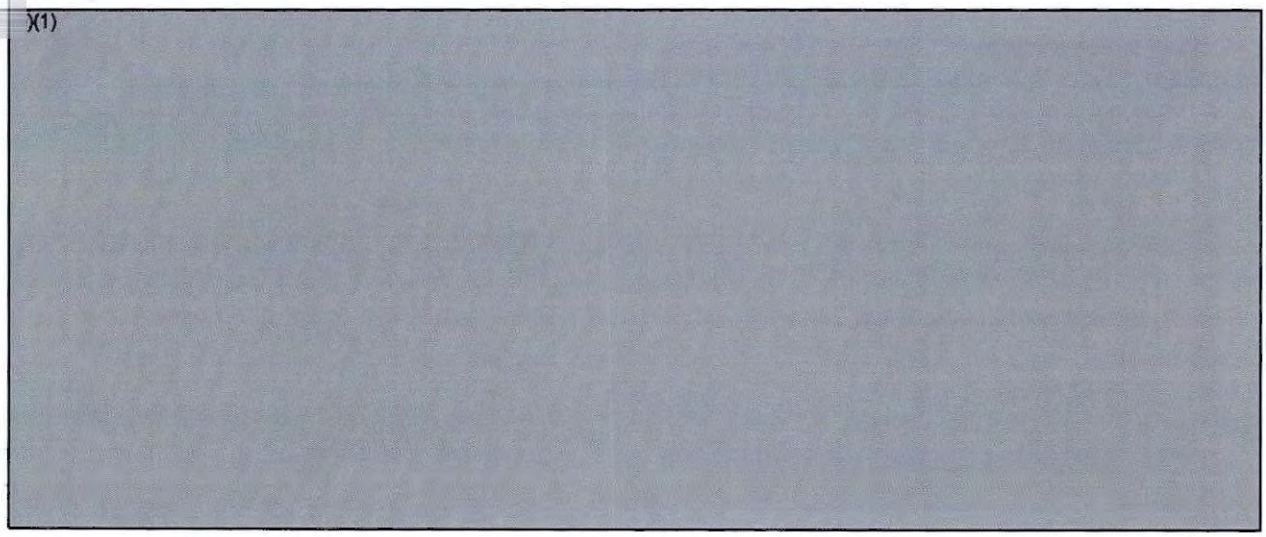
5. [redacted] Related Programs:
Submarine Fire Control and Launch Systems Mobile ASW Target

(b)(1)

7. [redacted] Program Highlights:

(b)(1)

)(1)



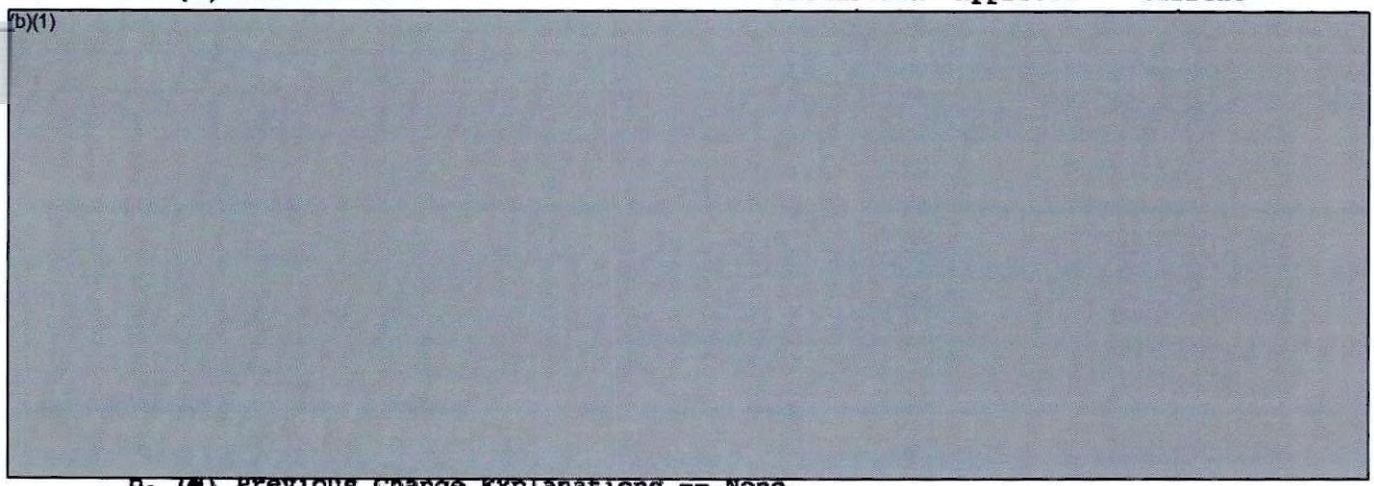
c. [redacted] Changes Since As Of Date -- None.

8. ([redacted]) Threshold Breaches: None.

9. ([redacted]) Schedule:

a. [redacted] Milestones --

	Production	Approved	Current
b)(1)			



b. ([redacted]) Previous Change Explanations -- None.

c. ([redacted]) Current Change Explanations -- None.

9d. ([redacted]) Schedule (Cont'd):

d. ([redacted]) References --

([redacted]) Production Estimate:
NDCP Rev. 2, dated 6 Sep 88, subject 'Navy Decision Coordinating Paper (NDCP) for Torpedo MK 48 ADCAP Program.' DAE Program Baseline dated 14 Jul 1989.

([redacted]) Approved Program:
NAE Approved Acquisition Program Baseline dated 8 January 1992.

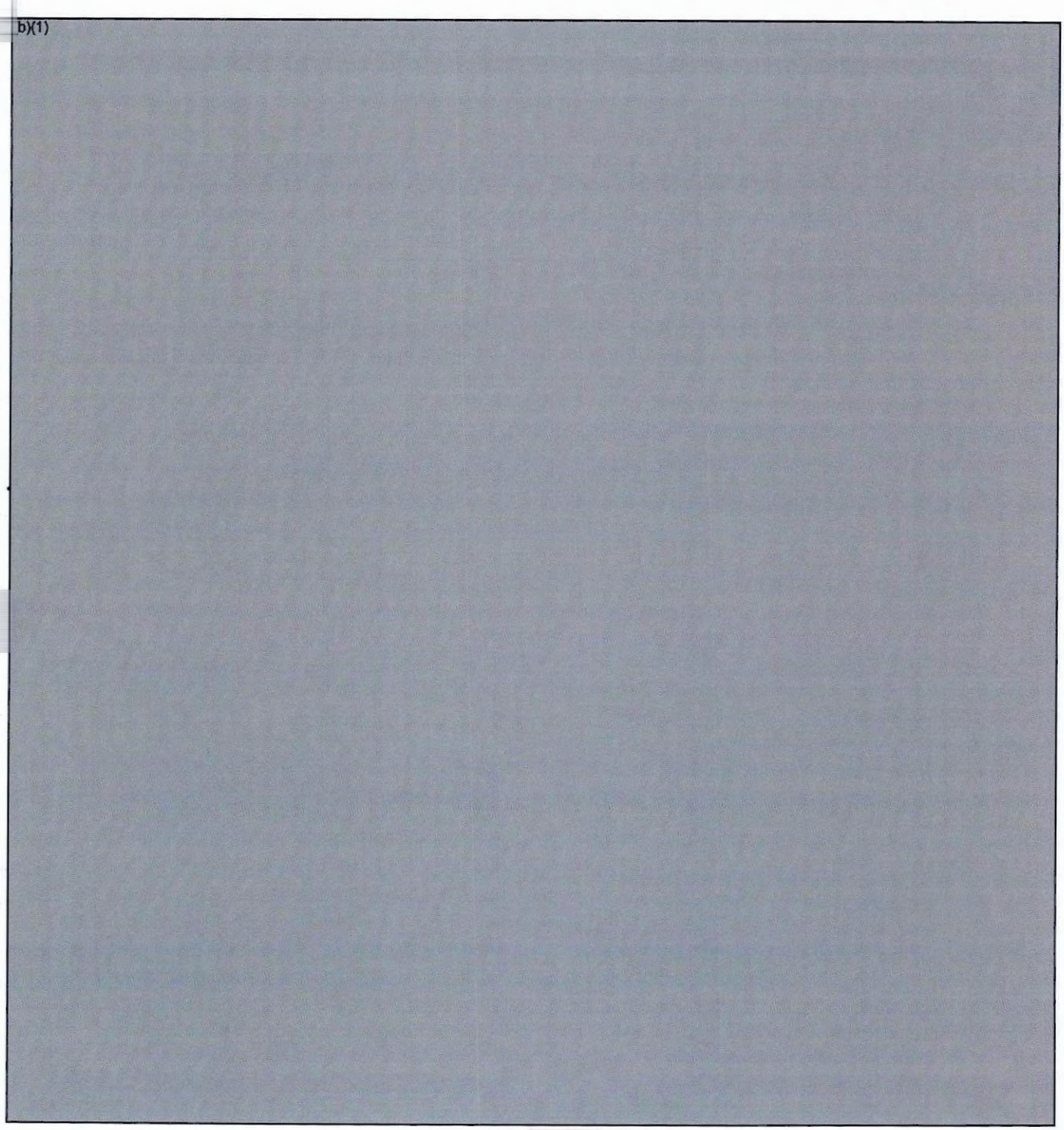
10. ([redacted]) Performance Characteristics:

a. ([redacted]) Performance --

	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

MK 48 ADCAP (MYP), December 31, 1991

b)(1)



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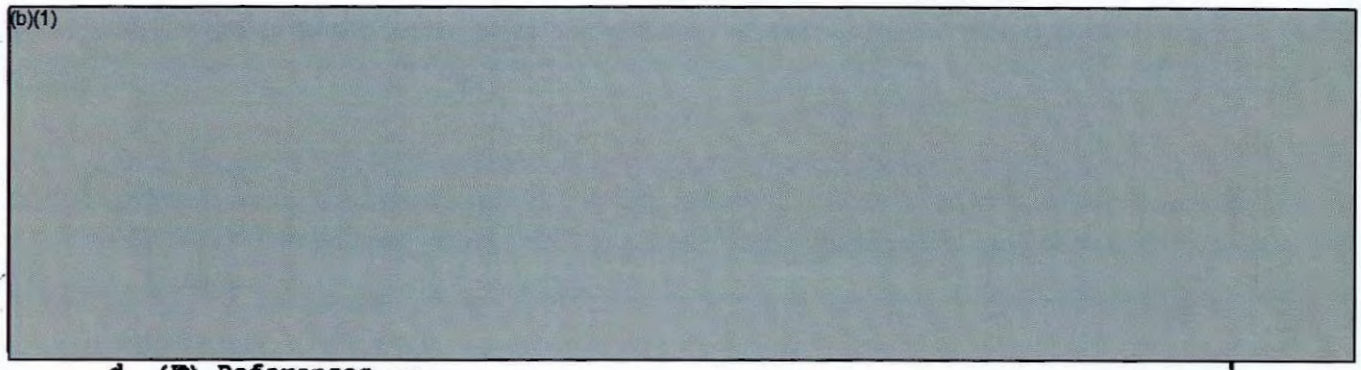


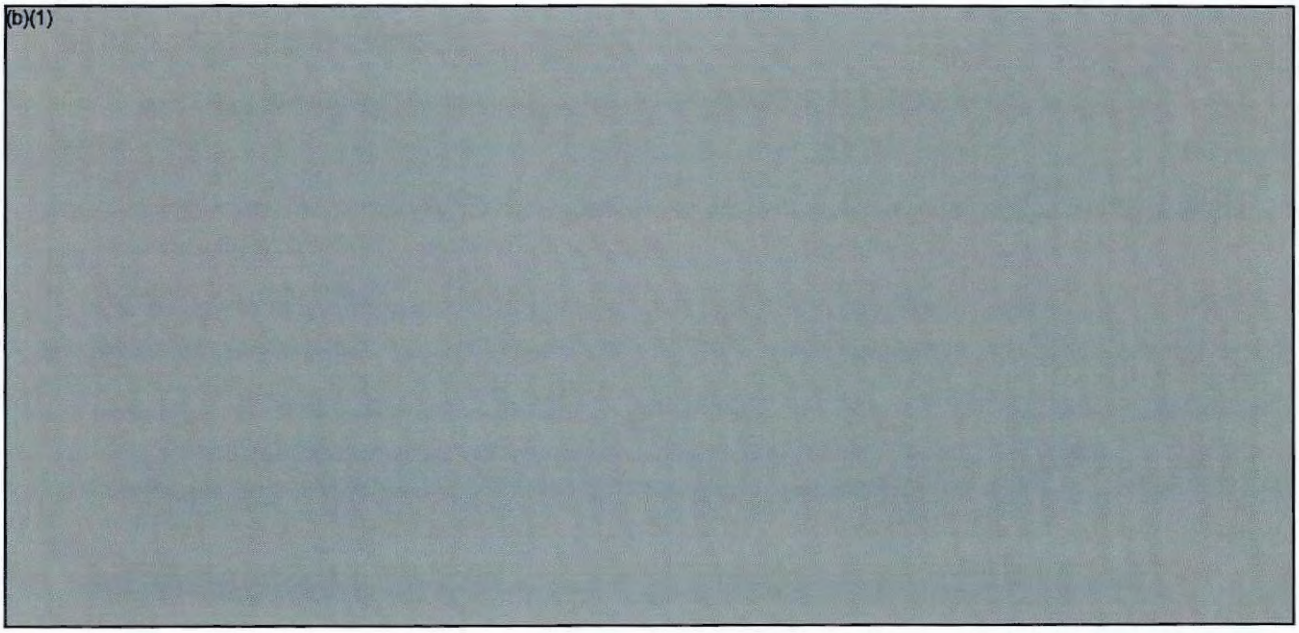
d. (U) References --

(U) Production Estimate:
NDCP Rev. 2, dated 6 Sep 88, subject 'Navy Decision Coordinating Paper (NDCP) for Torpedo MK 48 ADCAP Program.' DAE Program Baseline dated 14 Jul 1989.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 8 January 1992.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

(b)(1)



(b)(1) [redacted]

c. ([redacted]) Foreign Military Sales -- None.

d. ([redacted]) Nuclear Costs -- None.

e. ([redacted]) References --

[redacted] Production Estimate:
NDCP Rev. 2, dated 6 Sep 88, subject 'Navy Decision Coordinating Paper (NDCP) for Torpedo MK 48 ADCAP Program.' DAE Program Baseline dated 14 Jul 1989.

[redacted] Approved Program:
NAE Approved Acquisition Program Baseline dated 8 January 1992.

12. [redacted] Program Acquisition/Current Procurement Unit Cost Summary:

(b)(1)

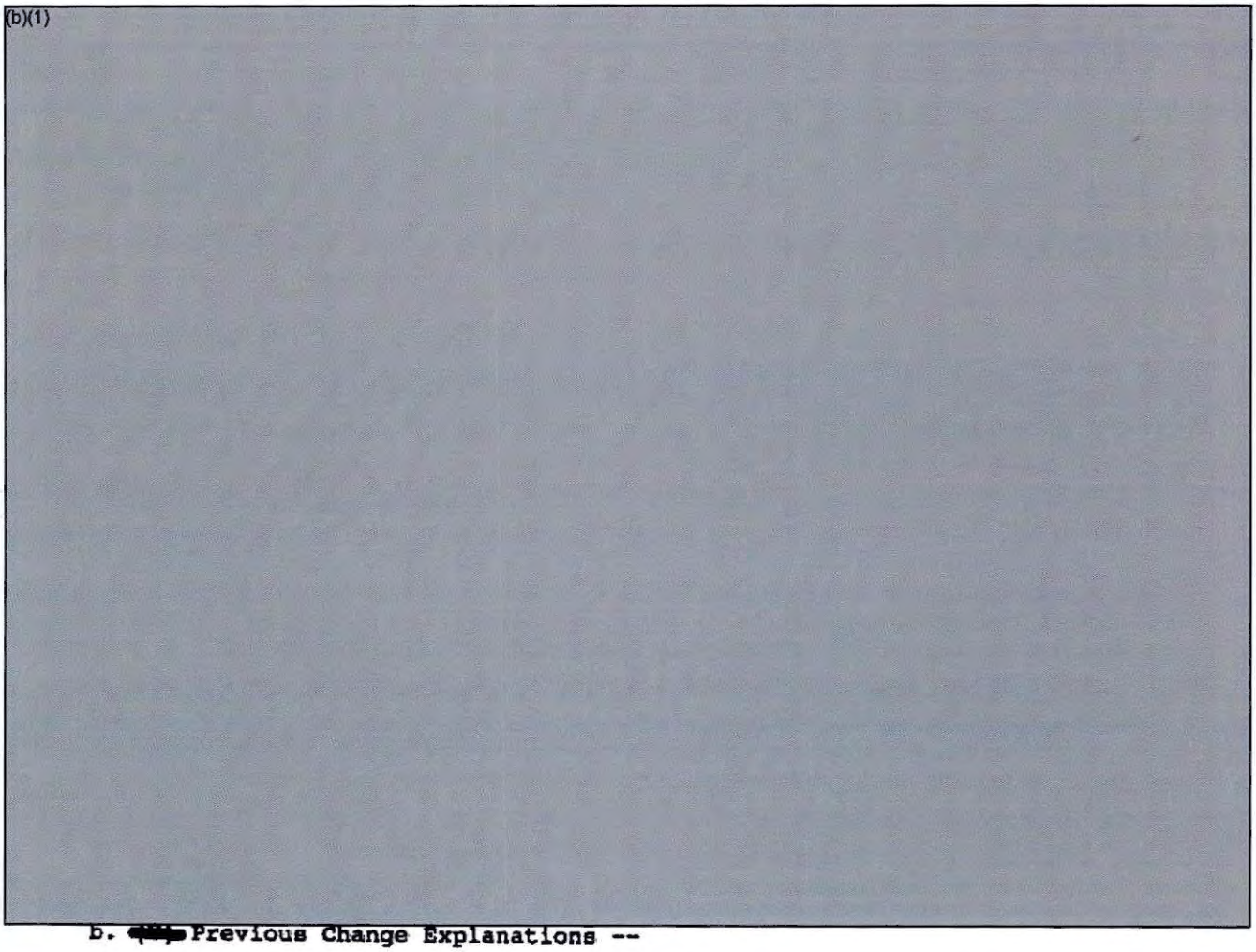
	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
[redacted]			

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	1148.2	5635.5	16.6	6800.3
Previous Changes:				
Economic	+4.1	+399.4	+0.1	+403.6
Quantity	-	-	-	-
Schedule	+53.4	+2743.3	+0.1	+2796.8
Engineering	-	-	-	-
Estimating	+108.9	-283.5	+13.9	-160.7
Other	-	-	-	-
Support	-	+183.6	-	+183.6
Subtotal	+166.4	+3042.8	+14.1	+3223.3
Current Changes:				
Economic	-6.1	-278.4	-0.2	-284.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-63.3	-634.5	-	-697.8
Estimating	-3.9	+26.0	-0.7	+21.4
Other	-	-	-	-
Support	-	+3.7	-	+3.7
Subtotal	-73.3	-883.2	-0.9	-957.4
Total Changes	+93.1	+2159.6	+13.2	+2265.9
Current Estimate	1241.3	7795.1	29.8	9066.2

(b)(1)



b. [redacted] Previous Change Explanations --

RDT&E
Economic: Revised Escalation Rates
Schedule: CCAPS schedule slip, technical problems during CCAPS D&V phase
Estimating: Budget Adjustments, new program starts for Warhead Lethality Improvements and OADEX, addition of SYDP funding for continuation of program through FY97, repricing, and inflation offset

PROCUREMENT
Economic: Revised Economic Escalation Rates
Schedule: Program extension from reduced annual quantities
Estimating: Sole source reduction, Multiyear Procurement

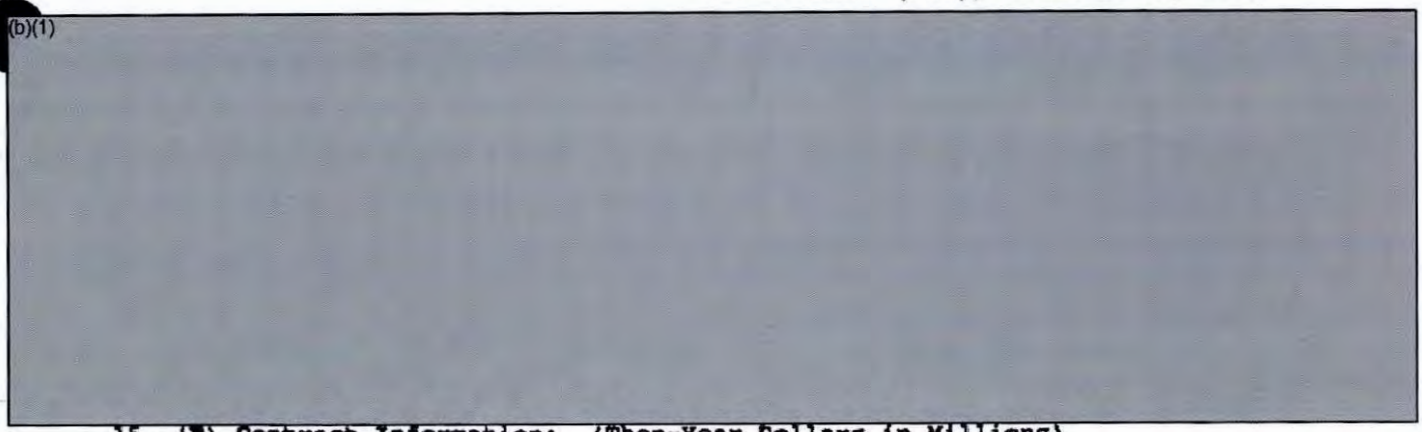
13b. [redacted] Cost Variance Analysis (Cont'd):
reduction, sample proofing reduction, budget adjustments and inflation offset
Support: Revised spares requirements

MILCON
Economic: Revised Economic Escalation Rates
Schedule: Slip in magazine construction at NWS Yorktown
Estimating: Construction of automated material handling facility at NUWC, Keyport and magazines at Yorktown and New London, and offset of escalation

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 economic escalation rates (Economic)	N/A	-6.1
Propulsion improvement system restructuring (Engineering)	-56.3	-63.3
Repricing Adjustments and inflation offset (Estimating)	-3.0	-3.9
Total Changes	-59.3	-73.3
(2) PROCUREMENT		
Revised Jan 92 economic escalation rates (Economic)	N/A	-278.4
Propulsion improvement program restructuring (Engineering)	-386.1	-634.5
Repricing Adjustments and inflation offset (Estimating)	-16.8	26.0
Revised outyear spares requirements (Support)	1.4	3.7
Total Changes	-401.5	-883.2
(3) MILCON		
Revised Jan 92 economic escalation rates (Economic)	N/A	-0.2
Economic offset (Estimating)	0.1	0.2
Repricing adjustments (Estimating)	-0.7	-0.9
Total Changes	-0.6	-0.9

(b)(1)



15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a.([redacted]) Procurement --

[redacted] WPN PRIME (P2/P3):

X WESTINGHOUSE ELEC CORP, CLEVELAND, OH
N00024-88-C-6325, FFP
Award: September 30, 1988
Definitized: September 30, 1988

Initial Contract Price		
Target	Ceiling	Qty
$166.1	$0.0	167

Current Contract Price		
Target	Ceiling	Qty
$158.3	$0.0	167

Estimated Price At Completion	
Contractor	Program Manager
$158.3	$158.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

[redacted] WPN PRIME (P2/P3):

X HUGHES AIRCRAFT CORP, FULLERTON, CA
N00024-88-C-6215, FFP
Award: September 30, 1988
Definitized: September 30, 1988

Initial Contract Price		
Target	Ceiling	Qty
$219.1	$0.0	255

Current Contract Price		
Target	Ceiling	Qty
$233.6	$0.0	255

Estimated Price At Completion	
Contractor	Program Manager
$233.6	$233.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change: None.

[redacted] P2/P3 TEST EQUIPMENT:
HUGHES AIRCRAFT CORP, FULLERTON, CA
N00024-89-C-6034, FFP
Award: December 16, 1988
Definitized: December 16, 1988

Initial Contract Price		
Target	Ceiling	Qty
$167.4	$0.0	0

Current Contract Price		
Target	Ceiling	Qty
$195.3	$0.0	0

Estimated Price At Completion	
Contractor	Program Manager
$195.3	$195.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

[redacted] WPN PRIME (P4):
HUGHES AIRCRAFT CORP., FULLERTON, CA
N00024-90-C-6055, FFP
Award: January 31, 1990
Definitized: January 31, 1990

Initial Contract Price		
Target	Ceiling	Qty
$130.9	$0.0	108

Current Contract Price		
Target	Ceiling	Qty
$140.2	$0.0	108

Estimated Price At Completion	
Contractor	Program Manager
$140.2	$140.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

[redacted] WPN PRIME (P4):
WESTINGHOUSE ELEC. CORP., CLEVELAND, OH
N00024-90-C-6054, FFP
Award: January 31, 1990
Definitized: January 31, 1990

Initial Contract Price		
Target	Ceiling	Qty
$120.6	$0.0	132

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$127.0	$0.0	132	$127.0	$127.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

[redacted] WPN PRIME (P5):
WESTINGHOUSE ELEC. CORP, CLEVELAND, OH
N00024-91-C-6104, FFP
Award: January 31, 1991
Definitized: January 31, 1991

Initial Contract Price		
Target	Ceiling	Qty
$122.7	$0.0	119

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$124.6	$0.0	119	$124.6	$124.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

(b)(1)

16b. [redacted] Program Funding Summary (Cont'd):

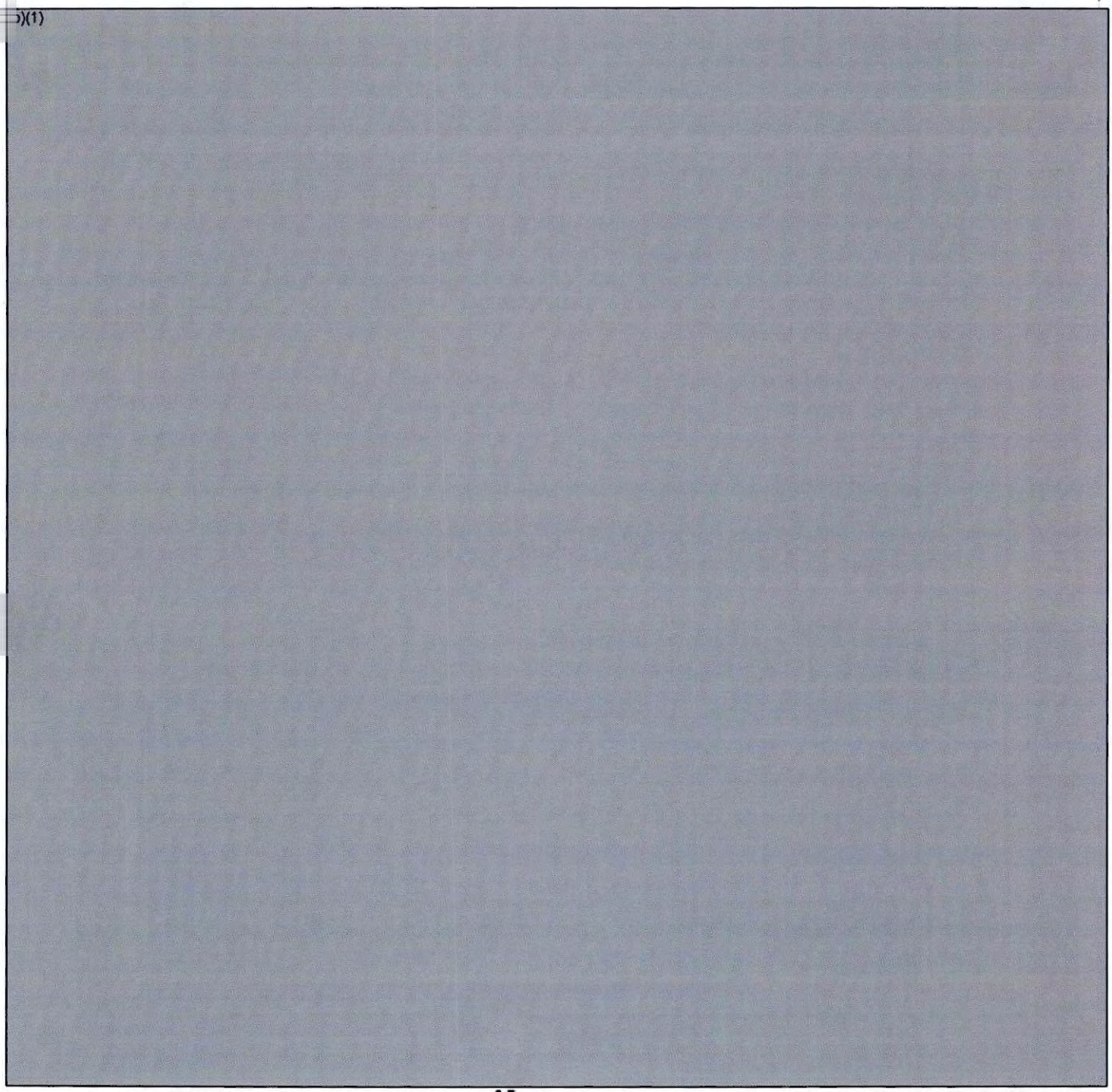
(b)(1)

[redacted]

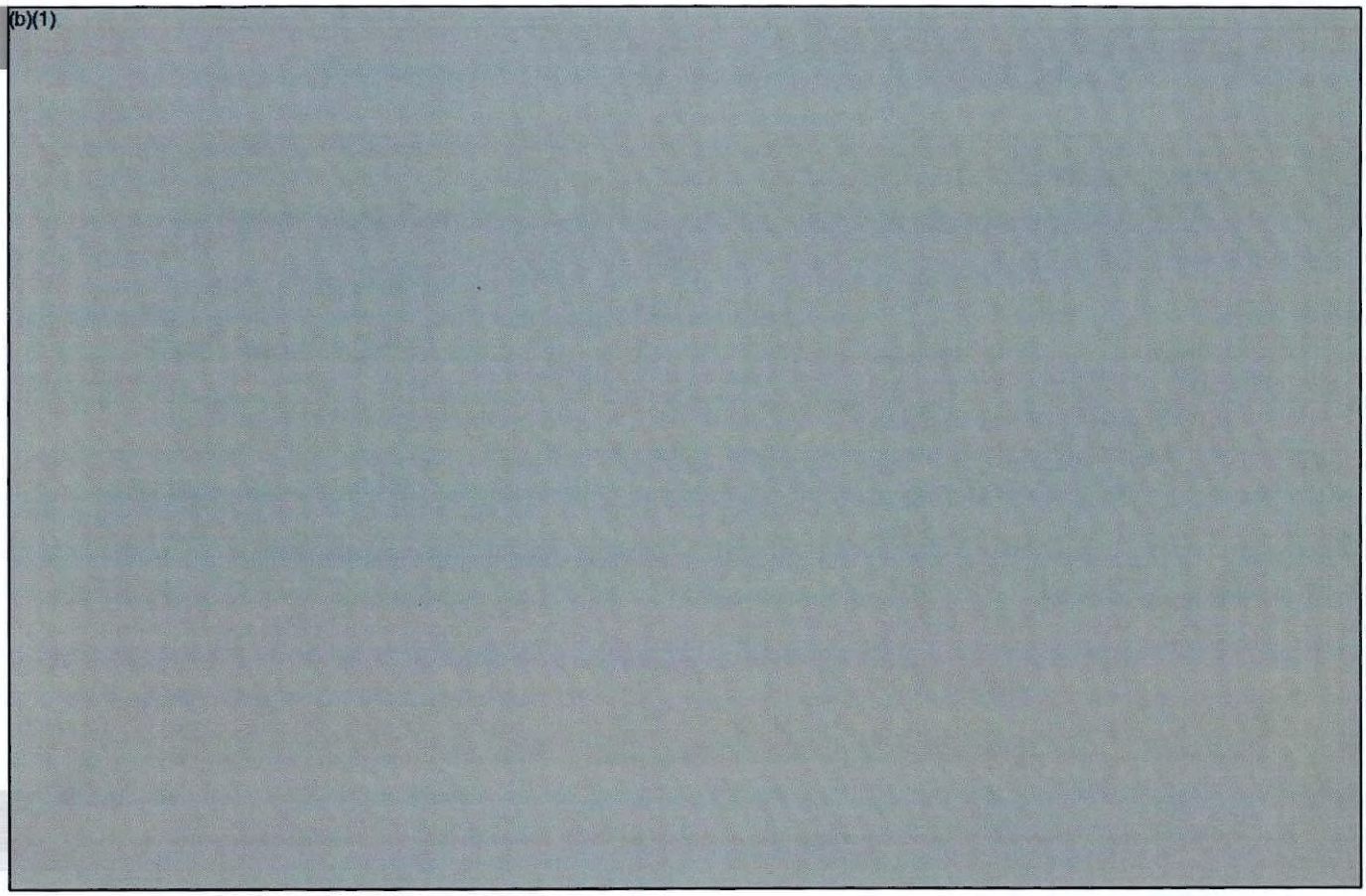
c. [redacted] Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obligated	Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1979				28.3	17.9	17.9	17.9	8.4
1980				75.2	52.6	52.6	52.6	10.6
1981				118.7	90.6	90.6	90.6	10.6
1982				192.2	154.4	154.4	154.4	7.6
1983				214.9	180.4	180.4	180.4	4.9
1984				198.8	172.9	172.9	172.1	3.8
1985				140.0	125.5	125.5	125.5	3.4
1986				65.4	60.3	60.3	60.1	2.8
1987				59.5	56.5	56.5	55.6	2.7
1988				20.6	20.2	20.1	15.8	3.0
1989				25.6	26.2	26.2	23.1	4.2
1990				32.0	34.0	33.8	28.4	4.0
1991				53.7	59.2	56.1	38.7	3.9
1992				12.9	14.7	2.5	0.4	3.1
1993				25.2	29.6			3.3
1994				24.9	30.2			3.3
1995				26.3	33.0			3.3

)(1)



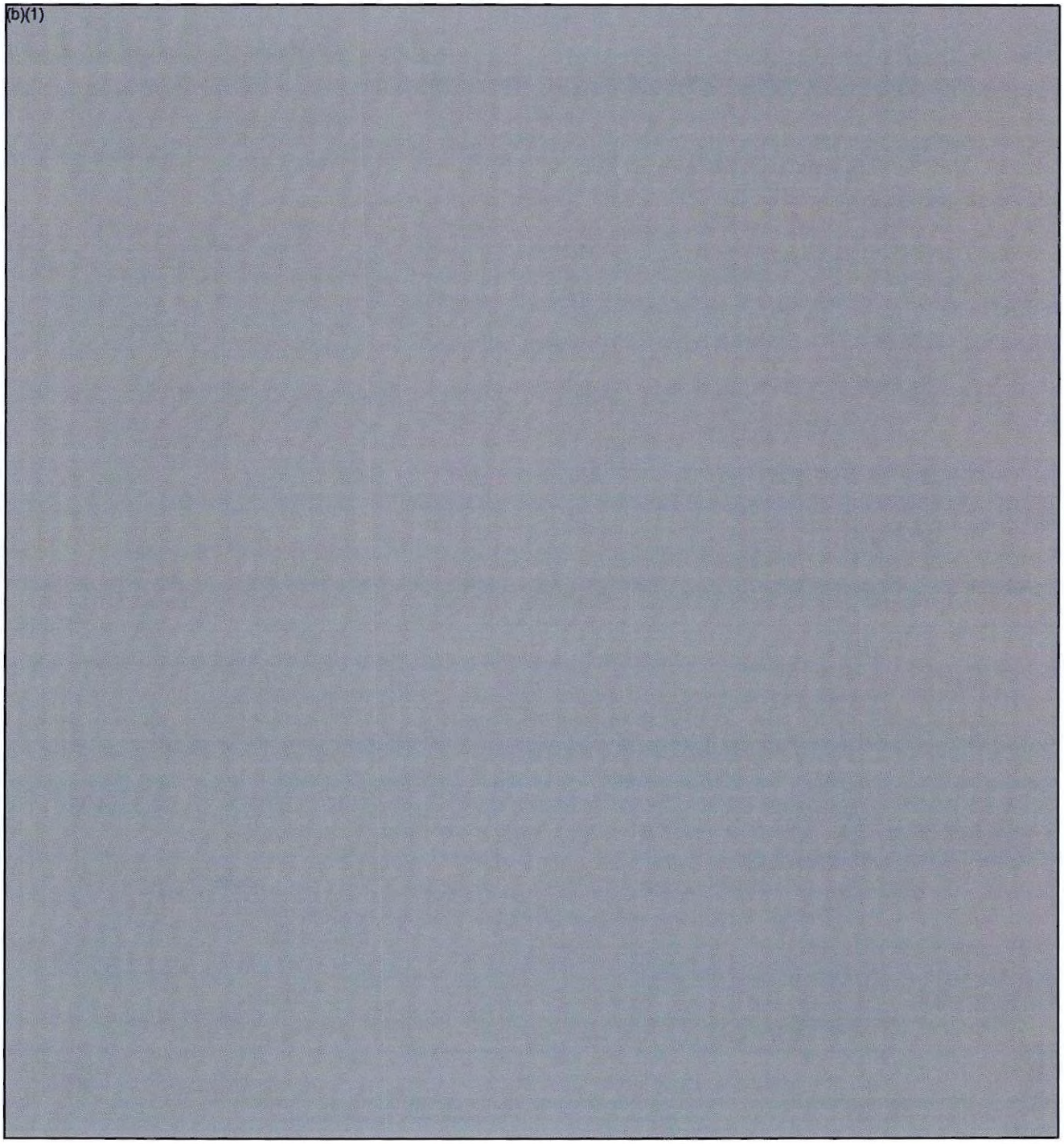
(b)(1)



17. (U) Production Rate Data:

a. (U) Annual Production Rates --

(b)(1)



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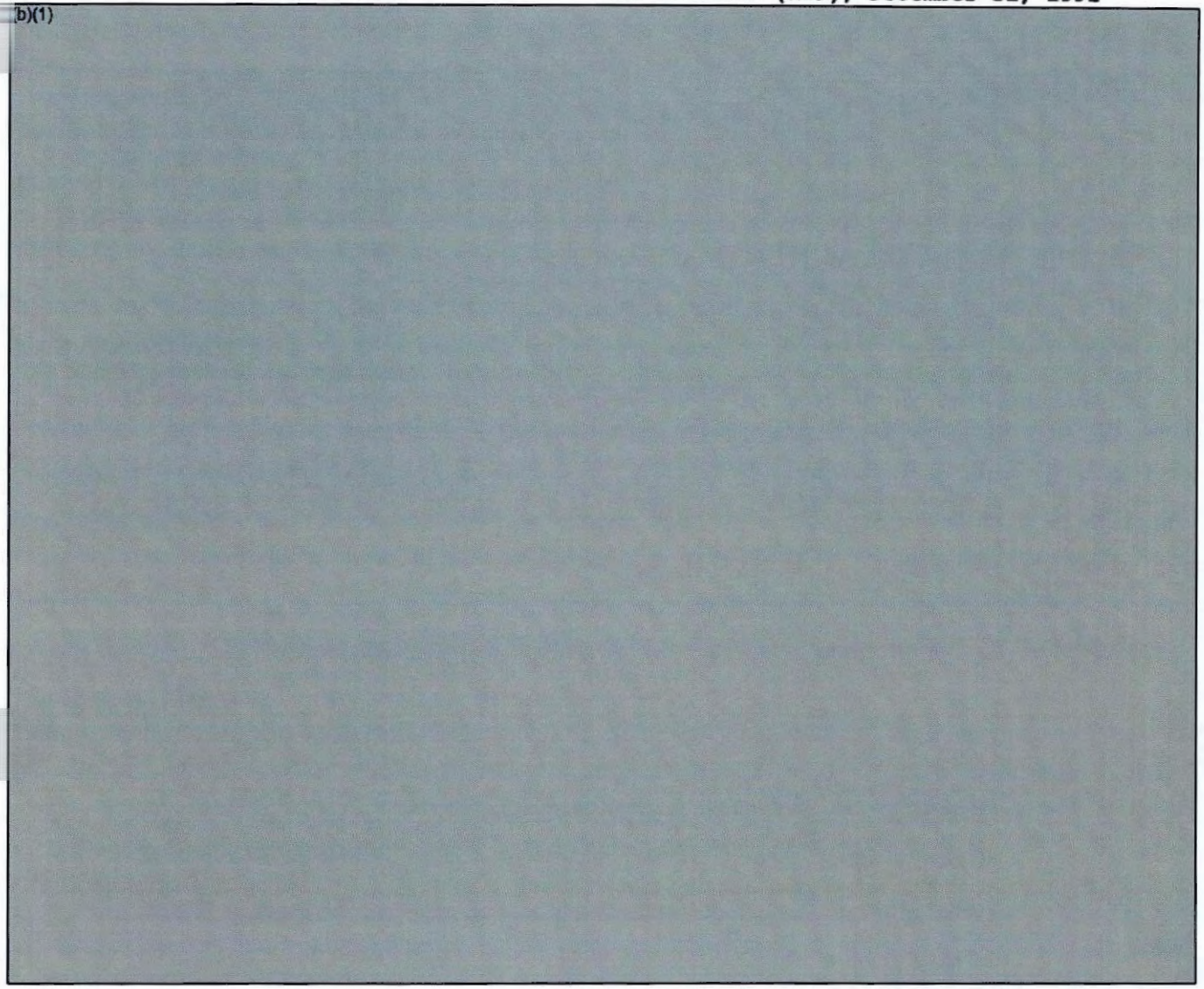
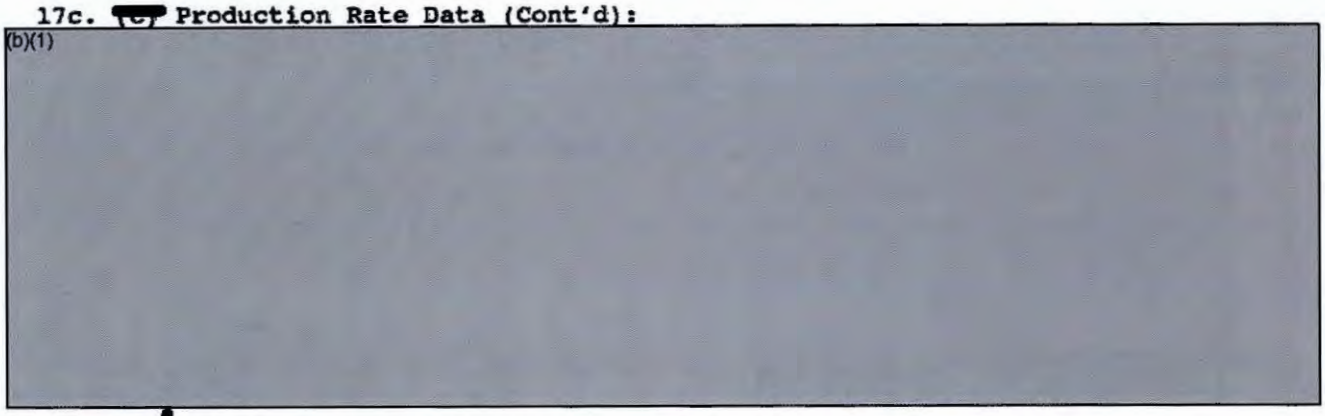


17c. (U) Production Rate Data (Cont'd):

(b)(1)



d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	48/48
Procurement	481/508

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The costs are for the operation and support of the ADCAP Torpedo. The data was prepared by PMO402 based on current budget projections in January 1989. Cost catagories are Direct Depot Support, Sustaining Investment, Other Direct Costs, and Consumables/Personnel. Direct Depot Costs is a summary cost which includes costs associated with fleet firings, turnarounds, torpedo storage, and other direct maintenance costs. Sustaining Investment costs includes engineering technical support and maintenance support. The Other Direct Costs category includes production related administration, facilities, and technical support. Consumables/Personnel consists of MILPERS estimates of ADCAP related costs and cost associated with consumable items for torpedo support.

18b. ([redacted]) Operating and Support Costs (Cont'd):

b. ([redacted]) Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per ADCAP	Avg Annual Cost Per MK 48
Direct Depot Maintenance	55.7	40.4
Sustaining Investment	25.2	20.2
Other Direct Costs	9.8	9.6
Consumables/Personnel	32.9	30.4
Total	123.6	100.6

c. [redacted] Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	12.3	5.3	5.5	323.9	347.0
Industrial Fund	---	---	---	---	---
Total	12.3	5.3	5.5	323.9	347.0

Note: The costs provided in 18b. above are in thousands vice millions.

N-36 SSN 688

91-154

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: SSN 688 ATTACK SUB

AS OF DATE: December 31, 1991

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[redacted]

AS AMENDED

MAR 24 1992

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. ([redacted]) **Designation and Nomenclature (Popular Name):**
SSN 688 Class Nuclear Submarine (Los Angeles Class)

2. ([redacted]) **DoD Component:** Navy

3. ([redacted]) **Responsible Office and Telephone Number:**
NAVAL SEA SYSTEMS COMMAND — CAPT P. M. HUBER
PMS 393 — Assigned: March 1, 1991
WASHINGTON, DC 20362-5101 — AV 332-3407 COMM 703 602-3405

4. [redacted] **Program Elements/Procurement Line Items:**

RDT&E:
PE 0603569N Project S1803
PE 0604567N Project S1570
PROCUREMENT:
APPN 1611 ICN 02 01 2010 (Navy)
MILCON:
PE 0804731N

No Security Objection to Open Publication
(AS AMENDED)
MAR 23 1992
Office of the Chief of
Naval Operations Dept. of the Navy

Classified by: ERDA-DOD Classification Guide for the Nav Nuc Propulsion Prg
Declassify on: OADR
Downgrade Instructions: Not Subject to Automatic Downgrade

(THIS PAGE IS [redacted])

[redacted]

92-T-0657

5. [redacted] Related Programs:
Harpoon, Tomahawk, SSBN (Trident), BSY-1 Advanced Combat System, SSN-21.

(b)(1)

[redacted]

7. [redacted] Program Highlights:

a. [redacted] Significant Historical Developments --
The SSN 688 Class submarine construction program consists of 62 awarded ships from FY 70 to FY 90: 33 awarded to General Dynamics Corporation, Electric Boat Division, and 29 to Newport News Shipbuilding. Prior to the period covered by this SAR, 45 ships had been delivered to the Navy--26 by Electric Boat and 19 by Newport News.

b. [redacted] Significant Developments Since Last Report --
General Dynamics Corporation, Electric Boat Division, delivered one SSN 688 Class submarine to the Navy in 1991, the USS ALEXANDRIA (SSN 757) on 13 June 1991, and Newport News Shipbuilding delivered one SSN 688 Class submarine to the Navy in 1991, the USS ASHEVILLE (SSN 758) on 29 August 1991. The total number of ships delivered since program inception is 47. In addition, three SSN 688's were launched in 1991: the ANNAPOLIS (SSN 760) on 18 May 1991 at Electric Boat and the BOISE (SSN 764) on 23 March 1991 and the MONTPELIER (SSN 765) 23 August 1991 at Newport News Shipbuilding.

c. [redacted] Changes Since As Of Date --
General Dynamics Corporation, Electric Boat Division, delivered the USS JEFFERSON CITY (SSN 759) to bring the total for the program to 48. In addition the USS SPRINGFIELD (SSN 761) was launched at Electric Boat. The Program Manager expects increases in overhead costs due to the termination of the SSN 21 program by the President's budget.

8. [redacted] **Threshold Breaches:**
DAE baseline approved 31 December 1988. There are no threshold breaches. There are no unit cost breaches.

9. [redacted] **Schedule:**

a. [redacted] Milestones --

	Development Estimate	Approved Program	Current Estimate
Characteristics Approved	NOV 68	N/A	NOV 68
DSARC I	FEB 70	N/A	FEB 70
DSARC Production Approval	N/A	JAN 71	JAN 71
DCP #27 Approved	MAR 70	N/A	MAR 70
Lead Ship Los Angeles Delivered	DEC 74	NOV 76	NOV 76
Production Contract	JAN 71	N/A	JAN 71
Production Started	JAN 71	N/A	JAN 71
Lead Ship Launch	MAR 73	N/A	APR 74
Acceptance Trials -- Lead Ship	DEC 74	N/A	OCT 76
Lead Ship Los Angeles IOC	DEC 74	NOV 76	NOV 76
Last Follow-Ship (65) Delivery	MAY 96	MAY 96	OCT 95

b. [redacted] Previous Change Explanations --

Early ships experienced schedule delays primarily due to late contractor-furnished equipment, shipbuilder's limitations in application of his work force, production/productivity problems, and late and defective design agent furnished information. Follow ships were delayed to maintain intervals between ships. Additional delays resulted from strikes at Electric Boat during Jun-Nov 1975 and Jun-Oct 1988. Four ships in FY 1990, 1991 and FY 1992 were deleted from the program in prior years. The sixty-second and last ship of the class was awarded to Newport News Shipbuilding on 28 November 1989 and is projected to deliver October 1995.

c. ([redacted]) Current Change Explanations -- None.

d. ([redacted]) References --

([redacted]) Development Estimate:
DCP #104 dated September 1970, revised and reapproved 13 April 1978. USDR&E letter 13 March 1970 cancelled DCP #104 and returned surveillance to the Navy. DCP #27, dated 19 March 1970. Ship Construction Awards dated 8 January 1971.

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated December 31, 1988.

10. (U) Performance Characteristics:

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Length (ft)	360	N/A / N/A	360	360
Beam Maximum (ft)	33	N/A / N/A	33	33
Draft Dev. (ft)	32	N/A / N/A	32	32
Displacement (tons)	6900	N/A / N/A	6900	6900

(b)(1)

[redacted]

b. (U) Previous Change Explanations --

AN/BQQ-5B are based on demonstrated performance during OPEVAL and FOT&E. Deleted from DCP #104 on 9 September 1975.

c. (U) Current Change Explanations --

NONE.

d. (U) References --

(U) Development Estimate:
DCP #104 dated September 1970, revised and reapproved 13 April 1978. USDR&E letter 13 March 1970 cancelled DCP #104 and returned surveillance to the Navy. DCP #27, dated 19 March 1970. Ship Construction Awards dated 8 January 1971.

10d. ([redacted]) **Performance Characteristics (Cont'd):**

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated December 31, 1988.

11. ([redacted]) **Total Program Cost and Quantity:** **(Current Estimate in Millions of Dollars)**

	Development Estimate	Approved Program	Current Estimate
a. ([redacted]) Cost --			
Development (RDT&E)	0.0	24.5	24.4
Procurement	5126.8	11960.2	11692.8
Other	(5126.8)		(11692.8)
Total Sailaway	(5126.8)		(11692.8)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	20.4	20.5
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 71 Base-Year $	5126.8	12005.1	11737.7
Escalation	620.7	16074.5	16330.9
Development (RDT&E)	(0.0)	(23.3)	(23.4)
Procurement	(620.7)	(16033.3)	(16289.6)
Construction (MILCON)	(0.0)	(17.9)	(17.9)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	5747.5	28079.6	28068.6
b. ([redacted]) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	32	63	62
Total	32	63	62

c. ([redacted]) Foreign Military Sales -- None.

d. ([redacted]) Nuclear Costs --
The nuclear propulsion cost is $3870.6 M in then-year dollars.

e. ([redacted]) References --

([redacted]) Development Estimate:
DCP #104 dated September 1970, revised and reapproved 13 April 1978. USDR&E letter 13 March 1970 cancelled DCP #104 and returned surveillance to the Navy. DCP #27, dated 19 March 1970. Ship Construction Awards dated 8 January 1971.

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated December 31, 1988.

SSN 688 ATTACK SUB, December 31, 1991

12. [redacted] Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. ([redacted]) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	28068.6	28042.4	28068.6
(2) Quantity	62	62	62
(3) Unit Cost	452.72	452.30	452.72
b. ([redacted]) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	227.9	227.9	119.7
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	227.9	227.9	119.7
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	0.0	5747.5	0.0	5747.5
Previous Changes:				
Economic	+6.2	-4588.0	-5.0	-4586.8
Quantity	-	+22306.6	-	+22306.6
Schedule	-	+87.3	-	+87.3
Engineering	+40.0	+1879.6	-	+1919.6
Estimating	+1.6	+1497.4	+0.2	+1499.2
Other	-	-	-	-
Support	-	+1025.8	+43.2	+1069.0
Subtotal	+47.8	+22208.7	+38.4	+22294.9
Current Changes:				
Economic	-	-225.1	-	-225.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+236.3	-	+236.3
Other	-	-	-	-
Support	-	+15.0	-	+15.0
Subtotal	-	+26.2	-	+26.2
Total Changes	+47.8	+22234.9	+38.4	+22321.1
Current Estimate	47.8	27982.4	38.4	28068.6

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1971 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	0.0	5126.8	0.0	5126.8
Previous Changes:				
Quantity	-	+5628.0	-	+5628.0
Schedule	-	+14.6	-	+14.6
Engineering	+23.2	+500.4	-	+523.6
Estimating	+1.3	+184.9	+0.2	+186.4
Other	-	-	-	-
Support	-	+156.0	+20.4	+176.4
Subtotal	+24.5	+6483.9	+20.6	+6529.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.1	+77.8	-0.1	+77.6
Other	-	-	-	-
Support	-	+4.3	-	+4.3
Subtotal	-0.1	+82.1	-0.1	+81.9
Total Changes	+24.4	+6566.0	+20.5	+6610.9
Current Estimate	24.4	11692.8	20.5	11737.7

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Engineering: Increase to fund costs directly related to the SSN 688 Class Program.
Estimating: Refinement of R&D estimate and addition of the SSN 688 Class Development Line.

PROCUREMENT
Economic: Revised escalation indices.
Quantity: Addition of 2 SSNs since the authorization of the DE and 28 SSNs at the established baseline value.
Schedule: Revision of schedule baseline.
Engineering: Changes to the propulsion plant associated with the

13b. [redacted] Cost Variance Analysis (Cont'd):

Long life core, cost reduction improvements and the addition of VLS, BSY-1, and IPMP.

Estimating: Refinement of estimate, changes in procurement plan, increased estimates for deferred work, shipbuilding contract over-target increases. The Government's liability under P.L. 85-804 to fund REA settlements.

Support: Increased outfitting and post delivery requirements.

MILCON

Economic: Revised escalation indices.

Support: Fund Military Construction projects at New London, Norfolk, San Diego, Portsmouth, and Pearl Harbor.

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Rounding Error (Estimating)	-0.1	--
Total Changes	-0.1	--
(2) PROCUREMENT		
Revised Dec 91 economic escalation (Economic)	--	-225.1
Refined estimates to reflect later pricing data including shipbuilding contract price, change orders and GFE. (Estimating)	77.8	236.3
Increased outfitting and post-delivery costs (Support)	4.3	15.0
Total Changes	82.1	26.2
(3) MILCON		
Rounding Error (Estimating)	-0.1	
Total Changes	-0.1	--

14. (U) **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
165.80	18.40	-5.20	--	--	--	--	0.60	13.80	179.60

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
179.61	-77.61	272.88	1.41	30.96	27.99	--	17.48	273.11	452.72

15. (U) **Contract Information:** (Then-Year Dollars in Millions)

a. (U) Procurement --

(U) FLIGHT IX SHIPS:

NEWPORT NEWS SHIPBUILDING, NEWPORT NEWS, VA
N00024-84-C-2064, FPIF
Award: November 29, 1983
Definitized: November 29, 1983

Initial Contract Price		
Target	Ceiling	Qty
$278.0	$317.4	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1185.1	$1337.0	4	$1337.0	$1337.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-298.2	$-35.5
Cumulative Variances To Date (08/25/91)	$-308.5	$-10.5
Net Change	$-10.3	$25.0

Explanation of Change:

The growing cost variance reflects increased submarine construction complexity, the impact of the first modular constructed ships at this facility, and an optimistic budget due to the effects of aggressive competition. The improved schedule variance is due to the contract being near to completion. All four ships have been delivered. The contract will not be reported in future SARs.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

([redacted]) FLIGHT X SHIPS:

	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL DYNAMICS CORP, GROTON, CT N00024-86-C-2076, FPIF Award: March 21, 1986 Definitized: March 21, 1986	$1032.6	$1171.1	4

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1063.8	$1206.0	4	$1206.0	$1206.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-35.0	$-60.2
Cumulative Variances To Date (09/28/91)	$-58.2	$-21.4
Net Change	$-23.2	$38.8

Explanation of Change:

The worsening cost variance reflects increased submarine construction complexity, and an optimistic budget due to to the effects of aggressive competition. The improved schedule variance is due to more accurate data as a result of Electric Boat improvements to their accounting system.

The Program Manager is aggressively monitoring the shipbuilder's ability to deliver all FY 86 ships by the end of 1993. The government's liability for this contract is ceiling.

([redacted]) FLIGHT XI SHIPS:

	Initial Contract Price		
	Target	Ceiling	Qty
NEWPORT NEWS SHIPBUILDING, NEWPORT NEWS, VA N00024-87-C-2007, FPIF Award: February 6, 1987 Definitized: February 6, 1987	$1018.1	$1209.3	4

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1069.5	$1264.5	4	$1264.5	$1264.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-147.1	$-62.2
Cumulative Variances To Date (09/29/91)	$-214.8	$-58.6
Net Change	$-67.7	$3.6

Explanation of Change:

The worsening cost variance reflects increased submarine construction

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)
complexity and an optimistic budget due to the effects of aggressive competition. The improved schedule variance over the past year, as the first ship nears completion, is due to learning associated with modular construction.

The government's liability for this contract is the current ceiling price.

[redacted] FLIGHT XII SHIPS - NNS:	Initial Contract Price Target	Ceiling	Qty
NEWPORT NEWS SHIPBUILDING, NEWPORT NEWS, VA			
N00024-88-C-2195, FPIF	$606.7	$698.7	2
Award: June 30, 1988			
Definitized: June 30, 1988			

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$954.9	$1098.5	3	$994.0	$1035.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-19.3	$-41.3
Cumulative Variances To Date (10/27/91)	$-60.0	$-68.5
Net Change	$-40.7	$-27.2

Explanation of Change:

The worsening cost variance reflects increased submarine construction complexity, and an optimistic budget due to the effects of aggressive competition. The worsening schedule variance is due to delays in material.

The Program Manager decreased his final price from the prior year due to learning associated with modular construction from $1086.6M. The Program Manager reduced the total manhours from 24M to 23.5M.

[redacted] FLIGHT XII SHIPS - EB:	Initial Contract Price Target	Ceiling	Qty
GENERAL DYNAMICS CORP, GROTON, CT			
N00024-88-C-2196, FPIF	$399.9	$475.0	1
Award: June 30, 1988			
Definitized: June 30, 1988			

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$758.0	$892.9	2	$759.3	$776.3

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-9.0	$-22.9
Cumulative Variances To Date (09/29/91)	$-17.9	$-20.8
Net Change	$-8.9	$2.1

Explanation of Change:

The worsening cost variance reflects increased submarine construction complexity, and an optimistic budget due to the effects of aggressive competition. The nominal improvement in the schedule variance is due to more accurate data as a result of Electric Boat improvements to their accounting system.

The Program Manager decreased his final price from the prior year due to an increase in productivity by the contractor from $787.4M. The Program Manager reduced the total manhours from 17.1M to 16.9M.

[redacted] SSN ATTACK SUB:

	Initial Contract Price		
	Target	Ceiling	Qty
NEWPORT NEWS SHIPBUILDING, NEWPORT NEWS, VA			
N00024-90-C-2100, FPIF	$412.9	$467.5	1
Award: November 28, 1989			
Definitized: November 28, 1989			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$412.8	$467.4	1	$424.9	$432.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (08/25/91)	$-6.7	$-33.4
Net Change	$-6.7	$-33.4

Explanation of Change: None.

This contract is only 12% complete with material accounting for 69% of the total effort to date, therefore the data provides limited projection value. The schedule variance reflects increased problems with the declining vendor base.

16. ([redacted]) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. ([redacted]) Program Status --

(1) Percent Program Completed: 82.8% (24 yrs/29 yrs)

(2) Percent Program Cost Appropriated: 99.0% ($27797.0 / $28068.6)

b. ([redacted]) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY69-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	47.8	-	-	-	47.8
Procurement	27482.9	227.9	119.7	151.9	27982.4
MILCON	38.4	-	-	-	38.4
O&M	-	-	-	-	-
Total	27569.1	227.9	119.7	151.9	28068.6

c. ([redacted]) Annual Summary --

Fiscal Year	Qty	Flyaway FY71 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1970				0.5	0.5	0.5	0.5	5.5
1971				1.8	1.8	1.8	1.8	5.1
1972				1.1	1.2	1.2	1.2	4.6
1973				1.1	1.2	1.2	1.2	4.4
1974				0.4	0.5	0.5	0.5	8.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY71 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1977				1.2	1.8	1.8	1.8	2.6
1978				1.0	1.7	1.7	1.7	6.8
1979				3.6	6.6	6.6	6.6	8.4
1980				1.3	2.7	2.7	2.7	10.6
1981				2.2	4.7	4.7	4.7	10.6
1982				2.2	5.0	5.0	4.9	7.6
1983				3.1	7.5	7.5	7.4	4.9
1984				1.7	4.3	4.3	4.2	3.8
1985				1.2	3.0	3.0	2.9	3.4
1986				2.0	5.3	5.3	5.2	2.8
1987								2.7
Subtot				24.4	47.8	47.8	47.3	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1969			23.9	23.9	26.5	26.5	26.5	
1970	3		542.3	542.3	601.2	601.2	601.2	5.6
1971	4		517.8	517.8	617.2	617.2	617.2	5.1
1972	5		696.3	696.3	911.5	911.5	906.4	4.4

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY71 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1973	6		706.9	706.9	1041.8	1041.8	1022.8	5.3
1974	5		575.2	575.2	935.1	935.1	920.2	9.0
1975	3		296.0	296.0	531.7	531.6	527.5	14.1
1976	2		299.3	299.3	579.7	579.3	567.6	11.5
197T			88.5	88.5	189.0	190.5	190.5	2.0
1977	3		658.3	658.3	1413.8	1409.0	1409.2	6.2
1978	1		192.6	192.6	451.6	451.6	449.0	8.2
1979	1		316.6	316.6	757.5	757.7	753.3	9.6
1980	2		388.0	388.0	1008.4	1008.9	999.9	9.9
1981	2		428.3	428.3	1149.2	1162.0	1146.5	9.6
1982	2		558.6	558.6	1542.5	1538.6	1505.5	7.5
1983	2		624.5	624.5	1751.5	1736.4	1715.3	3.8
1984	3		732.7	732.7	2092.3	2092.6	2022.1	3.6
1985	4		965.1	965.1	2806.0	2737.9	2612.0	2.1
1986	4		841.1	841.1	2497.0	2416.8	1924.8	1.1
1987	4		825.4	825.4	2502.6	2335.8	1821.6	1.5
1988	3		589.8	589.8	1840.8	1754.7	908.3	2.3
1989	2		418.1	418.1	1342.8	1268.9	514.9	2.8

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY71 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1990	1		255.9	255.9	845.8	747.7	252.9	1.3
1991			13.9	13.9	47.4	41.9	34.9	1.3
1992			64.8	64.8	227.9	5.3	5.3	3.1
1993			32.9	32.9	119.7			3.3
1994			26.9	26.9	101.0			3.3
1995			10.5	10.5	40.6			3.3
1996			2.5	2.5	10.0			3.2
1997			0.1	0.1	0.3			3.2
Subtot	62		11692.8	11692.8	27982.4	26900.5	23455.4	
Appropriation: 1205 Military Construction, Navy								
1973				2.9	3.9	3.9	3.9	5.6
1974				1.6	2.3	2.3	2.3	11.8
1975				2.7	4.3	4.3	4.3	16.1
1976				4.2	7.0	7.0	7.0	3.0
1978				2.5	4.8	4.8	4.8	7.7
1979				3.8	7.6	7.6	7.6	9.3
1982				0.2	0.6	0.6	0.6	7.6

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY71 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1205 Military Construction, Navy (Cont'd)								
1987				2.0	6.1			2.7
1988								
1989				0.6	1.8			4.2
Subtot				20.5	38.4	30.5	30.5	
Grand Total	62		11692.8	11737.7	28068.6	26978.8	23533.2	

FOR FY 1987-9: OBLIGATIONS AND EXPENDITURES ARE NOT REPORTED TO NAVSEA.

17. ([redacted]) **Production Rate Data:**

a. ([redacted]) Annual Production Rates -- None.

Not required since production is less than six per year.

b. ([redacted]) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	11737.7	N/A	0.0
(TY $)	N/A	N/A	28068.6	N/A	0.0
PAUC Cost (BY $)	N/A	N/A	189.318	N/A	N/A
(TY $)	N/A	N/A	452.719	N/A	N/A

c. ([redacted]) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. ([redacted]) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	48/48

e. ([redacted]) Approved Design-to-Cost Objective -- N/A.

18. ([redacted]) **Operating and Support Costs:**

a. ([redacted]) Assumptions and Ground Rules --

not required

b. ([redacted]) Costs -- None.

18c. ([redacted]) Operating and Support Costs (Cont'd):

c. ([redacted]) Contractor Support Costs -- None.

N-4 AN/SQQ-89

91-115

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AN/SQQ-89 ASWCS

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
ASW COMBAT SYSTEM

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**
Program Executive Officer — CAPT T. L. RICE
ATTN: PMO411 — Assigned: July 29, 1991
Surface Ship ASW Systems — AV 286-3030 COMM (703) 746-3030
Washington, DC 20362-5104

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 020562N Project V0896
PE 0604212N Project W1707
PE 0604575N Project S1451
PE 0604713N Project S0234, V1916

AS AMENDED
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Declassify on: [redacted]
~~Downgrade Instructions: GADR~~

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CLEARED 92-0676

4. [redacted] **Program Elements/Procurement Line Items (Cont'd):**

PROCUREMENT:
- APPN 1810 ICN 33213300 (Navy)
- APPN 1810 ICN 33213400 (Navy)
- APPN 1810 ICN 33213600 (Navy)
- APPN 1810 ICN 33223600 (Navy)
- APPN 1810 ICN 33425500 (Navy)
- APPN 1810 ICN 33425500 (Navy)
- APPN 1810 ICN 33545200 (Navy)

MILCON:
- PE 0204262N

O & M:
- PE 78012N, 78017N

5. [redacted] **Related Programs:**
LAMPS MK III and the Surface ASW System Improvement Programs

(b)(1) [redacted]

7. [redacted] **Program Highlights:**

a. [redacted] Significant Historical Developments --
Historical Developments:

The various subsystems in the AN/SQQ-89 were originally developed under independent programs. The subsystems were designed so that they could be integrated into a single system. Subsequent to FY87, only AN/SQQ-89 systems were procured and the AN/SQQ-89 subsystems lost their separate identities.

Subsystem testing has been completed as follows:

SUBSYSTEM	OPERATIONAL TESTING COMPLETED
AN/SQR-19	1983
AN/SQQ-28	1981
AN/SQS-53B	1983
MK 116	1982

7a. [redacted] Program Highlights (Cont'd):

AN/SRQ-4	1981
AN/SQS-53C	1989

AN/SRQ-4 is a data link between AN/SQQ-89 and the LAMPS MK III helicopter and is included as part of the AN/SQQ-89 for SAR reporting. Responsibilities and funding for the AN/SRQ-4 and AN/SQQ-28 were transferred from the LAMPS MK III SAR to the AN/SQQ-89 SAR.

The AN/SQS-53C subsystem entered full rate production in June 1989.

The FY89 production option on contract N00024-88-C-6219 was awarded to General Electric in June 1989.

The AN/SQQ-89 TEMP 802-2 was approved 27 April 1990.

The FY90 competitive AN/SQQ-89 production contract was awarded to Westinghouse Electric Corporation on 14 June 1990.

Congress directed in the FY90 and FY91 Appropriation Acts that the AN/SQQ-89 be redesigned to incorporate Advanced Video Processor (AVP). Congress further directed that AN/SQQ-89s procured in FY91 for DDG 51 Class ships incorporate AVP.

Redesign of AN/SQQ-89 to incorporate AVP/Basic is being pursued to incorporate the technical advantages AVP/Basic has to offer. Development and testing of AVP/Basic is scheduled to be completed in FY92 and will serve as the basis for further effort to redesign the AN/SQQ-89 to accomodate AVP.

Congress provided $30M in FY90 to redesign the AN/SQQ-89 to incorporate AN/UYS-2 (EMSP). $24M was used to procure AN/UYS-2 units and the remainder was used to fund non-recurring costs required to support the AN/SQQ-89 redesign effort. Congress provided an additional $30M in FY91 and directed the Navy to budget additional funds to redesign the AN/SQQ-89 to incorporate AN/UYS-2 (EMSP). Funds to incorporate EMSP in the AN/SQQ-89 program are budgeted starting in FY92.

The FY91 competitive production contract was awarded to General Electric Company, 15 February 1991.

GE contracts N00024-85-C-6116, N00024-85-C-6012, and N00024-88-C-6219 were rebaselined in February 1991 in exchange for consideration. The new schedule meets revised program requirements.

7b. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report --
A Program Acquisition Baseline Change Request and Program Deviation Report were submitted 28 March 91 to document the increase in RDT&E funding. SECNAV notified Congress of the +22% breach on 23 April 91. The AN/SQQ-89 program has received a new approved baseline dated 10 May 91.

The AVP FSED phase In Process Design Review (IPDR) milestone was conducted 2 - 12 October 1991, at the contractor's facility. The next milestone is dependent upon Navy receipt of acceptable documentation that describes the AVP functional and product baseline. FSED is still planned to be completed in FY92.

The AVP contract was modified to incorporate various ECPs with a negotiated cost of $1.22M.

OT-IIIB was completed March 1991. COMOPTEVFOR reported "within constraints imposed by the equipment configurations and limitations to scope testing, the AN/SQQ-89(V)4 is determined to have the potential to be operationally effective." OT-IIIC will be conducted in several phases completing in May 1992.

A plan for the initiation of Congressionally directed AVP/CI testing is being reviewed. Initiation of testing is expected to start momentarily.

This SAR includes funds for the Surface ASW Systems Improvement program, which was previously included in the AN/SQY-1 SAR.

PMO411 plans to procure beyond FY95 using SCN funding for DDG and DDV. This information will be provided in the DDG-51 SAR.

This system will satisfy mission requirements.

c. (U) Changes Since As Of Date --
In FY92 Congress directed the Navy to develop an Integrated Display Station as an ECP to the existing AVP (AIDS). A CBD announcement was released on 8 January 92 notifying private industry of the Navy's plans.

ASN(RD&A) letter dated 31 January 1992 reported the decision not to pursue nor restructure the AN/SQY-1 program and to modify the AN/SQQ-89. A second letter dated 17 March 1992 presented the Navy's plan to forgo a major upgrade to the AN/SQQ-89, and, instead, incrementally modernize the system. This approach still must be reviewed and approved by OUSD(A), but it is expected that the modernization program will result in cost savings. Funding changes

7c. [redacted] Program Highlights (Cont'd):

are being addressed in the POM 94 process and will be reported in future SARs.

As of 31 January 1992, there was a change of command in PMO411. The responsible person is Capt. G. K. Nifontoff.

8. [redacted] Threshold Breaches:
There are currently no Acquisition Program Baseline (APB) (dated 10 May 1991) breaches or unit cost breaches.

9. [redacted] Schedule:

a. [redacted] Milestones --	Production Estimate	Approved Program	Current Estimate
AN/SRQ-4 Subsystem			
FSD Contract Award	SEP 77	SEP 77	SEP 77
DNSARC III	JUN 82	JUN 82	JUN 82
Approval for Production	DEC 82	DEC 82	DEC 82
AN/SRQ-19 Subsystem			
FSD Contract Award	OCT 76	OCT 79	OCT 79
DNSARC III	NOV 80	MAR 83	MAR 83
Approval for Production	MAR 83	DEC 84	DEC 84
AN/SQQ-28 Subsystem			
FSD Contract Award	FEB 78	FEB 78	FEB 78
DNSARC IIIA (PASU)	DEC 81	DEC 81	DEC 81
DNSARC IIIB (ASU)	AUG 82	AUG 82	AUG 82
AN/SQS-53B Subsystem			
FSD Contract Award	JUN 79	JUN 79	JUN 79
DNSARC III	DEC 82	DEC 82	DEC 82
Approval for Production	JUN 83	JUN 83	JUN 83
AN/SQS-53C Subsystem			
FSD Contract Award	MAY 82	MAY 82	MAY 82
DNSARC IIIA	JAN 86	JAN 86	JAN 86
Navy Prod Decision Memo IIIB	SEP 86	SEP 86	SEP 86
Navy Prod Decision Memo IIIC	DEC 87	DEC 87	MAR 88
Approval for Production	DEC 87	DEC 87	JUN 89
MK 116 Subsystem			
Approval for Production	DEC 82	DEC 82	DEC 82

b. [redacted] Previous Change Explanations -- None.

c. [redacted] Current Change Explanations -- None.

9d. (U) Schedule (Cont'd):

d. (U) References --

(U) Production Estimate:
(1) DCP-92 dated August 16, 1976 (AN/SQR-19)
(2) DCP-85 dated March 5, 1979 (AN/SRQ-4 and AN/SQQ-28)
(3) OR 062-03-86 dated December 24, 1985 (AN/SQQ-89)
(4) ASN (RE&S) Milestone IIIC (NPDM held November 19, 1987; Decision Memorandum was issued March 1988) (AN/SQS-53C); The AN/SQS-53C subsystem entered full rate production in June 1989.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 10 May 1991.

10. (U) Performance Characteristics:

a. (U) Performance --

	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

10a. (U) **Performance Characteristics (Cont'd):**

	PdE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) **Performance Characteristics (Cont'd):**

	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

(U) The "Demonstrated Performance" data are currently being updated to reflect recent average fleet performance. Subsequently, the "Current Estimate" data will be updated as appropriate.

(b)(1)

AN/SQR-19 Operational Availability values do not reflect Mean Logistic Delay Time (MLDT).

AN/SQQ-89 thresholds were developed to address the composite capability of the individual subsystems within the overall AN/SQQ-89 ASW combat system architecture.

AN/SQQ-89 Operational Availability values account for Mean Logistics Delay Time (MLDT) in the calculation for the system.

10b. (U) Performance Characteristics (Cont'd):

b. (U) Previous Change Explanations --

Demonstrated performances of the AN/SQR-19 subsystem Figure of Merit (FOM) and Array MTBF have been revised to accurately show performance demonstrated subsequent to TECHEVAL/OPEVAL. The current estimates in Streaming and Recovery Time and Array MTTR have been revised to accurately show performance being achieved.

Operational performance thresholds for the AN/SQQ-89 system have been identified in TEMP 802-2.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Production Estimate:
(1) DCP-92 dated August 16, 1976 (AN/SQR-19)
(2) DCP-85 dated March 5, 1979 (AN/SRQ-4, AN/SQQ-28)
(3) OR 062-03-86 dated December 24, 1985 (AN/SQQ-89)
(4) ASN (RE&S) Milestone IIIC (NPDM held November 19, 1987; Decision Memorandum was issued March 1988) (AN/SQS-53C); The AN/SQS-53C subsystem entered full rate production in June 1989.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 10 May 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. [redacted] Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	754.2	1331.2	1317.1
Procurement	2961.0	2637.6	2480.0
Major System Equipment	(1986.5)		(1366.3)
System Support	(207.9)		(441.5)
Total Sailaway	(2194.4)		(1807.8)
Other Weapon Systems Cost	(548.3)		(363.3)
Total Other Wpn Sys	(548.3)		(363.3)
Peculiar Support	(0.0)		(130.5)
Initial Spares	(218.3)		(178.4)
Construction (MILCON)	0.0	4.6	4.6
Ops. and Maint. (O&M)	183.8	N/A	79.7
Total FY 85 Base-Year $	3899.0	3973.4	3881.4

11a. [redacted] Total Program Cost and Quantity (Cont'd):

	Production Estimate	Approved Program	Current Estimate
Escalation	248.6	630.4	579.0
Development (RDT&E)	(-66.4)	(76.0)	(68.1)
Procurement	(291.9)	(554.6)	(506.0)
Construction (MILCON)	(0.0)	(-0.2)	(-0.2)
Ops. and Maint. (O&M)	(23.1)	(N/A)	(5.1)
Total Then-Year $	4147.6	4603.8	4460.4

b. [redacted] Quantity --

Development (RDT&E)	0	N/A	0
Procurement	120	92	84
Total	120	92	84

c. [redacted] Foreign Military Sales --

(1) AN/SQR-19

Spain: 3 AN/SQR-19 subsystems in FY83 for $50.9M
1 AN/SQR-19 subsystem in FY87 for $8.0M

Canada: 7 Handling and Stowage Groups (H&SGs) and
8 Towed Array Groups (TAGs) in FY85 for $47.1M

(2) AN/SQQ-28

Spain: 4 AN/SQQ-28 subsystems in FY81 for $14.2M

Canada: 1 AN/SQQ-28 subsystem in FY85 for $2.3M

d. ([redacted]) Nuclear Costs -- None.

e. ([redacted]) References --

[redacted] Production Estimate:

(1) DCP-92 dated August 16, 1976 (AN/SQR-19)
(2) DCP-85 dated March 5, 1979 (AN/SRQ-4, AN/SQQ-28)
(3) OR 062-03-86 dated December 24, 1985 (AN/SQQ-89)
(4) ASN (RE&S) Milestone IIIC (NPDM held November 19, 1987; Decision Memorandum was issued March 1988) (AN/SQS-53C); The AN/SQS-53C subsystem entered full rate production in June 1989.

[redacted] Approved Program:

MAR Approved Acquisition Program Baseline dated 10 May 1991.

12. ([redacted]) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. ([redacted]) Program Acquisition	(Dec 91 SAR)	(MAR 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	4460.4	4688.6	4460.4
(2) Quantity	84	92	84
(3) Unit Cost	53.100	50.963	53.100
b. ([redacted]) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	328.1	328.1	162.7
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	328.1	328.1	162.7
(2) Quantity	8	8	2
(3) Unit Cost	41.013	41.013	81.350

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	687.8	3252.9	0.0	206.9	4147.6
Previous Changes:					
Economic	+13.9	+188.3	-	+5.3	+207.5
Quantity	-	-784.2	-	-	-784.2
Schedule	+4.5	+733.8	-	-	+738.3
Engineering	+6.7	+251.0	-	-	+257.7
Estimating	+694.3	-467.5	-	-24.9	+201.9
Other	-	-	-	-	-
Support	-	+17.9	+4.4	-102.5	-80.2
Subtotal	+719.4	-60.7	+4.4	-122.1	+541.0
Current Changes:					
Economic	-3.8	-63.9	-	-	-67.7
Quantity	-	-165.2	-	-	-165.2
Schedule	-	-165.1	-	-	-165.1
Engineering	-	-42.1	-	-	-42.1
Estimating	-18.2	+366.9	-	-	+348.7
Other	-	-	-	-	-
Support	-	-136.8	-	-	-136.8
Subtotal	-22.0	-206.2	-	-	-228.2
Total Changes	+697.4	-266.9	+4.4	-122.1	+312.8
Current Estimate	1385.2	2986.0	4.4	84.8	4460.4

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	754.2	2961.0	0.0	183.8	3899.0
Previous Changes:					
Quantity	-	-653.2	-	-	-653.2
Schedule	+4.7	+377.6	-	-	+382.3
Engineering	+9.0	+211.4	-	-	+220.4
Estimating	+563.3	-263.5	-	-23.2	+276.6
Other	-	-	-	-	-
Support	-	+4.3	+4.6	-80.9	-72.0
Subtotal	+577.0	-323.4	+4.6	-104.1	+154.1
Current Changes:					
Quantity	-	-126.5	-	-	-126.5
Schedule	-	-79.3	-	-	-79.3
Engineering	-	-44.0	-	-	-44.0
Estimating	-14.1	+190.9	-	-	+176.8
Other	-	-	-	-	-
Support	-	-98.7	-	-	-98.7
Subtotal	-14.1	-157.6	-	-	-171.7
Total Changes	+562.9	-481.0	+4.6	-104.1	-17.6
Current Estimate	1317.1	2480.0	4.6	79.7	3881.4

For Previous Change Explanations, this SAR report addresses all AN/SQQ-89 subsystems (AN/SQR-19 and AN/SQS-53C) previously reported separately in SARs. Only the AN/SQR-19 Subsystem SAR reported previous changes.

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Schedule: Program restructured due to funding constraints.

Engineering: System redesigned to use new Navy standard hardware.

Estimating: Increased contractor support costs, hardware development and integration costs. Increased costs due to funding deferments and an addition of 3

13b. [redacted] Cost Variance Analysis (Cont'd):

years funding for ASWCSI. Increase from transfer of funds from the AN/SQY-1 program to meet fleet requirements and to incorporate next generation of Navy standards and Congressional mandated AVP and EMSP.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Decreased ship market.

Schedule: Program restructured due to funding restraints and the addition of one more year of funding. Revised ship installation schedule with reduction in procurement rate.

Engineering: System redesigned to use new Navy standard hardware.

Estimating: Change due to administrative error in applying Then-Year dollar factors only instead of outlay factors. Increased contractor support costs, hardware development, and integration costs. Revisions in the ship schedule, different hulls require different equipment upgrades.

Support: Change procurement requirements. FMP has been previously reported as O&M,N in FY84-FY89. FMP funding has been transferred to the OPN account by PBD631.

MILCON

Support: PMA266 transfer of AN/SQQ-28 and AN/SRQ-4 MILCON funding. This funding was for the construction of operations and maintenance facilities in Mayport, Florida and N.I. San Diego, California.

O & M

Economic: Revised escalation indices.

Estimating: Refinement of estimate to include two additional program years for shipboard portion of LAMPS MK III (AN/SRQ-4 and AN/SQQ-28) programs.

Support: O&M,N funding has been transferred to OPN FMP.

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year

13c. [redacted] Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic indices. (Economic)	N/A	-3.0
Economic Adjustment for Negative Program Change. (Economic)	N/A	-0.8
Adjustment for current and prior year inflation offset. (Estimating)	-11.0	-8.7
Refinement of estimate to reflect program cuts. (Estimating)	-3.1	-9.5
Total Changes	-14.1	-22.0
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	3.3
Economic adjustment for Negative Program Change (Economic)	N/A	-67.2
Total Variance associated with quantity change (Quantity)	-194.9	-253.1
Decrease in procurement quantities of 8 OPN systems. (Quantity)	-126.5	-165.2
Restructuring of schedule due to quantity decrease. (Schedule)	-79.3	-124.7
Fewer systems receiving upgraded components due to quantity decrease. (Engineering)	-44.4	-42.7
Increase in costs of components due to fewer quantities procured. (Estimating)	55.4	79.5
Realignment of schedule. (Schedule)	--	-40.4
Change from AN/UYH-3 to AN/UYH-16. (Engineering)	0.4	0.6
Current and Prior Inflation Offset (Estimating)	-25.5	-22.7
HW mix change among systems from DDG 993 and FFG 7 to DD 963: incorporate full fundg in last year of procurement (Estimating)	161.1	310.1
Decrease in spares and other support due to quantity decrease (Support)	-98.7	-136.8
Total Changes	-157.6	-206.2

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
34.563	1.664	3.510	6.824	2.567	6.555	--	-2.583	18.537	53.100

15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a.([redacted]) Procurement --

[redacted] AN/SQQ-89 ASW COMBAT SYS:

	Initial Contract Price		
	Target	Ceiling	Qty
General Electric, Syracuse, NY N00024-88-C-6219, FFP Award: July 1, 1988 Definitized: July 1, 1988	$276.9	$0.0	14

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$587.1	$0.0	18	$587.1	$587.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

This is a firm fixed price contract. No contract performance report is required.

Modifications to the delivery schedule and test procedures were incorporated into the contract on 7 February 1991. The impact of these modifications was to reduce the technical and schedule risks to an insignificant level while permitting the Program Office to meet its FY88/89 AN/SQQ-89(V) System production requirements. At the same time, the contractor agreed to provide additional services/supplies with an estimated value of $9,500,000 at no increase in cost to the Government. At this time, the contract has a value of $587.1M as shown in target price.

GE is currently delivering systems ahead of schedule with more in-plant tests completed than required by the contract.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

([redacted]) AN/SQQ-89 ASW COMBAT SYS:	Initial Contract Price Target	Ceiling	Qty
Westinghouse Electric Co., Sykesville, MD N00024-90-C-6013, FFP Award: June 1, 1990 Definitized: June 1, 1990	$177.6	$0.0	7

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$197.5	$0.0	7	$197.5	$197.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

This is a firm fixed price contract, therefore no cost performance reporting is required on this contract.

Westinghouse FY90 production under Contract N00024-90-C-6013 remains on schedule. Unit assembly work is in progress at all manufacturing sites. Special Test Equipment (STE) is in development, and the Production Test Facility (PTF) is under construction with completion of the first bay scheduled for 3 March 92. Integration and test of the first system is scheduled to begin in May 92. Delivery of the first system is scheduled for December 92. Current programmatic and technical issues include the resolution of baseline issues and validation of STE.

[redacted] AN/SQQ-89 ASWCS:	Initial Contract Price Target	Ceiling	Qty
General Electric Co., Syracuse, NY N00024-91-C-6309, FFP Award: February 15, 1991 Definitized: February 15, 1991	$138.1	$0.0	7

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$138.1	$0.0	7	$138.1	$138.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change:

This is a firm fixed price contract, therefore no cost performance reporting is required on this contract.

GE is currently on schedule.

16. ([redacted]) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. ([redacted]) Program Status --

(1) Percent Program Completed: 78.3% (18 yrs/23 yrs)

(2) Percent Program Cost Appropriated: 76.3% ($3403.4 / $4460.4)

b. [redacted] Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY75-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	869.5	76.0	19.6	420.1	1385.2
Procurement	2040.6	328.1	162.7	454.6	2986.0
MILCON	4.4	-	-	-	4.4
O&M	84.8	-	-	-	84.8
Total	2999.3	404.1	182.3	874.7	4460.4

16c. ([redacted]) Program Funding Summary (Cont'd):

c. ([redacted]) Annual Summary --

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1975				16.4	8.7	8.7	8.7	10.9
1976				18.8	10.6	10.6	10.6	6.6
197T				7.0	4.1	4.1	4.1	2.9
1977				41.6	25.1	25.1	25.1	2.6
1978				57.9	37.6	37.6	37.6	6.8
1979				65.0	46.6	46.6	46.6	8.4
1980				93.8	74.3	74.3	74.3	10.6
1981				81.2	70.2	70.2	70.2	10.6
1982				85.5	77.8	77.8	77.8	7.6
1983				94.5	89.9	89.9	89.9	4.9
1984				71.3	70.3	70.3	70.3	3.8
1985				60.4	61.4	61.4	61.4	3.4
1986				50.0	52.3	52.3	52.3	2.8
1987				35.9	38.6	38.6	38.6	2.7
1988				19.3	21.5	21.5	21.5	3.0
1989				14.6	16.9	16.9	16.9	4.2
1990				37.0	44.6	44.6	44.6	4.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1991				95.3	119.0	17.3	15.2	3.9
1992				59.0	76.0			3.1
1993				14.7	19.6			3.3
1994				115.8	159.2			3.3
1995				140.9	200.0			3.3
1996				30.0	43.9			3.2
1997				11.2	17.0			3.2
Subtot				1317.1	1385.2	767.8	765.7	

An RDT&E quantity is not applicable because a complete AN/SQQ-89 has never been procured using RDT&E funds. Total costs reflect the AN/SQQ-89 Program only. The AN/SQQ-89 Improved costs are now reflected in the AN/SQY-1 SAR Report. Funds required to integrate EMSP in AN/SQQ-89 are reported in the AN/SQQ-89 SAR.

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1810 Other Procurement, Navy								
1979			0.9	0.9	0.7	0.7	0.7	8.7
1980			2.4	2.7	2.3	2.3	2.3	10.6
1981			3.8	3.9	3.6	3.6	3.6	10.6
1982			33.4	39.4	37.6	37.5	36.8	7.6
1983	2	6.0	69.2	124.7	123.4	123.4	120.4	4.9

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1810 Other Procurement, Navy (Cont'd)								
1984	8	10.9	152.5	264.8	269.7	262.9	253.1	3.8
1985	8	7.7	140.5	234.1	245.5	239.9	213.9	3.4
1986	11	5.9	134.6	216.0	234.4	234.4	206.2	2.8
1987	7	10.7	144.6	211.7	238.0	238.0	196.1	2.7
1988	6	8.5	107.0	153.6	180.6	174.3	126.8	3.0
1989	6	14.6	107.1	194.7	237.6	226.9	184.3	4.2
1990	7	13.4	119.5	149.2	188.6	177.8	115.6	4.0
1991	9	63.5	111.9	213.4	278.6	210.4	67.7	3.9
1992	8	8.6	186.6	243.4	328.1			3.1
1993	2	1.4	97.9	116.9	162.7			3.3
1994	5	2.1	104.1	134.7	193.6			3.3
1995	5	1.4	137.1	175.9	261.0			3.3
Subtot	84	154.7	1653.1	2480.0	2986.0	1932.1	1527.5	

There are 9 variants of the AN/SQQ-89 currently being produced or supported in the fleet. A variant will be upgraded to another variant based on the addition of equipments/components. To avoid distortion of the number of AN/SQQ-89 systems in the Fleet, the quantity acquired with OPN funds is considered to be equal to the number of ships receiving an AN/SQQ-89, where some subsystem of the system are procured using OPN, plus shore systems and trainers. Ships, shore systems and trainers will receive several incremental upgrades over the program years to achieve AN/SQQ-89 capability. To

16c. (U) Program Funding Summary (Cont'd):

prevent duplicate counting, each ship, shore site or trainer is counted as having received and AN/SQQ-89 at the time it is upgraded to the final AN/SQQ-89 configuration. The number of AN/SRQ-4s, AN/SQQ-28s, AN/SQR-19s AN/SQS-53Cs and the individual subsystems contained in Other Component Programs, procured in the years prior to FY88, in RDT&E and OPN, is not included in the quantities total as it is subsumed by the AN/SQQ-89 program.

In the December 1990 SAR, some systems were erroneously counted as an AN/SQQ-89 configuration when they received an On-Board Trainer (OBT). Because the OBT does not change the AN/SQQ-89 variant, the program office now counts these systems in the year the final variant was procured. This is reflected in the quantity increases in FY82 - FY85 and quantity decreases in FY88, FY89 and FY91.

Appropriation: 1205 Military Construction, Navy

1982				2.6	2.5	2.5	2.5	7.6
1983				2.0	1.9	1.9	1.9	4.9
Subtot				4.6	4.4	4.4	4.4	

Appropriation: 1804 Operation and Maintenance, Navy

1984				1.2	1.2	1.2	1.2	3.8
1985				15.4	15.4	15.4	15.4	3.4
1986				16.1	16.6	16.6	16.6	2.8
1987				30.6	33.0	33.0	33.0	2.7
1988				10.9	12.2	12.2	12.2	3.0
1989				5.5	6.4	6.4	6.4	4.2
1990								
1991								
1992								
1993								

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1804 Operation and Maintenance, Navy (Cont'd)								
1994								
Subtot				79.7	84.8	84.8	84.8	
Grand Total	84	154.7	1653.1	3881.4	4460.4	2789.1	2382.4	

17. [redacted] Production Rate Data:

a. [redacted] Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1983	0	2	2	2
1984	0	8	8	8
1985	0	8	8	8
1986	0	11	11	11
1987	0	7	7	11
1988	0	6	6	11
1989	0	6	6	11
1990	0	7	7	22
1991	0	9	9	22

17a. [redacted] Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1992	0	8	8	0
1993	0	2	2	0
1994	0	5	5	0
1995	0	5	5	0

Due to the year to year changes in the mix of hardware components and the various contractors building these components, a maximum economic rate for the AN/SQQ-89 system may vary.

b. [redacted] Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	3899.0	-17.6	3881.4	N/A	0.0
(TY $)	4147.6	+312.8	4460.4	N/A	0.0
PAUC Cost (BY $)	32.492	13.715	46.207	N/A	N/A
(TY $)	34.563	18.537	53.100	N/A	N/A

c. [redacted] Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	MAR 81	0	MAR 81	N/A	MAR 81
Duration (in MON)	204	0	204	0	204
End Date(MON YY)	MAR 98	0	MAR 98	N/A	MAR 98

17c. (U) Production Rate Data (Cont'd):

Due to the year to year changes in the mix of hardware components being purchased under this program, there is no maximum economic rate calculated for the total program.

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	72/74

The AN/SQQ-89 ship systems are counted as being delivered when they are "certified", while trainers and shore sites are counted when they are delivered to the site. The Procurement Quantity includes SCN/OPN counts.

Of the 74 systems delivered, 16 are partial deliveries (system includes the functional equivalent of any two of the subsystems previously known as the AN/SQR-19, AN/SQS-53B, AN/SQQ-28, and the AN/SQS-53C). The remaining 13 deliveries are final (final AN/SQQ-89 configuration the ship is scheduled to receive).

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

1. There is no antecedent system.

2. O&S costs for the AN/SQQ-89 are based upon 84 AN/SQQ-89 systems.

3. OPN O&S costs are for ECPs to the system and procurement of spares.

4. MPN O&S costs are for personnel required to operate and support the shipboard system.

5. O&M,N O&S costs are for laboratory and program office support in-service systems, field services, and equipment and software maintenance.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1985 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per system	Avg Annual Cost Per N/A
O&M,N	1.2	N/A
OPN	0.3	N/A
MPN	0.7	N/A
Total	2.2	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M,N	20.8	3.3	3.4	---	27.5
Total	20.8	3.3	3.4	---	27.5

The O&M,N cost category identifies interim support, logistics support, systems engineering, CETS, and depot maintenance support costs. It however, does not correlate to the O&M,N (FMP) costs previously reported in this report. Balance to complete is to be determined.

N-41 TOMAHAWK

91-085

[redacted]

SELECTED ACQUISITION REPORT (SCR:DD-COMP(QA)823)
PROGRAM: TOMAHAWK (R/UGM-109)

AS OF DATE: December 31, 1991

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MAR 24 1992

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

2

1. (U) **Designation and Nomenclature (Popular Name):**
RGM-109/UGM-109 (TOMAHAWK)

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**
Director, Cruise Missiles Project — RADM George F A Wagner
PEO Cruise Missiles Project And Unmanned Aerial Vehicles Joint Proj. — Assigned: February 8, 1991
Washington, DC 20361-1014 — AV 222-7409 COMM 202-692-7409

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604367N Project W1784
PE 0204229N Project W0545

No Security Objection to Open Publication
(AS AMENDED)
98-S-0501
MAR 24 1992
Ann S. Anderson
Office of the Chief of
Naval Operations Dept. of the Navy

Classified by: OPNAVINST S5513.2B
Declassify on: [redacted]
Downgrade Instructions: NA

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[redacted]

OASD(PA) DFOISR 92-T-0678

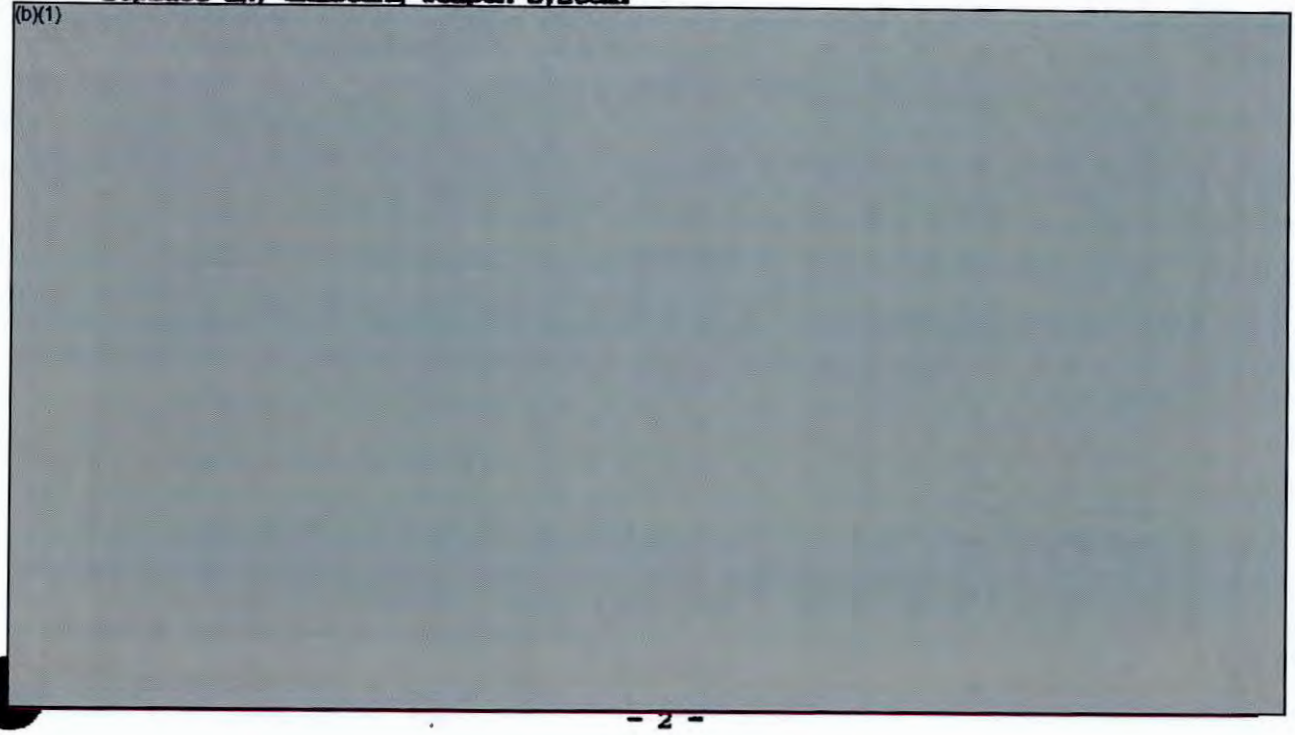
4. (U) **Program Elements/Procurement Line Items (Cont'd):**

PROCUREMENT:
APPN 1810 ICN 33525000 (Navy)
APPN 1810 ICN 33525500 (Navy)
APPN 1810 ICN 33902000 (Navy)
APPN 1507 ICN 30210100 (Navy)
APPN 1507 ICN 30612000 (Navy)

5. (U) **Related Programs:**
Air-Launched and Ground-Launched Cruise Missiles (USAF); MK-41 Vertical Launching System; Harpoon Missile; OTH Targeting; SSN 21 Combat System Improvement; BB-61; CG-47; DDG-51; DD-963; SSN-688; and SSN-637 Class Ships.

6. (U) **Mission and Description:**
The TOMAHAWK Land Attack Missile/Conventional (TLAM/C) variant counters threats against the U.S. Navy by destroying naval targets ashore, fleet command, control and logistic systems; industrial or other high value targets and ground-based air defense systems aiding aircraft penetration. The TOMAHAWK Anti-Ship Missile (TASM) redresses the current Soviet anti-ship cruise missile stand-off advantage and complements aircraft strikes against combat ships with effective air defense systems. The TOMAHAWK Land Attack Missile/Nuclear (TLAM/N) variant provides a highly survivable, world-wide theater nuclear capability. The TOMAHAWK program does not replace any existing weapon system.

(b)(1)



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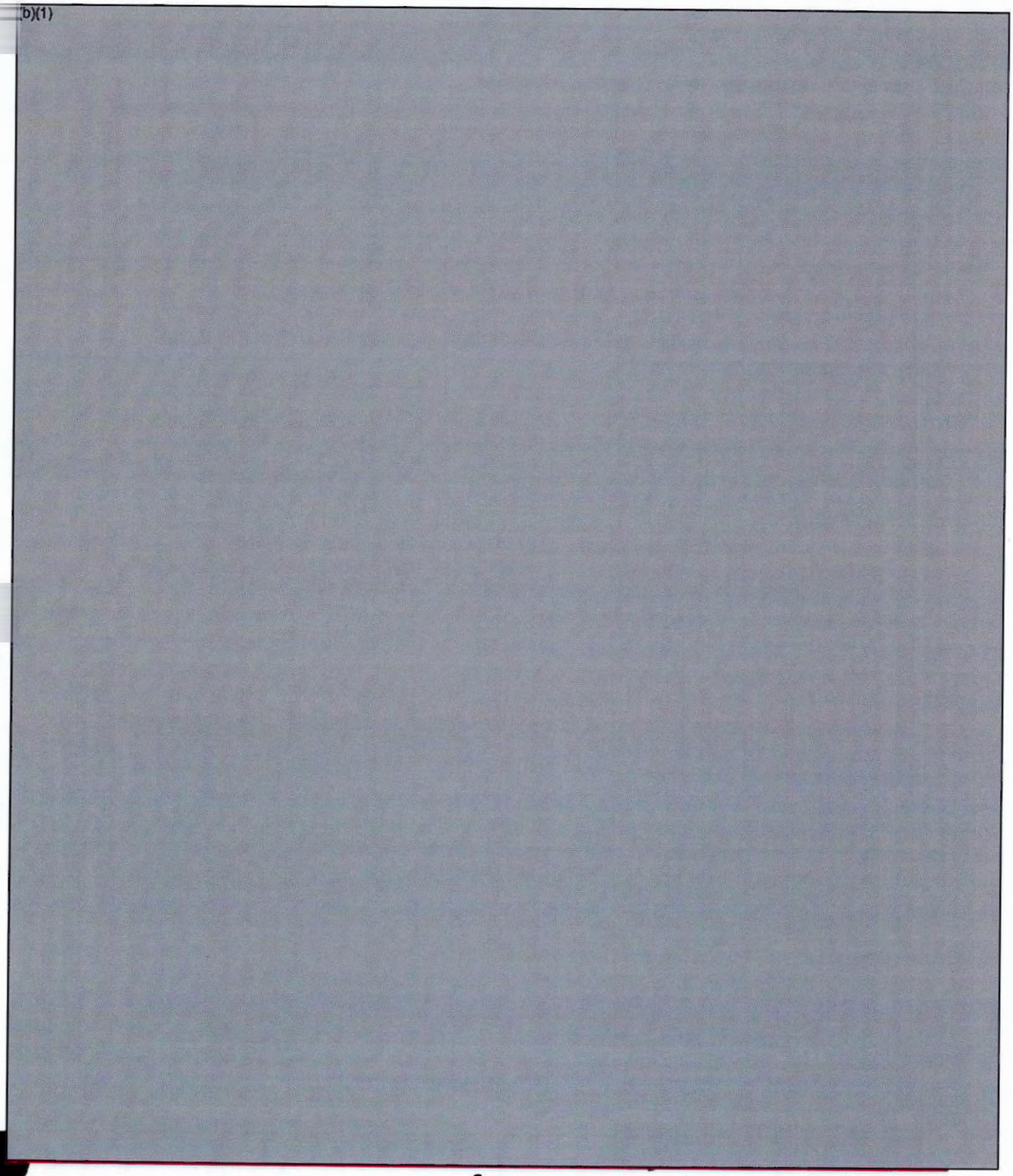

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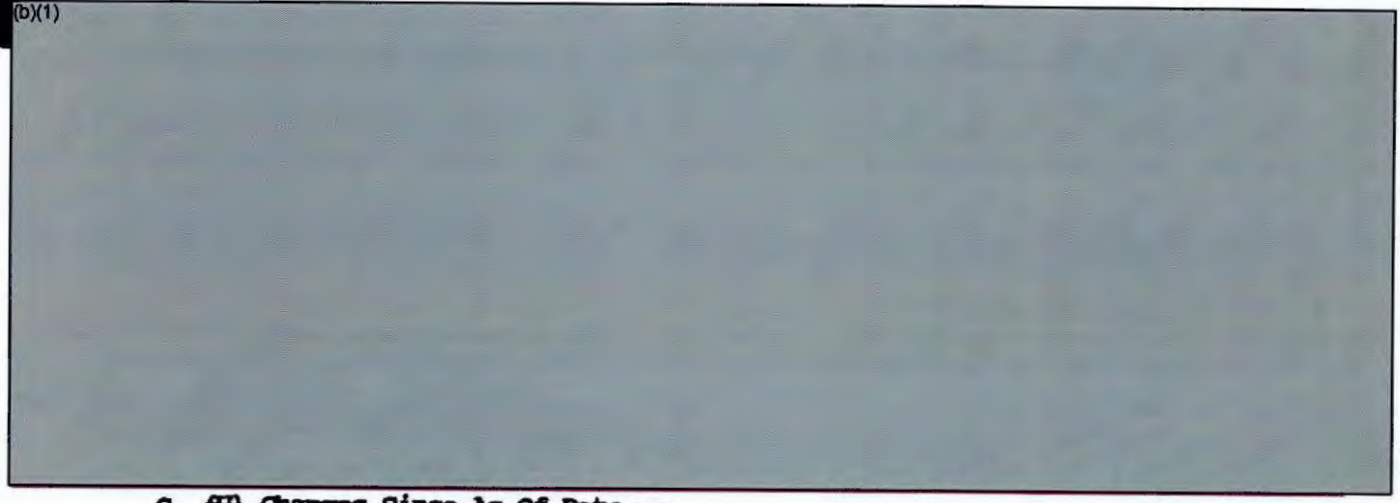

c. (U) Changes Since As Of Date —

Block III Milestones: In January 1992, a Milestone IIA NPDM was held. Authority was granted for IRIP of the Block III (24 from the original program and 278 Desert Storm replacements were from the FY 91S appropriation). A Milestone III (FRP) decision is scheduled for June 1992.

8. (U) Threshold Breaches:
There are currently no performance breaches of the Acquisition Program Baseline (APB) (dated 31 December 1988); there are no unit cost breaches. There are no NUNN-McCURDY unit cost breaches.

9. (U) Schedule:

a. (U) Milestones —

	Development Estimate	Approved Program	Current Estimate
DSARC I - Land Attack		N/A	
Nuclear	FEB 74	N/A	FEB 74
Anti-Ship	FEB 74	N/A	FEB 74
First Flight	MAY 76	N/A	MAR 76
First Guided Flight		N/A	
Land Attack Nuclear	OCT 76	N/A	DEC 76
Anti-Ship	DEC 76	N/A	DEC 76
DSARC II			
Nuclear	JAN 77	JAN 77	JAN 77
Anti-Ship	JAN 77	JAN 77	JAN 77
First Full Scale Development (FSD)		N/A	
Flight			
Land Attack Nuclear	MAR 77	N/A	JAN 77

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) —

	Development Estimate	Approved Program	Current Estimate
Anti-Ship	FEB 77	N/A	FEB 77
Combined DTOT/OPEVAL Complete			
Block IIB (Sub)	JUL 87	JUN 87	MAY 88
Block IIB (Ship)	JUL 87	JUN 87	MAY 88
Block III	N/A	MAR 93	
Anti-Ship (Sub)	MAY 80	N/A	OCT 83
Anti-Ship (Ship)	JAN 81	N/A	MAY 84
Land Attack Nuclear (Ship)	JAN 81	N/A	OCT 83
Land Attack Nuclear (Sub)	MAY 80	N/A	APR 84
NPDM			
Land Attack Dispenser	DEC 87	AUG 88	AUG 88
Anti-Ship (Sub)	SEP 80	N/A	DEC 84
Anti-Ship (Ship)	MAY 81	N/A	DEC 84
Land Attack Nuclear (Sub)	SEP 80	N/A	OCT 83
Land Attack Nuclear (Ship)	MAY 81	N/A	APR 84
IOC Complete			
Block IIB (Sub)	SEP 87	SEP 88	SEP 88
Block IIB (Ship)	SEP 87	SEP 88	SEP 88
Anti-Ship (Sub)	JUN 81	N/A	NOV 83
Anti-Ship (Ship)	JUN 82	N/A	JUN 84
Land Attack Nuclear (Sub)	JAN 82	N/A	JUN 84
Land Attack Nuclear (Ship)	JUN 82	N/A	JUN 84

b. (U) Previous Change Explanations —

Conventional Dispenser Variant OPEVAL completion was delayed from 2/88 to 5/88 due to ship availability and delay in missile delivery due to hardware availability.

c. (U) Current Change Explanations —

All previous Program Schedule Milestones with N/A in the Development Estimate and Approved Program Columns have been deleted.

d. (U) References —

(U) Development Estimate:
Draft DCP 125 dated Dec 22, 1976 (Land-Attack), Program Memorandum No. 117, Dec 22, 1976 (Anti-Ship) approved by SECNAV Jan 5, 1977; NDCP W0545 dated Aug 31, 1987 (TOMAHAWK Weapons System) approved by OPNAV.

9d. ([redacted]) Schedule (Cont'd):

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated 12 Feb 92.

10. ([redacted]) Performance Characteristics:

a. [redacted] Performance —

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

TASM - Tomahawk Anti-Ship Missile
TLAM/N - Tomahawk Land Attack Missile/Nuclear
TLAM/C - Tomahawk Land Attack Missile/Conventional (Unitary

10a. (U) Performance Characteristics (Cont'd):

Warhead)

TLAM/D - Tomahawk Land Attack Missile/Conventional (Submunition Dispenser)

UGM-109A - Submarine Launched Cruise Missile/Nuclear

UGM-109B - Submarine Launched Cruise Missile/Anti-Ship

UGM-109C - Submarine Launched Cruise Missile/Conventional (Unitary Warhead)

UGM-109D - Submarine Launched Cruise Missile/Conventional (Submunition Dispenser)

RGM-109A - Ship Launched Cruise Missile/Nuclear

RGM-109B - Ship Launched Cruise Missile/Anti-Ship

RGM-109C - Ship Launched Cruise Missile/Conventional (Unitary Warhead)

RGM-109D - Ship Launched Cruise Missile/Conventional (Submunition Dispenser)

b. (U) Previous Change Explanations —

A result of incorporating the latest flight test and storage data as of 2 February 1991.

c. (U) Current Change Explanations —

(CH-1 thru CH-17) - Result from incorporating the NAE approved Acquisition Program Baseline dated 12 Feb 92.

d. (U) References —

(U) Development Estimate:
Draft DCP 125 dated Dec 22, 1976 (Land-Attack), Program Memorandum No. 117, Dec 22, 1976 (Anti-Ship) approved by SECNAV Jan 5, 1977; NDCP W0545 dated Aug 31, 1987 (TOMAHAWK Weapons System) approved by OPNAV.

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 12 Feb 92.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost —	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	782.8	1315.7	1319.7
Procurement	1023.6	3850.8	3947.1
Flyaway	(786.0)		(3050.9)
Total Flyaway	(786.0)		(3050.9)
Flyaway	(90.2)		(526.3)
Total Other Wpn Sys	(90.2)		(526.3)
Peculiar Support	(81.1)		(228.8)
Initial Spares	(66.3)		(141.1)
Construction (MILCON)	0.0	23.6	18.1
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 77 Base-Year $	1806.4	5190.1	5284.9
Escalation	616.5	5538.0	5860.7
Development (RDT&E)	(83.3)	(554.4)	(554.1)
Procurement	(533.2)	(4955.2)	(5285.6)
Construction (MILCON)	(0.0)	(28.4)	(21.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2422.9	10728.1	11145.6

Flyaway consists of only Air Vehicle (Flyaway).

Other Wpn Sys consists of Other Launch/Fire Control Costs.

b. (U) Quantity —			
Development (RDT&E)	81	N/A	74
Procurement	1082	4030	4048
Total	1163	4030	4122

c. (U) Foreign Military Sales — None.

(b)(1) [redacted]

e. (U) References —

(U) Development Estimate:
Draft DCP 125 dated Dec 22, 1976 (Land-Attack), Program Memorandum No. 117, Dec 22, 1976 (Anti-Ship) approved by SECNAV Jan 5, 1977; NDCP W0545 dated Aug 31, 1987 (TOMAHAWK Weapons System) approved by OPNAV.

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 12 Feb 92.

12. [redacted] Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. [redacted] Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	11145.6	10927.3	11145.6
(2) Quantity	4122	3904	4122
(3) Unit Cost	2.704	2.799	2.704
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	486.6	486.6	474.5
Less CY Adv Proc	0.0	0.0	0.0
Plus FY Adv Proc	0.0	0.0	0.0
Net Total	486.6	486.6	474.5
(2) Quantity	176	176	200
(3) Unit Cost	2.765	2.765	2.373

Note: Unit cost calculations include dollars for remanufacture program, but not quantities.

13. (U) Cost Variance Analysis:

a. (U) Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	866.1	1556.8	0.0	2422.9
Previous Changes:				
Economic	-9.2	-1668.5	0.8 ~~+1.4~~	-1676.3
Quantity	-22.6	+7480.0	-	+7457.4
Schedule	+211.6	-39.2	-	+172.4
Engineering	+820.5	+1523.2	-	+2343.7
Estimating	+5.4	-1635.5	31.8 ~~+37.2~~	-1592.9
Other	-	-	-	-
Support	+2.9	+1796.7	+0.5	+1800.1
Subtotal	+1008.6	+7456.7	+39.1	+8504.4
Current Changes:				
Economic	-2.5	-56.3	-0.6	-59.4
Quantity	-	+264.0	-	+264.0
Schedule	-	-60.4	-	-60.4
Engineering	-	-	-	-
Estimating	+1.6	+94.1	+0.6	+96.3
Other	-	-	-	-
Support	-	-22.2	-	-22.2
Subtotal	-0.9	+219.2	-	+218.3
Total Changes	+1007.7	+7675.9	+39.1	+8722.7
Current Estimate	1873.8	9232.7	39.1	11145.6

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary — (FY 1977 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	782.8	1023.6	0.0	1806.4
Previous Changes:				
Quantity	-17.5	+2589.5	-	+2572.0
Schedule	+148.5	-311.2	-	-162.7
Engineering	+409.4	+604.5	-	+1013.9
Estimating	-6.4	-789.4	+17.4	-778.4
Other	-	-	-	-
Support	+2.1	+724.4	+0.4	+726.9
Subtotal	+536.1	+2817.8	+17.8	+3371.7
Current Changes:				
Quantity	-	+89.0	-	+89.0
Schedule	-	-0.5	-	-0.5
Engineering	-	-	-	-
Estimating	+0.8	+25.3	+0.3	+26.4
Other	-	-	-	-
Support	-	-8.1	-	-8.1
Subtotal	+0.8	+105.7	+0.3	+106.8
Total Changes	+536.9	+2923.5	+18.1	+3478.5
Current Estimate	1319.7	3947.1	18.1	5284.9

b. (U) Previous Change Explanations —

RDT&E

Economic: Revised escalation rates.

Quantity: Reduction of 7 missiles.

Schedule: Program delay to make design improvements, increase commonality, accelerate development of conventional land attack missile variant, and realign development of nuclear land attack. Theater Mission Planning Center IOC slip from FY90 to late FY91.

Engineering: Design changes for commonality with the Ground Launch Cruise Missile. Complete Tomahawk baseline program including BGM-109C. Establishment of Tomahawk Improvement Program. Implementation of

13b. [redacted] Cost Variance Analysis (Cont'd):

program restructuring including additions such as Submunition Dispenser, Terminal Maneuver, Improved Booster, Nuclear Safety, specific Weapon System block upgrades, Theater Mission Planning Center Upgrades. Block IIIB Overrun. Program years add-on. Revised Integrated Strike Planning System Requirement.

Estimating: Revised estimate to offset economic indicies. Addition of Theater Mission Planning System development caused by program restructuring. Revised program estimate.

Support: To fund the first surface ship fire control system trainer from RDT&E.

PROCUREMENT

Economic: Revised escalation rates.

Quantity: Reduction of fire control systems for 33 ships and 52 submarines. Establish Procurement objective of 3994 missiles. Quantity change of 36 missiles. Deletion of 400 missiles in FY94 from total program. Addition of 200 missiles to the program.

Schedule: Delay first procurement from FY80 and FY81. Rephasing of 689 missiles from FY85-87 to FY88-92 and the Congressionally mandated rephasing of FY84 TASM's. Missile procurement schedule slip for affordability issues. Accelerate procurement of 400 missiles from FY93 into FY91/92. Rephase procurement of 564 missiles from FY91/FY92 into FY93-FY95.

Engineering: Requirements to use Armored Boxed Launcher vice canister launchers and production of 1,157 R/UGM-109D variants, vice R/UGM-109C versions. Remanufacturing program to Upgrade to Block III. Production incorporation of the -402 engine.

Estimating: Congressionally mandated amortization of tooling and test equipment. Re-estimate of Quality Assurance requirements. Inclusion of both Systems Engineering/Integrating Agent and Principal Support Laboratory in FY85 and later years. Lower costs due to competition. Estimating reductions related to competitive contract awards and repricing. Expected multi-year contract savings. Revised estimates of surface and submarine support equipment. FY89 competition savings. Reclassification of costs as inflation. Additional Non-recurring to support program stretch (FY93-FY97). New program year FY95/96/97 add-on for Weapon Control System Alts/Mods; Surface and

13b. (U) Cost Variance Analysis (Cont'd):

Submarine System Engineering/Integrating Agents and special support equipment.

Support: Support equipment and initial spares associated with missile quantity changes. Schedule rephasing of associated missile support equipment, spares and Common Weapon Control System (CWCS) spares. Transfer of Theater Mission Planning Center (TMPC) support requirements from missile flyaway. Deletion of one AN/SWG-3. Reduction for initial spares. Initial spares reestimate to support increased quantity and rephased procurement.

MILCON

Economic: Revised escalation rates.

Estimating: Economic Adjustment. Additional missile magazines. Revised project estimates.

Support: Revised project estimates.

c. (U) Current Change Explanations —

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 Escalation rates (Economic)	N/A	-2.5
Revised program estimate (Estimating)	0.8	1.6
Total Changes	0.8	-0.9

13c. [redacted] Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised Jan 92 Escalation rates (Economic)	N/A	-56.3
Addition of 278 missiles in FY91 as Desert Storm replacements and deletion of 60 nuclear missiles in FY92 (Quantity)	89.0	264.0
Realignment associated with Quantity changes in FY91 and FY92 (Schedule)	-0.5	-60.4
Reestimation of FY91 and FY92 requirements required by Quantity and Schedule changes (Estimating)	25.3	94.1
Revised Fleet Support and Spares requirements (Support)	-8.1	-22.2
Total Changes	105.7	219.2
(3) MILCON		
Revised Jan 92 Escalation Rates (Economic)	N/A	-0.6
Revised project estimates (Estimating)	0.3	0.6
Total Changes	0.3	—

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.083	-0.421	0.378	0.027	0.569	-0.363	—	0.431	0.621	2.704

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) Procurement —

(U) FY89 AUR:

General Dynamics, San Diego, CA
N00019-88-C-3137, FFP
Award: April 7, 1988
Definitized: April 7, 1988

Initial Contract Price		
Target	Ceiling	Qty
$141.8	N/A	86

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$176.0	N/A	111	$176.0	$176.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

(U) FY89 AUR:

McDonnell Douglas, St. Louis, MO
N00019-88-C-3128, FFP
Award: April 7, 1988
Definitized: April 7, 1988

Initial Contract Price		
Target	Ceiling	Qty
$239.0	N/A	206

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$267.0	N/A	254	$267.0	$267.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

(U) FY90 AUR:

General Dynamics, San Diego, CA
N00019-89-C-0092, FFP
Award: December 13, 1989
Definitized: December 13, 1989

Initial Contract Price		
Target	Ceiling	Qty
$238.2	N/A	280

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$238.2	N/A	280	$238.2	$238.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

(b)(1) [redacted]

Explanation of Change:

CPR information not required on this FFP contract.

(U) FY91 AUR:
McDonnell Douglas, St. Louis, MO
N00019-91-C-0001, FFP
Award: January 30, 1991
Definitized: January 30, 1991

Initial Contract Price		
Target	Ceiling	Qty
$253.9	$0.0	240

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$381.6	$0.0	310	$381.6	$381.6

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

Additional 70 missiles for $127.7M.

(U) FY91 AUR:
General Dynamics, San Diego, CA
N00019-91-C-0002, FFP
Award: January 30, 1991
Definitized: January 30, 1991

Initial Contract Price		
Target	Ceiling	Qty
$188.6	$0.0	160

Current Contract Price		
Target	Ceiling	Qty
$407.7	$0.0	368

Estimated Price At Completion	
Contractor	Program Manager
$407.4	$407.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

Additional 208 missiles for $219.1M.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status —

(1) Percent Program Completed: 79.2% (19 yrs/24 yrs)

(2) Percent Program Cost Appropriated: 83.1% ($9258.2 / $11145.6)

16b. ([redacted]) Program Funding Summary (Cont'd):

b. ([redacted]) Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY74-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	1745.3	61.3	29.2	38.0	1873.8
Procurement	6925.9	486.6	474.5	1345.7	9232.7
MILCON	28.4	10.7	-	-	39.1
O&M	-	-	-	-	-
Total	8699.6	558.6	503.7	1383.7	11145.6

c. ([redacted]) Annual Summary —

Fiscal Year	Qty	Flyaway FY77 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1974				7.9	6.6	6.6	6.6	8.0
1975				40.9	37.3	37.3	37.3	10.9
1976				135.1	130.6	130.6	130.6	6.6
1977				115.3	119.2	119.2	119.2	2.6
1978				188.1	209.5	209.5	209.5	6.8
1979				125.3	154.1	154.1	154.1	8.4
1980				77.5	105.4	105.4	105.4	10.6
1981				90.2	133.8	133.8	133.8	10.6

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY77 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1982				92.4	144.3	144.3	144.3	7.6
1983				72.6	118.4	118.4	118.4	4.9
1984				79.9	135.0	135.0	135.0	3.8
1985				46.2	80.5	80.5	80.5	3.4
1986				41.2	73.9	73.9	73.9	2.8
1987				41.8	77.1	76.8	76.4	2.7
1988				36.4	69.5	69.4	67.5	3.0
1989				28.5	56.7	56.6	51.8	4.2
1990				23.2	47.9	47.9	34.3	4.0
1991				21.2	45.5	45.5	31.8	3.9
1992				27.7	61.3	19.0	0.2	3.1
1993				12.8	29.2			3.3
1994				6.1	14.4			3.3
1995				3.9	9.4			3.3
1996				2.8	7.1			3.2
1997				2.7	7.1			3.2
Subtot	74			1319.7	1873.8	1763.8	1710.6	

[redacted]

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY77 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1507 Weapons Procurement, Navy								
1980	6	1.6	10.3	22.5	34.6	32.7	32.7	11.8
1981	50	13.8	83.8	100.1	171.7	195.3	195.3	11.6
1982	61	15.5	92.8	119.0	221.6	231.6	231.6	14.3
1983	51	14.1	84.1	111.2	219.0	219.0	219.0	9.0
1984	124	20.2	121.4	167.6	343.3	343.2	343.2	8.0
1985	180	32.2	192.7	266.2	561.2	561.3	561.3	3.4
1986	249	34.0	219.2	316.0	689.3	689.3	689.3	2.8
1987	324	42.2	236.1	323.8	731.6	732.4	728.5	2.7
1988	475	53.5	283.6	359.9	845.0	751.5	730.1	3.0
1989	510	52.4	194.8	281.3	686.1	589.7	558.9	4.2
1990	400	48.5	186.9	238.5	602.9	559.1	505.6	4.0
1991	678	38.6	351.6	411.4	1074.0	996.0	219.1	3.9
1992	176	59.6	89.4	158.4	427.1	50.0		3.1
1993	200	44.4	95.4	150.4	418.9			3.3
1994	282	47.0	119.5	172.6	496.2			3.3
1995	282	52.3	119.4	176.8	524.5			3.3
1996				37.3	114.3			3.2
1997				7.8	24.6			3.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY77 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1507 Weapons Procurement, Navy (Cont'd)								
Subtot	4048	569.9	2481.0	3420.8	8185.9	5951.1	5014.6	
Appropriation: 1810 Other Procurement, Navy								
1981				22.3	35.0	35.0	35.0	10.6
1982				36.8	60.4	60.4	70.9	7.6
1983				74.7	127.1	127.1	127.1	4.9
1984				35.2	61.7	61.7	61.7	3.8
1985				44.2	79.8	79.8	78.2	3.4
1986				56.1	104.7	104.7	101.9	2.8
1987				54.7	105.8	105.8	100.7	2.7
1988				27.0	54.6	47.1	45.9	3.0
1989				17.6	36.9	32.8	31.2	4.2
1990				25.7	55.8	45.3	24.9	4.0
1991				10.6	23.8	21.2	12.8	3.9
1992				25.6	59.5	13.8	0.1	3.1
1993				23.2	55.6			3.3
1994				24.6	60.8			3.3
1995				21.4	54.6			3.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY77 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1810 Other Procurement, Navy (Cont'd)								
1996				19.9	52.5			3.2
1997				6.7	18.2			3.2
Subtot				526.3	1046.8	734.7	690.4	
Appropriation: 1205 Military Construction, Navy								
1982				0.3	0.5	0.5	0.5	7.6
1983								4.9
1984								3.8
1985								3.4
1986								2.8
1987				1.9	3.7	3.7	3.7	2.7
1988								3.0
1989				4.1	8.5	2.5		4.2
1990				2.1	4.6	2.4		4.0
1991				5.0	11.1	3.2		3.9
1992				4.7	10.7	4.1		3.1
1993								3.3
1994								3.3

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY77 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1205 Military Construction, Navy (Cont'd)								
1995								3.3
1996								3.2
1997								3.2
Subtot				18.1	39.1	16.4	4.2	
Grand Total	4122	569.9	2481.0	5284.9	11145.6	8466.0	7419.8	

17. (U) Production Rate Data:

a. (U) Annual Production Rates —

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1980	0	6	6	6
1981	30	50	50	50
1982	104	61	61	120
1983	149	51	51	135
1984	156	124	124	124
1985	161	180	180	300
1986	190	249	249	249
1987	198	330	324	350
1988	94	450	475	600
1989	0	617	510	600
1990	0	614	400	600
1991	0	631	678	600
1992	0	631	176	314
1993	0	0	200	0
1994	0	0	282	0
1995	0	0	282	0

17b. ([redacted]) Production Rate Data (Cont'd):

b. ([redacted]) Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	6240.0	-955.1	5284.9	+1377.5	3907.4
(TY $)	13791.4	-2645.8	11145.6	+2073.5	9072.1
PAUC Cost (BY $)	1.534	-0.252	1.282	+0.334	0.948
(TY $)	3.390	-0.686	2.704	+0.503	2.201

c. ([redacted]) Schedule Variance

Item	Production Decision	Variance (CE less PDE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JUL 82	0	JUL 82	N/A	JUL 82
Duration (in MON)	140	36	176	48	128
End Date(MON YY)	MAR 94	36	MAR 97	N/A	MAR 93

d. ([redacted]) Deliveries (Plan/Actual) —

	To Date
RDT&E	74/74
Procurement	2328/2430

e. ([redacted]) Approved Design-to-Cost Objective — N/A.

18. ([redacted]) Operating and Support Costs:

a. ([redacted]) Assumptions and Ground Rules —

The operating and Support costs are based on annual averages derived from a nine year period from FY89 through FY97. These costs are a summary of the FY93 Congressional Budget Submission.

The operational concept is a "Wooden round" which does not undergo maintenance except at the depot level. This maintenance cycle is known as a recertification and includes examination and replacement of time limited components as well as the installation of kits to

18a. (U) Operating and Support Costs (Cont'd):
bring the missile up to a current configuration. Over the next five years the recertifications will ramp up from approximately 230 per year to over 300 per year.

An operational flight test program is conducted to determine operational readiness and aging effects of the deployed weapons system. Operational flight tests are currently scheduled at the rate of 12 per year.

The software support programs include operational flight software, the weapons control system software, and independent validation and verification of the software.

Technical and Operations costs include training, Naval Weapons station operations, and contractor technical engineering services.

Theater Mission Planning provides for the programming of Tomahawk missions.

Platform maintenance is included for Tomahawk launch platforms at an approximate level of 165 platforms per year.

There is no antecedent system.

b. (U) Costs — (FY 1977 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Total system	Avg Annual Cost Per N/A
Operational Test Launch	9.9	N/A
Depot Maintenance	20.0	N/A
Software Support Program	7.8	N/A
Technical/Ops Support	9.5	N/A
Platform Maintenance	1.6	N/A
Theater Mission Planning	4.8	N/A
Total	53.6	N/A

18c. (U) Operating and Support Costs (Cont'd):

c. (U) Contractor Support Costs — (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M,N	17.9	6.4	8.3	—	32.6
Total	17.9	6.4	8.3	—	32.6

Operating and Support costs date - 17 March 1992.

A-35 UH-60 A/L

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: UH-60A/L BLACK HAWK

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
BLACK HAWK

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
Utility Helicopters Project Mgr. Off COL Gerald Green
ATTN: SFAE-AV-BH Assigned: July 10, 1990
4300 Goodfellow Blvd AV 693-1700 COMM (314) 263-1700
St. Louis, MO 63120-1798

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 64206 Project D378, D189, D069
PE 23744 Project D193
PE 64217 Project DE70, D275
PROCUREMENT:
APPN 2031 ICN A05002 (Army)
APPN 2031 ICN A09400 (Army)
APPN 2031 ICN AA0005 (Army)
APPN 2031 ICN AA0952 (Army)
APPN 0350 ICN ------ (DCA/DNA)

No SECURITY Objection to PUBLIC RELEASE
23 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

5. **Related Programs:**
Army's EH-60A QUICK FIX, MH-60K Special Operations BLACK HAWK, UH-60A/L Flight Simulator, and AH-64 APACHE programs; Navy's SH-60B SEAHAWK and SH-60F (CV-HELO) programs; and Air Force's MH-60G PAVE

*** [redacted] ***

OASD(PA) DFOISR 92-0638

5. Related Programs (Cont'd):

HAWK program.

6. Mission and Description:
The BLACK HAWK is a twin engine helicopter that is used in the performance of the air assault, air cavalry, and aeromedical evacuation mission. This aircraft is sized as an infantry squad assault helicopter, capable of carrying up to 14 troops, but normally configured for a crew of 3 and 11 troops. It performs the missions of transporting troops and equipment into combat, resupplying the troops while in combat, and performing the associated functions of aeromedical evacuation, repositioning of reserves, and command and control. The UH-60L BLACK HAWK is continuing to replace the UH-1H Iroquois in air assault, air cavalry, and aeromedical evacuation units.

7. Program Highlights:
a. Significant Historical Developments --
On June 22, 1971 the BLACK HAWK program was approved by the DEPSECDEF for full-scale development. On March 6, 1972 a contract to develop a 1500 shaft horsepower advanced technology engine was awarded to General Electric Company (GE). August 30, 1972 contracts were awarded to Boeing Vertol and Sikorsky Aircraft to develop the BLACK HAWK airframe. Prototype qualification testing commenced October 17, 1974 and was completed December 8, 1976. These tests accumulated 2,990 flight test hours and 2,676 ground vehicle test hours. The BLACK HAWK was approved for production as a result of Defense Systems Acquisition Review Council (DSARC) III, held on November 30, 1976. December 23, 1976--Sikorsky Aircraft and GE were awarded initial production contracts for airframes and engines, respectively. October 22, 1979--Army Systems Acquisition Review Council (ASARC) IIIA was held, at which time permission was granted for follow-on BLACK HAWK production.

May 15, 1979--FY80 HASC report 96-166 directed the Army to perform a UH-60A HELLFIRE feasibility demonstration. The demonstration was integrated with Army requirements for the UH-60A BLACK HAWK to carry external stores, such as fuel tanks, to meet self deployment and extended range needs--the External Stores Support System (ESSS) program. May 20, 1982--the HELLFIRE feasibility demonstration was satisfactorily completed. July 1, 1983--Development Testing II (DT II) of the ESSS was successfully completed. September 23, 1983--Operational Test II (OT II) was successfully completed at Ft. Campbell, KY. The DOD FY84 Authorization and Appropriation Acts directed the Army to qualify the HELLFIRE missile system on the UH-60A, and appropriated $15M to fund the program. Congress appropriated an additional $15.8M in the DOD FY86 Appropriation Act to complete qualification of the HELLFIRE missile system on the

7a. Program Highlights (Cont'd):

UH-60A. DT II for the UH-60A HELLFIRE Missile System was completed in November, 1987. The HELLFIRE system is qualified on the UH-60A and a Technical Data Package (TDP) has been procured for any future UH-60A HELLFIRE system procurement requirements.

The multiyear III airframe contract for FY88-91 to procure 252 UH-60's was fully executed with an additional 36 UH-60L procured in FY91, bringing the total contract quantity procured to 288 UH-60's. Congressional interest and subsequent funding in FY88 initiated an Army effort to develop an upgrade to the UH-60A, to include a composite rotor system, designated as the Multi-Stage Improvement Program (MSIP). Development of the MSIP was scheduled to conclude in 1992, with incorporporation of the changes on the production line (no retrofit of the fielded fleet was planned). After development contracts had been negotiated, however, the program was terminated due to insufficient resources in the outyear procurement program.

The procurement objective for the the UH-60 was increased from 1,107 to 2,253 in February, 1989, as stated in the Army Aviation Modernization Plan. The propulsion system for the UH-60 was changed from the T700-GE-700 to the T700-GE-701C in October, 1989, as the result of a competitive procurement of an engine with increased horsepower. With the incorporation of the T701C engine into the UH-60, the aircraft series designation was changed to the UH-60L. The significant improvement in performance of the UH-60L over the UH-60A eliminated all Material Need deficiencies except for the requirement for mission endurance.

b. Significant Developments Since Last Report --
An FY92-96 airframe multiyear contract to buy out an additional 300 UH-60L aircraft has been negotiated, and is planned for award in March, 1992, pending Congressional approval. Additional procurement is contingent upon results of the Utility Aircraft Requirements Study (UTARS).

The BLACK HAWK system is expected to meet the mission requirements.

c. Changes Since As Of Date --
None.

8. Threshold Breaches:
There are currently no breaches to the approved Acquisition Program Baseline (APB), dated March 2, 1989 for the UH-60A and February 26, 1990, for the UH-60L.

The UH-60L meets all the critical mission performance thresholds, but falls slightly short of the mission endurance time specified in the

8. Threshold Breaches (Cont'd):

Material Need as 2.3 hours. The decrease in mission endurance time is primarily due to the weight increase of the Improved Durability Main Gearbox and the 701C engines, coupled with a slight increase in specific fuel consumption.

There are no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --	Development Estimate	Approved Program	Current Estimate
UH-60A			
Initial Production Contract Award (FY77)	N/A	DEC 76	DEC 76
Single Yr Contract Award (FY78)	N/A	OCT 77	OCT 77
Single Yr Contract Award (FY79)	N/A	OCT 78	OCT 78
Deliveries FY77 Contract Start	N/A	OCT 78	OCT 78
Deliveries FY78 Contract Start	N/A	MAY 79	MAY 79
FDT&E			
Start	N/A	JUL 79	JUL 79
Complete	N/A	OCT 79	OCT 79
MS IIIA	N/A	OCT 79	OCT 79
IOC	JUN 79	NOV 79	NOV 79
Single Yr Contract Award (FY80)	N/A	NOV 79	NOV 79
Deliveries FY79 Contract Start	N/A	AUG 80	AUG 80
Single Yr Contract Award (FY81)	N/A	DEC 80	DEC 80
Deliveries FY80 Contract Start	N/A	JUL 81	JUL 81
Deliveries FY81 Contract Start	N/A	MAR 82	MAR 82
Multiyear Contract Award (FY82-84)	N/A	APR 82	APR 82
Deliveries MYC 82-84 Start	N/A	DEC 82	DEC 82
Multiyear Contract Award (FY85-87)	N/A	OCT 84	OCT 84
Deliveries MYC 85-87 Start	N/A	MAR 85	MAR 85
Deployment Plan 1/	N/A		
36th Med - Ft Polk	N/A	DEC 86	DEC 86
5/17 Atk Hel Bn - Ft Hood	N/A	DEC 86	DEC 86
5/17 Atk Hel Bn - Ft Hood	N/A	FEB 87	FEB 87
101st Av (Replacement) - Ft Campbell	N/A	MAR 87	MAR 87
82nd Av (Replacement) - Ft Bragg	N/A	MAR 87	MAR 87
228th Atk Bn - Ft Hood	N/A	MAR 87	MAR 87
82nd Av (Replacement) - Ft Bragg	N/A	APR 87	APR 87
247th med Det - Ft Irwin	N/A	APR 87	APR 87
9th LID (Replacement) - Ft Lewis	N/A	JUN 87	JUN 87

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
101st Av (Replement) Ft - Campbell	N/A	JUN 87	JUN 87
101st Av (Replacement) - Ft Campbell	N/A	SEP 87	SEP 87
82nd Av (Replacement) - Ft Bragg	N/A	SEP 87	SEP 87
VII Corps Atk Hel Bn - Ft Hood	N/A	SEP 87	SEP 87
101st Av (Replacement) - Ft Campbell	N/A	DEC 87	DEC 87
82nd Av (Replacement) - Ft. Bragg	N/A	DEC 87	DEC 87
VII Corps Atk Hel Bn - Ft Hood	N/A	DEC 87	DEC 87
3/227th AHB - Hanau, GE	N/A	FEB 89	APR 89
E/1st Aslt - Ft Riley	N/A	APR 89	FEB 89
1/245th Aslt - OKNG	N/A	APR 89	JUL 89
140th Aslt - CANG	N/A	MAY 89	MAY 89
1/24th AHB - Hunter/Ligget AAF	N/A	JUL 89	JUL 89
2/1st AHB - Ansbach, GE	N/A	OCT 89	JUL 89
Multiyear Airframe Contract Award (FY88-91)	N/A	JAN 88	JAN 88
Deliveries MYC 88-91 Start	N/A	JAN 88	JAN 88
H-60 Series Competitive Engine Contract Award	N/A	MAY 88	MAY 88
Multiyear Airframe Contract Award (FY89)	N/A	NOV 88	NOV 88
Approval of MSIP IPR by DA	N/A	MAR 89	N/A
Award MSIP Development Contract	N/A	APR 89	N/A
Award Composite Rotor System Development Contract	N/A	APR 89	N/A
MSIP/CRS Prelim Design Review	N/A	OCT 89	N/A
MSIP/CRS Critical Design Review	N/A	OCT 90	N/A
Initial Proc Objective (1107) Completed	N/A	JUN 91	JUL 91(Ch-1)
First Year of Funding	JUL 67	N/A	JUL 67
Engine Develop Contract Award	DEC 71	N/A	MAR 72
Prototype Dev Contract Awards	SEP 72	N/A	AUG 72
First Flight	SEP 74	N/A	NOV 74
Engine Mil Qual Test (150 hrs)	DEC 75	N/A	MAR 76
Development Test II		N/A	
Started	FEB 76	N/A	MAR 76
Completed	DEC 77	N/A	DEC 76
Operational Test II		N/A	
Started	N/A	N/A	JUN 76
Completed	N/A	N/A	SEP 76

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Milestone III (DSARC)	SEP 76	N/A	NOV 76
Type Classification (Standard)	N/A	N/A	NOV 76
Prototype Evaluation Completed	N/A	N/A	DEC 76
First Prod Aircraft Delivery UH-60L	N/A	N/A	OCT 78
Multiyear Airframe Contract Award (FY88-91)	JAN 88	JAN 88	JAN 88
Multiyear Engine Contract Award (FY89-93)	NOV 88	NOV 88	NOV 88
UH-60 Series Eng (GE T701C)Del Start	JAN 89	JAN 89	JAN 89
Approval of Revised UH-60 Proc Obj (2253)	FEB 89	FEB 89	FEB 89
DA IPR for Type Class of UH-60L	SEP 89	SEP 89	SEP 89
Incorp of GE T701C Engine	OCT 89	OCT 89	OCT 89
Multiyear Airframe Contract Award (FY90)	NOV 89	NOV 89	NOV 89
Multiyear Engine Contract Award (FY90)	NOV 89	NOV 89	NOV 89
Multiyear Airframe Contract Award (FY91)	NOV 90	NOV 90	DEC 90
Multiyear Engine Contract Award (FY91)	NOV 90	NOV 90	DEC 90
Deployment Plan			
TXNG -- Austin, TX	NOV 89	NOV 89	NOV 89
2/229 Aslt -- Ft Rucker	JAN 90	JAN 90	JAN 90
1/6th AHB -- Ft Hood	MAR 90	MAR 90	MAR 90
4/6th AHB -- Ft Hood	MAR 90	MAR 90	MAR 90
3rd ACR -- Ft Bliss	APR 90	APR 90	APR 90
3/6 AHB -- Ft Hood	MAY 90	MAY 90	MAY 90
1/3rd AHB -- Ft Hood	MAY 90	MAY 90	MAY 90
C/25th Aslt -- Ft Drum	JUN 90	JUN 90	JUN 90
E/3 Aslt -- Ft Hood	JUN 90	JUN 90	JUN 90
1/4th AHB -- Ft Carson	JUL 90	JUL 90	JUL 90
1/5th AHB -- Ft Polk	SEP 90	SEP 90	SEP 90
MY Engine Contract Award (FY92)	N/A	N/A	JAN 92(Ch-2)
MYP III AF Deliveries Complete	N/A	N/A	SEP 93(Ch-3)
MYP IV Airframe Con. Aw. (FY92)	N/A	N/A	MAR 92(Ch-4)

1/ The first sixteen entries in the UH-60A Deployment Plan were inadvertantly excluded from the December, 1990 SAR. This SAR submission corrects that discrepency.

9b. Schedule (Cont'd):

b. Previous Change Explanations --

Changes in the current estimate of milestone accomplishments have been caused by (a) conformance with the new Army Acquisition Guidelines; (b) reduction in prototype aircraft from 6 to 3; (c) time required to repair the prototype which was damaged in November 1975; (d) scheduling problems and additional time required by other Government agencies for testing; (e) the decision by DSARC III on initial production go ahead in December 1976; (f) the January 22, 1979 temporary grounding of the BLACK HAWK fleet because of the observance of a failure mode in a primary servo; (g) the June 11, 1979 official beginning of FDTE at Ft. Campbell, KY; (h) the October 15, 1979 completion of FDTE at Ft. Campbell, KY; (i) addition and subsequent termination of the Multistage Improvement Program (MSIP), and (k) minor changes to contract awards and aircraft deliveries and deployments.

c. Current Change Explanations --

(CH-1) Current Estimate changed from Jun 91 to actual date of Jul 91
(CH-2) Current Estimate changed from Nov 91 to Jan 92
(CH-3) Current Estimate changed from Dec 91 to Sep 93, to reflect the DD-250 date for the aircraft as an MH-60K
(CH-4) Current Estimate changed from Dec 91 to Mar 92

d. References --

Development Estimate:
UH-60A DCP #13, June 13, 1971 and DCP #13 Update, November 1, 1977.
UH-60L AAE approved baseline, dated February 26, 1990.

Approved Program:
AAE Approved Acquisition Program Baseline dated 26 February 1990.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
UH-60A					
Payload					
Troops	11	11	/ 11	11	11
Pounds	2640	2640	/ 2640	2640	2640
Air Transportability					
C-130 (qty)	1	N/A	/ N/A	N/A	N/A
C-141 (qty)	2	2	/ 2	2	2

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
C-5 (qty)	6	6	/ 6	6	6
Flight Performance with Payload					
Vertical Rate of Climb (ft/min) 1/	500	450	/ 425	450	425
Cruise Speed (knots) 1/	150	145	/ 139	145	139
Endurance (hrs) 1/	2.3	2.3	/ 2.3	2.3	2.3
Mission Reliability					
Probability of Success	0.986	.991	/ .987	.991	.991
Mean Time Between Maint action (hrs)	70.9	106.0	/ 75.9	106.0	106.0
System MTBF (hrs)	4.0	4.0	/ 4.0	6.6	4.7
Maintenance Manhrs per Flight Hour (MMH/FH)	3.8	3.0	/ 3.0	3.0	3.0
UH-60L					
Payload (lbs)					
Troops	11	11	/ 11	11	11
Pounds	2640	2640	/ 2640	2640	2640
Air Transportability					
C-141 (qty)	N/A	2	/ 2	2	2
C-5 (qty)	N/A	6	/ 6	6	6
Flight Performance with Payload					
Vertical Rate of Climb (ft/min) 1/	785	900	/ 785	785	785
Cruise Speed (Knots) (using max cont power) 1/	150	152	/ 150	150	150
Endurance (hrs) 1/	2.1	2.3	/ 2.1	2.1	2.1
Mission Reliability					
Probability of Success	N/A	.991	/ .987	.987	.987
Mean Time Between Maint Actions (hrs)	N/A	106.0	/ 75.9	75.9	75.9
System Mean Time Between Failures (hrs)	4.0	4.7	/ 4.0	4.0	4.0
Maintenance Manhrs per Flight Hour (MMH/FH)	3.8	3.0	/ 3.8	3.8	3.8

10a. Performance Characteristics (Cont'd):
Notes:

The UH-60L is a derivative of the UH-60A. Approval for production incorporation was granted by a DA IPR for type classification--there is no Development Estimate.

Vertical Rate of Climb (VROC) in FPM is predicated on using 95% of Intermediate Rated Power (IRP).

The current estimate of VROC in FPM for the UH-60A is based on the actual weighing of the latest configuration of a production aircraft.

Cruise Speed in Knots is based on using Maximum Continuous Power (MCP).

Endurance in Hours is based on using a mission profile.

Maintenance Man-hours per Flight Hour (MMH/FH) include inspection and servicing, total corrective MMH/FH, mission reconfiguration, preparation of aircraft for air transport, and refueling, through Aviation Intermediate Maintenance (AVIM) level.

The requirement for Air Transportability on a C-130 was approved for deletion from the program (TWX, DAMO-RQD, June 8, 1978).

Mission reliability is currently being measured in terms of Meantime Between Failure (MTBF) in hours. The value shown is equivalent to the value for probability of success.

1/ At 4000 ft altitude and 95 deg F, with a crew of 3 and mission fuel.

b. Previous Change Explanations --

Variances in the demonstrated performance and current estimates of the operational/technical characteristics for the UH-60A are due to: (1) bands of acceptable performance which were identified to allow for cost effective trade-offs in the BLACK HAWK MN, ED October 1976; (2) weight growth due to design revisions and added capabilities have reduced the vertical rate of climb demonstrated performance from 664 to 425 feet per minute and have reduced the cruise speed to 139 knots; (3) system meantime between failure has improved from 4.3 to 4.7 based on sample data collected on Lot 9 (FY85) and newer UH-60A aircraft; (4) misiion reliability improved from .980 to .991 with the associated meantime between mission abort in hours improving from an estimated 49.5 hours to the demonstrated value of 106.0 hours. These values are based on a mission reliability evaluation performed on Lot 12 (FY88) UH-60A aircraft during the period of Mar-Aug 1988.

10c. **Performance Characteristics (Cont'd):**

c. Current Change Explanations -- None.

d. References --

Development Estimate:
UH-60A DCP #13, June 13, 1971 and DCP # 13 Update, November 1, 1977.
UH-60L AAE approved baseline, dated February 26, 1990.

Approved Program:
AAE Approved Acquisition Program Baseline dated 26 February 1990.

11. **Total Program Cost and Quantity:** (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	357.6	384.0	384.3
Procurement	1584.4	3899.6	2467.7
Airframe	(670.3)		(1510.8)
Engine	(176.5)		(418.9)
Avionics	(114.4)		(77.7)
Other Flyaway	(178.1)		(196.2)
Total Flyaway	(1139.3)		(2203.6)
Data	(28.8)		(28.3)
Training	(0.4)		(41.0)
Other			(8.4)
Total Other Wpn Sys	(29.2)		(77.7)
Peculiar Support	(58.9)		(16.7)
Initial Spares	(357.0)		(169.7)
Construction (MILCON)	0.0	7.1	8.2
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 71 Base-Year $	1942.0	4290.7	2860.2
Escalation	365.3	11881.1	5825.6
Development (RDT&E)	(52.3)	(155.6)	(155.1)
Procurement	(313.0)	(11709.8)	(5650.9)
Construction (MILCON)	(0.0)	(15.7)	(19.6)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2307.3	16171.8	8685.8

b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	1107	2257	1447
Total	1107	2257	1447

Excludes ten RDT&E units that are not considered fully configured end items.

11c. Total Program Cost and Quantity (Cont'd):

c. Foreign Military Sales --
UH-60L DESERT HAWK aircraft configured for a MEDEVAC mission. 8 Ea $133.0M

d. Nuclear Costs -- None.

e. References --

Development Estimate:
UH-60A DCP #13, June 13, 1971 and DCP #13 Update, November 1, 1977.
Uh-60L AAE approved baseline, dated February 26, 1990.

Approved Program:
AAE Approved Acquisition Program Baseline dated 26 February 1990.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	8685.8	8726.1	8685.8
(2) Quantity	1447	1447	1447
(3) Unit Cost	6.003	6.030	6.003
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	507.5	507.5	428.3
Less CY Adv Proc	173.3	173.3	154.5
Plus PY Adv Proc	70.3	70.3	150.3
Net Total	404.5	404.5	424.1
(2) Quantity	60	60	60
(3) Unit Cost	6.742	6.742	7.068

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	409.9	1897.4	0.0	2307.3
Previous Changes:				
Economic	+53.1	+1658.2	+1.8	+1713.1
Quantity	-22.0	+904.6	-	+882.6
Schedule	+3.0	-46.0	-	-43.0
Engineering	+41.5	+147.6	+44.8	+233.9
Estimating	+22.5	+3267.7	-18.8	+3271.4
Other	+18.5	+1.4	-	+19.9
Support	+12.9	+328.0	-	+340.9
Subtotal	+129.5	+6261.5	+27.8	+6418.8
Current Changes:				
Economic	-0.7 -	-85.9	-0.6	-86.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	0.7 -	+149.7	+0.6	+150.3
Other	-	-	-	-
Support	-	-104.1	-	-104.1
Subtotal	-	-40.3	-	-40.3
Total Changes	+129.5	+6221.2	+27.8	+6378.5
Current Estimate	539.4	8118.6	27.8	8685.8

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1971 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	357.6	1584.4	0.0	1942.0
Previous Changes:				
Quantity	-20.2	+262.6	-	+242.4
Schedule	+1.4	-100.5	-	-99.1
Engineering	+16.7	+25.0	+13.5	+55.2
Estimating	+7.9	+842.3	-5.4	+844.8
Other	+12.6	+0.8	-	+13.4
Support	+7.9	-150.8	-	-142.9
Subtotal	+26.3	+879.4	+8.1	+913.8
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.4	+34.1	+0.1	+34.6
Other	-	-	-	-
Support	-	-30.2	-	-30.2
Subtotal	+0.4	+3.9	+0.1	+4.4
Total Changes	+26.7	+883.3	+8.2	+918.2
Current Estimate	384.3	2467.7	8.2	2860.2

b. Previous Change Explanations --

RDT&E

Economic: Revised Escalation Indicies.

Quantity: Due to a reduction in the engines and the number of flying prototypes from 12 to 6.

Schedule: Due to decreases resulting from a Congressional reduction in FY75 and an OSD reduction in FY78, more than offset by increases from program rescheduling because the 1975 Boeing-Vertol and 1978 Sikorsky Aircraft prototype accidents.

Engineering: Due to increases resulting from developing a prototype auxiliary fuel cell system and the addition of the External Stores Support System (ESSS) as well as a Solid State Flight Data

13b. Cost Variance Analysis (Cont'd):

Recorder, offset by the deletion of the vertical instrument requirement.

Estimating: Due to increases from the extension of the airframe and engine maturity contracts, addition of the Congressionally directed HELLFIRE qualification program, and the transfer of CIP from APA funding to RDT&E funding, partially offset by decreases resulting from reduced cost estimates based on data from contract negotiations, application of OSD generic historical inflation factors, and the provision of funds to the DIVADS program.

Other: Due to increases to overhaul/repair the Boeing-Vertol prototype damaged in the October, 1975 accident and to sustain the Development Program as a consequence of the Sikorsky Aircraft prototype damaged in the 1978 accident.

Support: Due to increases for providing engine and avionics representatives for support at the airframe contractor's site and the development of additional trainers (Cockpit Emergency Procedures Trainer and Command Instrument Systems Trainer), partially offset by decreases resulting from favorable cost performance on the Maturity Test, reduction in the number of overhauls during GCT, and reduced support associated with the reduction in the number of flying prototypes from 12 to 6.

PROCUREMENT

Economic: Revised Escalation Indicies.

Quantity: Due to the procurement of four aircraft for the Drug Enforcement Agency in FY 87, and an additional 336 aircraft over the period of FY91-1996, reflecting an increase in the procurement objective.

Schedule: Due to increases resulting from strething the duration of the procurement program from FY77-85 to FY77-91, more than offset by decreases resulting from the increase in the quantity procured in FY77-FY79 from 85 to 200, an increase in the quantity procured in FY82-90 due to the cancellation of the SOTAS program, and an increase in the procurement quantity in FY85 from 78 to 86.

Engineering: Due to the addition of requirements for special mission aircraft as well as more stringent requirements for protection against Electromagnetic Environment (EME).

Estimating: Due to increases from changes in estimates as a result of the March 1974 design-to-cost review and

13b. Cost Variance Analysis (Cont'd):

independent parametric cost estimate and the December 1976 Source Selection Evaluation Board review, the addition of mission flexibility kits and aircraft survivability equipment, airframe production start-up problems, and application of system unique inflation indices to prior year costs, partially offset by decreases from revisions to the parametric estimating methodology, the transfer of PEP funding from procurement to RDT&E, reductions in the FY78 avionics initial spares requirement, revision of production estimates to reflect multiyear contracting on the airframe from FY82-91 and the engine from FY83-91, production acceleration during the FY82-84 timeframe, and a reduction in the projected procurement of mission kits as well as a reduction in the provision for engineering changes.

Other: Due to cost growth on the FY77 airframe production contract.

Support: Due to increases resulting from the requirement for additional engines for initial spares at an increased unit price, increased funding requirements for initial spares in subsequent years to accommodate an increased number of deployment sites and the carryover of funding shortfalls from earlier years, resumption of funding liability for Peculiar Ground Support Equipment (PGSE), increased technical data requirements, addition of flight simulator requirements to FY87 and beyond, additional requirements associated with the increase in the procurement quantity,and the transfer of PMO costs and total package fielding from another appropriation, partially offset by decreases resulting from the transfer of initial spares requirements for Army Stock Fund items from the PMO to the MSC, and reduced support requirements resulting from acceleration of production.

MILCON

Economic: Revised Escalation Indicies.

Engineering: Due to the addition of construction funds required for UH-60 Flight Simulator facilities.

Estimating: Reduction in the number of flight simulator facilities as well a revision in the allocation of the cost of the facilities between aircraft programs.

13c. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Escalation Indices. (Economic)	N/A	-0.7
Current and prior year inflation offset (Estimating)	0.4	0.7
Total Changes	0.4	--
(2) PROCUREMENT		
Revised Escalation Indices. (Economic)	N/A	-55.7
Economic adjustment for negative program change to support elements (Economic)	N/A	-30.2
Current and prior year inflation offset (Estimating)	4.6	18.7
Increased estimates of airframe costs based on negotiation of FY92-96 MYC, partially offset by reduced kit buys (Estimating)	29.5	131.0
Increase in initial spares requirements (Support)	3.1	9.9
Reduction of requirements for PGSE and trainers(primarily flight simulators) (Support)	-33.3	-114.0
Total Changes	3.9	-40.3
(3) MILCON		
Revised Escalation Indicies. (Economic)	N/A	-0.6
Current and prior year inflation offset (Estimating)	--	0.2
Due increased base year estimate of flight simulator facility. (Estimating)	0.1	0.4
Total Changes	0.1	0.0
(4) O & M		
Total Changes	--	--

14. **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.084	1.124	0.120	-0.030	0.162	2.365	0.014	0.164	3.919	6.003

15. **Contract Information:** (Then-Year Dollars in Millions)

a. Procurement --

AIRFRAME MYP III FY88-91:	Initial Contract Price Target	Ceiling	Qty
UNITED TECHNOLOGY CORP, STRATFORD, CT DAAJ09-88-C-A003, FFP Award: N/A Definitized: January 11, 1988	$983.2	N/A	252

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$1835.6	N/A	380	N/A	$1822.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and performance reporting is not required for this FFP contract.

Engine MYP III(FY89-93):	Initial Contract Price Target	Ceiling	Qty
GENERAL ELECTRIC CO., LYNN, MA DAAJ09-88-C-A084, FFP Award: N/A Definitized: November 30, 1988	$564.2	N/A	1156

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$976.3	N/A	2043	$976.3	$976.3

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and performance reporting is not required for this FFP contract.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 83.3% (25 yrs/30 yrs)

(2) Percent Program Cost Appropriated: 82.5% ($7167.5 / $8685.8)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY68-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	539.4	-	-	-	539.4
Procurement	6103.3	507.5	428.3	1079.5	8118.6
MILCON	17.3	-	-	10.5	27.8
O&M	-	-	-	-	-
Total	6660.0	507.5	428.3	1090.0	8685.8

16c. **Program Funding Summary (Cont'd):**

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY71 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1968				0.6	0.5	0.5	0.5	3.6
1969				1.9	1.8	1.8	1.8	4.7
1970				1.2	1.2	1.2	1.2	5.5
1971				7.7	7.9	7.9	7.9	5.2
1972			0.1	21.1	22.7	22.7	22.7	4.6
1973			7.8	44.8	50.3	50.3	50.3	4.3
1974			21.0	84.0	102.6	102.6	102.6	8.0
1975			6.5	39.3	52.7	52.7	52.7	10.9
1976			8.1	65.4	93.6	93.6	93.6	6.6
197T			0.8	12.5	18.6	18.6	18.6	2.9
1977			3.9	50.4	76.0	76.0	76.0	2.6
1978			2.5	24.2	39.2	39.2	39.2	6.8
1979			0.6	6.3	11.4	11.4	11.4	8.4
1980			0.5	1.8	3.6	3.6	3.6	10.6
1981			0.7	3.2	7.0	7.0	7.0	10.6
1982			0.7	2.9	6.7	6.7	6.7	7.6
1983			0.4	3.8	9.1	9.1	9.1	4.9

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY71 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1984			0.5	6.0	15.0	14.8	14.8	3.8
1985								3.4
1986			0.1	6.0	15.9	15.9	15.9	2.8
1987				0.8	2.3	2.3	2.3	2.7
1988				0.2	0.7	0.7	0.6	3.0
1989				0.2	0.6	0.6	0.6	4.2
Subtot			54.2	384.3	539.4	539.2	539.1	
Appropriation: 2031 Aircraft Procurement, Army								
1977	15	19.6	37.8	75.3	140.6	140.6	140.6	3.7
1978	56	13.3	89.1	124.4	245.8	245.1	245.1	6.0
1979	92	6.4	140.6	168.9	395.6	392.8	392.8	12.0
1980	94	3.6	127.6	141.6	380.2	378.6	378.6	19.8
1981	80	2.1	109.9	149.5	478.0	478.0	478.0	13.5
1982	96	2.4	130.0	189.7	618.8	618.8	618.8	8.1
1983	96	8.0	138.0	168.6	540.6	540.6	540.6	-0.3
1984	84	1.3	121.9	125.4	389.6	389.6	389.6	1.7
1985	86	0.9	122.0	141.4	436.7	436.7	436.7	-0.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY71 Dollars Nonrec	Flyaway FY71 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2031 Aircraft Procurement, Army (Cont'd)								
1986	78	1.3	109.2	133.9	411.5	411.5	411.5	-1.0
1987	82	3.7	119.2	124.3	380.8	380.5	376.7	0.2
1988	72	9.2	108.4	147.0	492.4	492.4	483.3	7.6
1989	72	3.3	110.6	127.0	473.2	473.1	435.5	10.8
1990	72	0.8	98.1	107.3	411.1	409.2	303.3	4.0
1991	48	2.5	69.2	38.4	152.4	121.8	58.2	3.9
1992	60	1.5	94.5	123.9	507.5	63.0		3.1
1993	60	0.1	89.8	101.2	428.3			3.3
1994	60	0.1	87.8	95.9	419.2			3.3
1995	60	0.1	89.5	92.0	415.0			3.3
1996	60	0.1	90.8	52.3	243.4			3.2
1997				0.4	1.9			3.2
Subtot	1423	80.3	2084.0	2428.4	7962.6	5972.3	5689.3	
Appropriation: 2050 Military Construction, Army								
1987				3.1	9.4	9.4	9.4	2.7
1988				2.5	7.9	7.9	7.9	3.0
1989								4.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY71 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2050 Military Construction, Army (Cont'd)								
1990								4.0
1991								3.9
1992								3.1
1993								3.3
1994								3.3
1995				0.9	3.5			3.3
1996				1.7	7.0			3.2
Subtot				8.2	27.8	17.3	17.3	
Army	1423	80.3	2138.2	2820.9	8529.8	6528.8	6245.7	
Appropriation: 0350 National Guard & Reserve Equipm, Defense								
1991	24		39.3	39.3	156.0	153.0	73.2	3.9
Subtot	24		39.3	39.3	156.0	153.0	73.2	
DoD	24		39.3	39.3	156.0	153.0	73.2	
Grand Total	1447	80.3	2177.5	2860.2	8685.8	6681.8	6318.9	

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1977	15	15	15	15
1978	45	56	56	56
1979	66	129	92	92
1980	165	168	94	94
1981	165	168	80	97
1982	165	168	96	113
1983	165	168	96	103
1984	165	180	84	103
1985	156	55	86	102
1986	0	0	78	125
1987	0	0	82	109
1988	0	0	72	106
1989	0	0	72	119
1990	0	0	72	124
1991	0	0	72	89
1992	0	0	60	0
1993	0	0	60	0
1994	0	0	60	0
1995	0	0	60	0
1996	0	0	60	0

17b. **Production Rate Data (Cont'd):**

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	1755.6	+1104.6	2860.2	+108.2	2752.0
(TY $)	3402.4	+5283.4	8685.8	+729.1	7956.7
PAUC Cost (BY $)	1.586	0.391	1.977	0.075	1.902
(TY $)	3.074	2.929	6.003	+0.504	5.499

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	OCT 78	0	OCT 78	N/A	OCT 78
Duration (in MON)	92	132	224	70	154
End Date(MON YY)	JUN 86	132	JUN 97	N/A	AUG 91

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	10/10
Procurement	1147/1124

e. Approved Design-to-Cost Objective --

	(Average Unit Flyaway Cost) Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 1107 - @ Peak Rate: 17.0/mo			
FY 72 Base-Year $	0.951	1.516	0.000
Then Year $	1.089	4.881	0.000
@ Qty 0 (1st three years) - @ Peak Rate: 0.0/mo			
FY 72 Base-Year $	0.000	0.000	0.000
Then Year $	0.000	0.000	0.000

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

Uh-60A/L cost estimates are based on a flying hour rate of 18.2 hours per aircraft per month, with aircraft deployed in three representative units--a Combat Aviation Company, an Air Cavalry Troop(Air Cavalry Squadron), and a Medical Evacuation Company. Personnel cost includes the Pay and Allowances and Permanent Change of Station (MPA appropriation) for crew, maintenance, and support personnel attributable to the UH-60A/L BLACK HAWK in the aforementioned units. Consumption includes the cost of replenishment spares and repair parts, war reserve spares and repair parts, and petroleum, oil, and lubricants(POL). Depot maintenance includes the cost of labor, material, and transportation associated with the end item as well as component repair programs. Material modifications reflect the estimated hardware cost of aircraft changes installed after fielding. Other direct costs include the cost of civilian maintenance on the flight simulators, as well as the cost of applying modifications with OLR teams. Other indirect costs include the cost of replacement training for military personnel, as well as the cost of quarters, maintenance, and utilities. The source of the O&S estimate is the Baseline Cost Estimate (BCE) dated July 1991. Assumptions and ground rules for the UH-1 (antecedent system) are the same as for the UH-60, except for a flying hour rate of 20 hours per aircraft per month and that the flight simulator maintenance as well as modification application are completed by military personnel. Source of the estimate is a 1987 study.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1971 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Flying Hours Blackhawk	Avg Annual Cost Per FH in M (Antecedent)
Personnel	463.5	355.7
Consumption	237.3	130.2
Depot Maintenance	24.2	135.5
Modifications--Material	28.1	19.4
Other Direct Cost	66.6	0.0
Other Indirect Cost	95.3	153.9
Total	915.0	794.7

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Int. Contractor Spt.	---	---	---	---	---
Contractor Log. Spt.	---	---	---	---	---
Sust. Engineering	---	---	---	---	---
Depot Maintenance	1.5	---	---	---	1.5
Cont. Eng./Tech.Srv.	1.1	0.6	0.7	---	2.4
Other	---	---	---	---	---
	---	---	---	---	---
Total	2.6	0.6	0.7	---	3.9

18. Operating and Support Costs (Cont'd):
Costs in 18b. are in thousands of dollars vs. millions.

Depot Maintenance: Rrepresents repair of BLACK HAWK and items. Transition to organic support is in progress, which attributes to the decrease.

Contract Eng./Tech. Services: Changes in materiel fielding schedules are the reason for the variance between FY91 & FY92.

Costs shown in the column for FY91 and Prior are for FY91 only.

A-23 M1 ABRAMS TANK

91-070

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: ABRAMS SERIES TANK

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
M1/M1A1/M1A2 (Abrams)/Tank, Combat, Full Tracked
(General Abrams Tank)

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
US ARMY TANK-AUTOMOTIVE COMMAND — COL JOHN S. CALDWELL JR.
ATTN: SFAE-ASM-AB — Assigned: July 15, 1990
WARREN, MI 48397-5000 — AV 786-6885 COMM (313) 574-6885

4. [redacted] **Program Elements/Procurement Line Items:**

RDT&E:
PE 23735 (Shared) Project D330 (Shared)
PE 64620 (Sunk)
Project DG20
PE 64630 (Sunk)
Project D287

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AS AMENDED
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DEPARTMENT OF DEFENSE

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4. (U) Program Elements/Procurement Line Items (Cont'd):

PROCUREMENT:
APPN 2033 ICN G82917 (Army)
APPN 2033 ICN GA0167 (Army) (Initial Spares)
APPN 2033 ICN GB1300 (Army)
MILCON:
PE (FY80 NA) Project 704 (Sunk)

PE 72007 Project 096 (Sunk)

PE 84731 Project 333 (Sunk)

PE 85796 Project 295 (Sunk)

PE 22496 Project 32021

5. (U) Related Programs:
Tank Main Armament Systems (TMAS); Combat Vehicle Improvement Program; PM, Survivability Systems.

6. (U) Mission and Description:
The mission of the Abrams tank is to close with and destroy enemy forces on the integrated battlefield using firepower, maneuver, and shock effect. The M1A1 Abrams is currently in production. The 120mm main gun, the powerful 1500 HP turbine engine, the specialized armor, and the levels of Nuclear, Biological, and Chemical (NBC) protection make the M1A1 Abrams particularly suitable for attacking or defending against large concentrations of heavy armor forces on a highly lethal battlefield. The M1A2 development program will provide an Abrams tank with the necessary improvements in lethality, survivability, and fightability required to defeat the threat of the middle nineteen nineties. Noteworthy improvements being developed for the M1A2 include an Improved Commander's Weapon Station (ICWS), the Commander's Independent Thermal Viewer (CITV), Position Navigation (POS/NAV) equipment, Radio Interface Unit (RIU), and distributed data and power architecture. The Abrams tank replaces the M60 tank in active Army units and reserve components.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
The M1 Abrams Tank program was formally approved with the release of DCP #117 on January 8, 1973. A Full Scale Engineering Development/ Producibility Engineering and Planning (FSED/PEP) contract, for the first generation tank, was awarded on November 12, 1976. The SECDEF authorized production beyond 30 tanks per month on November 19, 1981. The Army Systems Acquisition Review Council (ASARC) met on August 28, 1984 to approve production of the improved M1A1 tank and the Defense

7a. [redacted] Program Highlights (Cont'd):

Systems Acquisition Review Council (DSARC) gave its approval on December 12, 1984. The last of 3,268 105mm M1 Abrams Tanks was accepted by the Government on May 30, 1986 and the first M1A1s were fielded in December 1986. On December 2, 1988, The Defense Acquisition Board (DAB) gave its conditional approval for the Block II improvement program and the M1A2 Full Scale Development (FSD) contract was awarded on December 14, 1988. On January 25, 1989, the DEPSECDEF issued an Acquisition Decision Memorandum (ADM) approval for the Army to proceed with the M1A2 modernization program pending the publication of a complete Cost and Operational Effectiveness Analysis (COEA). Based on further analytic data presented to the DAB on August 31, 1989, the DEPSECDEF signed another ADM on October 18th which established the baseline (FY91-97) procurement objective of 2,926 3rd generation Abrams Tanks. However, subsequent budget decisions reduced the program to a FY91 procurement objective of 62 M1A2s to demonstrate readiness for continued production. The specific M1A2 configuration to be developed for production was decided by the special ASARC which met on March 21, 1990. As of December 31, 1990, total production of the 120mm M1A1 Abrams stood at 3,687 units.

b. [redacted] Significant Developments Since Last Report --
There were 343 120mm M1A1 Abrams tanks produced for the U.S. Army in 1991, bringing total M1A1 production up to 4,030 units and total Abrams tank production up to 7,298 units as of December 31, 1991. In addition, ten M1A2 prototypes were delivered to test sites during the year. The M1A2 Early User Test and Evaluation (EUT&E) at Ft. Hunter-Liggett, CA ended on December 20, 1991. Abrams deliveries, at 93%, have exceeded the 90% delivery criterion and it is expected that this will be the final SAR.

The Abrams series tank is expected to satisfy the mission requirement.

c. [redacted] Changes Since As Of Date --
The AAE approved the Low Rate Initial Production of 62 M1A2 tanks to be delivered (in lieu of 62 M1A1 tanks) at the end of the current M1A1 production run.

8. [redacted] Threshold Breaches:
There are no breaches to the Acquisition Program Baseline (APB), dated November 15, 1991. There are no Nunn-McCurdy Unit Cost breaches.

9. [redacted] Schedule:

a. [redacted] Milestones --	Development Estimate	Approved Program	Current Estimate
M1		N/A	
Milestone I (DSARC)	NOV 72	N/A	NOV 72
Validation Contracts Awarded	JUN 73	N/A	JUN 73
Development/Operational Test I		N/A	
Started	FEB 76	N/A	FEB 76
Completed	MAY 76	N/A	MAY 76
Milestone II (DSARC)	JUL 76	N/A	NOV 76
Full Scale Development Contract Awarded	JUL 76	N/A	NOV 76
Development/Operational Test II		N/A	
Started	MAR 78	N/A	FEB 78
Started	MAY 78	N/A	MAY 78
Completed	JUL 79	N/A	SEP 79
Completed	DEC 78	N/A	FEB 79
Milestone III (DSARC)	FEB 79	N/A	APR 79
Low Rate Initial Production Contract Awarded	MAY 79	N/A	MAY 79
Development/Operational Test III		N/A	
Started	MAY 80	N/A	MAR 80
Started	MAY 80	N/A	SEP 80
Completed	NOV 80	N/A	NOV 81
Initial Operational Capability (Tank Company)	DEC 80	N/A	JAN 81
Milestone IIIA (DSARC) (Full Production Decision)	FEB 81	N/A	SEP 81
Full Production Contract Awarded	FEB 81	N/A	OCT 81
European Operational Capability	N/A	N/A	DEC 82
M1A1		N/A	
M1A1 Management Review III (ASARC/DSARC)	N/A	DEC 84	DEC 84
FY 85 Tank Prod Contract Award	N/A	APR 85	APR 85
FY 85 First Prod Delivery	N/A	FEB 86	FEB 86
Initial Prod Test			
Start	N/A	JUN 86	JUN 86
Complete	N/A	SEP 87	SEP 87
Material Release (CONUS-Conditional)	N/A	JUL 86	JUL 86
First Unit Equipped (CONUS)	N/A	DEC 86	DEC 86
Material Release (Europe-Conditional)	N/A	JAN 87	JAN 87
First Unit Equipped (Europe)	N/A	JAN 87	JAN 87
Follow-On Evaluation			
Start	N/A	JAN 87	JAN 87
Complete	N/A	JUL 87	JUL 87

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Award MYP Tank Contract (FY86 & FY87 Tanks)	N/A	MAY 87	MAY 87
Call-Up FY86 and FY87 Tanks	N/A	MAY 87	MAY 87
First MYP Prod Delivery	N/A	MAY 87	MAY 87
Live Fire Test			
Start	N/A	AUG 87	AUG 87
Complete	N/A	JUL 88	AUG 88
Call-Up FY88	N/A	DEC 87	DEC 87
Call-Up FY89	N/A	DEC 88	DEC 88
Material Release	N/A	FEB 89	FEB 89
FY90 Tank Prod Contract Award	N/A	DEC 89	DEC 89
FY91 Tank Prod Contract Award (omits USMC requirements)	N/A	AUG 91	AUG 91(Ch-1)
FY90 First Prod Delivery	N/A	APR 91	APR 91
M1A2	N/A		
Block II ASARC Approval	N/A	FEB 85	FEB 85
Award Block II Prelim System Dev Contract	N/A	JUL 85	JUL 85
Award ICWS/SE #3 Prelim Eng Dev Contract	N/A	SEP 86	SEP 86
Award CO2 LRF Prel Eng Dev Contract	N/A	SEP 86	SEP 86
Award Block II Advanced System Dev Contract	N/A	DEC 87	DEC 87
M1A2 Milestone II Decision Review	N/A	DEC 88	DEC 88
Award Block II FSD Contract	DEC 88	DEC 88	DEC 88
DAB Program Review	N/A	AUG 89	AUG 89
Special M1A2 ASARC	N/A	MAR 90	MAR 90
First Prototype Delivery (FSED)	N/A	JUN 91	JAN 91
Technical Test			
Start	N/A	JAN 91	JAN 91
Complete	DEC 91	OCT 92	MAR 92(Ch-2)
User Test			
Start	N/A	MAY 91	JUN 91(Ch-3)
Complete	APR 91	OCT 91	DEC 91(Ch-4)
Milestone III Prod Decision	AUG 91	N/A	N/A (Ch-5)
Milestone IIIA Prod Decision	N/A	JAN 92	MAR 92(Ch-6)
Mod FY91 M1A1 Prod Contr (Incorp Block II Changes)	N/A	JAN 92	APR 92(Ch-7)
Initial Operational Test & Evaluation			
Start	N/A	MAY 92	N/A

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --

	Development Estimate	Approved Program	Current Estimate
Complete	N/A	OCT 92	N/A
First M1A2 Delivery	AUG 92	NOV 92	NOV 92
Initial Prod Testing			
Start	N/A	MAR 93	MAR 93
Complete	N/A	DEC 93	FEB 94(Ch-8)
First Unit Equipped (Europe)	MAR 93	N/A	N/A

NOTE: Although the Initial Operational Test & Evaluation appears in the Test and Evaluation Master Plan (TEMP) and the Approved Program, it is being proposed for deletion because it is not needed for demonstrating the producibility of the M1A2.

Testability requirements are augmented by Manual Test Procedures. Conditions for determining 1st Round Hit Probability: Tank-Target (Stationary or Moving).

ACRONYMS:

ICWS - Independent Commander's Weapon Station
GPS - Gunner's Primary Sight
CO2 - LRF - CO2 Laser Range Finder
DTV - Driver's Thermal Viewer
POS/NAV - Position Navigation System
TIS - Thermal Imaging System
MYP - Multi-Year Procurement

b. (U) Previous Change Explanations --

M1:
The M1 Full Scale Development (FSD) Contract Award was delayed 4 months (from Jul 76 to Nov 76) due to funding constraints. Continuing resolution spending authority to cover fiscal year 1976T (the 3 month transition period from Jul 76 through Sep 76) did not permit the award of new contracts. The Milestone II DSARC which approved the FSD award was similarly delayed. The Development / Operational Test (DT/OT) II (Phase I) started one month earlier than the Development Estimate (DE) (Mar 78), but its duration was 19 months -- or 3 months longer than expected. DT/OT II (Phase II) started on time (May 78), but it continued for 9 months -- or 2 months longer than anticipated. Consequently, the Milestone III (DSARC) (Limited Production Decision) was delayed by 2 months from Feb 79 to Apr 79. DT/OT III started 2 months ahead of schedule (Mar 80), but it was extended until Nov 81 -- a full year later than the DE (Nov 80) in order to fix the

9b. [redacted] Schedule (Cont'd):
problems encountered during earlier testing and to make sure the solutions worked. This test/fix/test cycle is not unusual for a new weapon system. Nevertheless, Initial Operational Capability (IOC) was still achieved in Jan 81 -- just after the DE goal of calendar year 1980. However, the Milestone IIIa (DSARC) (Full Production Decision) was delayed from Feb 81 to Sep 81 as a direct result of the extended testing schedule. This cleared the way for the Full Production Contract awarded in Oct 81 -- about 8 months later than planned. European Operational Capability, not a DE milestone, was achieved in calendar year 1982.

M1A1:
M1A1 development milestones were first introduced in the December 31, 1987 SAR. The FY91 Tank Production Contract Award was changed from Dec 90 to Apr 91 to recognize prolonged negotiations over late additions to the Army's budget and new accounting standards for benefits payable to retirees.

M1A2:
M1A2 development milestones were first introduced in the December 31, 1988 SAR. In the December 31, 1989 SAR, some necessary schedule adjustments (arising from the decision to limit the M1A2 program to a production demonstration of 62 tanks) were made; these included: the recommendation to replace the MS III (full production decision) in Aug 91 with a MS IIIA (limited production decision) in Jan 92 and the recommendation to replace the IPT with a "Follow-on Test and Evaluation" to start in Jun 93 (duration undetermined). Four other areas were affected: 1) End User Testing was changed from Apr 91 to Dec 91; 2) End Technical Testing changed from Dec 91 to Jun 92; 3) First M1A2 Delivery changed from Aug 92 to Nov 92; and 4) First Unit Equipped (Europe) was dropped because fielding of just 62 tanks will not occur. General Dynamics delivered the first M1A2 prototype tank in Jan 91 instead of Dec 90 due to late subcontractor deliveries of power supplies and remote power controllers. Several test milestones were later changed to conform to the Test and Evaluation Master Plan (TEMP), approved by the Army on November 20, 1990 and by the DoD on February 12, 1991: Start User Testing changed from Jul 91 to May 91; End User testing was changed from Dec 91 to Oct 91; End Technical Testing changed from Jun 92 to Oct 92; and the IPT was reinstated (after being recommended for deletion in the December 31, 1989 SAR) with projected start and end dates of Mar 93 and Dec 93.

c. [redacted] Current Change Explanations --

M1A1:
(CH-1) - Changed from Apr 91 to Aug 91, the actual Contract Award date.

9c. (U) Schedule (Cont'd):

M1A2:
(CH-2) - Changed from Oct 92 to Mar 92, the actual Technical Test completion date to support a U.S. Army MS IIIA (Limited Production Decision).
(CH-3) - Changed from May 91 to Jun 91, the actual User Test start date.
(CH-4) - Changed from Oct 91 to Dec 91, the actual User Test completion date.
(CH-5) - Changed from Jan 92 to N/A to conform to the new Approved Program, dated November 15, 1991.
(CH-6) - Added to conform to the new Approved Program.
(CH-7) - Changed from Jan 92 to Apr 92 due to a delay in the M1A2 limited production decision (MS IIIA).
(CH-8) - Changed from Dec 93 to Feb 94, the anticipated IPT completion date.

d. (U) References --

(U) Development Estimate:
M1A1: DCP #117A, May 24, 1978.

M1A2: DCP, April 26, 1989.

(U) Approved Program:
AAE approved Acquisition Program Baseline dated 15 Nov 91.

10. (U) Performance Characteristics:

a. (U) Performance --

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
M1		N/A	/ N/A		
Weight, Combat Loaded (tons)	58.0	N/A	/ N/A	61.5	61.5
Width (inches)	120-144	N/A	/ N/A	144.125	144.125
Height (inches) (Top of Turret Roof)	90-95	N/A	/ N/A	93.5	93.5
Armament		N/A	/ N/A		
Main Armament (Cannon) (mm)	105-120	N/A	/ N/A	105	105
Coaxial MG (mm)	7.62	N/A	/ N/A	7.62	7.62
Commander's MG (cal)	.50	N/A	/ N/A	.50	.50
Loader's MG (mm)	7.62	N/A	/ N/A	7.62	7.62
Engine Horsepower (hp)	1500	N/A	/ N/A	1500	1500

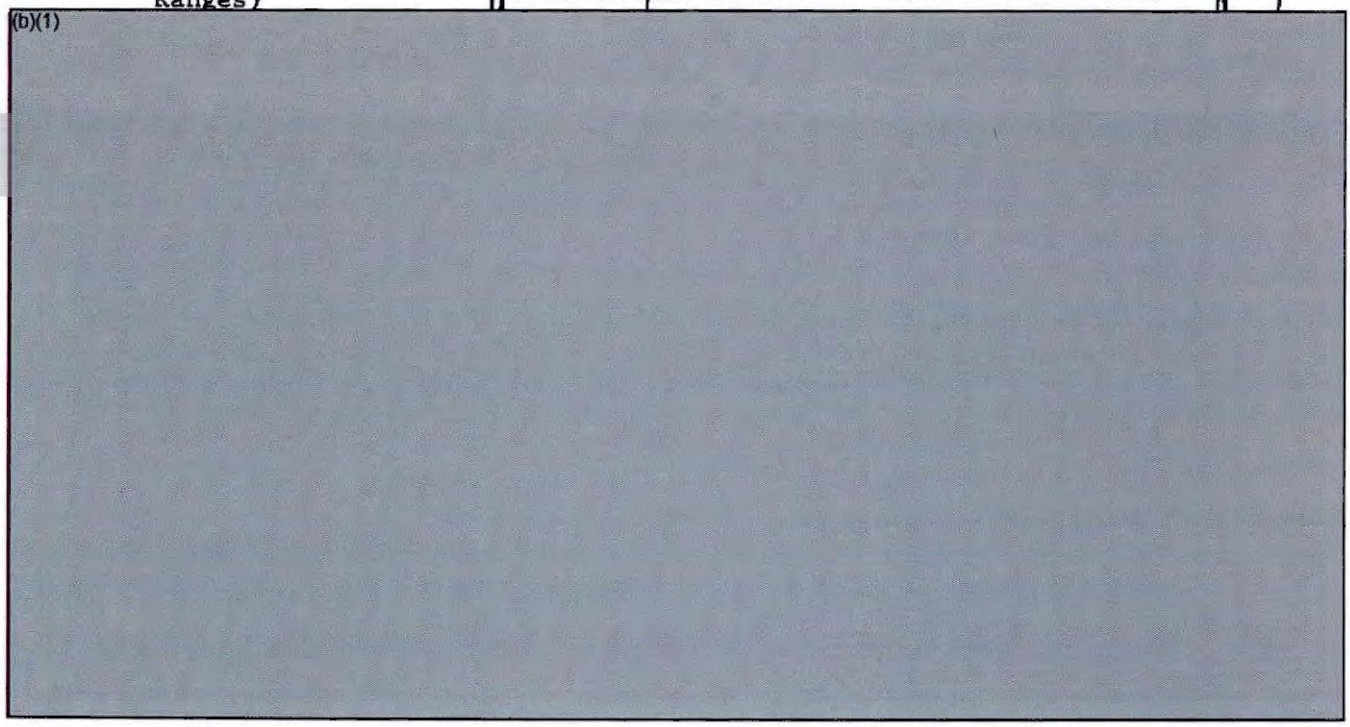
10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Acceleration (seconds) Hard Surface 0% slope 0-20 mph Tactical Idle	6.0	N/A	/ N/A	5.8	7.0
Speed: Level Terrain X-Country (mph) Sustained	30.0	N/A	/ N/A	31.6	30.0
Cruising Range (miles)	275-325	N/A	/ N/A	310	310
Hit Probability, KE RD, 500M, DT III Test Conditions (%)		N/A	/ N/A	[redacted]	[redacted]
(b)(1) [redacted]					
Combat Mission Reliability	360	N/A	/ N/A	372	385
System Maintainability (Maintenance Ratio)	1.00	N/A	/ N/A	1.22	1.18
Power Train Durability (Probability of 4,000 Miles)	.67	N/A	/ N/A	.66	.66
M1A1					
Max Width (inches)	N/A	144	/ 144	143.7	144.0
Max Height (inches) ground to ctr of turrent roof)	N/A	96	/ 96	96.0	96.0
Max Combat Weight (tons)	63.0	67.5	/ 69.5	67.59	67.59
Min. Range (miles): Paved Roads (0% Slope)					
With NBC	257-279	257	/ 243	293	278
Without NBC	270-289	270	/ 256	310	294
Max Speed (MPH):					
Paved Roads (0% Slope)	41.5	41.5	/ 41.5	41.5	41.5
Cross Country	30	30	/ 30	30.0	30.0

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Acceleration (0-20 MPH) (max sec) Paved Roads (0% Slope)					
With NBC	7.5	7.5	/ 9.0	7.1	7.5
Without NBC	7.2	7.2	/ 9.0	6.8	7.2
Combat Mission Reliability (Mean Miles Between Failure) (MMBF)	298	360	/ 320	403	360
System Maintainability (Max. Maint. Ratio)	1.40	1.04	/ 1.25	1.04	1.25
Air Transportability	C5A	C5A,C17	/ C5A,C17	C5A	C5A,C17
Track Life (Miles)	670	2000	/ 1000	2600	2600
Average 1st Round Hit Probabilities (Round/Condition/ Ranges)					

(b)(1)



10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
(b)(1)					
Power Train Durability (Probability of Achieving 4000 miles)	.50	N/A	/ N/A	.63	.50
Vehicle Life (Miles Prior to Hull & Turret Structure Being Reparable at Depot)	6000	N/A	/ N/A	6000	6000
Weapon Tube Life (rnds)	500	N/A	/ N/A	500	500
Sprocket Life (miles)	1500	N/A	/ N/A	2078	1900
Road/Idler Wheel Durability (% Replacement in 3000 Miles)	19.0	N/A	/ N/A	3.2	5.0
M1A2					
Max Width (inches)	N/A	144	/ 144	N/A	144.0
Max Height (inches) grnd to center of turret roof)	N/A	96	/ 96	N/A	96.0
Max Combat Weight (tons)	N/A	68.5	/ 69.5	N/A	68.75
Min. Range (miles):					
Paved Roads					
With NBC	N/A	257	/ 243	N/A	243
Without NBC	N/A	270	/ 256	N/A	256
Maximum Speed (MPH):					
Paved Roads (0% Slope)	N/A	41.5	/ 41.5	N/A	41.5
Cross Country	N/A	30	/ 30	N/A	30.0
Acceleration (0-20 MPH) (sec) Paved Roads (0% slope)	N/A				
With NBC	N/A	7.5	/ 9.0	N/A	7.5
Without NBC	N/A	7.2	/ 9.0	N/A	7.2

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Combat Mission Reliability (Mean Miles Between Failure) (MMBF)	N/A	360	/ 320	N/A	360
System Maintainability (Maint Ratio)	N/A	1.04	/ 1.40	N/A	1.40
Track Life (Miles)	N/A	2000	/ 1000	N/A	2600
Air Transportability	N/A	C5A,C17	/ C5A,C17	N/A	C5A,C17
Fightability					
Improved Commander's Weapon Station Visibility -- Improvement over M1A1 (%)	N/A	40	/ 25	N/A	25
Location Determination (% of dist. traveled)	N/A	+/- 2	/ +/- 3	N/A	+/- 3
Heading Error (After 1 hr) (deg - RMS)	N/A	+/- 1	/ +/- 3	N/A	+/- 3
Testability: Built-In Test (BIT) (%)					
On-Board System Level Detection Capability	N/A	95	/ 95	N/A	95
LRU Fault Isolation Capability	N/A	95	/ 90	N/A	90
Max. False Alarm	N/A	5	/ 10	N/A	10

(b)(1) [redacted]

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

b. [redacted] Previous Change Explanations --

M1:
Engineering changes and allowances for each item in the combat load increased the basic M1 weight from 60.28 to 61.5 tons. Height was measured at 93.5 inches during M1 DT/OT. Added weight increased acceleration time from 6.0 to 7.0 seconds. The current estimates for speed and hit probabilities were demonstrated during DT III. The cruising range was verified by Comparison Production Tests. Maturation of tank production processes improved both combat mission reliability and system maintainability. System availability -- not a DCP requirement -- was deleted.

M1A1:
M1A1 technical/operational characteristics were first introduced in

10b. (U) Performance Characteristics (Cont'd):
the December 31, 1986 SAR. Allowances for each item in the combat load, as well as, engineering changes (such as the T-158 track and certain survivability enhancements) increased the weight of the basic M1A1 from 63.0 to 67.59 tons. Performance demonstrated during IPT with a 63.4 ton vehicle was adjusted downward to reflect the impact of a heavier vehicle and five areas were affected: 1) range declined from 293 to 278 miles (with NBC equipment installed) and from 310 to 294 miles (without NBC); 2) combat mission reliability went from 403 down to 360 MMBF; 3) system maintainability (in terms of maintenance ratio) went from 1.04 up to 1.25 maintenance hours per operational hour; 4) sprocket life deteriorated from 2,078 miles down to 1,900 miles; and 5) road/idler wheel durability went from 3.2 up to 5.0 percent replacement after 3,000 miles. Based on a second power train durability test, the probability of achieving 4,000 miles without a major incident was estimated to be 50 percent -- the same as the requirement established for a much lighter vehicle. In the absence of a formal Independent Evaluation Report (IER), the current estimates for first round hit probability were supported by preliminary results obtained from TECOM in May 1989. Transportability by the C17 aircraft was added in the December 31, 1989 SAR. Track life increased to 2,600 miles based on T-158 track certification results achieved in 1990.

M1A2:
M1A2 performance characteristics were first introduced in the December 31, 1989 SAR. The approved program and the current estimates take into account the configuration changes resulting from the special ASARC held on March 21, 1990. Two survivability enhancements and the carbon dioxide laser rangefinder were dropped from the M1A2 program.

c. (U) Current Change Explanations --

M1A1: None.

M1A2: None.

d. (U) References --

(U) Development Estimate:
M1A1: DCP #117A, May 24, 1978.

M1A2: DCP, April 26, 1989.

(U) Approved Program:
AAE approved Acquisition Program Baseline dated 15 Nov 91.

11. ([redacted]) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. ([redacted]) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	1128.0	2178.2	2117.3
Procurement	5604.5	20908.8	20935.1
Primary Vehicle/105mm Gun	(5229.2)		(7817.5)
Primary Vehicle/120mm Gun	(0.0)		(9637.1)
Total Rollaway	(5229.2)		(17454.6)
Primary Vehicle/120mm Gun	(176.7)		(1962.4)
Total Other Wpn Sys	(176.7)		(1962.4)
Peculiar Support	(0.0)		(419.2)
Initial Spares	(198.6)		(1098.9)
Construction (MILCON)	0.0	34.9	30.5
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	6732.5	23121.9	23082.9
Escalation	-1953.1	-2476.8	-2511.9
Development (RDT&E)	(-543.4)	(-633.7)	(-641.4)
Procurement	(-1409.7)	(-1841.8)	(-1868.0)
Construction (MILCON)	(0.0)	(-1.3)	(-2.5)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	4779.4	20645.1	20571.0

b. ([redacted]) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	3312	7789	7822
Total	3312	7789	7822

Total quantities are categorized as follows:

	Development Estimate	Approved Program	Current Estimate
Procurement			
Primary Veh/105mm Gun	3312	3268	3268
Primary Veh/120mm Gun	0	4521	4554
Total	3312	7789	7822

There are 13 RDT&E prototypes that are not considered fully configured end items.

c. ([redacted]) Foreign Military Sales --

Customer	Case	Description of Items or Services	End Item Quantity	Case Value (Millions)
Egypt	NER	Intensive Management Office	N/A	17.0
Egypt	NEP	Manufacturing Technical	N/A	187.5

11c. (U) Total Program Cost and Quantity (Cont'd):

		Assistance		
Egypt	NES	Facilitization	N/A	154.4
Egypt	UKJ	Tanks, Spare Parts, and Field Support	10	263.5
Egypt	NEM	Production Hardware		1,611.4
		M1A1s	15	
		M1A1 Kits	530	
Egypt	NET	120mm Cannon and Gun Mount-Watervliet Arsenal	N/A	73.4
Egypt	NEQ	Technical Data Package	N/A	0.1
Egypt	UJZ	Rock Island Arsenal	N/A	1.2
Egypt	DCN	TRADOC	N/A	3.6
Saudi Arabia	VKZ	M1A2 Tanks & Associated Support Items	465	5,891.4

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
M1A1: DCP #117A, May 24, 1978.

M1A2: DCP, April 26, 1989.

(U) Approved Program:
AAE approved Acquisition Program Baseline dated 15 Nov 91.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	20571.0	20549.4	20571.0
(2) Quantity	7822	7789	7822
(3) Unit Cost	2.630	2.638	2.630

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	114.6	114.6	76.4
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	114.6	114.6	76.4
(2) Quantity	18	18	0
(3) Unit Cost	6.367	6.367	N/A

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	584.6	4194.8	0.0	4779.4
Previous Changes:				
Economic	-46.3	-883.3	-	-929.6
Quantity	-	+8061.6	-	+8061.6
Schedule	-	+804.7	-	+804.7
Engineering	+505.5	+987.0	-	+1492.5
Estimating	+306.5	+6060.8	+33.6	+6400.9
Other	-	-	-	-
Support	+98.5	-158.6	-	-60.1
Subtotal	+864.2	+14872.2	+33.6	+15770.0
Current Changes:				
Economic	-1.5	-40.9	-0.5	-42.9
Quantity	-	+87.3	-	+87.3
Schedule	-	+1.6	-	+1.6
Engineering	+20.8	+29.8	-	+50.6
Estimating	+7.8	-3218.4	-5.1	-3215.7
Other	-	-	-	-
Support	-	+3140.7	-	+3140.7
Subtotal	+27.1	+0.1	-5.6	+21.6
Total Changes	+891.3	+14872.3	+28.0	+15791.6
Current Estimate	1475.9	19067.1	28.0	20571.0

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1128.0	5604.5	0.0	6732.5
Previous Changes:				
Quantity	-	+8769.5	-	+8769.5
Schedule	-	+103.3	-	+103.3
Engineering	+569.3	+878.0	-	+1447.3
Estimating	+263.9	+5787.2	+34.9	+6086.0
Other	-	-	-	-
Support	+130.4	-233.7	-	-103.3
Subtotal	+963.6	+15304.3	+34.9	+16302.8
Current Changes:				
Quantity	-	+76.1	-	+76.1
Schedule	-	-	-	-
Engineering	+18.7	+26.1	-	+44.8
Estimating	+7.0	-3414.8	-4.4	-3412.2
Other	-	-	-	-
Support	-	+3338.9	-	+3338.9
Subtotal	+25.7	+26.3	-4.4	+47.6
Total Changes	+989.3	+15330.6	+30.5	+16350.4
Current Estimate	2117.3	20935.1	30.5	23082.9

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Engineering: Added 120mm system, Block II improvements, weight reduction, and survivability enhancement efforts.

Estimating: Turbine engine improvements. Revised 120mm system integration effort. Additional expense for contractor and government logistic support to technical and user testing [formerly developmental and operational testing].

Support: Extended M1A1 FSED test support program and additional logistics support of M1A1 DT/OT.

13b. [redacted] Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic:	Revised escalation indices.
Quantity:	Increase from 3,312 to 7,789 tanks.
Schedule:	Lengthened build-up and procurement schedule.
Engineering:	120mm gun, Chemical Agent Resistant Coating (CARC), Reliability, Availability, Maintainability, Durability (RAM-D) investments, optical improvements, and Block II.
Estimating:	Initial production facilities investments. Transmission and final drive savings. Revised estimates for basic vehicle, engine, fire control, other hardware items, and government engineering/product assurance. Additional special projects and test programs.
Support:	Revised estimates for other weapon system costs [non-Rollaway], peculiar support [training devices], and initial spares.

MILCON

Estimating:	Changed to include MILCON in December 31, 1982 SAR. Added requirements for Eighth U.S. Army motor pool facilities in December 31, 1990 SAR.

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	--	-1.5
Block II refinements. (Engineering)	18.7	20.8
Current & Prior Inflation Offset. (Estimating)	1.1	1.3
Historical program adjustment. (Estimating)	5.9	6.5
Total Changes	25.7	27.1

13c. [redacted] Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Adjustment to prior SAR variance analyses; reclassification of Rollaway to Support:		
CREDIT "Support Change". (Support)	3324.4	3119.5
DEBIT "Estimating Change". (Estimating)	-3324.4	-3119.5
Revised escalation indices. (Economic)	--	-40.9
Procurement of 33 more M1A1 tanks. (Quantity)	76.1	87.3
Shift 18 M1A1 tanks from FY91 to FY92. (Schedule)	--	1.6
Block II refinements. (Engineering)	26.1	29.8
Current & Prior Inflation Offset. (Estimating)	31.5	35.1
Historical program adjustments. (Estimating)	-54.0	-56.5
Revised Hardware prices. (Estimating)	-67.9	-77.5
Other Weapon System Costs. (Support)	-0.2	-0.2
Peculiar Support [Training Devices]. (Support)	-13.5	-13.0
Initial Spares. (Support)	28.2	34.4
Total Changes	26.3	0.1
(3) MILCON		
Revised escalation indices. (Economic)	--	-0.5
Current & Prior Inflation Offset. (Estimating)	0.2	0.2
Revised requirements for Eighth U.S. Army. (Estimating)	-4.6	-5.3
Total Changes	-4.4	-5.6

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. [redacted] Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.900	0.580	--	-0.030	-0.090	--	0.063	0.020	0.543	1.443

b. [redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1.443	-0.124	0.210	0.103	0.197	0.407	--	0.394	1.187	2.630

15. [redacted] Contract Information: (Then-Year Dollars in Millions)

a. [redacted] RDT&E --

[redacted] Abrams Block II FSD:

General Dynamics Corp., Warren, MI
DAAE07-89-C-R045, CPIF
Award: December 14, 1988
Definitized: July 31, 1989

Initial Contract Price		
Target	Ceiling	Qty
$187.8	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$185.5	N/A	0	$329.2	$329.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-40.4	$-18.5
Cumulative Variances To Date (11/24/91)	$-70.4	$-15.9
Net Change	$-30.0	$2.6

Explanation of Change:

Although the contractor continued to overspend his budget during 1991, the contract is over 90% complete and the actual monthly expenditure rate is declining. The cost growth is largely due to unforeseen software updates and increased effort for hardware upgrades to the ten M1A2 prototype tanks. Some of the contract scope is not necessary for a U.S. Army Milestone IIIA (limited production

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)
decision) but it is still required to support the sale of 465 M1A2 tanks to the Kingdom of Saudi Arabia (KSA) and achieve the Army goal of proving out the producibility of the M1A2.

b. [redacted] Procurement --

[redacted] Tank Production FY90/91:	Initial Contract Price Target	Ceiling	Qty
General Dynamics Corp., Warren, MI DAAE07-91-C-A037, FFP Award: August 7, 1991 Definitized: August 7, 1991	$646.1	N/A	538

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$646.1	N/A	538	$646.1	$646.1

CPR information is not a requirement on this FFP contract.

[redacted] Engine FY91:	Initial Contract Price Target	Ceiling	Qty
Textron Lycoming, Stratford, CT DAAE07-89-C-A028, FFP Award: September 30, 1991 Definitized: September 30, 1991	$105.2	N/A	240

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$105.2	N/A	240	$105.2	$105.2

CPR information is not a requirement on this FFP contract.

The following contracts have either been replaced by successor contracts or have been deleted because at least 90% of the Army deliveries have been completed:

Tank Prod FY86-90:
GENERAL DYNAMICS CORP., WARREN, MI
DAAE07-85-C-A043

T158 Track FY88-92:
FMC, ANNISTON, AL
DAAE07-88-C-R021

Transmission FY90:
GENERAL MOTORS CORP., INDIANAPOLIS, IN
DAAE07-90-C-A013

Tank Prd LLM FY90/91:
GENERAL DYNAMICS CORP., WARREN, MI

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)
DAAE07-90-C-A005

Engine FY90:
TEXTRON LYCOMING, STRATFORD, CT
DAAE07-89-C-A028

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status --

(1) Percent Program Completed: 80.8% (21 yrs/26 yrs)

(2) Percent Program Cost Appropriated: 98.6% ($20287.5 / $20571.0)

b. [redacted] Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY72-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	1434.5	29.6	11.8	-	1475.9
Procurement	18686.4	114.6	76.4	189.7	19067.1
MILCON	22.4	-	-	5.6	28.0
O&M	-	-	-	-	-
Total	20143.3	144.2	88.2	195.3	20571.0

c. [redacted] Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army								
1972				53.1	20.0	20.0	20.0	
1973				54.8	21.5	21.5	21.5	4.3

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)								
1974				125.8	53.8	53.8	53.8	8.0
1975				138.4	65.0	65.0	65.0	10.9
1976				105.4	52.8	52.8	52.8	6.6
197T				75.5	39.3	39.3	39.3	2.9
1977				187.0	98.6	98.6	98.6	2.6
1978				221.6	125.8	125.8	125.8	6.8
1979				146.1	92.3	92.3	92.3	8.4
1980				99.9	68.7	68.7	68.7	10.6
1981				127.2	96.4	96.4	96.4	10.6
1982				141.0	113.7	113.7	113.7	7.6
1983				81.9	69.0	69.0	69.0	4.9
1984				100.4	87.6	87.6	87.6	3.8
1985				54.5	49.0	49.0	49.0	3.4
1986				24.5	22.7	22.7	22.7	2.8
1987				25.7	24.5	24.5	24.5	2.7
1988				73.0	72.0	72.0	72.0	3.0
1989				101.0	103.6	103.6	103.6	4.2
1990				51.2	54.5	54.5	54.5	4.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)								
1991				93.5	103.7	94.0	73.3	3.9
1992				25.8	29.6	0.2	0.1	3.1
1993				10.0	11.8			3.3
Subtot				2117.3	1475.9	1425.0	1404.2	
Appropriation: 2033 Proc of Weapons & Tracked Combat Veh								
1977		43.7		43.7	21.2	21.2	21.2	
1978		208.0	70.5	313.9	164.8	155.7	155.7	7.1
1979	90	240.5	339.8	662.5	402.4	380.7	380.0	9.0
1980	309	201.8	718.7	1109.1	717.9	652.1	646.6	11.8
1981	569	229.6	1383.5	1872.9	1412.7	1351.6	1329.1	11.6
1982	665	63.4	1453.6	1890.6	1541.4	1458.9	1448.9	14.3
1983	855	118.6	1721.7	2227.0	1960.9	1863.4	1855.5	9.0
1984	840	62.2	1449.6	1893.9	1719.1	1560.0	1541.9	8.0
1985	854	49.0	1717.1	2038.4	1896.3	1886.3	1865.7	3.4
1986	811	5.3	1657.9	1964.3	1887.9	1762.2	1742.5	2.8
1987	810	0.6	1609.8	1869.1	1849.1	1778.9	1732.7	2.7
1988	725		1409.6	1672.6	1730.6	1654.8	1593.7	3.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2033 Proc of Weapons & Tracked Combat Veh (Cont'd)								
1989	555		1143.5	1286.4	1379.5	1338.3	1147.6	4.2
1990	481	82.4	895.8	1163.3	1291.1	1086.9	621.0	4.0
1991	240	83.8	426.3	620.5	711.5	416.9	48.0	3.9
1992	18		58.7	96.8	114.6	8.8		3.1
1993			9.6	62.5	76.4			3.3
1994				94.4	119.2			3.3
1995				34.0	44.3			3.3
1996				10.3	13.9			3.2
1997				8.9	12.3			3.2
Subtot	7822	1388.9	16065.7	20935.1	19067.1	17376.7	16130.1	

Obligations and expenditures for initial spares are not included in the above, since finance and accounting records containing this information are not available to the PM Abrams.

Appropriation: 2050 Military Construction, Army

1980				7.5	5.8	5.8	5.8	
1981								10.6
1982								7.6
1983				10.6	9.4	9.4	9.4	4.9

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2050 Military Construction, Army (Cont'd)								
1984				4.8	4.3	4.3	4.3	3.8
1985				3.1	2.9	2.9	2.9	3.4
1986								2.8
1987								2.7
1988								3.0
1989								4.2
1990								4.0
1991								3.9
1992								3.1
1993								3.3
1994				4.5	5.6			3.3
Subtot				30.5	28.0	22.4	22.4	
Grand Total	7822	1388.9	16065.7	23082.9	20571.0	18824.1	17556.7	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1979	110	90	90	90
1980	352	309	309	309
1981	360	569	569	569
1982	360	665	665	665
1983	360	776	855	855
1984	360	1080	840	1080
1985	360	1080	854	1080
1986	360	1080	811	1080
1987	360	1080	810	1080
1988	330	329	725	1014
1989	N/A	N/A	555	N/A
1990	N/A	N/A	481	N/A
1991	N/A	N/A	240	N/A
1992	N/A	N/A	18	N/A

17b. ([redacted]) Production Rate Data (Cont'd):

b. ([redacted]) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	22822.0	+260.9	23082.9	+916.2	22166.7
(TY $)	19574.2	+996.8	20571.0	+1442.7	19128.3
PAUC Cost (BY $)	3.233	-0.282	2.951	+0.117	2.834
(TY $)	2.773	-0.143	2.630	+0.184	2.445

c. ([redacted]) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	FEB 80	0	FEB 80	N/A	FEB 80
Duration (in MON)	113	46	159	38	121
End Date(MON YY)	JUL 89	46	MAY 93	N/A	MAR 90

d. ([redacted]) Deliveries (Plan/Actual) --

	To Date
RDT&E	13/13
Procurement	7298/7298

e. ([redacted]) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 3312 - @ Peak Rate: 60/mo			
FY 72 Base-Year $	0.6	0.6	0.0
Then Year $	1.2	1.4	0.0
@ Qty 0 (1st three years) - @ Peak Rate: 0/mo			
FY 72 Base-Year $	0.0	0.0	0.0
Then Year $	0.0	0.0	0.0

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The costs in paragraph 18.b. are a re-summarization of the costs for Alternative #2 in the M1A2 Decision Coordinating Paper (DCP) dated April 26, 1989. They are based on a total Abrams procurement objective of 10,421 systems made up of 3,268 M1s, 4,227 M1A1s and 2,926 M1A2s. Vehicle life is assumed to be 20 years and annual operating mileage ranges from 306 for National Guard units up to 960 for certain vehicles in the Training Base. However, some systems which were projected for fielding to POMCUS or War Reserves are assumed to accrue zero annual miles per tank on the philosophy that their operation adds a neglible amount to the total world-wide mileage for the entire fleet. Each active vehicle has four dedicated crew members while no dedicated crew is assumed for all Training Base vehicles. Candidates for depot overhaul are chosen on the basis of Combat Vehicle Evaluation Criteria which are expected to result in a total number of overhauls which is roughly equivalent to one per active tank per 20 year life cycle. There is no antecedent system.

b. [redacted] Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 58 Tank Battalion	Avg Annual Cost Per (Antecedent)
Military Personnel	5.9	N/A
Consumption	4.9	N/A
Depot Maintenance	1.2	N/A
Modifications/Kits	0.3	N/A
Other Direct Support	0.1	N/A
Indirect Support	1.3	N/A
Total	13.7	N/A

18c. (U) Operating and Support Costs (Cont'd):

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	135.1	2.5	2.3	---	139.9
Industrial Fund	---	---	---	---	---
Total	135.1	2.5	2.3	---	139.9

91-032

A-4 AH-64

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AH-64 (APACHE)

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
AH-64A/Advanced Attack Helicopter (Apache)

CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
ADVANCED ATTACK HELICOPTER PM
4300 GOODFELLOW BLVD
ATTN: SFAE-AV-AAH
ST. LOUIS, MO 63120-1798

COL SAMUEL L. DELOACH
Assigned: July 9, 1990
AV 693-1911 COMM (314) 263-1911

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 23744 Project D423
PROCUREMENT:
APPN 2031 ICN AA0968 (Army)
APPN 2031 ICN A06605 (Army)
APPN 2031 ICN AA0951 (Army)
APPN 2031 ICN AA0007 (Army)

Concur in Classification as marked
23 MAR 1992
SECURITY REVIEW, OCSINT, HQDA

[redacted] SCG and TADS/PNVS SCG
Declassify on: 28 Feb 95 [redacted] Determination Reqd
Downgrade Instructions: (Not Subject to Automatic Downgrade)

(THIS PAGE IS [redacted])

[redacted]

91-T-0637

4. (U) Program Elements/Procurement Line Items (Cont'd):

MILCON:
PE 30470, 30630, 23675, 23669, 18631, 23673, 23676

MILCON -PE 30630 and PE 23675 are not funded. PE 16511 is sunk.

PROCUREMENT - Deleted APPN 2031 ICN AA6605 (Army) (Shared) TADS/PNVS Salaries. $1.3M in FY92 and $1.4M in FY93 were added in Dec 90 SAR but not received.

5. (U) Related Programs:
HELLFIRE, 30MM Ammunition, AH-64 Combat Mission Simulator, 2.75" Rockets.

6. (U) Mission and Description:
The AH-64 is a twin engine rotary wing aircraft, designed as a stable, manned aerial weapon system capable of defeating a wide range of targets, including armored vehicles. It provides responsive direct aerial fire as an integral element of the ground units and is capable of performing its mission at night and under adverse weather conditions. It contributes highly mobile and effective firepower to the anti-armor capability of the Army in the field. Aircraft armament includes the Hellfire anti-tank missile system and 30MM automatic gun and 2.75" rockets. This aircraft is the platform for the Target Acquisition Designation Sight/Pilot Night Vision Sensor (TADS/PNVS) which will provide day and night acquisition and designation of targets and hand-off capabilities in support of Hellfire and other guided munitions. Apache's Stage I of a Longbow Apache (LBA) program has been initiated, which substantially improves current capabilities of AH-64A to withstand the projected threat from 1995 to 2005 in close, deep, and rear operations. This modification is portrayed in the Longbow SAR. The AH-64A does not replace another defense system.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
In September 1972, the U.S. Army approved the Advanced Attack Helicopter System. On 22 June 1973, competitive Phase I Development Contracts were awarded to Hughes Helicopter and Bell Helicopter Textron, Inc. On 7 December 1976, the AAH Defense Systems Acquisition Review Council (DSARC) approved the AAH entry into full scale engineering development (Phase 2), and the Secretary of the Army selected Hughes (Model YAH-64) as the Phase 2 prime aircraft systems contractor. The Target Acquisition Designation Sight/Pilot Night Vision Sensor (TADS/PNVS) subsystems were subsequently directed for development as a competitive program, with contracts awarded to Martin Marietta Orlando Aerospace (MMOA) and Northrop Corporation on 10 March 1977. On 30 January 1981 the Army awarded a Long Lead-Time Items (LLTI) contract to MMOA (TADS/PNVS) and on 20 February 1981 to

7a. [redacted] Program Highlights (Cont'd):

Hughes (LLTI for production AH-64s). OT II (Jun-Aug 81) was completed on time at Ft Hunter-Liggett. The Army Systems Acquisition Review Council (ASARC) III was completed on 18 November 1981. The DSARC III, at which initial production of the Apache was approved, was held on 26 March 1982. Production contracts for the first production quantity of 11 aircraft and associated equipment were awarded to Hughes, MMOA, and General Electric in April 1982. McDonnell Douglas Helicopter Company (MDHC) acquired Hughes Helicopter in early 1984. MDHC rolled out the first production vehicle (PV01) on 26 January 1984. The first production lot of Air Vehicles (11 ea) was completed on 20 October 1984. Initial hand-off of Apaches to FORSCOM occurred at Ft. Hood (6th Cavalry Brigade's 7th Squadron, 17th cavalry) on 25 February 1986. First Unit Equipped (FUE) was 10 May 1986. Initial Operational Capability (IOC) was 22 July 1986. First two production Combat Mission Simulators (CMSs) were installed at Fts. Rucker and Hood. Apache Multi-Stage Improvement Program (MSIP) renamed Longbow Apache May 1989.

b. [redacted] Significant Developments Since Last Report --
A total of 700 production Apaches have been delivered through 31 December 1991. Currently, 24 Attack Helicopter Battalions (AHBs) have been fielded and are combat ready - 12 at FORSCOM, 9 at USAREUR, 3 at USARNG. Four battalions are in training. As of 31 December 1991, fielded Apaches had flown approximately 361,000 hours.

The AH-64 system is expected to satisfy the current mission requirement.

c. [redacted] Changes Since As Of Date --
None

8. [redacted] Threshold Breaches:
There are currently no breaches to the Acquisition Program Baseline (APB), dated February 26, 1990. There are no Nunn-McCurdy unit cost breaches.

9. [redacted] Schedule:

a. [redacted] Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone I (DSARC)	SEP 72	N/A	SEP 72
Issue Request for Proposal (RFP)	NOV 72	N/A	NOV 72
Contract Award-Phase I Eng Dev	JUN 73	N/A	JUN 73

9a. ([redacted]) Schedule (Cont'd):

([redacted]) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Mockup Review Completed	MAY 74	N/A	MAY 74
Critical Design Review Completed	MAY 74	N/A	MAY 74
First T700 Engine Delivery	OCT 74	N/A	OCT 74
Initial Grnd Test Vehicle Oper	JUN 75	N/A	JUN 75
First Flight	SEP 75	N/A	SEP 75
DT/OT I Completed	SEP 76	N/A	SEP 76
Milestone II (DSARC)	DEC 76	N/A	DEC 76
Contract Award-Phase 2 Eng Dev	DEC 76	N/A	DEC 76
Competitive TADS Fly-Off Complete	DEC 79	N/A	MAR 80
Long Lead Time Contracts Awarded	JUN 80	FEB 81	FEB 81
OT II Completed	FEB 81	N/A	AUG 81
Milestone III (ASARC)	N/A	NOV 81	NOV 81
Milestone III (DSARC)	MAY 80	MAR 82	MAR 82
First Prod Contract Award (FY82)	OCT 80	APR 82	APR 82
Second Prod Contract Award (FY83)	N/A	NOV 82	NOV 82
Third Prod Contract Award (FY84)	N/A	NOV 83	NOV 83
Prod Verification/Validation Tests			
Start	N/A	JAN 84	JAN 84
Complete	N/A	OCT 87	OCT 87
First Prod Deliveries Start	JUN 82	JAN 84	JAN 84
Fourth Prod Contract Award (FY85)	N/A	NOV 84	NOV 84
Second Prod Deliveries Start	N/A	DEC 84	DEC 84
Fifth Prod Contract Award (FY86)	N/A	NOV 85	NOV 85
Third Prod Deliveries Start	N/A	DEC 85	DEC 85
First Unit Equipped (Initial Deployment) CONUS	N/A	APR 86	APR 86
IOC	MAY 83	JUL 86	JUL 86
First Article Test Complete	N/A	OCT 86	OCT 86
Sixth Prod Contract Award (FY87)	N/A	NOV 86	NOV 86
Fourth Prod Deliveries Start	N/A	NOV 86	NOV 86
Full Rate Prod (12 A/C per month)	N/A	JAN 87	JAN 87
Seventh Prod Contract Award (FY88)	N/A	NOV 87	NOV 87
Fifth Prod Deliveries Start	N/A	JAN 88	JAN 88
First Unit Equipped (USAREUR)	N/A	FEB 88	FEB 88
Contract Award (Preliminary MSIP Design AH-64)	N/A	AUG 88	AUG 88
Contract Award (Preliminary MSIP Design TADS/PNVS)	N/A	SEP 88	SEP 88

9a. ([redacted]) Schedule (Cont'd):

([redacted]) Milestones (Cont'd) --

	Development Estimate	Approved Program	Current Estimate
Sixth Prod Deliveries Start	N/A	DEC 88	DEC 88
Eighth Prod Contract Award (FY89)	N/A	DEC 88	DEC 88
AH-64 MSIP Program Review-DA	N/A	MAY 89	JUL 89
Seventh Prod Deliveries Start	N/A	NOV 89	NOV 89
Ninth Prod Contract Award (FY90)	N/A	NOV 89	APR 89
Eighth Prod Deliveries Start	N/A	JUL 90	JUL 90
Tenth Prod Contract Award (FY91)	N/A	NOV 90	NOV 90
Ninth Prod Deliveries Start	N/A	JUL 91	JUL 91
Tenth Prod Deliveries Start	N/A	JUL 92	SEP 92
Final Prod Delivery	N/A	SEP 93	OCT 93
Last Unit Equipped (LUE)	N/A	FEB 94	FEB 94

b. ([redacted]) Previous Change Explanations --

The development estimate reflected a 50-month schedule with a LLTI award in June 1980. The current estimate reflects a 56-month schedule for completion of Operational Test II with a LLTI contract in February 1981 and a production decision in March 1982. Complete single rather than split operational testing permitted deletion of OT IIa and completion of EDT 5 in January 1981 rather than June 1981. DSARC III Prod Decision, LLTI Contract Award, First Production Delivery, and Initial Operational Capability delayed due to program restructuring. First Production Delivery reflects actual delivery. Prior to Dec 85, IOC dates were FUE. Contract schedule change due to program restructuring and incorporation of Stage I of MSIP. Decrease procurement quantity eliminates Eleventh and Twelfth Prod Contract and Award, changes Final Prod Delivery from May 95 to Sep 93 and revises LUE from Sep 95 to Feb 94.

c. ([redacted]) Current Change Explanations -- None.

d. ([redacted]) References --

([redacted]) Development Estimate:
Dep Sec Def Memo, January 5, 1977, subject: "Advanced Attack Helicopter (AAH) DSARC II."

([redacted]) Approved Program:
AAE Approved Acquisition Program Baseline dated 26 February 1990.

10. (U) **Performance Characteristics:**

a. (U) Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate	
Vertical Rate of Climb (ft/min) Prime Msn Config	450-500	1007 / 450	917	801	(CH-1)
Primary Mission Gross Weight (PMGW) (lbs) w/8 HELLFIRE missiles & 320 rounds 30MM	13910	N/A / N/A	14660	14780	(CH-2)
Cruise Airspeed (knots) Prime Msn Config	145-175	148 / 145	145	145	(CH-3)
Primary Mission Endurance (hrs) Prime Msn Config	1.83	1.83 / 1.83	1.83	1.83	
Alternate Mission Endurance (hrs) Prime Msn Config	2.5-2.8	2.5 / 2.5	2.5	2.5	
Ordnance Load Prime Msn Config					
HELLFIRE (no.)	N/A	16 / 8	8	8	(CH-4)
30mm Rounds	N/A	1200 / 320	320	320	(CH-4)
(b)(1) [redacted]					
Maintainability (AVUM/AVIM maint man hours/flight hour)	8-13	4.01 / 13	4.4	4.4	(CH-5)
Mission Reliability (MTBF)	19.5	20.7 / 19.5	24.2	24.2	(CH-5)
System Reliability (MTBF)	N/A	4.0 / 2.8	6.6	6.6	(CH-5)
Operational Availability (%)	N/A	62 / 62	.73	.78	
TADS System Reliability (MTBF)	N/A	125 / 63	212.5	212.5	(CH-5)

10a. (U) **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate	
PNVS System Reliability (MTBF)	N/A	219 / 160	390	390	(CH-5)
Maximum Mission Gross Weight (lbs)	N/A	15200 / 15200	15200	15200 1/	

(b)(1)

1/ Calculated maximum weight at which aircraft can achieve primary mission performance parameters.

b. (U) Previous Change Explanations --

Technical characteristics portray current estimate for production aircraft. VROC reflects incorporation of T700-GE-701 engine in production vehicles. Weapon accuracy reflects demonstrated performance during Armament Fire Control Demonstrations. TADS/PNVS System Reliability (MTBF) changes to reflect latest RAM/Log data. Target Detection, Recognition, Designation, Mission Reliability (MTBF), AVUM/AVIM Direct Maintenance MMH per FH and Operational Availability changed to reflect most recent test data available. PMGW reflects current specification value and VROC has been corrected.

c. (U) Current Change Explanations --

(Ch-1) VROC Prime Msn Config changed from 780 to 801 due to latest specifications and empirical test data.

(Ch-2) Primary Mission Gross Weight (PMGW) lbs w/8 HELLFIRE missiles & 320 rounds 30MM changed from 14815 to 14780 due to latest specification value consistent with fielded aircraft.

(Ch-3) Cruise Airspeed (Knots) Prime Msn Config changed from 146 to 145 to reflect latest empirical test data.

(Ch-4) Ordnance Load Prime Msn Config HELLFIRE changed from 16 to 8 and 30MM rounds changed from 1200 to 320 to correct reporting error.

(Ch-5) Maintainability (AVUM/AVIM) Maintenance Man hours/flight hours changed from 3.2 to 4.4, Mission Reliability (MTBF) changed from 20.9 to 24.2, System Reliability (MTBF) changed from 3.2 to 6.6, TADS System Reliability (MTBF) changed from 126 to 212.5 and PNVS System Reliability (MTBF) changed from 253 to 390.0 to reflect final

10c. (U) **Performance Characteristics (Cont'd)**:
scoring of AH-64 RAM LOG Follow-on Assessment at Ft. Hood, Texas.

d. (U) References --

(U) **Development Estimate**:
Dep Sec Def Memo, January 5, 1977, subject: "Advanced Attack Helicopter (AAH) DSARC II."

(U) **Approved Program**:
AAE Approved Acquisition Program Baseline dated 26 February 1990.

11. (U) **Total Program Cost and Quantity**: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	609.4	818.4	731.3
Procurement	1283.0	3158.7	3143.2
Aircraft	(998.0)		(2457.6)
HF Launcher (APA)	(0.0)		(19.1)
HF Launcher (other)	(15.4)		(5.5)
Total Flyaway	(1013.4)		(2482.2)
Other Weapon System	(132.3)		(367.5)
Total Other Wpn Sys	(132.3)		(367.5)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(137.3)		(293.5)
Construction (MILCON)	0.0	36.0	32.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 72 Base-Year $	1892.4	4013.1	3906.5
Escalation	1897.4	7950.0	7841.6
Development (RDT&E)	(326.3)	(661.0)	(495.6)
Procurement	(1571.1)	(7222.6)	(7275.6)
Construction (MILCON)	(0.0)	(66.4)	(70.4)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	3789.8	11963.1	11748.1

b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	536	807	811
Total	536	807	811

The Program Acquisition Unit Cost (PAUC) for the UCR Baseline SAR has been revised to exclude nine R&D units that are not planned to be part of the inventory objective. Such R&D units are not considered fully configured end items for the purpose of this calculation.

11c. (U) Total Program Cost and Quantity (Cont'd):

c. (U) Foreign Military Sales --
Completed FMS Case
Federal Republic of Germany 25.0M

One primary FMS case with the Federal Republic of Germany for three TADS/PNVS systems, IHADSS and related equipment for PAH-2 helicopter. Two additional FMS cases for developmental work and transfer of data related to the primary FMS case were completed.

Active FMS cases:

Government of Israel, Case IS-B-XZN	246.7M
Government of Egypt, Case EG-B-ULB	450.8M
Government of Saudi Arabia, Case SR-B-JBN	330.0M
United Arab Emirates, Case TC-B-JAH	472.0M
Government of Greece, Case EG-B-ULB	330.0M

In March 1990, Israel entered into an FMS case for 18 APACHEs and support equipment. Deliveries were completed in March 1991. Value of the case is $246.7M. In August 1990, Egypt signed an FMS case for 24 Apaches to include support, facilities, and training devices. Aircraft delivery is scheduled to begin January 1994 with completion in June 1994. Value of the case is $450.8M. The Saudi Arabia case was implemented January 3, 1991 for 12 Apaches and support. Delivery of the first 6 aircraft was scheduled for January 1992 but has slipped to September 1992 due to requested avionics modifications. The balance is scheduled for delivery in January 1993. The value of the case is $330.0M. The United Arab Emirates case was implemented 9 December 1991 for 20 Apaches. Diversion of the first six aircraft is scheduled for July 1993. Estimated delivery schedule for the remaining 14 is September 1994. The value of the case is $472.0M. The Greece case was signed 24 December 1991 for 12 Apaches with an option for 8 additional. Deliveries are estimated to begin in February 1995. The value of the case is approximately $330.0M.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
Dep Sec Def Memo, January 5, 1977, subject: "Advanced Attack Helicopter (AAH) DSARC II."

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 26 February 1990.

12. ([redacted]) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. ([redacted]) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	11748.1	11693.3	11748.1
(2) Quantity	811	807	811
(3) Unit Cost	14.486	14.490	14.486
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	133.9	133.9	149.5
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	133.9	133.9	149.5
(2) Quantity	4	4	0
(3) Unit Cost	33.475	33.475	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	935.7	2854.1	0.0	3789.8
Previous Changes:				
Economic	+28.4	+705.7	-7.3	+726.8
Quantity	-	+1417.8	-	+1417.8
Schedule	+200.4	+407.2	-	+607.6
Engineering	+61.9	+194.2	-	+256.1
Estimating	+207.0	+3189.5	+128.3	+3524.8
Other	-238.9	-	-	-238.9
Support	+32.4	+1576.9	-	+1609.3
Subtotal	+291.2	+7491.3	+121.0	+7903.5
Current Changes:				
Economic	-0.1	-16.3	-2.2	-18.6
Quantity	-	+35.8	-	+35.8
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.1	+67.8	-16.4	+51.5
Other	-	-	-	-
Support	-	-13.9	-	-13.9
Subtotal	-	+73.4	-18.6	+54.8
Total Changes	+291.2	+7564.7	+102.4	+7958.3
Current Estimate	1226.9	10418.8	102.4	11748.1

13a. ([redacted]) Cost Variance Analysis (Cont'd):

a. ([redacted]) Summary -- (FY 1972 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	609.4	1283.0	0.0	1892.4
Previous Changes:				
Quantity	-	+532.7	-	+532.7
Schedule	+94.6	+46.2	-	+140.8
Engineering	+27.6	+62.4	-	+90.0
Estimating	+63.3	+800.6	+36.6	+900.5
Other	-80.9	-	-	-80.9
Support	+17.4	+395.0	-	+412.4
Subtotal	+122.0	+1836.9	+36.6	+1995.5
Current Changes:				
Quantity	-	+8.9	-	+8.9
Schedule	-	-	-4.6	-4.6
Engineering	-	-	-	-
Estimating	-0.1	+18.0	-	+17.9
Other	-	-	-	-
Support	-	-3.6	-	-3.6
Subtotal	-0.1	+23.3	-4.6	+18.6
Total Changes	+121.9	+1860.2	+32.0	+2014.1
Current Estimate	731.3	3143.2	32.0	3906.5

b. ([redacted]) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices. Corrects economic error Dec 89.

Schedule: Phase 2 sched adjustment (56 mos); 3 mos sustaining prog effort; accidental crash of prototype.

Engineering: Correction of technical difficulties in tail section; addition of Optical Improvement Program.

Estimating: Application of revised FY 80-72 deflators; approval of OSD historical indices through Jan 83; withdrawal of funds by AMC for development of TPS for depot support which will remain with the contractor. Congressional/Gramm Rudman cuts and reprogramming actions. Reprogrammed funding for

13b. [redacted] Cost Variance Analysis (Cont'd):

Optical Improvement Program. Addition of Multistage Improvement Program. Removal of non-Apache related Black Program, change in OSD Historical Deflators and addition of composite factors for prior years. Current and prior offset to economic error in escalated dollars only.

Other: Delete LBA program from Apache SAR.

Support: SPA, obscurant tests; increased log support for OT II testing: FY 82-84 budget cuts.

PROCUREMENT

Economic: Revised escalation indices. Corrects economic error Dec 89.

Quantity: Reduction of 90 aircraft (from 536 to 446); increase of 69 additional helicopters (446 to 515); increase of 160 aircraft (515 to 675); reduction of 82 aircraft (675 to 593); increase of 82 aircraft (593 to 675); increase of 300 aircraft (675 to 975); reduction of 168 aircraft (975 to 807).

Schedule: BLACKHAWK sched extension; AAH sched extension to accommodate LLTI; early year program slips; revision to max rate (12/mo); additional tooling for accelerated (515 A/C) schedule. Movement of 6 Acft from FY 85 to 88.

Engineering: Incorp of T700-GE-701 engine; transfer of HELLFIRE Launcher costs from HELLFIRE SAR; addition of Optical Improvement Program (OIP). Additional Airborne Target Handover System (ATHS) work; incorporation of ATHS, Blue/Green lighting, OIP, Wirestrike Protection System and Integrated Flight Information Data System modifications.

Estimating: Nov 77 BCE; T700-GE-700 cost increases, DTC review impacts; revised prog estimates resulting from 1979 reviews; DTC/BCE/final assembly and electrical work; application of reserve for additional quantity; use of OSD historical inflation indices on base year $; changes applicable to increase of 160 aircraft; changes applicable to HF missile launcher funds decrease due to competitive procurement; labor and overhead rates; failure to achieve multiyear procurement savings; changes applicable to increase of 82 aircraft and period of performance; movement of 6 aircraft from FY85 to 88; changes applicable to increase of 300 aircraft; changes applicable to decrease of 168 aircraft and period of performance. Changes applicable to budgetary adjustments. Corrects current and prior years inflation offsets and errors. Increased

13b. [redacted] Cost Variance Analysis (Cont'd):

system program management for PSS through negotiation and final deliveries.

Support: Reduction of initial spares rqmts; new rqmts (Alt Msn Eqp, GSE, Cmd Spt); installation of support eqpt and assoc data and training; sched revisions; cost of kits; FAT; PDSSP, bigger training base; increase to support additional (69) helicopters; addition of HELLFIRE (HF) support costs; support of 160 additional aircraft; HF missile launcher funds increase due to acft qty increase. Revised spares definition. Support of 82 additional aircraft; additional ATHS effort; support of additional 300 aircraft; funding of Flight Simulator and Procedures Training Devices. Decrease of Special Mission Kits, ASE Suites, Ground Spt Equipment and Spares as a result of smaller fleet size (807 vs 975). Decrease of Special Mission Kits, ASE Suites, Ground Spt Equipment, Trainers and Spares ae a result of Budgetary Adjustments. Added Total Package fielding, PMO salaries and increased spares funding. Reduced production support to reflect FY89-91 actuals, and new estimate of cost to complete deliveries through FY93. Delete from A09000 funded portion of CMS (FY89), trainers (FY90) and cancel funded Combat Weapons Emergency Procedures Trainers (FY91).

MILCON

Economic: Revised escalation indices. Corrects economic error Dec 89.

Estimating: Reidentification of system peculiar construction projects into APACHE SAR. Decrease due to deletion of FY92 system specific construction projects for APACHE. Corrects prior years inflation offset.

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	-0.1
Current and prior year inflation offset. (Estimating)	-0.1	0.1
Total Changes	-0.1	--

13c. [redacted] Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices. (Economic)	N/A	-16.3
Current and Prior Year Inflation Offset. (Estimating)	4.3	16.3
Increase of four Desert Storm Replacement Aircraft in FY92. (Quantity)	8.9	35.8
Increase of 4 Desert Storm Replacement Aircraft in FY92 (Incr Flyaway Cost for Prog Sys Spt, GFE & Recurring Cost.) (Estimating)	3.9	15.6
Increase Flyaway Cost in FY90, for Prog Sys Spt, GFE and Recurring Cost. (Estimating)	15.5	58.2
Decrease in Flyaway Cost for Program Systems Support in FY91. (Estimating)	-5.7	-22.3
Increase in Spares in FY93. (Support)	2.2	9.1
Decrease in Spares in FY94 (Support)	-0.6	-2.7
Increase in Salaries in FY95. (Support)	0.2	0.8
Decrease in Salaries in FY96 and FY97. (Support)	-0.1	-0.3
Decrease in Weapons Sys Cost in FY90 for Ground Spt Equip, ASE and Training. (Support)	-17.4	-71.8
Increase in Weapons System Cost in FYs 91 - 94 for Product Support. (Support)	12.1	51.0
Total Changes	23.3	73.4
(3) MILCON		
Revised escalation indices. (Economic)	N/A	-2.2
Current and prior year inflation offset (Estimating)	0.5	2.2
Projects 23675 and 30630 not funded. (Estimating)	-5.1	-18.6
Total Changes	-4.6	-18.6

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
7.071	0.873	-0.605	0.749	0.316	4.410	-0.295	1.967	7.415	14.486

15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a.([redacted]) Procurement --

[redacted] P7PLUS UP;P8,9,10 AF/PSS:

	Initial Contract Price		
	Target	Ceiling	Qty
MCDONNELL DOUGLAS, MESA, AZ DAAJ09-89-C-A003, FFP	$105.1	N/A	82

Award: N/A
Definitized: August 31, 1989

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1931.5	N/A	256	$1931.5	$1931.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and performance reporting is not required for this FFP contract.

Contract includes P7 plus-up, P8 & P9 follow-on (P10) and FMS for AF and PSS. (214 Army, 42 FMS) Israeli option for three aircraft was added and settlement for FY91 and FY92 PSS contract.

[redacted] T700-GE-701C ENGINES:

	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL ELECTRIC, LYNN, MA DAAJ09-88-C-A084, FFP MY	$64.8	N/A	147

Award: N/A
Definitized: June 17, 1988

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$251.4	N/A	541	$251.4	$251.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and performance reporting is not required for this FFP contract.

Target Price has $23.4M (Israel), $25.6M (Egypt) and $12.4M (Saudi) FMS for engines. Added FMS engines to contract deliveries.

[redacted] TADS/PNVS LOT 8 & 9 HDW:
MARTIN MARIETTA, ORLANDO, FL
DAAJ09-89-C-A017, FFP
Award: N/A
Definitized: March 10, 1989

Initial Contract Price		
Target	Ceiling	Qty
$87.9	N/A	132

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$180.7	N/A	132	$180.7	$180.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and performance reporting is not required for this FFP contract.

The Target Price on this contract was reduced; $15.6M was added to DAAJ09-90-A022, TADS/PNVS Lot 10 Hardware.

[redacted] LOG SPT & HDWE P8,P9:
MCDONNELL DOUGLAS, MESA, AZ
DAAJ09-89-C-A004, FFP
Award: N/A
Definitized: January 27, 1989

Initial Contract Price		
Target	Ceiling	Qty
$70.3	N/A	N/A

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$70.3	N/A	N/A	$70.3	$70.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and performance reporting is not required for this FFP contract.

[redacted] TADS/PNVS LOT 10 HDWE:
MARTIN MARIETTA, ORLANDO, FL
DAAJ09-90-C-A022, FFP
Award: N/A
Definitized: December 6, 1990

Initial Contract Price		
Target	Ceiling	Qty
$235.6	N/A	119

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$235.6	N/A	119	$235.6	$235.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and performance reporting is not required for this FFP contract.

Added Contract DAAJ09-90-C-A022. The total cost of this contract includes $15.6M from DAAJ09-89-C-A017.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status --

(1) Percent Program Completed: 80.0% (20 yrs/25 yrs)

(2) Percent Program Cost Appropriated: 97.4% ($11447.5 / $11748.1)

16b. ([redacted]) Program Funding Summary (Cont'd):

b. ([redacted]) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY73-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	1226.9	-	-	-	1226.9
Procurement	10030.7	133.9	149.5	104.7	10418.8
MILCON	53.0	3.0	-	46.4	102.4
O&M	-	-	-	-	-
Total	11310.6	136.9	149.5	151.1	11748.1

c. ([redacted]) Annual Summary --

Fiscal Year	Qty	Flyaway FY72 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1972								
1973				18.6	20.0	20.0	20.0	4.4
1974				42.0	49.1	49.1	49.1	8.0
1975				47.4	60.8	60.8	60.8	11.0
1976				54.0	73.9	73.9	73.9	6.6
197T				12.6	17.9	17.9	17.9	2.9
1977				90.7	130.8	130.8	130.8	2.6
1978				107.2	166.4	166.4	166.4	6.8

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY72 Dollars Nonrec	Flyaway FY72 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1979				103.9	179.4	179.4	179.4	8.4
1980				93.6	176.0	176.0	176.0	10.6
1981				83.4	172.8	172.8	172.8	10.6
1982				41.6	91.7	91.7	91.7	7.6
1983				9.6	22.1	22.1	22.1	4.9
1984				9.2	22.0	22.0	22.0	3.8
1985				10.1	24.9	24.9	24.9	3.4
1986				5.2	13.3	13.2	13.2	2.8
1987								2.7
1988				2.2	5.8	5.8	5.8	3.0
Subtot				731.3	1226.9	1226.8	1226.8	
Appropriation: 2031 Aircraft Procurement, Army								
1981		20.3		23.7	61.2	61.2	61.2	11.6
1982	11	85.1	71.6	196.6	545.7	545.7	545.7	14.3
1983	48	65.5	152.8	304.8	909.7	909.7	909.7	9.0
1984	112	69.2	280.7	441.2	1354.1	1354.1	1351.2	8.0
1985	138	50.0	309.7	451.5	1428.8	1428.8	1427.7	3.4

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY72 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2031 Aircraft Procurement, Army (Cont'd)								
1986	116	46.7	246.8	370.9	1212.9	1212.9	1212.9	2.8
1987	101	47.1	208.9	327.3	1094.6	1094.6	1080.6	2.7
1988	77	50.8	148.4	243.6	852.0	852.0	835.8	3.0
1989	72	38.3	175.4	267.4	978.8	978.8	929.6	4.2
1990	132	74.8	279.0	399.9	1504.5	1487.5	680.0	4.0
1991		15.1		22.7	88.4	60.2	20.6	3.9
1992	4	10.7	12.9	33.3	133.9	31.0		3.1
1993		22.4		36.0	149.5			3.3
1994				21.5	92.1			3.3
1995				1.1	5.0			3.3
1996				0.8	3.5			3.2
1997				0.9	4.1			3.2
Subtot	811	596.0	1886.2	3143.2	10418.8	10016.5	9055.0	
Appropriation: 2050 Military Construction, Army								
1983				3.4	8.7	8.7	8.7	4.9
1984				1.2	3.1	3.1	3.1	3.8

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY72 Dollars Nonrec	Flyaway FY72 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2050 Military Construction, Army (Cont'd)								
1985				5.8	15.6	15.6	15.6	3.4
1986				2.5	6.9	6.9	6.9	2.8
1987				1.3	3.7	3.7	3.7	2.7
1988								3.0
1989				4.9	15.0	15.0	15.0	4.2
1990								4.0
1991								3.9
1992				0.9	3.0			3.1
1993								3.3
1994								3.3
1995				3.5	13.0			3.3
1996				5.5	21.4			3.2
1997				3.0	12.0			3.2
Subtot				32.0	102.4	53.0	53.0	
Grand Total	811	596.0	1886.2	3906.5	11748.1	11296.3	10334.8	

17. ([redacted]) **Production Rate Data:**

a. ([redacted]) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1982	14	11	11	11
1983	78	48	48	48
1984	96	112	112	112
1985	96	144	138	138
1986	96	144	116	116
1987	96	56	101	101
1988	60	0	77	77
1989	0	0	72	72
1990	0	0	132	132
1991	0	0	0	0
1992	0	0	4	4

b. [redacted] Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2712.2	+1194.3	3906.5	+19.8	3886.7
(TY $)	7402.4	+4345.7	11748.1	+59.4	11688.7
PAUC Cost (BY $)	5.266	-0.449	4.817	0.024	4.792
(TY $)	14.374	0.112	14.486	0.073	14.413

17c. (U) **Production Rate Data (Cont'd)**:

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JAN 84	0	JAN 84	N/A	JAN 84
Duration (in MON)	63	53	116	0	116
End Date(MON YY)	APR 89	53	SEP 93	N/A	SEP 93

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	9/9
Procurement	700/700

e. (U) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 515 - @ Peak Rate: 12/mo			
FY 72 Base-Year $	1.8	3.0	3.3
Then Year $	4.5	9.9	10.6
@ Qty 0 (1st three years) - @ Peak Rate: 0/mo			
FY 72 Base-Year $	0.0	0.0	0.0
Then Year $	0.0	0.0	0.0

18. (U) **Operating and Support Costs**:

a. (U) Assumptions and Ground Rules --

AH-64 APACHE cost estimates are based on an 18 helicopter battalion with a flying hour rate of 20 hours per aircraft per month. Replenishment cost includes replenishment spares and replenishment repair parts. POL cost includes JP-4 fuel as well as oil and other lubricants. Ammunition cost includes 30mm ammunition rounds, 2.75" rockets, and HELLFIRE training and dummy missiles. Depot Maintenance includes the cost of labor, material, and transportation associated with end item and component repair programs. Field Maintenance cost includes the civilian labor on training aircraft. System Specific Replacement Training cost includes the O&M funded portion of replacement training courses for maintenance personnel and crew. Military Personnel cost includes Pay and Allowances, and Permanent Change of Station (MPA) for crew, maintenance and support personnel.

18a. [redacted] Operating and Support Costs (Cont'd):

Modification Kit cost includes the estimated hardware cost of modifications applied to the aircraft after fielding; it does not include Longbow Apache retrofit costs. Other Sustainment cost includes quarters, maintenance and utilities cost, and other indirect O&M costs for military personnel. There is no antecedent system for the AH-64 Apache. All costs are taken from the latest validated Baseline Cost Estimate for Apache dated July 1991.

b. [redacted] Costs -- (FY 1972 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per flying hour (APACHE)	Avg Annual Cost Per (Antecedent)
Replenishment	648.5	N/A
Petroleum,Oil,&Lubricant	24.0	N/A
Ammunition	152.6	N/A
Depot Maintenance	33.6	N/A
Field Maintenance	8.1	N/A
System Specific Repl Trn	73.4	N/A
Military Personnel	600.8	N/A
Modification Kits	72.2	N/A
Other Sustainment	50.2	N/A
Total	1663.4	N/A

18c. (U) **Operating and Support Costs (Cont'd):**

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Interim Contrctr Sup	---	---	---	---	---
Contractor Log Sup	---	---	---	---	---
Sustaining Engnring	---	---	---	---	---
Depot Maintenance	12.0	3.2	3.2	---	18.4
ContractEng/TechSvcs	9.7	7.2	7.3	---	24.2
Other	---	---	---	---	---
Total	21.7	10.4	10.5	---	42.6

Costs shown in 18b. are in thousands of dollars vs. millions.

Information provided shows FY91 Actuals, FY92 & FY 93 estimates. Prior year information not available.

Narrative:

Depot Maintenance: National Maintenance Contract - contractor repair for AH-64 helicopter secondary item repair.

Contract Eng/Tech Services: Provide Army oil analysis, water disposal and Eng/Tech Services contract, sample data collection, and flight safety parts.

N-10 CG 47

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: CG 47 AEGIS CRUISER

AS OF DATE: December 31, 1991

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AS AMENDED
MAR 23 1992

1. ( ) Designation and Nomenclature (Popular Name):
CG 47 AEGIS Cruiser Class/Guided Missile Cruiser
(AEGIS Cruiser)

( ) DoD Component: Navy

3. ( ) Responsible Office and Telephone Number:
AEGIS PROGRAM MANAGER
NATIONAL CENTER BUILDING 2
2521 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202-5102

RADM G.A. HUCHTING, USN
Assigned: August 2, 1991
AV 332-7395 COMM (703)-602-7395

No Security Objection to Open Publication
(AS AMENDED)
MAR 23 1992
Office of the Chief of
Naval Operations Dept. of the Navy

4. ( ) Program Elements/Procurement Line Items:

PROCUREMENT:
APPN 1611 ICN 24292N (Navy)

5. ( ) Related Programs:
DDG 51, SM-2 (MR), HARPOON, TOMAHAWK, PHALANX, MK-46, LAMPS MK-I/MK-III, VERTICAL LAUNCH, and VERTICAL LAUNCH ANTI-SUBMARINE ROCKET.

Classified by: OPNAVINST [illegible]
Declassify on: OADR
Downgrade Instructions: Not Subject To Automatic Downgrade

(THIS PAGE IS UNCLASSIFIED)

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92-D644

6. (U) Mission and Description:
To destroy enemy aircraft, missiles, submarines, and surface ships in order to prohibit the employment of such forces against U.S. forces. CG 47 Class ships will normally be assigned to carrier battle groups or surface action groups. The design of the TICONDEROGA (CG 47) Class is based on the fleet-demonstrated hull and gas turbine propulsion system of the SPRUANCE (DD 963) Class. The combat system is based on the fleet-demonstrated armaments of the VIRGINIA (CGN 38) Class and eleven years at-sea operation in the AEGIS test ship, USS NORTON SOUND (AVM 1). With AEGIS, SM-2, HARPOON, TOMAHAWK, 5-inch guns, SEAHAWK helicopter, MK-46 torpedoes, anti-submarine rockets, Vertical Launch System (MK-26 Guided Missile Launch System CG-51 and prior), SQQ-89 ASW System, and advanced electronic systems, the CG 47 Class is the most heavily armed surface combatant constructed by the U.S. since World War II. Augmented by passive protection devices, including fragmentation protection of launchers and magazines, she provides operational commanders great flexibility.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
The contract for the construction of the lead ship of the class, TICONDEROGA, was awarded to Litton Industries Ingalls Shipbuilding Division, Pascagoula, Mississippi in September 1978. Construction of TICONDEROGA began in July 1979. She launched in April 1981: [illegible]an acceptance trials in November 1982, was commissioned in January 1983 and completed Post Shakedown Availability in July 1983. CG 47 has satisfied all mission requirements.

b. (U) Significant Developments Since Last Report --
The keel was laid on the last two ships of the class in 1991 - CG 72 in April, and CG 73 in November. Two ships were launched in 1991 - CG 70 in July and CG 69 in August. Four ships were commissioned in 1991 - USS Chosin (CG 65) in January, USS Cowpens (CG 63) in March, USS Gettysburg (CG 64) in June, and USS Hue City (CG 66) in September. With the commissioning of USS Hue City (CG 66) there are now twenty AEGIS Cruisers in active service.

c. (U) Changes Since As Of Date --
CG 68 delivered in February, 10 weeks ahead of the planned schedule. BIW has confirmed an adjustment in the completion date of CG-70 from December 92, which is the contract date, to March 93. This adjustment is necessary as a result of the total yard work load impact on production shops.

8. (U) Threshold Breaches:
There are currently no Acquisition Program Baseline (APB) (dated 31 Dec 88) breaches or unit cost breaches.

CG 47 AEGIS CRUISER, December 31, 1991

9. ( ) Schedule:

a. ( ) Milestones --

	Development Estimate	Approved Program	Current Estimate
DSARC III	JAN 78	JAN 78	JAN 78
Ship Construction Contract Award (CG 47)	SEP 78	SEP 78	SEP 78
Launch TICONDEROGA (CG 47)	AUG 81	APR 81	APR 81
Ship Commissioning, TICONDEROGA (CG 47)	APR 83	JAN 83	JAN 83
Post Shakedown Availability (CG 47)	MAR 84	SEP 83	JUL 83
TICONDEROGA Deployed	N/A	OCT 83	OCT 83
Launch VINCENNES (CG 49)	N/A	JAN 84	JAN 84
Lay Keel BUNKER HILL (CG 52)	N/A	JAN 84	JAN 84
Ship Commissioning VINCENNES (CG 49)	N/A	JUL 85	JUL 85
Launch MOBILE BAY (CG 53)	N/A	AUG 85	AUG 85
Ship Christening THOMAS S. GATES (CG 51)	N/A	DEC 85	DEC 85
Ship Commissioning, VALLEY FORGE (CG 50)	N/A	JAN 86	JAN 86
Ship Commissioning, BUNKER HILL (CG 52)	N/A	SEP 86	SEP 86
Ship Commissioning, MOBILE BAY (CG 53)	N/A	FEB 87	FEB 87
Ship Commissioning, ANTIETAM (CG 54)	N/A	JUN 87	JUN 87
Ship Commissioning, THOMAS S. GATES (CG 51)	N/A	AUG 87	AUG 87
Ship Commissioning, LEYTE GULF (CG 55)	N/A	SEP 87	SEP 87
Ship Commissioning, SAN JACINTO (CG 56)	N/A	JAN 88	JAN 88
Ship Commissioning, LAKE CHAMPLAIN (CG 57)	N/A	JUL 88	AUG 88

b. ( ) Previous Change Explanations --

The current estimate for the launch, commissioning and completion of post shakedown availability for CG 47 was revised based on the construction schedule.

c. ( ) Current Change Explanations --

None.

d. ( ) References --

( ) Development Estimate:
AEGIS DCP #16 Revision #2 and CG 47 Class Guided Missile Cruiser DCP #134 were approved 2 March 1978.

( ) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

10. (U) Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Length (overall ft)	563	567	/ 567	567	567
Beam (ft)	55	55	/ 55	55	55
Draft Navigational (ft)	31.7	31.7	/ 31.7	31.7	31.7
Displacement (long tons)	9100	9600	/ 9600	10200	9600
Propulsion					
- Type	LM 2500	Gas TURB	/ Gas TURB	LM 2500	LM2500
- Horsepower (2 shafts)	80000	80000	/ 80000	80000	80000
Accomodations					
- Officers	33	33	/ 33	37	37
- CPO's and Enlisted	327	342	/ 342	372	372

(b)(1)

[redacted]

CG 47 AEGIS CRUISER, December 31, 1991

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

b. (U) Previous Change Explanations --

The overall length of the TICONDEROGA (CG 47) was planned as 563 feet. All CG 47 Class Cruisers are constructed to 567 feet, the additional four feet is for the bulwark on the bow. 10,200 LT represents limiting displacement. Accommodations were increased beginning with CG 49 to support an increase in the Combat Systems. The Underwater Fire Control System, starting with CG 56, changed MK-116 to Mod 6 and AN/SQS-53A to AN/SQS-53B. Incorporation of the AN/SQR-19 was in CG 54 and beyond during construction. Incorporation of Seahawk was in CG 49 and beyond during construction. CG 47 and CG 48 are armed with Sea Sprites. ASROC is on CG 47 through CG 51. VLA replaces ASROC beginning with CG 52. Vertical Launch System MK 41 replaces MK 26 Mod 1 starting with CG 52. MK 15 Mod 2 Block I was approved for limited production in November 1985 with installation beginning on the FY86 ships. TOMAHAWK begins on CG 52. The AEGIS Weapon System changed from SPY-1A to SPY-1B (MK-7/Mod 5) starting with CG 59. Accommodations were increased to meet operating requirements.

c. (U) Current Change Explanations --

None.

d. (U) References --

(U) Development Estimate:
AEGIS DCP #16 Revision #2 and CG 47 Class Guided Missile Cruiser DCP #134 were approved 2 March 1978.

CG 47 AEGIS CRUISER, December 31, 1991

10d. (U) Performance Characteristics (Cont'd):

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	55.5	68.2	68.2
Procurement	8958.2	14258.8	14015.3
Basic Ship Cost	(3440.3)		(5080.9)
AEGIS Weapon System	(2598.8)		(3374.0)
Other GFE	(1874.6)		(4981.2)
Other Sailaway Costs	(832.9)		(173.6)
OF/PD	(211.6)		(405.6)
Total Flyaway	(8958.2)		(14015.3)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	14.4	14.4
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 78 Base-Year $	9013.7	14341.4	14097.9
Escalation	5069.8	9729.5	9196.2
Development (RDT&E)	(1.8)	(7.9)	(7.9)
Procurement	(5068.0)	(9712.3)	(9179.0)
Construction (MILCON)	(0.0)	(9.3)	(9.3)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	14083.5	24070.9	23294.1
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	16	27	27
Total	16	27	27

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
AEGIS DCP #16 Revision #2 and CG 47 Class Guided Missile Cruiser DCP #134 were approved 2 March 1978.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

CG 47 AEGIS CRUISER, December 31, 1991

11e. (U) Total Program Cost and Quantity (Cont'd):

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	23294.1	23315.9	23294.1
(2) Quantity	27	27	27
(3) Unit Cost	862.74	863.55	862.74
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	75.9	75.9	103.6
Less CY Adv Proc	75.9	75.9	103.6
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

NOTE: The category "Less CY Adv Proc" includes $75.9 in FY 1992 and $103.6M in FY 1993 for Outfitting and Post Delivery.

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	57.3	14026.2	0.0	14083.5
Previous Changes:				
Economic	+1.8	-998.2	-0.8	-997.2
Quantity	-	+11739.0	-	+11739.0
Schedule	-	+435.4	-	+435.4
Engineering	+9.7	+970.9	-	+980.6
Estimating	+7.3	-3365.7	-	-3358.4
Other	-	-	-	-
Support	-	+408.5	+24.5	+433.0
Subtotal	+18.8	+9189.9	+23.7	+9232.4
Current Changes:				
Economic	-	-163.4	-	-163.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+120.5	-	+120.5
Other	-	-	-	-
Support	-	+21.1	-	+21.1
Subtotal	-	-21.8	-	-21.8
Total Changes	+18.8	+9168.1	+23.7	+9210.6
Current Estimate	76.1	23194.3	23.7	23294.1

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1978 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	55.5	8958.2	0.0	9013.7
Previous Changes:				
Quantity	-	+5491.4	-	+5491.4
Schedule	-	-2.6	-	-2.6
Engineering	+7.6	+564.3	-	+571.9
Estimating	+5.1	-1276.0	-	-1270.9
Other	-	-	-	-
Support	-	+181.8	+14.4	+196.2
Subtotal	+12.7	+4958.9	+14.4	+4986.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+86.1	-	+86.1
Other	-	-	-	-
Support	-	+12.1	-	+12.1
Subtotal	-	+98.2	-	+98.2
Total Changes	+12.7	+5057.1	+14.4	+5084.2
Current Estimate	68.2	14015.3	14.4	14097.9

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Engineering: HDF and SDMS design changes.
Estimating: Refinement of RDT&E estimates.

PROCUREMENT
Economic: Revised escalation indices.
Quantity: Addition of 11 cruisers.
Schedule: Procurement Profile compressed from 2-2-1 (FY88-90) to 5-0-0 (FY88-90).
Engineering: Engineering enhancements including introduction of the Vertical Launch System, the upgrade of the Underwater Fire Control System and the change in

13b. (U) Cost Variance Analysis (Cont'd):

the AEGIS Weapon System from SPY-1A to SPY-1B. Deletion of the Level IIA Collective Protection System.

Estimating: Refinement of procurement estimates. Program buy out.

Support: Adjustment of outfitting and post delivery costs corresponding to program changes.

MILCON

Economic: Revised escalation indices.

Support: Funds for training and support sites.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised Jan 91 economic escalation rates. (Economic)	N/A	-163.4
Revised estimates for all ship systems and adjustments to projected ship construction contract requirements (Estimating)	86.1	120.5
Adjustment of outfitting and post delivery costs corresponding to program changes. (Support)	12.1	21.1
Total Changes	98.2	-21.8

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes Econ	Qty	Sch	Eng	Est	Other	Spt	Total	PAUC (Current Est)
880.2	-43.0	76.2	16.1	36.3	-119.9	--	16.8	-17.5	862.7

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) Procurement --

(U) CG 66/8 CONSTRUCTION:
INGALLS SHIPBUILDING, PASCAGOULA, MS
N00024-87-C-2030, FPI
Award: April 16, 1987
Definitized: April 16, 1987

Initial Contract Price		
Target	Ceiling	Qty
$368.0	$390.6	2

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$398.7	$425.0	2	$411.2	$406.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$8.8	$-0.7
Cumulative Variances To Date (11/30/91)	$-0.2	$-13.0
Net Change	$-9.0	$-12.3

Explanation of Change:

The deterioration in the cumulative cost variance is due to a slight overtarget estimate in production labor hours. The deterioration in the cumulative schedule variance was primarily in material, and is attributed to a lag in billings. However, this will not impact delivery dates as CG 66 delivered on 28 June 1991, 16 weeks ahead of schedule and CG 68 is expected to deliver 10 weeks ahead of schedule.

Estimated price at completion incorporates anticipated change orders (3.6M) and overtarget estimates which are not included in the current contract target and ceiling price.

(U) CG 67 CONSTRUCTION:
BATH IRON WORKS, BATH, ME
N00024-87-C-2221, FPI
Award: April 16, 1987
Definitized: April 16, 1987

Initial Contract Price		
Target	Ceiling	Qty
$236.0	$253.0	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$256.9	$275.6	1	$262.1	$267.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-10.6	$-2.2
Cumulative Variances To Date (11/30/91)	$-22.4	$1.9
Net Change	$-11.8	$4.1

Explanation of Change:

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)
The deterioration in the cumulative cost variance was due to labor hour ineffiencies in the Pipe and Paint departments.

Estimated price at completion incorporates anticipated change orders (3.8M) and overtarget estimates which are not included in the current contract target and ceiling price.

(U) CG 66-73 & DDG 52/53:
GENERAL ELECTRIC CO., MOORESTOWN, NJ
N00024-88-C-5140, FPI
Award: January 14, 1988
Definitized: January 14, 1988

	Initial Contract Price		
	Target	Ceiling	Qty
	$365.2	$393.4	5

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$713.7	$768.1	10	$712.6	$712.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$24.2	$-17.2
Cumulative Variances To Date (11/30/91)	$29.6	$-2.8
Net Change	$5.4	$14.4

Explanation of Change:

The schedule variance improvement occured on the CG 69/70/71/72/73 systems, and is a reflection of invoicing in the Equipment category catching up with work completed.

Estimated price at completion incorporates anticipated change orders (2.2M), undertarget estimates and amortization for special tooling and special test equipment (17.3M) which are not included in the current contract target and ceiling price.

(U) CG 69/71-73 CONSTRUCTION:
INGALLS SHIPBUILDING INC., PASCAGOULA, MS
N00024-88-C-2034, FPI
Award: February 25, 1988
Definitized: February 25, 1988

	Initial Contract Price		
	Target	Ceiling	Qty
	$769.1	$819.0	4

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$799.7	$856.4	4	$806.0	$805.4

CG 47 AEGIS CRUISER, December 31, 1991

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$23.1	$7.5
Cumulative Variances To Date (11/30/91)	$26.4	$-21.5
Net Change	$3.3	$-29.0

Explanation of Change:

The deterioration in the schedule variance is a misleading indicator driven by a lag in billing for material. The improvement in cost variance is driven primarily by production labor hour underruns.

Estimated price at completion incorporates anticipated change orders (22.6M) and undertarget estimates which are not included in the current contract target and ceiling price.

[redacted] CG 70 CONSTRUCTION:
BATH IRON WORKS, BATH, ME
N00024-88-C-2178, FPI
Award: February 25, 1988
Definitized: February 25, 1988

Initial Contract Price		
Target	Ceiling	Qty
$226.1	$242.3	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$232.4	$249.3	1	$253.4	$261.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-8.3	$-0.6
Cumulative Variances To Date (11/30/91)	$-15.9	$-4.9
Net Change	$-7.6	$-4.3

Explanation of Change:

The deterioration in the cumulative cost variance was due to labor hour overruns in the Pipe and Paint department.

Estimated price at completion incorporates anticipated change orders (14.8M) and overtarget estimates which are not included in the current contract target and ceiling price.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 88.2% (15 yrs/17 yrs)

(2) Percent Program Cost Appropriated: 99.5% ($23173.1 / $23294.1)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY78-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94)	Total
RDT&E	76.1	-	-	-	76.1
Procurement	22997.4	75.9	103.6	17.4	23194.3
MILCON	23.7	-	-	-	23.7
O&M	-	-	-	-	-
Total	23097.2	75.9	103.6	17.4	23294.1

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY78 Dollars Nonrec	Flyaway FY78 Dollars Rec	Total Base YearS	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1978				39.4	39.4	39.4	39.4	6.8
1979				10.0	10.8	10.8	10.8	8.4
1980				5.4	6.5	6.5	6.5	10.6
1981				3.4	4.5	4.5	4.5	10.6
1982				5.0	7.2	7.2	7.2	7.6
1983				2.1	3.1	3.1	3.1	4.9
1984				1.0	1.5	1.5	1.5	3.8
1985				1.0	1.6	1.6	1.6	3.4
1986				0.6	1.0	1.0	1.0	2.8
1987				0.3	0.5	0.5	0.5	2.7
Stot				68.2	76.1	76.1	76.1	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars Nonrec	Flyaway FY78 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Obligated	Expended	Escl Rate (%)
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1978	1		663.3	663.3	923.1	923.1	922.0	8.2
1979					1.7	1.7	1.7	9.6
1980	1		494.7	494.7	791.9	791.9	780.2	9.9
1981	2		1012.1	1013.2	1785.2	1785.2	1758.6	9.6
1982	3		1774.3	1776.5	2708.2	2708.2	2613.7	7.5
1983	3		1491.0	1502.0	2392.6	2392.6	2318.9	3.8
1984	3		1639.7	1655.0	2703.7	2703.7	2568.1	3.6
1985	3		1479.1	1501.8	2583.0	2583.0	2434.4	2.1
1986	3		1417.1	1448.8	2420.3	2394.6	2192.6	1.1
1987	3		1417.1	1525.4	2563.8	2480.7	2146.5	1.5
1988	5		2177.7	2216.7	3936.7	3473.0	2409.6	2.3
1989				29.8	50.1	48.3	41.6	2.8
1990				38.7	66.1	64.0	54.0	1.3
1991				41.1	71.0	53.3	36.2	1.3
1992				42.7	75.9	4.2	0.2	3.1
1993				56.4	103.6			3.3
1994				9.2	17.4			3.3
1995								3.3
Subtot	27		13566.1	14015.3	23194.3	22407.5	20278.3	
Appropriation: 1205 Military Construction, Navy								
1982				1.2	1.9	1.9	1.9	7.6
1983				6.8	10.8	10.8	10.8	4.9
1984				2.6	4.2	4.2	4.2	3.8
1985								
1986								
1987				3.8	6.8	6.8	6.8	2.7
Subtot				14.4	23.7	23.7	23.7	
Grand Total	27		13566.1	14097.9	23294.1	22507.3	20378.1	

17. [redacted] Production Rate Data:

a. ([redacted]) Annual Production Rates -- None.

b. ([redacted]) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	14097.9	N/A	0.0
(TY $)	N/A	N/A	23294.1	N/A	0.0
PAUC Cost (BY $)	N/A	N/A	522.144	N/A	N/A
(TY $)	N/A	N/A	862.744	N/A	N/A

c. [redacted] Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Slait Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. ([redacted]) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	20/20

e. ([redacted]) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 0 - @ Peak Rate: 0.0/mo			
FY 78 Base-Year $	540.000	526.060	0.000
Then Year $	864.800	850.533	0.000
@ Qty 0 (1st three years) - @ Peak Rate: 0.0/mo			
FY 78 Base-Year $	0.000	0.000	0.000
Then Year $	0.000	0.000	0.000

17e. (U) Production Rate Data (Cont'd):

The CG 47 production estimate is based on average follow ship's unit procurement cost for 15 ships as approved by DCP #134, dated 2 March 1978. This goal is based upon the execution of the procurement plan shown in DCP #134 and does not include the cost of LAMPS aircraft, expendable shipfill ordnances, ship design, or outfitting and post delivery costs. The current estimate is the average unit procurement cost computed on ships 2 through 16 in the FYDP estimate.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

None.

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
	220.6	74.6	60.5	---	355.7
Industrial Fund	---	---	---	---	---
Total	220.6	74.6	60.5	---	355.7

18c. Contractor Support Costs -- The Contractor Support Costs are combined costs for both the CG 47 AEGIS Class Cruiser and DDG 51 Class Destroyer programs.

- Funding for FY 1991 & prior includes FY 1989 through FY 1991 only.
- Total of 355.7 does not include funds required for FY 1994 and beyond.

N-12 CVN 68 CLASS

9H24

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: CVN-68 Class

AS OF DATE: December 31, 1991

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1. [redacted] **Designation and Nomenclature (Popular Name):**
CVN-68 Class/Carrier Replacement Program (Nuclear Aircraft Carriers)

2. [redacted] **DoD Component:** Navy

3. [redacted] **Responsible Office and Telephone Number:**

Aircraft Carrier Program	Capt. Roland B. Knapp
Naval Sea System Command (PMS-312)	Assigned: April 20, 1990
Washington, DC 20362-5101	AV 332-7280 COMM (703) 602-7280

4. [redacted] **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604567N
PE 0605567N Project S1803
PROCUREMENT:
APPN 1611 ICN 32200100 (Navy)

~~Classified by: DDA-DOD Classification Guide CG-RN-1 Dated 1 Jan 1977~~
Declassify on: Originating Agency Determination Required (OADR)
~~Downgrade Instructions: Not Subject to Automatic Downgrade~~

(THIS PAGE IS [redacted])

No Security Objection to Open Publication
92-C-0492
MAR 24 1992
M. Newell
Office of the Chief of Naval Operations Dept. of the Navy

*** CONFIDENTIAL ***

AS AMENDED
FOR OPEN PUBLICATION

MAR 24 1992

OASD(PA) DFOISR 92-T-0682

DIRECTOR FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

5. (U) **Related Programs:**
SSN new construction, submarine and carrier overhauls

6. (U) **Mission and Description:**
Nuclear Aircraft Carriers (CVN 68 CLASS) support and operate aircraft to engage in attacks on targets afloat and ashore which threaten our use of the sea and to engage in sustained operations in support of other forces. These ships have two nuclear reactors and nuclear fuel for at least 15 years of normal carrier operations, the equivalent of 11 million barrels of propulsion fuel oil. Speeds of over 30 knots were achieved during NIMITZ (CVN 68) trials. The ship's overall length is 1,092 feet with an extreme breadth of 252 feet. Combat load displacement is approximately 97,000 tons. The flight deck area is about 4.5 acres. The ship has four propellers, four aircraft elevators, and four catapults. The CVN 68 Class is expected to meet all its mission requirements.

7. (U) **Program Highlights:**

a. (U) Significant Historical Developments --
Construction of the CVN 68 Class aircraft carriers began in October 1967 with the start of the NIMITZ (CVN 68). To date five ships have been delivered. The USS NIMITZ (CVN 68), USS DWIGHT D. EISENHOWER (CVN 69), USS CARL VINSON (CVN 70), USS THEODORE ROOSEVELT (CVN 71), AND USS ABRAHAM LINCOLN (CVN 72) were delivered in 1975, 1977, 1982, 1986, and 1989, respectively. There are three ships currently under construction at Newport News Shipbuilding, the GEORGE WASHINGTON (CVN 73), the JOHN C. STENNIS (CVN 74), and the UNITED STATES (CVN 75). Construction of CVN 73 began in February 1983 and has a contract delivery date of 03 July 1992. The CVN 74 construction began in October 1988. Target delivery date is December 1995 and contract delivery date is June 1996. CVN 75 construction began in April 1989 and contract delivery date is June 1998.

b. (U) Significant Developments Since Last Report --
A program increase for the CVN 74/75 program for change orders ($95.2M) was submitted and approved by Congress. The shipbuilder issued a revised construction schedule for CVN 75. This schedule change will result in improved construction efficiencies and will not affect the June 98 delivery date. A program deviation report was been submitted and aprroved on 12 Feb 1992. This system will satisfy mission requirements. The CVN 72/73 program is 90% complete, therefore this is its last report.

c. (U) Changes Since As Of Date --
There have been no changes since the as of date.

8. (U) **Threshold Breaches:**
An Acquisition Program Baseline breach in performance characteristics was submitted and approved on 12 Jul 91. An Acquisition Program

8. (U) Threshold Breaches (Cont'd):

Baseline breach for the schedule milestones for CVN 75 was submitted and approved on 12 Feb 1992. There are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:
CVN-72/73

a. (U) Milestones --

	Production Estimate	Approved Program	Current Estimate
CVN-72			
Establish Final Characteristics CVN 68 Class	OCT 66	OCT 66	OCT 66
Definitization of Contract	JAN 83	DEC 82	DEC 82
Start Production	FEB 83	FEB 83	FEB 83
Lay Keel	NOV 84	NOV 84	NOV 84
Launch	SEP 87	DEC 87	FEB 88
Complete Acceptance Trial	SEP 89	N/A	SEP 89
Contract Delivery	DEC 89	DEC 89	OCT 89
Complete Final Contract	JUN 90	JUN 90	MAR 90
War Ready	FEB 91	JAN 91	JAN 91
CVN-73			
Definitization of Contract	JAN 83	DEC 82	DEC 82
Start Production	FEB 83	FEB 83	FEB 83
Lay Keel	AUG 86	AUG 86	AUG 86
Launch	SEP 89	SEP 89	JUL 90
Complete Acceptance Trial	SEP 91	N/A	MAY 92
Delivery	DEC 91	JUL 92	JUN 92(Ch-1)
War Ready	FEB 93	FEB 93	AUG 93(Ch-1)

b. (U) Previous Change Explanations --

Contract modification was issued to extend the delivery date of CVN-73 from 1/3/92 to 7/3/92 for the mutual benefit of NNS and the Navy. Contract modification was also issued to extend delivery of CVN-72 to 1/90 vice 12/89 as a result of adverse weather. Revised CVN-73 launch date to coincide with later delivery. Actual CVN-72 delivery date. Trial date advanced as a result of early delivery date. Revised CVN-73 launch date to agree with contractor schedule.

c. (U) Current Change Explanations --

(CH-1). Current estimated delivery date changed from July 92 to June 1992 to reflect the shipbuilder's latest construction schedule and war ready date changed from September 93 to August 93 to reflect the latest estimated date operational readiness for CVN 73.

9d. [redacted] Schedule (Cont'd):
CVN-72/73

d. [redacted] References --

[redacted] Production Estimate:
Defense Appropriation Act of 1983 (CVN-72/73). Defense Appropriation Act of 1988 (CVN-74/75). FY 1992 President's Budget Request (CVN-76).

[redacted] Approved Program:
NAE approved Acquisition Program Baseline dated February 12, 1992.

CVN-74/75

a. [redacted] Milestones --

	Production Estimate	Approved Program	Current Estimate
CVN-74			
Definitization of Contract	AUG 88	JUN 88	JUN 88
Start Production	JAN 89	NOV 88	OCT 88
Lay Keel	OCT 91	DEC 90	MAR 91
Launch	JAN 94	DEC 93	DEC 93
Target Delivery	N/A	DEC 95	DEC 95
Contract Delivery	SEP 96	JUN 96	JUN 96
CVN-75			
Definitization of Contract	AUG 88	JUN 88	JUN 88
Start Production	JAN 89	NOV 89	APR 89
Lay Keel	APR 93	NOV 93	NOV 93(Ch-2)
Launch	JUL 96	SEP 96	SEP 96(Ch-2)
Delivery	SEP 97	JUN 98	JUN 98

b. [redacted] Previous Change Explanations --

CVN-74/75 dates reflect schedule IAW contract award on 6/30/88. CVN 74 actual start production date was October 1988 vice November 1988. CVN 74 keel laying was shifted from December 1990 to March 1991 at the request of the shipbuilder. CVN 75 actual start production date was changed from November 1989 to April 1989.

c. [redacted] Current Change Explanations --

(CH-2) The shipbuilder has issued a revised construction schedule (dated 27 September 1991) for the CVN 75. This schedule changed the CVN 75 keel laying to November 1993 (from August 1992) and CVN 75 launching to September 1996 (from December 1995). This was made as a result of lessons learned on the CVN 72/73 and will result in improved construction efficiency. The contract delivery date of 30 June 1998 will not be affected.

9d. [redacted] Schedule (Cont'd):
CVN-74/75

d. [redacted] References --

([redacted]) Production Estimate:
Defense Appropriation Act of 1988.

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated February 12, 1992.

CVN-76

a. [redacted] Milestones --

	Production Estimate	Approved Program	Current Estimate
CVN-76			
Contract Award	JUN 95	JUN 95	JUN 95
Start Production	NOV 95	NOV 95	NOV 95
Lay Keel	DEC 97	DEC 97	DEC 97
Launch	DEC 00	DEC 00	DEC 00
Delivery	DEC 02	DEC 02	DEC 02

b. ([redacted]) Previous Change Explanations -- None.

c. ([redacted]) Current Change Explanations -- None.

d. ([redacted]) References --

([redacted]) Production Estimate:
The FY 1992 President's Budget.

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated February 12, 1992.

10. ([redacted]) Performance Characteristics:
CVN-72/73

a. [redacted] Performance --

	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate	
Length Overall	1092	1092 / 1092	1092	1092	
Beam	134	134 / 134	134	134	
Maximum Width	252	252 / 252	252	252	
Draft (Combat Load) (ft)	38.4	39.0 / 40.4	40.4	38.9	(CH-1)
Displacement (tons)	96300	99000 / 102500	102500 1/	97337	(CH-1)

[redacted]

10a. [redacted] **Performance Characteristics (Cont'd):**
CVN-72/73

	PdE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
Propulsion	NUCLEAR	NUCLEAR / NUCLEAR	NUCLEAR	NUCLEAR

(b)(1)

[redacted]

b. [redacted] Previous Change Explanations --

CVN 72 projected estimates at delivery reflects 122 accommodations which have been converted to training spaces.

c. [redacted] Current Change Explanations --

(CH-1) The draft and displacement were updated to reflect re-evaluated torpedo side protection requirements. This re-evaluation permits an increase in draft and displacement limits while still obtaining the same torpedo side protection capability. An Acquisition Program Baseline breach was submitted and approved.

[redacted]

10d. [redacted] Performance Characteristics (Cont'd):

CVN-72/73

d. [redacted] References --

([redacted]) Production Estimate:
Defense Appropriation Act of 1983 (CVN-72/73).

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated February 12, 1992.

CVN-74/75

a. [redacted] Performance Characteristics -- None.

Performance characteristics for these vessels are the same as the CVN 72/73.

b. ([redacted]) Previous Change Explanations -- None.

c. ([redacted]) Current Change Explanations -- None.

d. ([redacted]) References --

([redacted]) Production Estimate:
Defense Appropriation Act of 1988.

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated February 12, 1992.

CVN-76

a. [redacted] Performance Characteristics -- None.

The CVN-76 will be a modified repeat of the CVN-74/75. RDT&E funding is available in FY 1991 to begin contract design for CVN 76. Performance characteristics for this vessel is the same as the CVN 72/73.

b. ([redacted]) Previous Change Explanations -- None.

c. ([redacted]) Current Change Explanations -- None.

d. ([redacted]) References --

[redacted] Production Estimate:
The FY 1992 President's Budget.

10d. [redacted] Performance Characteristics (Cont'd):
CVN-76

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated February 12, 1992.

11. ([redacted]) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)
CVN-72/73

	Production Estimate	Approved Program	Current Estimate
a. [redacted] Cost --			
Development (RDT&E)	0.0	1.5	1.6
Procurement	5265.5	5338.1	5229.1
Sailaway	(3261.4)		(3564.1)
Total Sailaway	(3261.4)		(3564.1)
Govt Furn. Equip.	(1900.7)		(1532.4)
Other Costs	(14.3)		(32.5)
Ship Design	(0.9)		(0.0)
Total Other Wpn Sys	(1915.9)		(1564.9)
Peculiar Support	(88.2)		(100.1)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 82 Base-Year $	5265.5	5339.6	5230.7
Escalation	2153.4	984.0	925.5
Development (RDT&E)	(0.0)	(0.1)	(0.0)
Procurement	(2153.4)	(983.9)	(925.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	7418.9	6323.6	6156.2
b. [redacted] Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	2	2	2
Total	2	2	2

c. [redacted] Foreign Military Sales -- None.

d. [redacted] Nuclear Costs --
$1,220.1M

e. [redacted] References --

[redacted] Production Estimate:
Defense Appropriation Act of 1983.

[redacted] Approved Program:
NAE approved Acquisition Program Baseline dated February 12, 1992.

11e. [redacted] Total Program Cost and Quantity (Cont'd):
CVN-72/73

CVN-74/75

	Production Estimate	Approved Program	Current Estimate
a. [redacted] Cost --			
Development (RDT&E)	0.0	0.0	0.0
Procurement	5911.0	5815.8	6136.2
Sailaway Cost	(3744.9)		(3905.3)
Total Sailaway	(3744.9)		(3905.3)
Government Furnished Equip	(1998.1)		(2083.6)
Other	(28.1)		(0.0)
Other Costs			(29.5)
Total Other Wpn Sys	(2026.2)		(2113.1)
Peculiar Support	(139.9)		(117.8)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 88 Base-Year $	5911.0	5815.8	6136.2
Escalation	1055.0	564.3	465.8
Development (RDT&E)	(0.0)	(0.0)	(0.0)
Procurement	(1055.0)	(564.3)	(465.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	6966.0	6380.1	6602.0
b. [redacted] Quantity --			
Development (RDT&E)	0	N/A	N/A
Procurement	2	2	2
Total	2	2	2

c. [redacted] Foreign Military Sales -- None.

d. [redacted] Nuclear Costs --
$1,165.0M

e. [redacted] References --

[redacted] Production Estimate:
Defense Appropriation Act of 1988.

[redacted] Approved Program:
NAE approved Acquisition Program Baseline dated February 12, 1992.

11a. [redacted] Total Program Cost and Quantity (Cont'd):
CVN-76

a. [redacted] Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	48.1	48.1	35.6
Procurement	3862.7	3935.7	3804.5
Sailaway	(2458.7)		(0.0)
Total Sailaway	(2458.7)		(2421.2)
Governmnet Furnished Equip	(1311.7)		(1291.7)
Sailaway	(18.6)		(0.0)
Other Costs			(18.3)
Total Other Wpn Sys	(1330.3)		(1310.0)
Peculiar Support	(73.7)		(73.3)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 95 Base-Year $	3910.8	3983.8	3840.1
Escalation	386.4	313.4	359.1
Development (RDT&E)	(-1.1)	(-1.1)	(-1.3)
Procurement	(387.5)	(314.5)	(360.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	4297.2	4297.2	4199.2
b. [redacted] Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	1	1	1
Total	1	1	1

c. ([redacted]) Foreign Military Sales -- None.

d. ([redacted]) Nuclear Costs --
$991.1M

e. ([redacted]) References --

([redacted]) Production Estimate:
The FY 1992 President's Budget.

([redacted]) Approved Program:
NAE approved Acquisition Program Baseline dated February 12, 1992.

12. [redacted] **Program Acquisition/Current Procurement Unit Cost Summary:**

CVN-72/73

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. [redacted] Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6156.2	6170.5	6156.2
(2) Quantity	2	2	2
(3) Unit Cost	3078.10	3085.25	3078.10
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	30.2	30.2	7.4
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	30.2	30.2	7.4
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

(b)(1) [redacted]

CVN-74/75

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. [redacted] Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6602.0	6514.4	6602.0
(2) Quantity	2	2	2
(3) Unit Cost	3301.00	3257.20	3301.00
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	130.0	130.0	11.6
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	130.0	130.0	11.6
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

The funding displayed for FY 1992 for the 31 December 1991 SAR is contract escalation funds ($130.0M).

12. [redacted] **Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):**

CVN-76

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. [redacted] Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	4199.2	4297.2	4199.2
(2) Quantity	1	1	1
(3) Unit Cost	4199.20	4297.20	4199.20
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	832.2
Net Total	0.0	0.0	832.2
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. [redacted] **Cost Variance Analysis:**
CVN-72/73

a. [redacted] Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	0.0	7418.9	0.0	7418.9
Previous Changes:				
Economic	-	-889.9	-	-889.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.6	-342.5	-	-340.9
Other	-	-	-	-
Support	-	-17.6	-	-17.6
Subtotal	+1.6	-1250.0	-	-1248.4
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-7.3	-	-7.3
Other	-	-	-	-
Support	-	-7.0	-	-7.0
Subtotal	-	-14.3	-	-14.3
Total Changes	+1.6	-1264.3	-	-1262.7
Current Estimate	1.6	6154.6	-	6156.2

13a. [redacted] Cost Variance Analysis (Cont'd):
CVN-72/73

a. [redacted] Summary -- (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	0.0	5265.5	0.0	5265.5
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.6	-47.4	-	-45.8
Other	-	-	-	-
Support	-	-10.1	-	-10.1
Subtotal	+1.6	-57.5	-	-55.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+25.7	-	+25.7
Other	-	-	-	-
Support	-	-4.6	-	-4.6
Subtotal	-	+21.1	-	+21.1
Total Changes	+1.6	-36.4	-	-34.8
Current Estimate	1.6	5229.1	-	5230.7

b. [redacted] Previous Change Explanations --

RDT&E
Estimating: Revised requirement

PROCUREMENT
Economic: Decreased economic rates.
Schedule:
Estimating: Congressional reduction of funds for management reserves, contractor support services, and Independent Research and Development/Bid and Proposal (IR&D/B&P). Transfer to the FY 1985 Peacekeeper program. Reduced program reserves.

13b. [redacted] Cost Variance Analysis (Cont'd):
CVN-72/73

Increased change order and shipbuilding contract cost. Reduced contract overrun, refinement of program estimates ,and recalculation of previous change for contract overrun.

Support: Revised estimates for outfitting and post delivery.

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Total Changes	--	--
(2) PROCUREMENT		
Decreased ship contract overrun. (Estimating)	-6.1	-7.3
Refinement of program estimates. (Estimating)	31.8	--
Revised amount for Outfitting and Post Delivery. (Support)	-4.6	-7.0
Total Changes	21.1	-14.3

13a. [redacted] Cost Variance Analysis (Cont'd):
CVN-74/75

a. [redacted] Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	0.0	6966.0	0.0	6966.0
Previous Changes:				
Economic	-	+39.5	-	+39.5
Quantity	-	-	-	-
Schedule	-	-644.4	-	-644.4
Engineering	-	-	-	-
Estimating	-	-15.2	-	-15.2
Other	-	-	-	-
Support	-	+168.5	-	+168.5
Subtotal	-	-451.6	-	-451.6
Current Changes:				
Economic	-	-173.7	-	-173.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+260.2	-	+260.2
Other	-	-	-	-
Support	-	+1.1	-	+1.1
Subtotal	-	+87.6	-	+87.6
Total Changes	-	-364.0	-	-364.0
Current Estimate	-	6602.0	-	6602.0

13a. [redacted] Cost Variance Analysis (Cont'd):
CVN-74/75

a. [redacted] Summary -- (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	0.0	5911.0	0.0	5911.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-124.1	-	-124.1
Engineering	-	-	-	-
Estimating	-	-25.0	-	-25.0
Other	-	-	-	-
Support	-	+130.8	-	+130.8
Subtotal	-	-18.3	-	-18.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+243.1	-	+243.1
Other	-	-	-	-
Support	-	+0.4	-	+0.4
Subtotal	-	+243.5	-	+243.5
Total Changes	-	+225.2	-	+225.2
Current Estimate	-	6136.2	-	6136.2

b. [redacted] Previous Change Explanations --

PROCUREMENT

Economic: Revised economic rates.

Schedule: Funding of two ship in FY 1988 vice one in FY 1990 and one in FY 1993.

Estimating: Congressional and Gramm-Rudman reductions.

Support: Revised estimates for Post Delivery and Outfitting.

13c. [redacted] Cost Variance Analysis (Cont'd):
CVN-74/75

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised Dec 91 economic indicies (Economic)	--	-173.7
Increase for Change orders to update the product baseline of CVN 74/75. (Estimating)	89.2	95.2
Current & Prior escalation offset. (Estimating)	153.9	165.0
Revised estimate for outfitting and post delivery. (Support)	0.4	1.1
Total Changes	243.5	87.6

13a. [redacted] Cost Variance Analysis (Cont'd):
CVN-76

a. [redacted] Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	47.0	4250.2	0.0	4297.2
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	+0.2	-21.2	-	-21.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-12.9	-62.8	-	-75.7
Other	-	-	-	-
Support	-	-1.3	-	-1.3
Subtotal	-12.7	-85.3	-	-98.0
Total Changes	-12.7	-85.3	-	-98.0
Current Estimate	34.3	4164.9	-	4199.2

13a. [redacted] Cost Variance Analysis (Cont'd):
CVN-76

a. [redacted] Summary -- (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	48.1	3862.6	0.0	3910.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-12.5	-57.6	-	-70.1
Other	-	-	-	-
Support	-	-0.5	-	-0.5
Subtotal	-12.5	-58.1	-	-70.6
Total Changes	-12.5	-58.1	-	-70.6
Current Estimate	35.6	3804.5	-	3840.1

b. ([redacted]) Previous Change Explanations -- None.

c. ([redacted]) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

13c. [redacted] Cost Variance Analysis (Cont'd):
CVN-76

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Dec 91 economic indices. (Economic)	--	0.1
Economic adjustment for Negative Program Change (Economic)	--	0.1
Revised program estimate, (Estimating)	-12.2	-12.7
Current & prior inflation offset. (Estimating)	-0.1	-0.1
Refinement of program estimates. (Estimating)	-0.2	-0.1
Total Changes	-12.5	-12.7
(2) PROCUREMENT		
Revised Dec 91 economic indices. (Economic)	--	-21.5
Economic adjustment for Negative Program Change. (Economic)		0.3
Program reduced based on latest inflation indicies. (Estimating)	-75.9	-82.5
Refinement of program estimates. (Estimating)	18.3	19.6
Revised estimates for outfitting and post delivery. (Support)	-0.5	-1.2
Total Changes	-58.1	-85.3

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

CVN-72/73
[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
3709.5	-445.0	--	--	--	-174.1	--	-12.3	-631.4	3078.1

14. [redacted] **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions) (Cont'd)

CVN-74/75

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
3483.0	-67.1	--	-322.2	--	122.5	--	84.8	-182.0	3301.0

CVN-76

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
4297.20	-21.00	--	--	--	-75.70	--	-1.30	-98.00	4199.20

15. [redacted] **Contract Information:** (Then-Year Dollars in Millions)

a. [redacted] Procurement --

[redacted] CVN-72/73 Construction:

Tenneco, Newport News, VA
N00024-83-C-2033, FPIF
Award: December 27, 1982
Definitized: December 27, 1982

Initial Contract Price		
Target	Ceiling	Qty
$3143.0	$3454.0	2

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$3344.4	$3670.1	2	$3456.2	$3459.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

The contract overtarget amount has continued to decrease and the contractor has continued with the productivity improvements on the CVN-73 experienced on the CVN-72. The program manager has funds available to fund the difference between estimated price and Program

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions) managers estimate at completion. Reporting under DOD 7000.2 is not required for this contract.

[redacted] Nuclear Components:

	Initial Contract Price		
	Target	Ceiling	Qty
General Electric CO., SCHENECTADY, NY N00024-82-C-4004, CPFF Award: December 29, 1982 Definitized: December 29, 1982	$399.8	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$324.8	N/A	0	$324.8	$324.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

The Navy has waived the cost/schedule control systems reporting requirements for Naval Nuclear Propulsion procurements.

[redacted] Nuclear Components:

	Initial Contract Price		
	Target	Ceiling	Qty
DEPARTMENT OF ENERGY, WASHINGTON, DC N00024-67-F-5110, EAO Award: December 30, 1982 Definitized: December 30, 1982	$914.4	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$784.3	N/A	0	$784.3	$784.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

The Navy has waived cost/schedule control systems reporting requirements for Naval Nuclear Propulsion procurements.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

([redacted]) CVN-74/75 Construction:

	Initial Contract Price		
	Target	Ceiling	Qty
Tenneco, Newport News, VA N00024-88-C-2055, FPIF Award: June 30, 1988 Definitized: June 30, 1988	$3674.0	$4318.6	2

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$3699.7	$4349.6	2	$3928.8	$3851.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-27.2	$-76.5
Cumulative Variances To Date (09/30/91)	$-46.7	$-39.1
Net Change	$-19.5	$37.4

Explanation of Change:

The shipbuilder has adjusted his keel laying and launch dates for the CVN 74/75 to permit a more orderly construction sequence. The keel laying for the CVN 75 will follow launch of CVN 74. This differs from the CVN 72/73 schedules in that the keel date for the CVN 73 preceded the CVN 72 launch. However, the shipbuilder has retained his original material ordering schedule and modular construction schedule to assure material deliveries and unit construction that will support an advance rate of modular erection at keel on CVN 75 but a shorter overall construction sequence to launch. This has created an artificial schedule variance. The shipbuilder has also revised his estimated manhours at completion for CVN 74/75. At this time it appears that an overtarget situation will occur, based on higher CFE costs resulting from a declining industrial base, a slight increase in manhours, and an increase in overhead due to a decrease in shipyard workload.

[redacted] Nuclear Components:

	Initial Contract Price		
	Target	Ceiling	Qty
Westinghouse Electric Co., Monroeville, Pa N00024-88-C-4007, CPFF Award: February 1, 1988 Definitized: February 1, 1988	$540.1	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$519.7	N/A	0	$519.7	$519.7

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

The Navy has waived the cost/schedule control systems reporting requirements for Naval Nuclear Propulsion procurements.

(U) Nuclear Components:

	Initial Contract Price		
	Target	Ceiling	Qty
Westinghouse Elect. Corp, Monroeville, PA N00024-73-C-5002, CPFF Award: December 1, 1982 Definitized: December 1, 1982	$540.1	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$519.7	N/A	0	$519.7	$519.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

The Navy has waived cost/schedule control systems reporting requirements for Naval Nuclear Propulsion procurements.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 52.4% (11 yrs/21 yrs)

(2) Percent Program Cost Appropriated: 74.3% ($12599.7 / $16957.4)

16b. [redacted] Program Funding Summary (Cont'd):
CVN-72/73

b. [redacted] Appropriation Summary -- CVN-72/73

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY82-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	1.6	-	-	-	1.6
Procurement	6117.0	30.2	7.4	-	6154.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	6118.6	30.2	7.4	-	6156.2

b. [redacted] Appropriation Summary -- CVN-74/75

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY88-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	-	-	-	-	-
Procurement	6311.1	130.0	11.6	149.3	6602.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	6311.1	130.0	11.6	149.3	6602.0

16b. [redacted] Program Funding Summary (Cont'd):
CVN-76

b. [redacted] Appropriation Summary -- CVN-76

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2002)	Total
RDT&E	1.8	8.0	8.0	16.5	34.3
Procurement	-	-	832.2	3332.7	4164.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1.8	8.0	840.2	3349.2	4199.2

c. [redacted] Annual Summary -- CVN-72/73

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1983			1.6	1.6	1.6	1.6	1.5	4.9
Subtot			1.6	1.6	1.6	1.6	1.5	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1982			410.1	410.1	451.0	462.7	439.7	7.5
1983	2		4718.9	4718.9	5580.8	5538.6	5123.5	3.8
1986								1.1
1987				6.8	7.6	7.5	7.2	1.5

16c. [redacted] Program Funding Summary (Cont'd):
CVN-72/73

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1988				10.0	11.4	10.2	9.6	2.3
1989				12.8	15.0	14.1	12.5	2.8
1990				31.1	37.1	36.8	29.7	1.3
1991				10.9	14.1	13.1	9.4	1.3
1992				23.0	30.2	0.5	0.2	3.1
1993				5.5	7.4			3.3
Subtot	2		5129.0	5229.1	6154.6	6083.5	5631.8	
Grand Total	2		5130.6	5230.7	6156.2	6085.1	5633.3	

c. [redacted] Annual Summary -- CVN-74/75

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1988	2		5910.4	5910.4	6311.1	6048.3	2284.7	2.3
1992			108.0	108.0	130.0			3.1
1993				9.3	11.6			3.3

16c. [redacted] Program Funding Summary (Cont'd):
CVN-74/75

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1994				16.1	20.7			3.3
1995				19.4	25.7			3.3
1996				33.4	45.7			3.2
1997				8.1	11.4			3.2
1998				31.5	45.8			3.2
Subtot	2		6018.4	6136.2	6602.0	6048.3	2284.7	
Grand Total	2		6018.4	6136.2	6602.0	6048.3	2284.7	

c. [redacted] Annual Summary -- CVN-76

Fiscal Year	Qty	Flyaway FY95 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1991			2.0	2.0	1.8			3.9
1992			8.6	8.6	8.0			3.1
1993			8.4	8.4	8.0			3.3
1994			12.8	12.8	12.6			3.3

16c. [redacted] Program Funding Summary (Cont'd):
CVN-76

Fiscal Year	Qty	Flyaway FY95 Dollars Nonrec	Flyaway FY95 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1995			3.8	3.8	3.9			3.3
Subtot			35.6	35.6	34.3			
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1993			802.5	802.5	832.2			3.3
1995	1		2928.7	2928.7	3235.3			3.3
1999				15.2	19.0			3.2
2000				15.2	19.7			3.2
2001				9.6	12.8			3.2
2002				33.3	45.9			3.2
Subtot	1		3731.2	3804.5	4164.9			
Grand Total	1		3766.8	3840.1	4199.2			

17. [redacted] **Production Rate Data:**
CVN-72/73

a. ( ) Annual Production Rates -- None.

b. ( ) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	5230.7	N/A	
(TY $)	N/A	N/A	6156.2	N/A	
PAUC Cost (BY $)	N/A	N/A	2615.350	N/A	N/A
(TY $)	N/A	N/A	3078.100	N/A	N/A

c. [redacted] Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. ( ) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	1/1

e. ( ) Approved Design-to-Cost Objective -- N/A.

17a. [redacted] Production Rate Data (Cont'd):

CVN-74/75

a. ([redacted]) Annual Production Rates -- None.

b. ([redacted]) Cost Variance -- None.

c. ([redacted]) Schedule Variance -- None.

d. ([redacted]) Deliveries (Plan/Actual) -- None.

e. ([redacted]) Approved Design-to-Cost Objective -- N/A.

CVN-76

a. ([redacted]) Annual Production Rates -- None.

b. ([redacted]) Cost Variance -- None.

c. ([redacted]) Schedule Variance -- None.

d. ([redacted]) Deliveries (Plan/Actual) -- None.

e. ([redacted]) Approved Design-to-Cost Objective -- N/A.

18. [redacted] Operating and Support Costs:

CVN-72/73

a. [redacted] Assumptions and Ground Rules --

These cost are based on the operating costs for supplies, equipage, and pierside support when deployed.

b. [redacted] Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Ship	Avg Annual Cost Per Ship
Operating costs	N/A	11.4
Total	N/A	11.4

c. [redacted] Contractor Support Costs -- None.

18a. [redacted] Operating and Support Costs (Cont'd):

CVN-74/75

a. ([redacted]) Assumptions and Ground Rules -- None

b. ([redacted]) Costs -- None.

c. ([redacted]) Contractor Support Costs -- None.

CVN-76

a. ([redacted]) Assumptions and Ground Rules -- None

b. ([redacted]) Costs -- None.

c. ([redacted]) Contractor Support Costs -- None.

91-016

AF-18 NAVSTAR

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(QA)823)
PROGRAM: NAVSTAR GPS

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
MAR 5 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW
OFFICE OF ASSISTANT SECRETARY OF DEFENSE (PUBLIC AFFAIRS)

1. (U) Designation and Nomenclature (Popular Name):
NAVSTAR GPS/NAVSTAR Global Positioning System

2. (U) DoD Component: USAF

Joint Participants:
USA, USN, USMC

3. (U) Responsible Office and Telephone Number:

NAVSTAR GPS Joint Program Office	COL LAWRENCE P GRAVISS
Space Systems Division	Assigned: September 27, 1991
P.O. Box 92960	AV 833-1526 COMM (310) 363-1526
Los Angeles AFB, CA 90009-2960	

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0305164F, 0305165F, 0603421F, 0604478F, 0604777N, 0604778A, 0604778F
PE 0206626M, 0305164A, 0305164N

SAF/PAS
92-279 - T

~~Classified by: GPS SOC Jul 84~~
~~Declassify on: OADR~~
~~Downgrade Instructions:~~

OASD(PA) DFOISR 92-T-0446

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4. (U) Program Elements/Procurement Line Items (Cont'd):

PROCUREMENT:
APPN 1506 ICN N/A (Navy)
APPN 1611 ICN N/A (Navy)
APPN 1810 ICN N/A (Navy)
APPN 2031 ICN N/A (Army)
APPN 2035 ICN N/A (Army)
APPN 3010 ICN MGPS003010 (Air Force)
APPN 3020 ICN MGPS003020 (Air Force)
APPN 3080 ICN MGPS003080 (Air Force)
MILCON:
PE 0305165F
O & M:
PE 0305164A, 0305164N, 0305164F

5. (U) Related Programs:
NUDET Detection System (NDS); and Space Boosters Program (Delta II).

6. (U) Mission and Description:
The NAVSTAR Global Positioning System (GPS) is a space-based radio positioning, navigation and time distribution system. The GPS will ultimately provide precise, continuous, all-weather, common grid worldwide positioning, navigation and time reference capability to a multiplicity of users. Mission areas supported include navigation and position fixing, air interdiction, close air support, special operations, strategic attack, counterair and aerospace defense, theater and tactical command, control communications and intelligence and ground and sea warfare. While NAVSTAR GPS does not replace any USAF weapon system, it provides the capability to replace the following support systems: VHF Omnidirectional Range (VOR), Long Range Aid to Navigation (LORAN), OMEGA, Tactical Air Navigation (TACAN), and Distance Measurement Equipment (DME).

7. (U) Program Highlights:
a. (U) Significant Historical Developments —
GPS was approved to enter Full Scale Development in Aug 79 and ten Block I development satellites were launched through Oct 85 to support system and User Equipment (UE) testing. The GPS ground control system was also developed during this phase. This system consists of three ground antenna systems, five monitor stations installed at various worldwide locations, and a master control station. Program Management Responsibility Transfer (PMRT) of the ground segment to Air Force Space Command (AFSPACECOM) was accomplished in Apr 90 at successful completion of operational test and evaluation.

In May 83 a fixed priced multiyear contract was awarded for 28 Block II GPS production satellites. Qualification testing was completed in

7a. (U) Program Highlights (Cont'd):

May 86. However, due to the space shuttle accident, the production contract was restructured in FY88 to meet projected launch vehicle schedules. The first production satellite was launched in Feb 89 on a Delta II rocket from Cape Canaveral. This launch program is continuing. In FY88 twenty replenishment satellites (Block IIR) were added to the program. The competitively awarded, multiyear contract resulted in a $209M savings from the government estimate. In FY90 the government exercised the GPS long lead item production option for the 20 Block IIR satellites with first delivery in FY95.

GPS UE development began in FY79. Testing was conducted on a variety of land, sea, and airborne test platforms. Test platforms include M-35 trucks, an aircraft carrier, a submarine, UH-60 helicopters, and F-16, A-6, and B-52 aircraft. Operational Test (OT) results showed that the UE navigation performance met or exceeded operational requirements; however, demonstration of reliable performance identified problems. Platform integration, supportability and Manpower Personnel Requirements Integrated with Training (MANPRINT) improvements were also identified.

Following a source selection Rockwell International/Collins Government Avionics Division (CGAD) was awarded the UE Research & Development (R&D) Contract, including production options, on 1 Apr 85.

The Joint Requirements Management Board (JRMB) approved Low Rate Initial Production (LRIP) for UE in Jun 86. The first production option of the Rockwell Contract was exercised in Aug 86. The production and integration schedules were coordinated by each service consistent with optimum installation schedules and budgetary guidance. In conjunction with the platform managers, common interfaces have been developed in order to reduce integration costs associated with the planned installations of over 26,000 sets in over 200 types of vehicles.

In Oct 87, the Naval Avionics Center (NAC) awarded two contracts, on behalf of the JPO, to potential second sources for the two- and five-channel airborne and shipboard receivers. The contracts were awarded to SCI Technology Inc. and Canadian-Marconi.

In Sep 90, the Defense Acquisition Board (DAB) met to review the Navstar GPS UE program to determine whether to proceed to Full Rate Production (FRP). The Joint Requirements Oversight Council (JROC) validated the continuing requirement for the UE. The Command, Control, Communications and Intelligence (C3I) Committee recommended continuation of LRIP while additional OT was conducted. Approval to continue LRIP through FY91 was granted on an Acquisition Decision

7a. (U) Program Highlights (Cont'd):

Memorandum (ADM) dated 20 Sep 90.

As a result of the ADM decision, five UE production contracts were awarded in Sep 90. In addition, a contract for the Miniaturized Airborne GPS Receiver (MAGR) was awarded in Dec 90. Numerous orders were received and contracts awarded for Small Lightweight GPS Receivers (SLGR) to support Operation Desert Storm.

b. (U) Significant Developments Since Last Report --
The requirement to procure Phase III one- and two-channel User Equipment has been replaced by the Precise Lightweight GPS Receiver (PLGR) and the Miniaturized Airborne GPS Receiver (MAGR). The Army has the largest validated requirement for acquisition of the PLGR due to the benefit gained using the commercial SLGR in Operation Desert Storm. The MAGR, originally developed to meet the needs of airborne platforms that could not accommodate the size and/or weight of the five-channel receiver, and the PLGR satisfy the Army requirement for the two-channel receiver as well. Results of the extended operational testing on the Phase III five-channel receiver show reliability criteria being met for Milestone III approval. The Air Force and OSD Cost Analysis Improvement Group (CAIG) adopted the Independent Cost Estimate (ICE) recommendation to proceed to the Defense Acquisition Board (DAB) for Milestone III decision.

The JPO completed the GPS Air Force Integrated Weapon Systems Management (IWSM) Concept of Operations (CONOPS) plan for the merger of the Air Force Systems Command and Air Force Logistics Command. The IWSM CONOPS was signed by the Air Force Acquisition Executive (AFAE) on 12 Dec 91 and the implementation plan is being developed for submittal to the AFAE on 11 Mar 92. NAVSTAR GPS JPO is the only Space Program selected to operate under IWSM prior to 1 Jul 92.

The NAVSTAR GPS system is expected to satisfy the mission requirement.

c. (U) Changes Since As Of Date --
The Acquisition Decision Memorandum (ADM), dated 30 January 1992, approved full rate production for the Phase III five-channel GPS user equipment. Additionally, the Air Force was directed to provide acquisition strategy for the PLGR and plans for acquisition of other future DoD GPS equipment to determine the appropriate level (Defense Acquisition Executive or Component Acquisition Executive) for subsequent production decisions.

Four reaction wheels were replaced on the NAVSTAR II-12 satellite and a successful mission Readiness Review was accomplished on 17 Jan 92. The NAVSTAR II-12 launch occurred 23 Feb 92.

8. (U) Threshold Breaches:
There are Acquisition Program Baseline (dated 8 Mar 1991) breaches in the following areas: a) User Equipment Milestones - First Full Rate UE Production Delivery, and b) Development and Procurement Cost for User Equipment. Program Deviation Reports (PDRs) are in progress. There are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:
NAVSTAR GPS Satellite

a. (U) Milestones —

	Development Estimate	Approved Program	Current Estimate
Milestone I (DSARC)	DEC 73	DEC 73	DEC 73
Milestone II (DSARC)	JUN 79	JUN 79	JUN 79
First Production Satellite Launch	JAN 87	FEB 89	FEB 89
Block IIR Contract Award	N/A	JUN 89	JUN 89
Control Segment Turnover to AFSPACECOM (6 months after third launch) 1/	N/A	TBD	APR 90
21 Satellites on-orbit	N/A	MAR 93	MAR 93
First Block IIR Satellite Launch	N/A	MAR 96	MAR 96(Ch-1)

1/ Turnover occurs six months after third successful Block II launch. Launch schedules are determined in coordination with AFSPACECOM based on user needs.

b. (U) Previous Change Explanations --

Launch of the first Block II satellite slipped from Jan 87 to Jan 89 due to the Shuttle standdown. Subsequently the Program Management Directive (PMD) was revised to incorporate the Space Transportation System (STS) standdown. The launch schedule was normalized to assure consistent support, constellation build, and to smooth the resulting satellite replenishment requirements. Delay in the Delta II initial launch capability resulted in first production satellite launch date being slipped to Feb 89. The Control Segment turnover to AFSPACECOM was accomplished in Apr 90.

c. (U) Current Change Explanations --

(Ch-1) First Block IIR Satellite Launch is an approved Acquisition Program Baseline milestone. The current estimate is March 1996.

d. (U) References --

(U) Development Estimate:
Decision Coordinating Paper (DCP) #133, Revision B, 1 Feb 80.

9d. (U) Schedule (Cont'd):
NAVSTAR GPS Satellite

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

NAVSTAR GPS User Equip

a. (U) Milestones —	Development Estimate	Approved Program	Current Estimate
Milestone I (DSARC)	DEC 73	N/A	DEC 73
Milestone II (DSARC)	JUN 79	N/A	JUN 79
Milestone III (DSARC)	SEP 83	N/A	SEP 83
Milestone IIIA (JRMB) Award	N/A	JUN 86	JUN 86
AF DT User Equipment (UE)			
Begin	N/A	JUL 88	JUL 88
Complete	N/A	MAY 89	AUG 89
User Equipment OT&E			
Begin	N/A	JUN 89	JUN 89
Complete	N/A	NOV 89	JUL 91
Milestone IIIB (DAB) UE	MAR 89	SEP 91	JAN 92(Ch-1)
First Full-Rate UE Production Delivery	N/A	MAR 93	NOV 93(Ch-2)
Depot Capability	N/A	SEP 92	SEP 92

* Denotes non-APB data elements.

b. (U) Previous Change Explanations --

Reliability and maintainability problems identified during Phase II dictated additional testing which caused the delayed completion of user equipment Development Testing (DT). Milestone IIIB, user equipment full rate production, is required to comply with Public Law 9894. Milestone IIIB decision delays, from Mar 89 to Sep 90, are attributed to schedule changes for the first Block II satellite launch, late User Equipment deliveries, and increased coordination at the conclusion of testing. In Sep 90, the Milestone IIIB decision was again delayed requiring additional operational testing to verify (without qualifications) that all exit criteria were met. The first full-rate UE production delivery date slipped as a result of the Milestone III delay.

c. (U) Current Change Explanations --

(Ch-1) The Milestone IIIB decision was delayed from Sep 91 to Jan 92.

(CH-2) As a result of the Milestone III delay, the first full rate UE production delivery date was delayed from Apr 93 to Nov 93.

9c. (U) Schedule (Cont'd):
NAVSTAR GPS User Equip
Program Deviation Report (PDR) is in progress.

d. (U) References --

(U) Development Estimate:
Decision Coordinating Paper (DCP) #133 Revision B, 1 Feb 1980; DCP on User Equipment, Jun 86.

(U) Approved Program:
DAE Approved Acquisition Program Baseline, dated 8 March 1991.

10. (U) Performance Characteristics:
NAVSTAR GPS Satellite

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
3-D System Positioning Accuracy (meters) (Spherical Error Probable (SEP))	16	16 / 16	10 B/	16
3-D System Positioning Accuracy for 180 days after last Nav Update				
Block II SEP (km)	N/A	10 / 10	TBD	10
Block IIR SEP (m)	N/A	16 / 16	TBD	16
Block II Satellite Mean Mission Duration (MMD)(yrs)	6	6 / 6	6.25 A/	6
System Availability % (minimum of 21 satellites are operational at any time)	98	98 / 98	98	98
Satellite Survivability/Nuclear Threat				

(b)(1) [redacted]

10a. Performance Characteristics (Cont'd):

NAVSTAR GPS Satellite

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Satellite Maximum Weight (lbs) (Delta II)	N/A	4480	/ 4480	4480	4480
Expected Ground Power (End of Life)(dbw)					
L1(C/A)	-160	-160	/ -160	-160	-160
L1 (Precision Code)	-163	-163	/ -163	-163	-163
L2 (Precision Code)	-166	-166	/ -166	-166	-166
Cesium Clock Stability (f/f)	2x10^ -13	2x10^-13	/ 2x10^-13	1X10^-13	2X10^-13
Time Transfer (Universal Coordinated Time) (nsec)	+/-100	+/- 100	/ +/- 100	+/- 100	+/-100
Block II Satellite Design Life (yrs)	N/A	7.5	/ 7.5	1.76	7.5
Block I Satellite Expected Ground Power (End of Life (dbw)					
L1 (C/A)	-160	N/A	/ N/A	-155	-160
L1 (Precision Code)	-163	N/A	/ N/A	-158	-163
L2 (Precision Code)	-166	N/A	/ N/A	-159	-166
Cesium Clock Stability f/f 2/	2x10^ -13	N/A	/ N/A	2x10^-13	2x10^-13

Note: The circumflex '^' has previously been reported as '**'. This symbol is meant to signify exponential number.

1/ Probability that a minimum of 21 satellites are operational at any time.

2/ DCP Threshold.

A/ Demonstrated performance of 6.25 years has been obtained for Block I Spacecraft which have a design mean mission duration of 4.0 years. A 6 year mean mission duration represents Block II production satellite design.

B/ The 16 meter objective (21 satellite constellation) corresponds to 10 meters achieved with DT&E satellite spacing.

C/ Total dose requirement can not be specified by a single number. It is specified by integral fission electron and natural spectrums.

10a. (U) Performance Characteristics (Cont'd):

NAVSTAR GPS Satellite

(b)(1)

b. (U) Previous Change Explanations — None.

c. (U) Current Change Explanations —

(CH-1) Previously reported in error.
(CH-2) This is changed to N/A due to total dose requirement can not be specified by a single number. It is specified by integral fission electron and natural spectrums.

d. (U) References —

(U) Development Estimate:
Decision Coordinating Paper (DCP) #133, Revision B, 1 Feb 80.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

NAVSTAR GPS User Equip

a. (U) Performance —

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Reliability Mean Time Between Operational Failures (hours)					
Airborne					
5-Channel	550	590	/ 500	2130.2	500
2-Channel	550	929	/ 500	722.8	500
Ground (hrs)	850	2000	/ 500	1653.2	500
Sea (hrs)	900	680	/ 680	2880.8	680
Maintainability Manhours to Repair (hours)					
Airborne					
5-Channel	1.3	1	/ 1	.75	1.0
2-Channel	1.3	.75	/ .75	.27	.75
Ground (hrs)	1.2	.75	/ .75	.18	.75
Sea (hrs)	1.3	1.5	/ 1.5	.77	1.5

b. (U) Previous Change Explanations —

The mean time between maintenance was decreased for the airborne, ground and sea user equipment sets at Milestone IIIB. In addition, airborne user equipment 2 and 5 channel sets were separated for mean

10b. (U) Performance Characteristics (Cont'd):
NAVSTAR GPS User Equip
time between maintenance and maintainability manhours to repair.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
Decision Coordinating Paper (DCP) #133 Revision B, 1 Feb 1980; DCP on User Equipment, Jun 86.

(U) Approved Program:
DAE Approved Acquisition Program Baseline, dated 8 March 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)
NAVSTAR GPS Satellite

a. (U) Cost —	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	967.6	919.3	998.0
Procurement	623.4	1435.3	1394.2
Flyaway	(583.6)		(1160.8)
Total Flyaway	(583.6)		(1160.8)
Other Weapon Systems	(39.8)		(233.4)
Total Other Wpn Sys	(39.8)		(233.4)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	8.4	4.7	4.7
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 79 Base-Year $	1599.4	2359.3	2396.9
Escalation	707.3	1681.1	1943.6
Development (RDT&E)	(204.9)	(273.4)	(370.1)
Procurement	(496.1)	(1405.1)	(1570.9)
Construction (MILCON)	(6.3)	(2.6)	(2.6)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2306.7	4040.4	4340.5

b. (U) Quantity --			
Development (RDT&E)	12	N/S	12
Procurement	28	48	53
Total	40	48	65

c. (U) Foreign Military Sales -- None.

11d. (U) Total Program Cost and Quantity (Cont'd):
NAVSTAR GPS Satellite

d. (U) Nuclear Costs — None.

e. (U) References —

(U) Development Estimate:
Decision Coordinating Paper (DCP) #133, Revision B, 1 Feb 80.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

NAVSTAR GPS User Equip

a. (U) Cost —	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	941.8	847.0	1005.3
Procurement	1613.1	1372.4	1919.2
Flyaway	(1115.9)		(1238.9)
Total Flyaway	(1115.9)		(1238.9)
Other Weapon Systems	(497.2)		(680.3)
Total Other Wpn Sys	(497.2)		(680.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	53.2
Total FY 79 Base-Year $	2554.9	2219.4	2977.7
Escalation	2320.9	1847.8	3542.5
Development (RDT&E)	(441.9)	(368.1)	(593.7)
Procurement	(1879.0)	(1479.7)	(2886.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(62.6)
Total Then-Year $	4875.8	4067.2	6520.2

Program Deviation Report (PDR) for Total Development Cost and Total Procurement Cost is in progress.

b. (U) Quantity —			
Development (RDT&E)	129	0	248
Procurement	27210	25377	77665
Total	27339	25377	77913

c. (U) Foreign Military Sales —

	Dollars	Quantity Receivers/AOCs

11c. (U) Total Program Cost and Quantity (Cont'd):

NAVSTAR GPS User Equip

Australia	$ .5M	38/547
Germany	$ 10.3M	59/295
Canada	$ .4M	6/15
Denmark	$ .0M	0/24
France	$ .1M	0/423
Italy	$ .0M	0/20
Japan	$ 4.2M	11/55
Netherlands	$ .1M	0/343
Norway	$ .0M	0/128
United Kingdom	$ .4M	0/1474

Notes: AOC - Auxiliary Output Chip. Currently the program has $1.0M for NATO under a service contract. Denmark, Italy and Norway have dollar values which round to less than $ .1M.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
Decision Coordinating Paper (DCP) #133 Revision B, 1 Feb 1980; DCP on User Equipment, Jun 86.

(U) Approved Program:
DAE Approved Acquisition Program Baseline, dated 8 March 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

NAVSTAR GPS Satellite

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	4340.5	4411.9	4340.5
(2) Quantity	65	65	65
(3) Unit Cost	66.777	67.875	66.777

12. [redacted] Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

NAVSTAR GPS Satellite

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	188.8	191.2	249.4
Less CY Adv Proc	66.0	66.0	59.2
Plus PY Adv Proc	62.9	62.9	62.3
Net Total	185.7	188.1	252.5
(2) Quantity	4	4	6
(3) Unit Cost	46.425	47.025	42.083

NAVSTAR GPS User Equip

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. [redacted] Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6520.2	5868.2	6520.2
(2) Quantity	77913	55915	77913
(3) Unit Cost	0.084	0.105	0.084
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	202.6	202.6	277.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	202.6	202.6	277.0
(2) Quantity	2245	2245	4609
(3) Unit Cost	0.090	0.090	0.060

13. [redacted] Cost Variance Analysis:
NAVSTAR GPS Satellite

a. [redacted] Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1172.5	1119.5	14.7	2306.7
Previous Changes:				
Economic	-27.5	+92.5	-1.4	+63.6
Quantity	-	+927.3	-	+927.3
Schedule	+6.8	+623.9	-	+630.7
Engineering	+269.1	+344.0	-	+613.1
Estimating	-106.5	-574.9	+0.5	-680.9
Other	-	-	-	-
Support	+58.8	+499.1	-6.5	+551.4
Subtotal	+200.7	+1911.9	-7.4	+2105.2
Current Changes:				
Economic	-7.3	-54.1	-	-61.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+22.5	-	-	+22.5
Estimating	-20.3	-30.8	-	-51.1
Other	-	-	-	-
Support	-	+18.6	-	+18.6
Subtotal	-5.1	-66.3	-	-71.4
Total Changes	+195.6	+1845.6	-7.4	+2033.8
Current Estimate	1368.1	2965.1	7.3	4340.5

13a. (U) Cost Variance Analysis (Cont'd):
NAVSTAR GPS Satellite

a. (U) Summary -- (FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	967.6	623.4	8.4	1599.4
Previous Changes:				
Quantity	-	+410.5	-	+410.5
Schedule	+4.5	+2.5	-	+7.0
Engineering	+149.4	+239.0	-	+388.4
Estimating	-159.2	-54.3	+0.4	-213.1
Other	-	-	-	-
Support	+33.1	+186.1	-4.1	+215.1
Subtotal	+27.8	+783.8	-3.7	+807.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+11.2	-	-	+11.2
Estimating	-8.6	-20.5	-	-29.1
Other	-	-	-	-
Support	-	+7.5	-	+7.5
Subtotal	+2.6	-13.0	-	-10.4
Total Changes	+30.4	+770.8	-3.7	+797.5
Current Estimate	998.0	1394.2	4.7	2396.9

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised economic escalation indices.
Schedule: One year acceleration in design/development of flexible modular interface for tailoring user equipment to host vehicles.
Engineering: Funds added to develop and integrate product improvement on the Block II space vehicle. Funding increased due to redefinition of GPS Survivability Program. Funds added for increased development and testing associated with adding replenishment satellites (Block IIR) to the Program.
Estimating: Adjustment made for current and prior year

13b. [redacted] Cost Variance Analysis (Cont'd):

NAVSTAR GPS Satellite

escalation changes. Funding for additional year in support of Control and User Segments. Funds added (FY86-88) for necessary control segment modifications for interface with Block II satellites. Funds added for GE Block IIR development contract and required Block IIR contract support (FY01-06).

Support: Funds withdrawn due to delay in Beneficial Occupancy Date for Master Control Station move into Consolidated Space Operations Center. Funds added to continue control segment support until turnover to Air Force Space Command. Additional support added due to space shuttle launch delays. Funds added for support costs associated with the Block IIR development and test effort.

PROCUREMENT

Economic: Revised economic escalation indices.

Quantity: Twenty Block IIR satellites procured on an annual basis (FY91-1, FY92-3, FY93-3, FY94-4, FY95-3, FY96-4, FY97-2) added and six Block IIR satellites procured on annual options added to the program. One optional Block IIR satellite deleted from the program (FY92).

Schedule: Funds reduced for one year delay in satellite production start. Funds added due to delay of STS launch capability. Reduced funding due to savings from changing Block IIR procurement to four per year. Change in optional Block IIR satellite funding profile; one satellite slipped from FY94 to FY95.

Engineering: Funds reduced due to deletion of crosslink ranging, increased hardening and autonomous housekeeping requirements. Funds added for engineering changes associated with Block IIR procurement.

Estimating: Adjustments made for prior and current year escalation changes. Funds reduced due to change in satellite procurement approach from an annual to a Multiyear Procurement (MYP) for Block II; savings partially offset by need to fully fund satellites by Congressional direction. Funds added for Orbital Insertion Motor and Data Transfer System for GPS satellites. Funds added associated with the addition of Block IIR. Funds reduced due to change in satellite procurement approach from an annual to a MYP for Block IIR. Funds added for Block IIR outyears (FY01-06).

13b. Cost Variance Analysis (Cont'd):

NAVSTAR GPS Satellite

Support: Funds added for flight operations due to one year extension in the satellite program. Funds added for Shuttle Recovery Program. Funds added for support costs associated with Block IIR procurement. Funds added for Block IIR outyears (FY01-06).

MILCON

Economic: Revised economic escalation indices.

Estimating: Adjustment for difference between President's Budget and required funding.

Support: Deletion of Consolidated Space Operation Center (CSOC) contingency funding.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices (Economic)	N/A	-7.3
Funding increased for Block IIR due to clarification of Engineering design requirements (Engineering)	11.2	22.5
Reduction of future ECO estimates and FFRDC funding as a result of AF reductions directed by Congress (Estimating)	-9.5	-22.0
Adjustment for current and prior year escalation (Estimating)	0.9	1.7
Total Changes	2.6	-5.1

13c. [redacted] Cost Variance Analysis (Cont'd):
NAVSTAR GPS Satellite

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised economic escalation indices (Economic)	N/A	-54.1
Adjustment for Current and Prior year escalation (Estimating)	4.2	9.3
Congressional withdrawal of FY92 cancellation ceiling for GE Block IIR MYP contract (Estimating)	-4.0	-8.8
Congressional withdrawal of funds identified for Block IIR due to clarification of Eng dsgn rqmts (Estimating)	-8.1	-18.1
Reduction of Engr. Chg. orders as a result of Congressionally directed Air Force reductions (Estimating)	-11.9	-28.1
Realignment of support and flyaway for GE Block IIR reductions (Estimating)	-2.6	-4.1
Realignment of support and flyaway for GE Block IIR (Support)	2.6	4.1
Air Force Reprogramming of excess prior year funds (Estimating)	-13.5	-28.6
FY98-FY06 funding for storage, launch and on-orbit suppport on GE Block IIR (not included in previous SAR) (Estimating)	15.4	47.6
Reduction of FFRDC & contract support funding as a result of Congressionally directed Air Force reductions (Support)	-1.6	-3.5
Air Force reprogramming of excess prior year funds (Support)	-0.9	-2.0
FY93-FY99 funding for tech support (not included in previous SAR) (Support)	7.4	20.0

13c. ([redacted]) Cost Variance Analysis (Cont'd):
NAVSTAR GPS Satellite

	(Dollars in Millions) Base-Year	Then-Year
Total Changes	-13.0	-66.3
(3) MILCON		
None	--	--
Total Changes	--	--

NAVSTAR GPS User Equip

a. ([redacted]) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	O&M	TOTAL
Development Estimate	1383.7	3492.1	0.0	4875.8
Previous Changes:				
Economic	-0.2	+136.2	+0.3	+136.3
Quantity	-	-302.9	-20.0	-322.9
Schedule	-	+405.9	-	+405.9
Engineering	-	-54.9	-	-54.9
Estimating	+50.9	+327.9	+307.2	+686.0
Other	-	-	-	-
Support	-	+142.0	-	+142.0
Subtotal	+50.7	+654.2	+287.5	+992.4
Current Changes:				
Economic	-8.5	-115.8	-4.6	-128.9
Quantity	-	+63.9	-	+63.9
Schedule	-	+100.1	-	+100.1
Engineering	-	+8.1	-	+8.1
Estimating	+190.9	+72.6	-167.1	+96.4
Other	-	-	-	-
Support	-17.8	+530.2	-	+512.4
Subtotal	+164.6	+659.1	-171.7	+652.0
Total Changes	+215.3	+1313.3	+115.8	+1644.4
Current Estimate	1599.0	4805.4	115.8	6520.2

13a. (U) Cost Variance Analysis (Cont'd):
NAVSTAR GPS User Equip

a. (U) Summary -- (FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	O&M	TOTAL
Development Estimate	941.8	1613.1	0.0	2554.9
Previous Changes:				
Quantity	-	-195.4	-10.0	-205.4
Schedule	-	+51.8	-	+51.8
Engineering	-	-24.8	-	-24.8
Estimating	+0.9	+208.2	+133.8	+342.9
Other	-	-	-	-
Support	-	-12.5	-	-12.5
Subtotal	+0.9	+27.3	+123.8	+152.0
Current Changes:				
Quantity	-	+20.9	-	+20.9
Schedule	-	+30.5	-	+30.5
Engineering	-	+3.5	-	+3.5
Estimating	+67.7	+28.3	-70.6	+25.4
Other	-	-	-	-
Support	-5.1	+195.6	-	+190.5
Subtotal	+62.6	+278.8	-70.6	+270.8
Total Changes	+63.5	+306.1	+53.2	+422.8
Current Estimate	1005.3	1919.2	53.2	2977.7

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised economic escalation indices.
Estimating: Decreased aircraft modification efforts and prior year escalation. Revised platform integration estimates from aircraft manufacturers. Adjustment for current and prior year escalation change. Increased cost for Navy group "B" (User Equipment) and "A" kits (integration hardware). Air Force revised Host Vehicle (HV) integration. Army revised platform integration and test estimates. Navy and Marine Corps revised HV integration estimates.

13b. (U) Cost Variance Analysis (Cont'd):
NAVSTAR GPS User Equip

PROCUREMENT

Economic:	Revised economic escalation indices.
Quantity:	Negative cost variance is due to the transition from MIL-SPEC User Equipment to Non-Developmental Items (NDI) procurement of MAGRs, SLGRs and PLGRs. The actual procurement of end items increased. However, the dollars decreased due to the lower costs of the NDI equipment.
Schedule:	Procurement schedule restructured toward the outyears due to revised force structure requirements.
Engineering:	Incorporation of Value Engineering Change Proposal for User Equipment Receiver.
Estimating:	Increase is due to changes in methodology including: Engineering Change Proposals (ECPs), type of equipment, update of learning curves to reflect new contract price, revised program support costs, correction of previous SARs and adjustment for current and prior year escalation.
Support:	Variance is due to increases/decreases of initial spares and support equipment associated with changes in User Equipment procurement, schedule delays and program stretch out.

O & M

Economic:	Revised economic escalation indices.
Quantity:	Navy and Marine Corps reduced labor estimates due to reduced quantity.
Estimating:	Installation funding for Air Force user equipment modifications which will be performed at Air Force Logistics centers. Addition of Marine and Navy requirements. Navy and Army added new estimates for installation labor.

c. (U) Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year

13c. [redacted] Cost Variance Analysis (Cont'd):
NAVSTAR GPS User Equip

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices (Economic)		-8.5
Increased Group B Development estimate - Air Force (Estimating)	17.0	53.0
New estimate for 1999 and beyond - Air Force (Estimating)	46.5	125.2
Revised host vehicle integration & engineering estimates - Navy (Estimating)	4.2	12.7
Increased Mission Support estimate - Air Force (Support)	7.3	14.7
Contractor Support estimate decreased - Air Force (Support)	-12.4	-32.5
Total Changes	62.6	164.6

13c. (U) Cost Variance Analysis (Cont'd):
NAVSTAR GPS User Equip

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised inflation indices (Economic)		-115.8
Total procurement quantities decreased (-567) - Air Force (Quantity)	-22.3	-57.8
Revised Army GPS UE requirements with (+19,164) transition from MILSPEC to Non-Developmental Item (NDI) - Army (Quantity)	63.2	157.1
Reduced aircraft/ship user equipment sets (-963). Increased PLGRs quantities (+3181) - Navy (Quantity)	-20.0	-35.4
Host vehicle procurement schedules slipped - Air Force (Schedule)	3.8	18.6
Delay to aircraft platform installs while accelerating ground users - Army (Schedule)	15.7	55.9
Procurement schedule restructured and extended due to revised force structure requirements - Navy (Schedule)	11.0	25.6
Incorporated Value Engineering Change Proposal (VECP) for user equipment receiver - Navy (Engineering)	3.5	8.1
Estimating methods changed for installation labor, engineering, A-kits, and documentation - Air Force (Estimating)	20.2	50.9
Revised estimating methodology for airft integ. & installation. New est. for non-GPS Grp B kits - Navy (Estimating)	8.1	21.7
New estimate for Depot Support - Air Force (Support)	22.1	67.9
New estimate for UE Test - Air Force	40.6	115.2

13c. (U) Cost Variance Analysis (Cont'd):
NAVSTAR GPS User Equip

	(Dollars in Millions) Base-Year	Then-Year
(Support)		
New estimate for JPO Tech Support/Program Support - Air Force (Support)	113.0	285.0
Adjustment of support costs to accomodate increased quantity - Army (Support)	9.5	35.8
Revised contractor support estimates associated with new NDI equipment requirements - Navy (Support)	10.4	26.3
Total Changes	278.8	659.1
(3) O & M		
Revised economic inflation indices (Economic)		-4.6
Adjustment in allocation for training of maintenance and operations personnel (Estimating)	-65.7	-152.3
Revised Interim Contractor Support (ICS) estimate (Estimating)	-4.9	-14.8
Total Changes	-70.6	-171.7

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

NAVSTAR GPS Satellite
(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
57.67	0.03	-7.91	9.70	9.78	-11.26	—	8.77	9.11	66.78

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions) (Cont'd)

NAVSTAR GPS User Equip

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.178	--	-0.117	0.006	-0.001	0.010	--	0.008	-0.094	0.084

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E --

(U) PHASE III UE DEVELOPMENT:

ROCKWELL INTERNATIONAL, Cedar Rapids, IA
F04701-85-C-0038, FPIF
Award: April 1, 1985
Definitized: April 1, 1985

	Initial Contract Price		
	Target	Ceiling	Qty
	$61.9	$66.3	51

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$149.2	$156.8	248	$152.9	$152.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-11.9	$-0.7
Cumulative Variances To Date (11/30/91)	$-13.7	$-0.7
Net Change	$-1.8	$0.0

Explanation of Change:

Late completion of required qualification tests which increased the cost variance slightly. These tests have now been completed. There is no impact to the program.

This contract is essentially complete and will no longer be reported.

(U) BLK IIR DEVELOPMENT:

GENERAL ELECTRIC, PRINCETON, NJ
F04701-89-C-0073, FPIF
Award: June 1, 1989
Definitized: June 1, 1989

	Initial Contract Price		
	Target	Ceiling	Qty
	$92.0	$104.3	0

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$99.2	$113.2	0	$136.0	$141.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-9.8	$-10.9
Cumulative Variances To Date (12/01/91)	$-24.1	$-8.4
Net Change	$-14.3	$2.5

Explanation of Change:

The cost variance is primarily due to the Telemetry Tracking & Command (TT&C), L-Band System (LBS), Electrical Power Subsystem (EPS) and the Program Management Office (PMO), and operate through. TT&C is overrunning due to underestimating the design cost of the Spacecraft Processor Unit. The Command Decoder design increased from 5 to 9 circuit boards and the Payload Control Electronics Design had additional requirements added after Incremental Critical Design Review (ICDR). The LBS variance is due to the unbudgeted reworks of the Direct Current (DC) converter and changes to the housing configuration. The overrun from the LBS is being caused by the design complexity of the Spacecraft Bus harness and the Power Regulator. PMO cost variance is primarily due to the CDR schedule slip and increased design efforts. Operate through proposal is currently being negotiated. There is no impact to the contract or the program.

The improvement in schedule variance is attributed to an increase in performance in Navigation Payload, Support Equipment and System Test & Evaluation. As a result, GE has been able to claim additional earned value with the completion of several contract milestones.

b. (U) Procurement —
(U) BLK II/IIA SATELLITE PRD:
ROCKWELL INTERNATIONAL, Seal Beach, CA
F04701-83-C-0031, FFP
Award: May 20, 1983
Definitized: May 20, 1983

Initial Contract Price		
Target	Ceiling	Qty
$1171.0	N/A	28

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1346.3	N/A	28	$1350.1	$1350.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change:

There is no cost reporting on this FFP contract.

Previously the two Rockwell contracts F04701-83-C-0031 CPFF and FFP were reported as one contract therefore incorrectly stating the variances. The contracts are now provided separately to accurately portray the variances.

[redacted] PHASE III UE PRODUCTION:
ROCKWELL INTERNATIONAL, CEDAR RAPIDS, IA
F04701-85-C-0038, FPIF
Award: April 1, 1985
Definitized: April 1, 1985

Initial Contract Price		
Target	Ceiling	Qty
$55.3	$56.9	356

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$299.3	$308.6	4264	$314.1	$314.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-22.7	$-13.5
Cumulative Variances To Date (11/30/91)	$-14.9	$-4.1
Net Change	$7.8	$9.4

Explanation of Change:

The cumulative cost variance is primarily due to manufacturing start-up and parts control problems. Problems have been resolved. Program office has budgeted to ceiling. Progress payments were withheld to promote contractor compliance. The program office estimate at completion of the contract is 4.9% over target. There is no impact to the contract or the program.

The cumulative schedule variance is primarily due to late deliveries of antennas and antenna electronics from the subcontractor. The schedule variance has improved in the last year as deliveries are almost complete. There is no impact to the contract or the program.

This contract is essentially complete and will no longer be reported.

[redacted]

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

([redacted]) LAUNCH SERV BLK II/IIA:

	Initial Contract Price		
	Target	Ceiling	Qty
ROCKWELL INTERNATIONAL, Seal Beach, CA F04701-83-C-0031, CPFF Award: May 20, 1983 Definitized: May 20, 1983	$40.6	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$134.2	N/A	0	$134.2	$134.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.6	$-1.1
Cumulative Variances To Date (11/29/91)	$-0.3	$-1.8
Net Change	$-0.9	$-0.7

Explanation of Change:

The cost variance is being caused by the increase in manpower to support a Reaction Wheel anomaly. There is no impact to the contract or the program.

Launch processing is behind schedule due to the rework of the Control Electronic Unit (CEU) and resolution of the Reaction Wheel problem. Rockwell is reworking its schedule and anticipates no impact to the Mission Launch Schedule. There has also been a two-month slip in the fabrication of the Qual Test units. There is no impact to the contract or the program.

Previously the two Rockwell contracts F04701-83-C-0031 CPFF and FFP were reported as one contract therefore incorrectly stating the variances. The contracts are now provided separately to accurately portray the variances.

[redacted] BLOCK IIR SATELLITE PROD:

	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL ELECTRIC, PRINCETON, NJ F04071-89-C-0073, FFP Award: June 1, 1989 Definitized: October 31, 1990	$580.4	N/A	20

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$580.4	N/A	20	$580.4	$580.4

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/01/91)	$2.9	$-18.7
Net Change	$2.9	$-18.7

Explanation of Change:

This FFP contract requires modified Cost Performance Reporting.

The positive cost variance is primarily due to the redesign of operate through, which is causing a delay in long-lead parts procurement and manufacturing support for this phase of the contract. There is no impact to the contract or the program.

The schedule variance is also attributed to the operate through design issue. Several cost accounts are behind schedule because GE has been unable to place procurement-part orders with its vendors. After the operate through effort is negotiated GE will replan the contract baseline in order to provide more accurate cost and schedule data for this phase. There is no impact to the contract or the program.

This is the first time this contract is being reported in the SAR.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status --

(1) Percent Program Completed: 54.3% (19 yrs/35 yrs)

(2) Percent Program Cost Appropriated: 44.5% ($4830.8 / $10860.7)

16b. [redacted] Program Funding Summary (Cont'd):
NAVSTAR GPS Satellite

b. [redacted] Appropriation Summary -- NAVSTAR GPS Satellite

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY74-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2006)	Total
RDT&E	1097.5	51.2	59.8	159.6	1368.1
Procurement	1376.7	188.8	249.4	1150.2	2965.1
MILCON	7.3	-	-	-	7.3
O&M	-	-	-	-	-
Total	2481.5	240.0	309.2	1309.8	4340.5

1/ Percent Program Completed: 57.6% (19 yrs/33 yrs)

2/ Percent Program Cost Appropriated: 62.7% ($2721.5/$4340.5)

b. [redacted] Appropriation Summary -- NAVSTAR GPS User Equip

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY74-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2008)	Total
RDT&E	1100.4	64.0	74.4	360.2	1599.0
Procurement	712.5	202.6	277.0	3613.3	4805.4
MILCON	-	-	-	-	-
O&M	26.9	2.9	4.0	82.0	115.8
Total	1839.8	269.5	355.4	4055.5	6520.2

1/ Percent Program Completed: 54.3% (19 yrs/35 yrs)

2/ Percent Program Cost Appropriated: 32.4% ($2109.3/$6520.2)

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS Satellite

c. (U) Annual Summary — NAVSTAR GPS Satellite

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1974				9.4	6.4	6.4	6.4	
1975				25.5	19.1	19.1	19.1	9.8
1976				72.2	58.9	58.9	58.9	9.4
197T				12.0	10.6	10.6	10.6	4.9
1977				56.3	50.2	50.2	50.2	4.6
1978				55.9	53.3	53.3	53.3	7.1
1979				53.9	56.0	56.0	56.0	7.1
1980				88.3	101.9	101.9	101.9	9.4
1981				78.8	100.7	100.7	100.7	11.9
1982				100.6	137.4	137.4	137.4	9.2
1983				67.3	96.2	96.2	96.2	4.9
1984				67.8	100.7	100.7	100.7	3.9
1985				49.0	75.2	75.2	75.2	3.4
1986				28.7	45.1	45.1	45.1	2.8
1987				21.5	35.0	35.0	35.0	2.7
1988				15.4	25.9	25.9	25.5	3.0
1989				25.8	45.1	45.0	44.2	4.2

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS Satellite

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1990				18.2	32.9	32.6	26.9	4.0
1991				24.9	46.9	46.4	26.2	3.9
1992				26.4	51.2	19.4	0.1	3.1
1993				29.8	59.8			3.3
1994				20.4	42.3			3.3
1995				16.0	34.3			3.3
1996				9.9	21.8			3.2
1997				7.9	18.0			3.2
1998				1.7	4.1			3.2
1999				1.8	4.3			3.2
2000				1.8	4.5			3.2
2001				1.8	4.7			3.2
2002				1.8	4.8			3.2
2003				1.8	5.0			3.2
2004				1.8	5.1			3.2
2005				1.8	5.3			3.2
2006				1.8	5.4			3.2
Subtot	12			998.0	1368.1	1116.0	1069.6	

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS Satellite

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force								
1982				13.2	20.1	20.1	20.1	9.5
1983				69.3	111.5	111.5	111.5	9.0
1984	1		25.2	152.7	256.0	256.0	256.0	8.0
1985	6		130.7	192.1	331.4	331.4	331.4	3.4
1986	9		198.6	112.7	203.4	203.4	203.4	2.7
1987	8		145.0	46.2	86.7	86.7	83.8	2.7
1988	4		110.4	46.6	91.0	90.1	64.5	3.0
1989		29.9		33.4	67.5	67.5	34.5	4.2
1990		12.1		20.2	42.2	36.0	15.8	4.0
1991		23.5		72.7	156.0	152.4	58.9	3.9
1992	4		72.0	84.3	186.8	117.4		3.1
1993	6		99.4	108.1	247.5			3.3
1994	5		86.9	93.7	221.4			3.3
1995	6		97.2	103.2	251.8			3.3
1996	4		68.0	53.7	135.2			3.2
1997		27.9		39.7	103.2			3.2
1998		4.4		16.3	43.7			3.2
1999		3.7		15.8	43.8			3.2

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS Satellite

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force (Cont'd)								
2000		3.7		15.8	45.1			3.2
2001		3.7		15.8	46.5			3.2
2002		3.7		15.8	48.0			3.2
2003		3.7		15.8	49.6			3.2
2004		3.7		15.8	51.1			3.2
2005		3.7		15.8	52.8			3.2
2006		3.7		15.8	54.5			3.2
Subtot	53	127.4	1033.4	1384.5	2946.8	1472.5	1179.9	
Appropriation: 3080 Other Procurement, Air Force								
1987				1.5	2.6	2.6	2.0	2.7
1988				4.7	8.3	8.3	4.8	3.0
1989								4.2
1990								4.0
1991								3.9
1992				1.0	2.0			3.1
1993				0.9	1.9			3.3
1994				0.5	1.0			3.3

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS Satellite

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3080 Other Procurement, Air Force (Cont'd)								
1995				0.8	1.8			3.3
1996				0.3	0.7			3.2
Subtot				9.7	18.3	10.9	6.8	
Appropriation: 3300 Military Construction, Air Force								
1984				4.7	7.3	7.3	7.3	3.8
Subtot				4.7	7.3	7.3	7.3	
Grand Total	65	127.4	1033.4	2396.9	4340.5	2606.7	2263.6	

c. (U) Annual Summary — NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1974				1.8	1.2	1.2	1.2	
1975				4.4	3.3	3.3	3.3	9.8
1976				7.8	6.4	6.4	6.4	9.4

16c. Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)								
197T				1.8	1.6	1.6	1.6	4.9
1977				8.4	7.5	7.5	7.5	4.6
1978				7.3	7.0	7.0	7.0	7.1
1979				9.3	9.7	9.7	9.7	7.1
1980				11.7	13.5	13.5	13.5	9.4
1981				13.8	17.7	17.7	17.7	11.9
1982				5.1	7.0	7.0	7.0	9.2
1983				7.5	10.7	10.7	10.7	4.9
1984				3.9	5.8	5.8	5.8	3.9
1985				7.6	11.6	11.6	11.6	3.4
1986				6.7	10.5	10.5	10.5	2.8
1987				2.8	4.5	4.5	4.5	2.7
1988				5.9	10.0	10.0	10.0	3.0
1989				5.1	8.9	8.9	8.7	4.2
1990				2.8	5.0	5.0	4.7	4.0
1991				3.3	6.3	6.3	5.5	3.9
Subtot	13			117.0	148.2	148.2	146.9	

16c. [redacted] Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2031 Aircraft Procurement, Army								
1986	67	4.0	3.6	7.7	13.7	13.7	13.7	2.7
1987	133	0.9	4.2	6.3	11.6	11.6	11.6	2.7
Subtot	200	4.9	7.8	14.0	25.3	25.3	25.3	
Appropriation: 2035 Other Procurement, Army								
1986	70	3.8	1.6	5.6	9.2	9.2	9.2	2.8
1987	60	1.3	1.2	3.1	5.3	5.3	5.3	2.7
1988	147	7.0	3.9	11.7	20.8	20.8	20.0	3.0
1989	175	4.3	3.0	8.0	14.6	14.6	12.3	4.2
1990	1092	4.0	5.3	11.0	20.8	20.8	13.6	4.0
1991	74	1.0	2.4	6.0	11.8	11.0	5.0	3.9
1992	1837	4.7	6.2	16.7	33.7	23.6	5.7	3.1
1993	2173	5.1	8.8	14.9	31.0			3.3
1994	2579	4.1	8.1	13.4	28.8			3.3
1995	2650	4.1	7.6	13.8	30.6			3.3
1996	2042	5.1	5.5	11.4	26.2			3.2
1997	2022	4.8	5.8	11.1	26.2			3.2
1998	5225	3.4	17.3	24.5	59.7			3.2

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2035 Other Procurement, Army (Cont'd)								
1999	5225	3.5	16.7	23.7	59.7			3.2
2000	5225	3.0	17.4	23.0	59.7			3.2
2001	5225	2.9	16.8	22.3	59.7			3.2
2002	5228	2.8	16.3	21.6	59.8			3.2
2003	5197	2.7	15.7	20.8	59.5			3.2
2004	6019	2.6	38.4	46.5	137.1			3.2
2005	2487	2.6	20.1	25.7	78.1			3.2
Subtot	54752	72.8	218.1	334.8	832.3	105.3	71.1	
Army	54965	77.7	225.9	465.8	1005.8	278.8	243.3	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1974				6.0	4.1	4.1	4.1	
1975				8.7	6.5	6.5	6.5	9.8
1976				13.5	11.0	11.0	11.0	9.4
197T				1.8	1.6	1.6	1.6	4.9
1977				7.4	6.6	6.6	6.6	4.6
1978				3.8	3.6	3.6	3.6	7.1
1979				9.5	9.9	9.9	9.9	7.1

16c. [redacted] Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1980				8.8	10.1	10.1	10.1	9.4
1981				13.4	17.1	17.1	17.1	11.9
1982				22.0	30.0	30.0	30.0	9.2
1983				19.7	28.1	28.1	28.1	4.9
1984				39.9	59.3	59.3	57.6	3.9
1985				38.3	58.8	58.8	53.8	3.4
1986				35.8	56.2	56.2	52.2	2.8
1987				39.5	64.3	64.3	54.7	2.7
1988				29.4	49.4	49.4	38.8	3.0
1989				22.6	39.6	39.6	38.8	4.2
1990				23.3	42.2	42.2	39.8	4.0
1991				26.3	49.5	49.5	43.3	3.9
1992				25.7	49.9	46.9	28.9	3.1
1993				26.1	52.4			3.3
1994				23.8	49.3			3.3
1995				15.1	32.3			3.3
1996				14.6	32.3			3.2
1997				15.1	34.5			3.2

[redacted]

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1998				2.6	6.0			3.2
1999				2.3	5.7			3.2
2000				2.3	5.8			3.2
2001				0.1	0.3			3.2
2002				0.1	0.3			3.2
2003				0.1	0.3			3.2
2004				0.1	0.3			3.2
2005				0.1	0.3			3.2
Subtot	89			497.8	817.6	594.8	536.5	
Appropriation: 1109 Procurement, Marine Corps								
1989	456		2.2	2.2	4.1	4.1	3.4	4.2
1990	504		0.7	0.8	1.6	1.6	1.1	4.0
1991								3.9
1992								3.1
1993	1000	1.3	2.8	6.1	12.7			3.3
1994	1000		2.2	5.5	11.8			3.3
1995	2294		4.5	10.0	22.1			3.3

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1109 Procurement, Marine Corps (Cont'd)								
1996								3.2
Subtot	5254	1.3	12.4	24.6	52.3	5.7	4.5	
Appropriation: 1506 Aircraft Procurement, Navy								
1988	42		1.9	2.6	5.1	5.1	4.8	3.0
1989	102		4.2	5.5	11.1	11.1	9.2	4.2
1990	105		5.4	6.1	12.6	12.6	8.3	4.0
1991	24		1.0	2.0	4.3	3.5	1.2	3.9
1992	229		12.8	17.0	37.7	23.0	1.7	3.1
1993	375		14.5	17.5	40.2		-	3.3
1994	439		19.8	23.7	56.2			3.3
1995	417		19.4	24.0	58.7			3.3
1996	429		19.0	23.3	58.7			3.2
1997	472		23.9	29.4	76.6			3.2
1998	330		22.8	28.3	76.0			3.2
1999	330		22.1	28.5	79.1			3.2
2000	243		15.9	21.5	61.6			3.2
2001	144		10.5	15.0	44.2			3.2

16c. Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
2002	92		5.6	9.4	28.7			3.2
Subtot	3773		198.8	253.8	650.8	55.3	25.2	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1987	11		0.1	0.8	1.4	1.4	1.4	2.7
1988	6		0.1	0.5	1.0	1.0	0.9	3.0
1989	11		0.4	0.7	1.5	1.5	1.2	4.2
1990	17			1.1	2.3	2.3	1.5	4.0
1991	11		0.1	0.4	0.8	0.7	0.2	3.9
1992	11		0.5	1.4	3.1	1.9	0.1	3.1
1993	9		0.4	1.0	2.3			3.3
1994	3		0.3	0.6	1.5			3.3
1995	2		0.1	0.2	0.6			3.3
1996	1		0.1	0.1	0.3			3.2
1997	4		0.2	0.3	0.8			3.2
1998	1		0.1	0.1	0.3			3.2
1999	2		0.1	0.2	0.5			3.2
Subtot	89		2.5	7.4	16.4	8.8	5.3	

16c. Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1810 Other Procurement, Navy								
1986	62	5.7	1.0	12.1	20.0	20.0	20.0	2.8
1987	148	8.1	1.4	13.8	23.6	23.6	23.6	2.7
1988	188	1.3	4.4	7.4	13.2	13.2	12.4	3.0
1989	133	0.4	2.3	6.1	11.2	11.2	9.4	4.2
1990	79	0.6	0.5	3.8	7.2	7.2	4.7	4.0
1991	38	0.1	2.6	3.7	7.3	6.8	3.1	3.9
1992	130		7.6	8.4	16.9	11.8	2.9	3.1
1993	421		5.3	6.3	13.2			3.3
1994	572		1.3	1.9	4.1			3.3
1995	615		1.3	1.8	3.9			3.3
1996				1.3	3.0			3.2
1997				0.7	1.6			3.2
Subtot	2386	16.2	27.7	67.3	125.2	93.8	76.1	
Appropriation: 1804 Operation and Maintenance, Navy								
1988				1.7	2.8	2.8	2.1	3.0
1989				2.6	4.6	4.6	2.4	4.2
1990				6.9	12.5	12.5	8.6	4.0

16c. [redacted] Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Flyaway FY79 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1804 Operation and Maintenance, Navy (Cont'd)								
1991				3.3	6.2	6.2	2.1	3.9
1992				1.1	2.2			3.1
1993				1.7	3.4			3.3
1994				2.9	6.0			3.3
1995				2.7	5.7			3.3
1996				3.1	6.8			3.2
1997				3.5	7.9			3.2
1998				3.5	8.3			3.2
1999				3.7	8.9			3.2
2000				3.8	9.5			3.2
2001				3.9	10.2			3.2
2002				4.0	10.8			3.2
Subtot				48.4	105.8	26.1	15.2	
Navy	11591	17.5	241.4	899.3	1768.1	784.5	662.8	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1974				1.5	1.0	1.0	1.0	
1975				6.4	4.8	4.8	4.8	9.8

[redacted]

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1976				19.5	15.9	15.9	15.9	9.4
197T				3.1	2.7	2.7	2.7	4.9
1977				15.5	13.8	13.8	13.8	4.6
1978				14.4	13.7	13.7	13.7	7.1
1979				18.9	19.6	19.6	19.6	7.1
1980				29.8	34.4	34.4	34.4	9.4
1981				19.2	24.5	24.5	24.5	11.9
1982				20.5	28.0	28.0	28.0	9.2
1983				18.1	25.9	25.9	25.9	4.9
1984				13.3	19.8	19.8	19.8	3.9
1985				13.5	20.7	20.7	20.7	3.4
1986				16.4	25.8	25.8	25.8	2.8
1987				17.4	28.3	28.3	28.3	2.7
1988				22.5	37.8	37.8	37.3	3.0
1989				22.7	39.7	39.7	38.9	4.2
1990				18.0	32.6	32.6	30.8	4.0
1991				6.7	12.6	12.6	11.0	3.9
1992				7.2	14.0	12.7	8.1	3.1

16c. Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1993				10.8	21.7			3.3
1994				5.7	11.8			3.3
1995				2.0	4.2			3.3
1996				1.9	4.3			3.2
1997				1.9	4.4			3.2
1998				7.1	16.6			3.2
1999				8.2	20.0			3.2
2000				5.8	14.4			3.2
2001				5.5	14.2			3.2
2002				5.4	14.5			3.2
2003				5.3	14.7			3.2
2004				5.2	14.9			3.2
2005				5.2	15.1			3.2
2006				5.1	15.3			3.2
2007				5.0	15.5			3.2
2008				3.9	12.5			3.2
Subtot	146			388.6	629.7	414.3	405.0	

16c. Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3010 Aircraft Procurement, Air Force								
1985		3.2		4.7	8.0	8.0	8.0	3.4
1986	70	4.9	7.7	29.2	52.1	52.1	52.1	2.7
1987	299	4.4	20.7	45.3	83.9	83.9	83.9	2.7
1988	351	5.5	20.8	55.8	108.3	108.3	101.9	3.0
1989	327	4.1	17.7	36.8	74.0	74.0	61.4	4.2
1990	207	3.8	7.1	25.8	53.6	53.6	35.4	4.0
1991	17	4.3	8.8	16.3	35.0	28.7	10.1	3.9
1992	38	17.8	6.2	47.8	106.3	64.8	4.8	3.1
1993	60	29.3	8.2	72.3	165.9			3.3
1994	292	33.4	27.3	96.9	229.5			3.3
1995	719	14.1	47.2	88.8	217.1			3.3
1996	714	6.2	41.2	85.2	214.9			3.2
1997	557	4.9	31.8	79.4	206.6			3.2
1998	467	3.7	34.6	63.3	170.1			3.2
1999	445	20.2	26.4	71.4	198.0			3.2
2000	483	1.4	28.4	49.1	140.5			3.2
2001	369	1.7	21.6	39.6	116.9			3.2
2002	730	1.1	38.8	67.4	205.3			3.2

16c. [redacted] Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
2003	759	0.2	38.2	67.5	212.3			3.2
2004	809	0.7	41.4	73.3	237.8			3.2
2005	209		8.6	21.9	73.3			3.2
2006	99		4.1	13.5	46.7			3.2
2007				5.9	21.0			3.2
2008				5.7	21.0			3.2
Subtot	8021	164.9	486.8	1162.9	2998.1	473.4	357.6	
Appropriation: 3080 Other Procurement, Air Force								
1986	87	1.1	2.3	6.2	10.3	10.3	10.3	2.8
1987	121	0.6	2.2	6.4	11.0	11.0	11.0	2.7
1988	757	0.1	3.8	8.3	14.7	14.7	13.8	3.0
1989	445	0.1	5.7	7.1	13.1	13.1	11.0	4.2
1990	179		4.3	5.7	10.8	10.8	7.1	4.0
1991				0.8	1.6	1.5	0.7	3.9
1992			0.4	2.4	4.9	3.4	0.8	3.1
1993	571		1.9	5.6	11.7			3.3
1994	360		0.8	3.9	8.4			3.3

16c. (U) Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3080 Other Procurement, Air Force (Cont'd)								
1995	290		0.6	2.1	4.6			3.3
1996	190		0.4	2.1	4.8			3.2
1997	190		0.4	2.2	5.3			3.2
1998				0.8	1.9			3.2
1999				0.8	1.9			3.2
Subtot	3190	1.9	22.8	54.4	105.0	64.8	54.7	
Appropriation: 3400 Operation & Maintenance, Air Force								
1991				0.4	0.8	0.8	0.7	3.9
1992				0.4	0.7	0.7	0.5	3.1
1993				0.3	0.6			3.3
1994				1.1	2.2			3.3
1995				0.9	1.9			3.3
1996				0.9	2.0			3.2
1997				0.8	1.8			3.2
Subtot				4.8	10.0	1.5	1.2	
USAF	11357	166.8	509.6	1610.7	3742.8	954.0	818.5	

16c. [redacted] Program Funding Summary (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 0400 RDT&E, Defense Agencies								
1989				0.1	0.2	0.2	0.2	4.2
1990				1.2	2.1	2.1	2.0	4.0
1991				0.2	0.4	0.4	0.3	3.9
1992				0.1	0.1	0.1	0.1	3.1
1993				0.1	0.3			3.3
1994				0.2	0.4			3.3
Subtot				1.9	3.5	2.8	2.6	
DoD				1.9	3.5	2.8	2.6	
Grand Total	77913	262.0	976.9	2977.7	6520.2	2020.1	1727.2	

Appropriation 0400 RDT&E, Defense Agencies is Marine Corps RDT&E - PE 26626M-1319 Appn.

[redacted]

17. (U) Production Rate Data:
NAVSTAR GPS Satellite

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1984	1	1	1	1
1985	6	6	6	6
1986	9	9	9	9
1987	8	8	8	8
1988	4	4	4	4
1989	0	0	0	0
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	4	4
1993	0	0	6	6
1994	0	0	5	5
1995	0	0	6	6
1996	0	0	4	4
1997	0	0	0	0

Annual Production Rates: The funded delivery period is 39 months for FY84, 42 months for FY85, 54 months for FY86, 42 months for FY87, and 36 months for FY88. Replenishment satellites begin production in FY92 and delivery period is 48 months.

17b. (U) Production Rate Data (Cont'd):
NAVSTAR GPS Satellite

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	1599.4	+797.5	2396.9	0.0	2396.9
(TY $)	2306.7	+2033.8	4340.5	0.0	4340.5
PAUC Cost (BY $)	39.985	-3.110	36.875	0.000	36.875
(TY $)	57.668	9.109	66.777	0.000	66.777

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	SEP 83	0	SEP 83	N/A	SEP 83
Duration (in MON)	84	106	190	0	190
End Date(MON YY)	SEP 90	106	JUL 99	N/A	JUL 99

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	12/12
Procurement	14/15

e. (U) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 0 - @ Peak Rate: 0.6/mo			
FY 79 Base-Year $	20.336	26.089	25.000
Then Year $	54.812	49.293	0.000
@ Qty 0 (1st three years) - @ Peak Rate: 0.0/mo			
FY 79 Base-Year $	0.000	0.000	0.000
Then Year $	0.000	0.000	0.000

17a. (U) Production Rate Data (Cont'd):
NAVSTAR GPS User Equip

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1986	356	499	356	587
1987	672	673	772	1961
1988	956	956	1491	2921
1989	2436	2259	1649	2981
1990	4452	4553	2183	5105
1991	4887	4887	164	4887
1992	4932	4932	2245	4373
1993	3295	3295	4609	10641
1994	1735	1735	5245	8000
1995	1140	1140	6987	6859
1996	794	794	3376	0
1997	642	642	3245	0
1998	354	354	6023	0
1999	496	495	6002	0
2000	63	60	5951	0
2001	0	0	5738	0
2002	0	0	6050	0
2003	0	0	5956	0
2004	0	0	6828	0

17a. (U) Production Rate Data (Cont'd):
NAVSTAR GPS User Equip

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
2005	0	0	2696	0
2006	0	0	99	0

b. (U) Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2554.9	+422.8	2977.7	+997.7	1980.0
(TY $)	4875.8	+1644.4	6520.2	+3144.7	3375.5
PAUC Cost (BY $)	0.094	-0.056	0.038	0.013	0.025
(TY $)	0.179	-0.095	0.084	0.040	0.043

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	AUG 86	0	AUG 86	N/A	AUG 86
Duration (in MON)	199	0	199	0	199
End Date(MON YY)	MAR 03	0	MAR 03	N/A	MAR 03

d. (U) Deliveries (Plan/Actual) —

	To Date
RDT&E	248/248
Procurement	4250/4245

17a. (U) Production Rate Data (Cont'd):
NAVSTAR GPS User Equip

e. (U) Approved Design-to-Cost Objective --

	(Average Unit Flyaway Cost) Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 26889 - @ Peak Rate: 390/mo			
FY 79 Base-Year $	0.1	0.1	0.1
Then Year $	0.2	0.2	0.0
@ Qty 0 (1st three years) - @ Peak Rate: 0/mo			
FY 79 Base-Year $	0.0	0.0	0.0
Then Year $	0.0	0.0	0.0

18. (U) Operating and Support Costs:
NAVSTAR GPS Satellite

a. (U) Assumptions and Ground Rules --

Operations and support costs include all costs of operating, maintaining, and supporting the NAVSTAR GPS spacecraft from the dedicated Master Control Station (MCS) located at Falcon AFB CO. Also included are the costs for operating, maintaining, and supporting four dedicated GPS Ground Antennas (GAs) located at Cape Canaveral AFS FL, Kwajalein Atoll, the Ascension Islands, and Diego Garcia; and five monitor stations located at Falcon AFB, Maui HI, Kwajalein Atoll, the Ascension Islands, and Diego Garcia. Satellite operations at the MCS include mission planning, mission payload operations, and monitoring of satellite state of health. GAs transmit navigation data uploads and commands to the GPS spacecraft and receive telemetry data from the spacecraft. Monitor stations receive mission payload data and transfers this data to the MCS to ensure spacecraft are operating as desired. Costs also include GPS-dedicated communications and contractor support for software maintenance. These costs do not include the unallocated costs associated with the shared use of remote tracking stations which are programmed and borne by the Air Force Satellite Control Network and the Consolidated Space Operations Center program elements.

There is no applicable antecedent program.

18b. (U) Operating and Support Costs (Cont'd):
NAVSTAR GPS Satellite

b. (U) Costs — (FY 1979 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per PROGRAM	Avg Annual Cost Per PROGRAM
O&M	6.4	N/A
Total	6.4	N/A

c. (U) Contractor Support Costs — (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	0.9	5.1	5.4	—	11.4
Total	0.9	5.1	5.4	—	11.4

NAVSTAR GPS User Equip

a. (U) Assumptions and Ground Rules —

(1) The operations & support costs are the direct costs to repair, replenish & support the GPS UE. The maintenance costs includes the material and labor costs at the organizational, intermediate, & depot levels. The training costs are necessary to maintain the required quantity of maintenance and operations personnel. The software support costs include all costs to provide life cycle software engineering for GPS UE. The support equipment support cost includes the cost of all necessary support and maintenance of the GPS user equipment. The sustaining investment costs include the cost of replenishment spares of air, sea, and ground sets, their respective batteries of memory cells, and their support equipment.

(2) Contracting Engineering Technical Services (CETS): The Air Force needs contractor technical experts to perform training and consultation to enable maintenance, support and logistics personnel to become proficient in supporting GPS.

There is no applicable antecedent program.

18b. (U) Operating and Support Costs (Cont'd):
NAVSTAR GPS User Equip

b. (U) Costs -- (FY 1979 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per PROGRAM	Avg Annual Cost Per PROGRAM
BELOW DEPOT LEVEL	2.3	N/A
DEPOT LEVEL	5.7	N/A
TRAINING	1.4	N/A
TRANSPORTATION	0.4	N/A
SOFTWARE SUPPORT	0.9	N/A
SE SUPPORT	0.8	N/A
SUSTAINING INVESTMENT	19.6	N/A
SYSTEM/PROJECT MGT	2.7	N/A
Total	33.8	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	---	---	---	---	---
Air Force	3.5	0.7	0.6	---	4.8
Navy	16.2	6.1	2.9	---	25.2
Marine	0.1	0.1	0.1	---	0.3
Army	---	---	---	---	---
Total	19.8	6.9	3.6	---	30.3

N-8 AV-8B

91-120

*** CONFIDENTIAL ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AV-8B HARRIER II

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
AV-8B/Attack, V/STOL, Close Air Support (HARRIER II)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
AIR ASW, Assault, & Special Mission Functions
1411 Jefferson Davis Hwy.
Washington, DC 20361-1257

Col Richard Priest
Assigned: February 15, 1991
AV 222-8325 COMM (703) 692-5750

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0604214N
PROCUREMENT:
APPN 1506 ICN 0124 (Navy)
MILCON:
PE 0206497M, 0206496M

AS AMENDED
FOR OPEN PUBLICATION
MAR 23 1992
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5. (U) Related Programs:
F/A-18, F-15, GR5 (UK Collaborative Program), AV-8B(s) Spanish Program, AV-8B (Spain and Italy Collaborative Program).

6. (U) Mission and Description:
The AV-8B (HARRIER II) is a second-generation, Vertical/Short Take-Off and Landing (V/STOL) light-attack jet aircraft utilized by the Marine Corps. The primary mission of the AV-8B is to provide responsive close air support for the ground forces. This single-piloted, advanced V/STOL aircraft can operate from short fields, forward sites, roads and surface ships providing minimum response time to target. The aircraft incorporates basic aerodynamic improvements such as a composite super critical high-lift wing, leading edge root extension, engine inlet modification, lift improvement devices, composite forward fuselage, and modern avionics package. The AV-8B is a transonic aircraft designed to carry up to 9200 lbs. of conventional ordnance including four AIM-9 Sidewinder missiles and a 25mm high rate of fire gattling gun. The Marine Corps has replaced all of its AV-8As and A-4M squadrons with the newer AV-8B, thus transitioning to an all Harrier II light-attack force. A two-seat version of the aircraft was introduced in the Marine Corps Training Squadron with delivery of the first production TAV-8B in July 1987. A Night Attack version of the aircraft incorporated a Forward Looking Infrared Sensor (FLIR) was introduced to the fleet with the delivery of the first Night Attack aircraft in September 1989.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
The General and Full Integration MOU was signed by Italy, Spain and the United States on 28 September 1990.

Workshare meetings were held at McAir in St. Louis 20-21 February 1991, in Washington 16-17 April 1991, and again in St. Louis 1-3 July 1991. An Industry Participation Plan (IPP) was developed from these meetings which was discussed at the Steering Committee Meeting in Madrid, Spain 16-18 July 1991. IPP meetings were held at McAir in St. Louis 12-13 September 1991 and again in St. Louis 23-24 October 1991. The IPP was presented to the Steering Committee in Rome on 13-14 November 1991.

A Cooperative Program with the Government of Spain (GOS) and the Government of Italy (GOI) has been approved for full integration of a radar in the AV-8B weapon system. It is anticipated that production deliveries of radar equipped AV-8B aircraft will commence the 2nd quarter of 1993. The AV-8B is expected to satisfy the mission requirement.

7b. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report --
Production, Remanufacture and In-Service Support MOU negotiations were held in Washington 13-15 March 1991, in Madrid 23-25 April 1991, and in Rome 10-12 June 1991. Negotiations are complete and the Production MOU is in the national staffing process of the three nations. The 30-day Congressional notification period was complete on 30 January 1992; the Under Secretary of Defense has authorized the Secretary of the Navy to conclude the United States-Italy-Spain MOU concerning the Production, Remanufacture, and In-Service Support MOU for the AV-8B Harrier II Plus Program. Signing of the MOU is anticipated by March 1992.

c. (U) Changes Since As Of Date --
None.

8. (U) Threshold Breaches:
There are currently no breaches of the 31 December 1988 APB Baseline. There are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Program Initiated Milestone I (DSARC)	MAR 76	MAR 76	MAR 76
First Flight YAV-8B Prototype	DEC 78	NOV 78	NOV 78
Milestone II (DSARC)	JUN 79	JUL 79	JUL 79
FSD Contract Award	JUN 79	AUG 79	AUG 79
Critical Design Review	JUL 80	JUL 80	JUL 80
First Flight AV-8B (FSD)	OCT 81	NOV 81	NOV 81
Award of Production Contract	APR 82	APR 82	APR 82
TECHEVAL Avionics	SEP 83	OCT 84	OCT 84
TECHEVAL Performance	SEP 83	OCT 84	OCT 84
OPEVAL	DEC 83	MAR 85	MAR 85
Milestone IIIB (DSARC)	APR 85	MAY 85	MAY 85
IOC (AV-8B)	JUN 85	AUG 85	AUG 85
IOC (TAV-8B)	N/A	JUL 88	SEP 88
IOC (Night Attack)	N/A	MAY 90	MAY 90

b. (U) Previous Change Explanations --

TECHEVAL Avionics and TECHEVAL Performance slipped due to lack of sufficient instrumented test program and technical difficulties. New milestones added are IOC TAV-8B and IOC Night Attack. Delivery of 7th TAV-8B September 1988. Delivery of 20th Night Attack airplane.

9c. ([redacted]) Schedule (Cont'd):

c. ([redacted]) Current Change Explanations --

None.

d. ([redacted]) References --

([redacted]) Development Estimate:
DCP approved 16 January 1987.

([redacted]) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

10. ([redacted]) Performance Characteristics:

a. ([redacted]) Performance --

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Weight (lbs) Empty	12,750	13126	/ 13126	12,835	13,126
Speed Maximum (Mach No)	.91	.91	/ .91	.905	.91
Dimensions (ft)					
Length	46.33	46.33	/ 46.33	46.33	46.33
Height	11.65	11.65	/ 11.65	11.65	11.65
Span	30.33	30.33	/ 30.33	30.33	30.33
Spotting Factor (A-7 1.0)	.95	.95	/ .95	TBD	.95
Maximum Vertical Gross Take-off (VTO) Weight (lbs)	19,185	19185	/ 19185	19,185	19,185
Maximum Short Gross Take-off (STO) Weight (lbs) (1,000 ft roll)	28,350	28350	/ 28350	30,060	30,060
Close Air Support Radius of Action (NM)					
VTO	50	50	/ 50	TBD	50
STO	209	155	/ 155	155	155
Mean Flight Hours Between Failures (MFHBF), (hrs)	2.40	2.04	/ 2.04	2.04	2.04
Maintainability (DMMH/FH), (hrs)	16.9	16.5	/ 16.5	14.5	14.5
Standard Depot Level Maintenance Cycle (Airframe hours)					
1st Period	1,000	1000	/ 1000	TBD	1,000
2nd Period	800	800	/ 800	TBD	800

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
3rd Period	600	600	/ 600	TBD	600
VTO Close Air Support Payload (lbs)	2,850	2850	/ 2850	TBD	2,850
STO Close Air Support Payload (lbs) (600ft, 20 kts WOD, 87 deg. F, Tropical Day)	7,980	7980	/ 7980	TBD	7,980

(b)(1) [redacted]

b. (U) Previous Change Explanations --

Current estimate reflects known weight growth to accommodate LERX, 25mm gun provisions, and deficiencies corrections. Close air support radius of action short take off, current estimate and demonstrated performance changes to reflect specific mission profile from MS IIIA DNSARC and 5 August 1984 DCP. Maximum short gross takeoff changed to reflect demonstrated performance with -406A engine. Maintainability (DMMH/FH) and weapon accuracies changed to reflect demonstrated performance.

c. (U) Current Change Explanations --

None.

d. (U) References --

(1) Development Estimate:
DCP approved 16 January 1987.

(2) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	872.7	1116.1	1127.6
Procurement	4862.4	3673.1	3783.9
Airframe	(2650.5)		(2199.0)
Engine	(899.0)		(449.5)
Avionics	(258.9)		(177.1)
Other GFE	(145.5)		(36.7)
Total Flyaway	(3953.9)		(2862.3)
Other Weapon Systems	(439.3)		(570.2)
Total Other Wpn Sys	(439.3)		(570.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(469.2)		(351.4)
Construction (MILCON)	5.5	5.5	5.5
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 79 Base-Year $	5740.6	4794.7	4917.0
Escalation	3384.9	3527.8	3682.4
Development (RDT&E)	(185.3)	(323.7)	(336.8)
Procurement	(3196.8)	(3201.3)	(3342.8)
Construction (MILCON)	(2.8)	(2.8)	(2.8)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	9125.5	8322.5	8599.4

b. (U) Quantity --			
Development (RDT&E)	6	0	6
Procurement	336	276	279
Total	342	276	285

c. (U) Foreign Military Sales --
There is a Spanish FMS case for 12 aircraft. The planned recoupment was $10,408,476. A waiver of $5,204,232 was granted by DSAA. The revised recoupment is $5,204,244. An LOA was signed in September 1989 for the sale of two T/AV-8B aircraft to the Italians.

Three aircraft on the multiyear contract, N0001988C0001, will be sold to Italy under FMS Case IT-B-SBJ. The aircraft quantity and funding are still included in the contract until a contract modification formally modifies the contract.

There is also cooperative development program described in detail in section 7.

11d. ([redacted]) Total Program Cost and Quantity (Cont'd):

d. ([redacted]) Nuclear Costs --
None.

e. ([redacted]) References --

([redacted]) Development Estimate:
DCP approved 16 January 1987.

([redacted]) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

12. ([redacted]) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. ([redacted]) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	8599.4	8292.6	8599.4
(2) Quantity	285	282	285
(3) Unit Cost	30.173	29.406	30.173
b. ([redacted]) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	239.7	239.7	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	239.7	239.7	0.0
(2) Quantity	6	6	0
(3) Unit Cost	39.950	39.950	N/A

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1058.0	8059.2	8.3	9125.5
Previous Changes:				
Economic	+6.6	-737.4	-	-730.8
Quantity	-	-1473.7	-	-1473.7
Schedule	+17.7	+1393.1	-	+1410.8
Engineering	+181.1	+568.8	-	+749.9
Estimating	+171.8	-1214.4	-	-1042.6
Other	-	-	-	-
Support	-	+253.5	-	+253.5
Subtotal	+377.2	-1210.1	-	-832.9
Current Changes:				
Economic	+3.0	-16.2	-	-13.2
Quantity	-	+83.8	-	+83.8
Schedule	-	+6.2	-	+6.2
Engineering	-	+179.3	-	+179.3
Estimating	+26.2	+19.7	-	+45.9
Other	-	-	-	-
Support	-	+4.8	-	+4.8
Subtotal	+29.2	+277.6	-	+306.8
Total Changes	+406.4	-932.5	-	-526.1
Current Estimate	1464.4	7126.7	8.3	8599.4

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	872.7	4862.4	5.5	5740.6
Previous Changes:				
Quantity	-	-580.5	-	-580.5
Schedule	+10.8	+703.4	-	+714.2
Engineering	+115.7	+240.2	-	+355.9
Estimating	+113.3	-1581.3	-	-1468.0
Other	-	-	-	-
Support	-	+10.9	-	+10.9
Subtotal	+239.8	-1207.3	-	-967.5
Current Changes:				
Quantity	-	+36.3	-	+36.3
Schedule	-	+19.8	-	+19.8
Engineering	-	+86.4	-	+86.4
Estimating	+15.1	-15.9	-	-0.8
Other	-	-	-	-
Support	-	+2.2	-	+2.2
Subtotal	+15.1	+128.8	-	+143.9
Total Changes	+254.9	-1078.5	-	-823.6
Current Estimate	1127.6	3783.9	5.5	4917.0

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation rates.

Schedule: Extend flight test program two years for follow on flight test program.

Engineering: Addition of design/fabrication/integration/test of 25mm gun pak, development of the TAV-8B. Increase for night attack capability with United Kingdom FLIR system.

Estimating: Decreased currency conversion rate for engine procurement, decrease offset for new economic indices and refinement of estimate, base year adjustment and prior year reprogrammings, prior year increase due to foreign exchange adjustment,

13b. [redacted] Cost Variance Analysis (Cont'd):
increase for TAV-8B, FY92 effort partially offset by reduced requirements in prior fiscal years, increase in non-recurring costs due to -408 engine upgrade and engine non-recurring recoupement. Anticipated savings in TAV-8B and night attack and correction of error in computation of inflation indices.

PROCUREMENT

Economic:	Correction of application of procurement outlay factors, revised escalation rates, and correction of previous error.
Quantity:	Decrease of 52 aircraft.
Schedule:	Revised procurement schedule for 336 aircraft accelerated procurement schedule, and four additional years added to program.
Engineering:	Decrease of 52 aircraft. Increase due to schedule change, night attack capability, ASPJ and ECPs which provide recurring systems for aircraft procured in FY88 and subsequent years.
Estimating:	Decreased currency conversion rate for engine procurement, offset for new economic decrease, correction of procurement outlay factor, and refinement of estimates, decreased dollar pound exchange rate, quantity adjustment, base year adjustment, reduction of 52 aircraft, and FY82/83 reprogramming. Prior year contracts negotiated lower than anticipated. Decrease due to overhead and labor rate decrease at MCAIR. Revised estimate reduction based on contract negotiation.
Support:	Reduced spares due to reduced aircraft buy. Increases in GSE, pubs, ILS/ME and spares to accommodate night attack, ASPJ and other configuration ECPs. Decrease in pubs, spares, GSE, training due to refined pricing based on contract negotiated lower than anticipated. Adjustment due to error in prior SARS in estimated variance category. Prior year readjustments plus elimination of three years of support and spares due to the quantity change. Adjustment to procure required baseline FY88 night attack avionics F406-408 engine and increased survivability improvement including stand up of Yuma.

13c. ([redacted]) Cost Variance Analysis (Cont'd):

c. ([redacted]) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Increased currency conversion rate. (Economic)	1.8	3.0
Reporting 1992-1994 controls as shown in current RDDS. (Estimating)	13.3	26.2
Total Changes	15.1	29.2
(2) PROCUREMENT		
Increase in spares to support six Desert Storm aircraft. (Support)	2.2	4.8
Revised escalation rates. (Economic)	--	-16.2
Increase aircraft procurement by six. (Quantity)	36.3	83.8
Revised procurement schedule. (Schedule)	19.8	6.2
Radar upgrade integration. (Engineering)	86.4	179.3
Revised to reflect actual costs in prior years. (Estimating)	-15.9	19.7
Total Changes	128.8	277.6

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes Econ	Qty	Sch	Eng	Est	Other	Spt	Total	PAUC (Current Est)
26.683	-2.611	0.460	4.972	3.260	-3.497	--	0.906	3.490	30.173

15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a.([redacted]) RDT&E --

	Initial Contract Price		
([redacted]) FY89 Engine:	Target	Ceiling	Qty
Rolls-Royce, Bristol, England, N00019-88-C-0065, FFP	$89.2	$0.0	31
Award: N/A			
Definitized: September 29, 1989			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$89.2	$0.0	31	$89.2	$89.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

This is the last time this contract will be reported.

	Initial Contract Price		
([redacted]) FY90 Engine:	Target	Ceiling	Qty
Rolls-Royce, Bristol, England, N00019-89-C-0198, FFP	$88.3	N/A	30
Award: September 30, 1989			
Definitized: September 21, 1990			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$88.3	N/A	30	$88.3	$88.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

This is the last time this contract will be reported.

b.([redacted]) Procurement --

	Initial Contract Price		
([redacted]) FY89/90/91 Airframe:	Target	Ceiling	Qty
McDonnell Douglas Corp., St. Louis, MO N00019-88-C-0001, FFP	$782.3	N/A	72
Award: March 14, 1988			
Definitized: September 27, 1989			

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$878.1	N/A	72	$878.1	$878.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

The target contract price for N0001988C0001 was established at $782.3M. Subsequent modifications to the contract for radar have increased the price to $878.1M.

Three aircraft on this contract will be sold to Italy under FMS Case IT-B-SBJ. The aircraft quantity and funding are still included in the above totals until a contract modification formally modifies the contract.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status --

(1) Percent Program Completed: 89.5% (17 yrs/19 yrs)

(2) Percent Program Cost Appropriated: 99.8% ($8582.4 / $8599.4)

b. [redacted] Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY76-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94)	Total
RDT&E	1438.2	9.2	11.1	5.9	1464.4
Procurement	6887.0	239.7	-	-	7126.7
MILCON	8.3	-	-	-	8.3
O&M	-	-	-	-	-
Total	8333.5	248.9	11.1	5.9	8599.4

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obligated	Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1976				5.2	4.3	4.3	1.6	6.6
197T				2.2	1.9	1.9	1.9	2.9
1977				37.6	33.6	33.6	33.6	2.6
1978				61.2	58.9	58.9	58.9	6.8
1979				158.8	168.7	168.7	168.7	8.4
1980				155.3	182.4	182.4	182.4	10.6
1981				186.2	238.6	238.6	236.2	10.6
1982				167.0	225.2	225.2	224.3	7.6
1983				82.3	116.0	114.7	110.6	4.9
1984				69.3	101.2	100.8	93.3	3.8
1985				40.8	61.4	61.4	60.2	3.4
1986				43.3	67.1	67.1	65.9	2.8
1987				26.1	41.7	41.7	39.4	2.7
1988				24.6	40.5	40.5	39.2	3.0
1989				21.5	36.9	36.9	33.5	4.2
1990				16.6	29.6	29.6	26.1	4.0
1991				16.3	30.2	30.1	24.7	3.9
1992				4.8	9.2	3.3	0.5	
1993				5.6	11.1			
1994				2.9	5.9			
Subtot	6			1127.6	1464.4	1439.7	1401.0	
Appropriation: 1506 Aircraft Procurement, Navy								
1981				59.1	86.6	86.6	84.9	11.6
1982	12		343.3	412.2	656.4	656.4	621.0	14.3
1983	21		295.7	482.8	818.0	818.0	793.4	9.0
1984	27		276.6	448.0	789.5	789.5	744.3	8.0
1985	32	5.6	295.1	375.4	680.8	680.2	666.5	3.4
1986	46	0.4	376.2	470.6	879.3	879.3	879.3	2.8
1987	42	17.8	310.7	361.4	698.8	698.8	698.8	2.7
1988	24	21.2	179.6	300.5	606.2	606.2	606.2	3.0
1989	24	12.6	252.5	280.7	588.9	588.9	524.7	4.2
1990	24	10.1	169.5	250.3	544.2	475.5	317.7	4.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY79 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
1991	21	14.5	181.7	239.6	538.3	494.3	83.7	3.9
1992	6	6.3	92.9	103.3	239.7			3.1
Subtot	279	88.5	2773.8	3783.9	7126.7	6773.7	6020.5	
Appropriation: 1205 Military Construction, Navy								
1983				3.2	4.6	4.6	4.6	4.9
1986				2.3	3.7	3.7	3.7	2.8
Subtot				5.5	8.3	8.3	8.3	
Grand Total	285	88.5	2773.8	4917.0	8599.4	8221.7	7429.8	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1981	0	0	0	0
1982	12	12	12	12
1983	24	21	21	21
1984	54	27	27	27
1985	54	32	32	32
1986	54	46	46	46
1987	54	42	42	42
1988	54	42	24	24
1989	30	42	24	24
1990	0	42	24	24
1991	0	22	21	21
1992	0	0	6	24

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	5083.9	-166.9	4917.0	+143.9	4773.1
(TY $)	9104.8	-505.4	8599.4	+306.8	8292.6
PAUC Cost (BY $)	15.221	2.032	17.253	+0.505	16.748
(TY $)	27.260	2.913	30.173	+1.076	29.097

17c. (U) Production Rate Data (Cont'd):

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	DEC 81	0	DEC 81	N/A	DEC 81
Duration (in MON)	120	25	145	0	145
End Date(MON YY)	DEC 91	25	JAN 94	N/A	JAN 94

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	6/6
Procurement	229/234

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

A-4M O&S Costs in FY91 Dollars

Aircraft per squadron	12
Flight hours/aircraft/month	21.7
Date of estimate/revision	3 Feb 92 (new)*

AV-8A O&S Costs in FY91 Dollars

Aircraft per squadron	9
Flight hours/aircraft/month	24.0
Date of estimate/revision	3 Feb 92*

*Estimates based on data from Visability and Management of Operating and Support Costs - AIR Total Support System.

AV-8B O&S Costs

Flight hours per aircraft per month	29
Number of aircraft/squadron	20
(14 aircraft per squadron with a six aircraft detachment)	
Consumption rate gal/hr	722.7
POL cost, JP-5, per barrel, FY90	25.2

18a. [redacted] Operating and Support Costs (Cont'd):
*There is no antecedent system.

b. [redacted] Costs -- (FY 1979 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per squadron/year	Avg Annual Cost Per squadron/year
Personnel	9.1	N/A
Consumables	7.9	N/A
Depot Maintenance	6.2	N/A
Sustaining Investment	3.2	N/A
Indirect Cost	0.4	N/A
Total	26.8	N/A

c. [redacted] Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&MN (A,N,AF)	16.4	9.9	8.7	10.4	45.4
Industrial Fund	6.7	1.7	1.7	---	10.1
Total	23.1	11.6	10.4	10.4	55.5

USAF-5 B-1B

91-096

*** [redacted] *** SECRET

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: B-1B

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
FEB 27 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
B-1B

2. (U) DoD Component: USAF

3. (U) Responsible Office and Telephone Number:
B-1B System Program Office
Oklahoma City Air Logistics Center
Tinker AFB
Midwest City, OK 73145-5990
Col Gary Pence
Assigned: September 1, 1991
AV 336-2001 COMM (405)736-2001

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0604226F
PROCUREMENT:
APPN 3010 ICN 0101B001B0 (Air Force)
APPN 3010 ICN 0501B1BM00 (Air Force)

SAF/PAS
92-148 -T

Classified by: B-1B SCG dated 30 Jun 91
Declassify on: Originating Agency's Determination Required (OADR)
Downgrade Instructions: OADR

(THIS PAGE IS [redacted])

OASD(PA) DFOISR 92-0328

[redacted]

SECRET

5. [redacted] Related Programs:
B-1B Simulator, Common Strategic Rotary Launcher (CSRL),Conventional Weapons Release Systems (CWRS), Air Launched Cruise Missile (ALCM), Short Range Attack Missile (SRAM-II), Radar Warning Receiver (RWR), Miniature Receive Terminal (MRT), MILSTAR, and Global Positioning System (GPS) and Advanced Expendables.

6. [redacted] Mission and Description:
The major purpose of the B-1B is to modernize the aircraft leg of the Strategic Triad. The B-1B has the capability to perform the missions of a conventional bomber, cruise missile launch platform, and a nuclear weapon delivery system in both the strategic and tactical roles. The long range and large payload of the B-1B makes it an ideal aircraft to support the United States deterrent posture across the full spectrum of conflict.

The B-1B uses the B-1A aerodynamic shape and structure, as well as many of the B-1A systems. The B-1B has heavyweight landing gear and is powered by four F101-GE-102 afterburning turbofan engines which are a direct derivative of the F101-GE-100 engines used on the original B-1A. The avionics systems are updated to accommodate revised B-1B missions, counter new threats, and employ currently available equipment and technology. The communications and traffic control group remains essentially the same as B-1A, except current inventory replacements and AFSATCOM are used. The offensive systems group maximizes the use of B-52 Offensive Avionics System equipment as well as adding a new forward Looking Radar/Terrain Following Sensor and a new inertial system. The Defensive Systems Group incorporates the ALQ-161 as well as adding four frequency bands, some new jamming technologies, and a Tail Warning Function. The B-1B weapon system is able to deliver conventional as well as nuclear ordnance. The B-1B aircraft will modernize the bomber leg of the Strategic Triad by partially replacing the 1950's designed B-52.

7. [redacted] Program Highlights:
a. [redacted] Significant Historical Developments --
The baseline configuration for the B-1B aircraft was established 4 November 1981 by the DepSecDef. Production and FSD contracts were awarded to Rockwell, General Electric, AIL, and Boeing in early 1982. The rollout of the first B-1B occurred on 4 Sept 1984. First flight occurred 18 October 1984. The first B-1B production aircraft going to Strategic Air Command (SAC), B-1B A/C #2, arrived at SAC HQ on 27 June 1985. The Initial Operational Capability (IOC) milestone was met in September 1986. Aircraft #100 was delivered on 30 April 1988. Program Management Responsibility Transfer (PMRT) to OC-ALC for the B-1B weapon system occurred on 1 January 1989. The B-1B established 36 world records for speed, distance and payload.

Automatic terrain following runs were completed at the minimum set

7a. [redacted] Program Highlights (Cont'd):

clearance of 200 feet hardride on 22 Sep 88. The Stall Inhibitor System 2/Stability Enhancement Function (SIS2/SEF) flight testing was completed on 31 May 89. In Sep 89, aircraft #9 completed its modification for SRAM II carriage and flight test began.

The Conventional Weapons Release System (CWRS) received Safety Certification on 25 May 89. On 21 Jul 89, the B-1B was certified for conventional weapons delivery. Air Launched Cruise Missile (ALCM) activity (internal carriage only) for the B-1B was completed on 30 Sep 89 when the ALCM Nuclear Weapons Systems Safety Group (NWSSG) safety rules were approved.

On 31 Jul 89, the Air Force issued a contract modification which implemented the CORE ALQ-161A recovery program. Successful flight test of defensive system software version Production Flight Software (PFS) 5.0 occurred Feb 91.

Risk reduction studies for the integration of an "off-the-shelf" Radar Warning Receiver (RWR) were started third quarter FY89, and later stopped because the FY90 Defense Appropriations Act directed that no additional funds were allowed to be obligated in FY90 toward RWR activities.

The FY90 Defense Appropriations Act did not provide baseline logistics support funds. Through reprogramming action, funds were eventually provided on 23 Sep 90. This caused a year's delay in the updating of 349 technical orders and the development of 204 Test Program Sets, and consequently undermines the program's ability to meet APB dates for transition to organic Air Force maintenance.

In Jan 90, Congress directed the Air Force to "fence" $50M for cruise missile testing. The loss of this funding resulted in the delay of SEF activitation, Electrical Multiplex Equipment (EMUX) sparkle development, and the Anti-Ice development effort.

Until 20 Dec 90, the AIL Core development program was on track to a Feb 91 Functional Configuration Audit (FCA). Then the program was placed on hold because of an engine problem that grounded the B-1B fleet. Laboratory System Qualification Testing (SQT) was completed in Nov 90 and results indicate the Core system will meet Air Force specifications with a few exceptions.

In the FY91 Defense Appropriations Act, Congress deleted funding for the RWR program and directed a side-by-side simulation of the ALR-56M and 62I but provided no funds to support such comparison. In addition, FY91 funding for the RWR program was eliminated.

7b. ([redacted]) Program Highlights (Cont'd):

b. ([redacted]) Significant Developments Since Last Report -- The FY92 budget significantly reduced baseline logistics support funds and, in addition, withheld obligation authority for appropriated funding until mid to late 92. As a result, the Acquisition Program Baseline (APB) dates for Boeing and Rockwell transition to organic depot maintenance will not be met.

The FY 92 authorization bill provided no funding for a CORE restart or RWR, but directed a side-by-side RWR comparison of the ALR-56M and the ALR-62I. No funding was provided for the side-by-side RWR comparison. In addition, sec 132 of Public Law 102-190 directed that the DOD conduct a Life Cycle Cost (LCC) comparison of the current AN/ALQ-161A, the developed CORE modification, and a ALQ-172 like system. Funding for Deferred Logistics support equipment will not be released until Congress receives the GAO comments.

The "M" account restrictions in the FY91 budget are having significant negative impacts on the B-1B program. In addition to funds not being available to start CORE production, the Air Force's ability to fund "must pay" liabilities is impaired. Funding assistance may be needed for items such as overtarget payments, termination costs and tool disposition costs.

Ninety-four of ninety-six aircraft have been modified to the SIS2/SEF configuration. The remaining two aircraft are scheduled to be completed by Jul 92. SEF is being activated through an update retrofit which is approximately 40% (36 aircraft) complete. This update will be completed in Dec 92.

The technical fixes to the Tail Warning Function (TWF) were successfully flight tested in Mar 91. A kitproof was completed in Oct 91 and follow-on aircraft retrofit is scheduled to begin in Jan 92. The aircraft retrofit is scheduled for completion in Dec 93.

The overwing fairing fire protection safety modification is on schedule. Production installations started with a kitproof installation in Jun 91 and follow-on aircraft retrofits began in Sep 91. The first production contract for the fire prevention modification was awarded in Sep 91.

In Jan 1991, structural cracks were detected in the 25 degree shoulder longeron, forward intermediate fuselage. These cracks can propagate to unacceptable length from usage if appropriate prevention and/or repair measures are not implemented. A retrofit program was implemented in the summer of 91 to repair cracked longerons. The 25 degree longeron retrofit activity is progressing well. Twenty

7b. [redacted] Program Highlights (Cont'd):

repair packages were procured, 19 for installation and 1 spare. Eighteen aircraft have been completed through Dec 91. The last retrofit is scheduled for completion 15 Jan 92.

The Integrated Weapon System Management (IWSM) Concept of Operations (CONOP) was approved by the Assistant Secretary of the Air Force, Acquisition on 1 Sep 91. It was decided that the B-1B single manager would be located at Oklahoma City Air Logistics Center (OC-ALC) and that the B-1B will remain a PEO program. Task transfers from the Product Center at Wright-Patterson AFB to the single manager organization at OC-ALC are well on their way to completion. A consolidated Program Management Directive (PMD) has been issued and an "IWSM" Acquisition Program Baseline (APB) will be completed. We are working with Strategic Air Command (SAC) to implement a conventional program for the B-1B.

All flight test activity at Edwards AFB CA, ceased on 31 Dec 91. The two flight test aircraft (#9 and #28) will be placed in flyable storage through FY92. One aircraft will be converted from contractor maintenance to Air Force organic maintenance capability during the year. Planned future uses for these aircraft include flight testing of software block updates and modifications.

Termination of the SRAM II program impacted the B-1B in several ways. Termination of flight test activities at Edwards AFB as stated above, and associated MIL-STD-1760A interface for conventional weapons and ancillary flight test benefits such as 25 degree longeron repairs, and fuel center of gravity management systems which were to have been done while SRAM II testing was going on.

On 5 Feb 91, the B-1B fleet returned to flying status. A strenghtened fan blade retainer ring was installed preventing catastrophic engine failures.

c. [redacted] Changes Since As Of Date --
During January 1992 installation of the nineteenth repair package for the 25 degree longeron retrofit was completed. A determination has been made that the repairs effected on the 19 aircraft is a permanent repair that reduces stresses to acceptable levels. Actions are being initiated to procure repair parts for the balance of the fleet as a preventive measure.

8. [redacted] Threshold Breaches:
There are three APB (31 Dec 88) milestone breaches and no Nunn McCurdy Unit Cost breaches.

1) DT&E/IOT&E Complete slipped from Sep 89 to Feb 91

8. [redacted] Threshold Breaches (Cont'd):

(19 months)
2) ECM Development Complete slipped from Sep 89 to Apr 91 (20 months)
3) ECM Retrofit Complete has been suspended due to lack of funding.

9. [redacted] Schedule:

a. [redacted] Milestones --

Milestones --	Development Estimate	Approved Program	Current Estimate
R & D Contract Award	JAN 82	JAN 82	JAN 82
Production Contract Award	JAN 82	JAN 82	JAN 82
Engineering Review	APR 82	APR 82	APR 82
Configuration Review	JAN 83	JAN 83	JAN 83
OSD Program Review	SEP 82	FEB 83	FEB 83
DT&E/IOT&E			
Start	APR 83	MAR 83	MAR 83
Complete	JUN 86	SEP 89	FEB 91
First Flight B-1/Aircraft #2	APR 83	MAR 83	MAR 83
First B-1B Flight	MAR 85	OCT 84	OCT 84
FOT&E Phase I			
Start	OCT 85	JUL 85	JUL 85
Complete	OCT 87	MAR 89	JUN 89
IOC (15th Aircraft Delivery)	SEP 86	SEP 86	SEP 86
Production Complete (100 A/C Delivered)	JUN 88	JUN 88	APR 88
Program Management Responsibility Transfer (PMRT)	N/A	JAN 89	JAN 89
ECM Development Complete	N/A	SEP 89	APR 91 (Ch-1)
ECM Retrofit Complete	N/A	MAR 92	N/A (Ch-2)

b. [redacted] Previous Change Explanations --

The Core ALQ-161 program was slipped 55 days when AIL was unable to accomplish System Qualification Testing on schedule. Flight test for Core has been on hold since 19 Dec 90 pending resolution of an engine problem. ECM development was expected to be complete in May 91 to meet a congressional requirement to review the Institute for Defense Analysis (IDA) assessment of Core effectiveness. The assessment is required by FY90 budget language before proceeding into Core production.

c. [redacted] Current Change Explanations --

(Ch-1) ECM development for the ALQ-161 was completed in April of 91 by virtue of a successful Functional Configuration Audit (FCA).

9c. (U) Schedule (Cont'd):

(Ch-2) The CORE production program (ECP-080) was terminated on 8 Mar 91 due to lack of funds. Therefore, the ECM Retrofit Complete milestone cannot be met.

The poor performance of the defensive system contractor and the identification of numerous system deficiencies during flight testing resulted in the inability to achieve the ECM development completion (Sep 89) and ECM retrofit completion (Mar 92) dates. When Congress eliminated the use of the merged account, the Air Force could no longer fund the Core ECM production program beyond Feb 91. This funding problem only impacted the Core retrofit schedule and the ECM development was completed in Apr 91 with a successful Functional Configuration Audit (FCA) which verified system performance met the development specification requirements. Without funding from the "M" account, the Air Force could not continue to incrementally fund the Core program. In Feb 91 the Air Force terminated the Core production funding contract. The Air Force attempted to obtain funds for Core via the FY91 onmibus reprogramming request; however, the request was denied. New schedule dates can be established only after the Department and Congress reach consensus on the B-1B program.

d. (U) References --

([redacted]) Development Estimate:
DCP dated 30 September 1983

([redacted]) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

10. ([redacted]) Performance Characteristics:

a. ([redacted]) Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Speed (Mach):				
Best Cruise at altitude	.72	.73 / .70	.72	.72
(b)(1) [redacted]				
Weapon Carriage				
AGM-69A (Internal)	24	24 / 24	16	24
AGM-86B				
Internal	8	8 / 8	8	8
External	14	12 / 12	N/A	12
B61/B83 (Internal)	24	24 / 24	24	24
MK-82 AIR/36DST (AIR)(Internal)	84	84 / 84	84	84

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Takeoff Distance (ft)						
470,000 pound A/C	9300	9300	/ 9500	N/A	9300	
440,000 pound A/C	6000	7600	/ 7800	N/A	7600	(CH-1)
Range (NM at 433,000 lbs takeoff; 24 SRAM, full internal fuel, one aerial refuel)	6000	6400	/ 5600	5880	5880	(CH-1)
Weight empty (lbs)	186000	186000	/ 186000	187400	187400	
(b)(1) [redacted]						
Maintainability (B-1B)(Mean Maintenance Manhours/flight hour)	37.6	37.6	/ 80	15.4	15.4	
Mean Time Between Unscheduled Maintenance Actions (flight hours)	1.0	1.0	/ 0.22	1.21	1.21	

(b)(1) [redacted] NOTES: 1. At approximately 280,000 lbs gross weight, MIL Thrust (1.3g maneuver capability). The aircraft has met the objective of 0-25,000 at maximum inflight gross weights for the same maneuver limits.

[redacted] NOTES:

Groundrules for range computation: (1) Assumes 24 SRAM - 53040 lbs; (2) Operating Weight - 191956 lbs; (3) Take Off Gross Wt - 432850 lbs; (4) Single Enroute Refueling - 100000 lbs.

Threshold at IOC

External ACM testing was deferred in PMD R-Q 010(7)/0604226F/11126F, dated 15 Jun 89.

Mean Time Between Unshed Maintenance Actions based on inherent maintenance actions and 03, 04 special inspections.

10b. ([redacted] Performance Characteristics (Cont'd):

b. ([redacted]) Previous Change Explanations --

Following USDR&E direction, the Air Force decided in Feb 86 to limit AGM-86B weapon carriages to ensure compliance with existing arms control policies. The flight test results have shown slightly higher drag which will decrease the mission range. Previous values were estimates based on wind tunnel drag data. Flight test results have also affected our estimates of Base Escape Data. Changes have occurred due to maturing of both B-1B systems and LRU components.

APB updates dated December 1988. Range changed due to revision in aerodynamic model. The change in weight empty (pounds) reflects a higher confidence in actual weights of delivered aircraft as more aircraft have actually been weighed. As the B-1B weapon system continues to accumulate flying hours toward its maturity, the reliability and maintenance factors continue to fluctuate. Changes in Base Escape (Minutes) are reflective of latest flight test results.

Constantly changing Maintainablity (Mean Maintenance Hours/Flight Hours and Mean Time Between Unshed Maintenance Actions (flight hours)) are a result of the B-1B weapon system continuing to accumulate flying hours towards its maturity.

c. [redacted] Current Change Explanations --

(Ch-1) All performance characteristics changes are due to actual demonstrated B-1B capability.

d. ([redacted]) References --

([redacted]) Development Estimate:
DCP dated 30 September 1983

[redacted] Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	2538.9	3051.8	3019.8
Procurement	17961.1	17251.4	17396.1
Flyaway	(15128.9)		(14880.8)
Total Flyaway	(15128.9)		(14880.8)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(1768.0)		(1698.7)
Initial Spares	(1064.2)		(816.6)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 81 Base-Year $	20500.0	20303.2	20415.9
Escalation	9037.6	7134.5	7254.6
Development (RDT&E)	(583.2)	(698.7)	(722.7)
Procurement	(8454.4)	(6435.8)	(6531.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	29537.6	27437.7	27670.5
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	100	100	100
Total	100	100	100

c. (U) Foreign Military Sales --
NONE

d. (U) Nuclear Costs --
NONE

e. (U) References --

(U) Development Estimate:
DCP dated 30 September 1983

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

12. ([redacted]) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. ([redacted]) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	27670.5	27774.4	27670.5
(2) Quantity	100	100	100
(3) Unit Cost	276.71	277.74	276.71
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	62.5	62.5	214.9
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	62.5	62.5	214.9
(2) Quantity	0		
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	3122.1	26415.5	0.0	29537.6
Previous Changes:				
Economic	-103.2	-1608.9	-	-1712.1
Quantity	-	-	-	-
Schedule	+9.2	+10.1	-	+19.3
Engineering	+213.8	+273.6	-	+487.4
Estimating	+461.3	-809.7	-	-348.4
Other	-	-	-	-
Support	-	-209.4	-	-209.4
Subtotal	+581.1	-2344.3	-	-1763.2
Current Changes:				
Economic	-7.4	-16.7	-	-24.1
Quantity	-	-	-	-
Schedule	-15.2	-359.2	-	-374.4
Engineering	+50.9	-	-	+50.9
Estimating	+11.0	+102.8	-	+113.8
Other	-	-	-	-
Support	-	+129.9	-	+129.9
Subtotal	+39.3	-143.2	-	-103.9
Total Changes	+620.4	-2487.5	-	-1867.1
Current Estimate	3742.5	23928.0	-	27670.5

13a. ([redacted]) Cost Variance Analysis (Cont'd):

a. ([redacted]) Summary -- (FY 1981 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2538.9	17961.1	0.0	20500.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-13.2	-	-13.2
Engineering	+140.0	+154.9	-	+294.9
Estimating	+311.7	-292.6	-	+19.1
Other	-	-	-	-
Support	-	-384.0	-	-384.0
Subtotal	+451.7	-534.9	-	-83.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-8.8	-166.1	-	-174.9
Engineering	+30.8	-	-	+30.8
Estimating	+7.2	+68.9	-	+76.1
Other	-	-	-	-
Support	-	+67.1	-	+67.1
Subtotal	+29.2	-30.1	-	-0.9
Total Changes	+480.9	-565.0	-	-84.1
Current Estimate	3019.8	17396.1	-	20415.9

b. ([redacted]) Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices

Schedule: Rephased schedule for Radar Warning Receiver (RWR)

Engineering: New Requirement - Addition of Radar Warning Receiver (RWR) to B-1B

1122 Antenna Redesign (Not a baseline requirement)

Addition of ALR-56M/ALR-62I Comparison (Unfunded)

Estimating: Congressional reduction during FY85 and FY86 enactment process; applied to reserves and other government costs

13b. [redacted] Cost Variance Analysis (Cont'd):

Re-estimate based on impact of revised economic escalation rates on prior years

Transfer of ALCM and CSRL integration from procurement and increases in airframe and avionics for ALCM and CSRL integration

Correction of typographical error in Dec 82 SAR

Realignment of fiscal phasing for other government costs

Gramm-Rudman-Hollings reduction during FY86 budget enactment process and Small Business Innovation Research (SBIR) assessment

Extension of flight test program for flight controls, terrain following and ECM systems

Strategic Mission Data Planning System (SMDPS) and Balanced Technology Insertion reductions

Prior year definitization of authorized effort

Reduced estimate to absorb increases resulting from Jan 90 economic indices

Reduction of flight testing due to reprogramming action

Boeing contract underrun deobligation

EPA adjustment

Reduction of RWR funding based on FY91 Amended President's Budget

RWR Funding Increase to cover previously unfunded effort

Removal of Congressional constraint on ACM testing

Revised estimate for reprogramming action

Current and prior year escalation offset

13b. [redacted] Cost Variance Analysis (Cont'd):

Prior year definitization of authorized effort

PROCUREMENT

Economic: Revised Jan 91 economic escalation indices

Schedule: FY91 Amended PB rephasing of RWR

Rephased RWR activity IAW FY90 Defense Appropriations Act

Engineering: Addition of RWR production costs

Estimating: Congressional reduction during FY85 and FY86 enactment process; applied to reserves and weapons equipment

Re-estimate based on impact of revised economic escalation rates on prior years

One-time change resulting from a correction to the methodology for computing inflation on programs with advance procurement funding

Transfer of ALCM and CSRL integration from procurement to RDT&E

Congressionally directed reprogramming to Peacekeeper (FY85 enactment process); applied to reserves

Re-estimate of engine requirements

Gramm-Rudman-Hollings reduction of reserves during FY86 budget enactment process

Undistributed Budget Cuts taken from engineering change orders

Adjustments to refine the mix of previous support and estimating category changes primarily related to the impact of escalation changes in current and prior years

Unobligated contingent liability reductions

Prior year definitization of authorized effort

Annual estimate revisions to realign ECP requirements

Rockwell contract over-target - Funded with expired

13b. [redacted] Cost Variance Analysis (Cont'd):

year funds

Boeing contract underrun deobligation

AIL Core effort (ECP-080) funded with expired year funds

Definitization of Undefinitized Contractual Actions (UCAs)

EPA adjustment

RWR Funding Increase to cover previously unfunded requirements

Rockwell Contract Overrun

Core Proposal Funded with Expired Funds

Current and prior year escalation offset

Support: Adjustment to peculiar support equipment based on FY90 APB and FY91 Amended President's Budget

Inclusion of Core initial spares

Re-estimate of initial spares requirement - reduced based on actual obligations

Adjustment to refine the mix of previous support and estimating category change primarily related to the impact of escalation changes in current and prior years

Gramm-Rudman-Hollings reductions resulted in limiting of initial spares and peculiar support equipment

Unobligated contingent liability reductions

Prior year definitization of authorized effort/support equipment requirements

Addition of deferred ECM support equipment - FY90-93

PSE Rephase and funding increase

Reduced Spares Estimate based on actuals

13b. (U) Cost Variance Analysis (Cont'd):

Inclusion of Additional Core Spares due to obligation of M-account

Current and prior year escalation offset

Reduced estimate to absorb increases resulting from Jan 91 economic escalation indices

Definitization of UCAs/Claims

c. (U) Current Change Explanations —

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 economic escalation indices (Economic)	N/A	-7.4
ECM reprogramming action (Estimating)	2.2	3.2
Deletion of Airborne Countermeasure Receiving, passive detecting (AIR) studies. (Engineering)	-7.2	-11.4
Funding for Studies Threat Assessment Group (TAG) and Strategic Arms Reduction Treaty (START). (Estimating)	1.0	1.6
Funding increases due to a change in mission role from SIOP to Conventional. (Engineering)	38.0	62.3
Rephase of Radar Warning Receiver (RWR) due to Congressional cancellation. (Schedule)	-8.8	-15.2
Revised current and prior year escalation. (Estimating)	1.9	2.4
Revised program estimate. (Estimating)	2.8	5.0
Arms Control Reduction (Estimating)	-0.7	-1.2
Total Changes	29.2	39.3

13c. [redacted] Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised Jan 92 economic escalation indices (Economic)	N/A	-16.7
Definitization of UCAs/Claims (Estimating)	66.6	91.8
Rephasing of RWR due to Congressional direction. (Schedule)	-166.1	-359.2
Transfer Interim Contractor Support (ICS) from O&M to Procurement (Support)	89.3	175.2
Reduction for deferred logistics that was Congressionally directed. (Support)	-28.1	-51.0
Revised current and prior escalation (Support)	1.5	2.6
Revised estimate (Support)	4.4	3.1
Revised current and prior escalation (Estimating)	-0.1	--
Revised estimate (Estimating)	2.4	11.0
Total Changes	-30.1	-143.2

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
295.38	-17.36	--	-3.55	5.38	-2.35	--	-0.80	-18.68	276.71

15. [redacted] Contract Information: (Then-Year Dollars in Millions)

a. [redacted] RDT&E --

[redacted] ROCKWELL FSD:
Rockwell, Los Angeles, CA
F33657-81-C-0208, FPIF
Award: January 20, 1982
Definitized: January 20, 1982

	Initial Contract Price		
	Target	Ceiling	Qty
	$1317.0	$1554.4	0

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1914.1	$2225.3	0	$1965.3	$1904.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-2.3	$2.3
Cumulative Variances To Date (11/30/91)	$-6.7	$-1.6
Net Change	$-4.4	$-3.9

Explanation of Change:

Design problems with overwing fairing and Stability Enhancement Function (SEF) have resulted in an increase of the cumulative cost variance. Also, problems with the Engine Bleed Air Distribution System (EBADS) retrofit subcontract, A/C 9 experienced lagging Interdivisional Work Authorization (IDWA) charges, and cost impacts associated with Operational Support Equipment (OSE). The decline in the cumulative schedule variance results from design delay of the Test Program Sets (TPS). There is no significant programmatic impact.

[redacted] BMA FSD:
Boeing Military Aircraft, Seattle, WA
F33657-81-C-0212, FPIF
Award: June 8, 1982
Definitized: June 8, 1982

Initial Contract Price		
Target	Ceiling	Qty
$435.0	$512.5	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$760.6	$878.9	0	$737.2	$720.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$7.8	$-0.6
Cumulative Variances To Date (11/28/91)	$7.6	$-0.3
Net Change	$-0.2	$0.3

Explanation of Change:

The improvement of the cumulative cost variance results from a lower skill mix and a fewer basic factory labor hours than planned in the Engineering account. The improvement of the cumulative schedule variance is due to budgeted and actual cost data remote site material provided late. There is no significant programmatic impact.

Initial Contract quantity and Current Contract quantity have been updated to reflect a correction to the December 1990 SAR.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

b. ([redacted]) Procurement --

[redacted] DEFENSIVE AVIONICS LOT 3:	Initial Contract Price Target	Ceiling	Qty
AIL CORPORATION, DEERPARK, NY F33657-81-C-0215, FPIF Award: May 22, 1982 Definitized: May 22, 1982	$143.2	$171.1	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$2626.4	$3021.8	100	$2735.0	$2769.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-75.2	$-14.4
Cumulative Variances To Date (11/24/91)	$-98.0	$-7.4
Net Change	$-22.8	$7.0

Explanation of Change:

The cumulative cost variance increase is attributed to correction of deficiencies, Test Program Sets (TPS) redesign and increases in overhead and general and administrative costs due to lower than expected business base projection. The improvement of the cumulative schedule variance results from fewer design changes and shorter integration and assembly durations due to increased familiarity with technical complexity. There is no significant programmatic impact.

Initial Contract quantity has been updated to reflect a correction to the December 1990 SAR.

[redacted] OFFENSIVE AVIONICS LOT 2:	Initial Contract Price Target	Ceiling	Qty
BOEING, SEATTLE, WA F33657-81-C-0213, FPIF Award: June 11, 1982 Definitized: June 11, 1982	$172.0	$183.1	9

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$2126.5	$2363.2	100	$2064.0	$2053.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$15.6	$-3.0
Cumulative Variances To Date (11/28/91)	$-1.6	$-2.7
Net Change	$-17.2	$0.3

Explanation of Change:

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)
The unfavorable cumulative cost variance results from overhead increases in Peculiar Support due to continued redesign of Test Program Sets (TPS) and more personnel, overtime, and development material than expected. Although the cumulative schedule variance improved, it is still unfavorable due to new hardware acceptance procedures imposed by the Air Force for the Inertial Navigation Unit (INU) Depot Support Equipment. There is no significant programmatic impact.

[redacted] ROCKWELL PRODUCTION:	Initial Contract Price Target	Ceiling	Qty
Rockwell, Los Angeles, CA F33657-81-C-0210, PPIF Award: January 20, 1982 Definitized: January 20, 1982	$886.0	$1051.2	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$14758.2	$17298.2	100	$15565.0	$15156.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-577.0	$-20.2
Cumulative Variances To Date (11/30/91)	$-624.5	$-20.9
Net Change	$-47.5	$-0.7

Explanation of Change:

The cumulative cost variance results from schedule delays in development of Test Program Sets (TPSs) and resulting schedule impacts to the production program. Also, due to delays in engineering data submittals and technical order validation/ verification. The increase of cumulative schedule variance results from delays in Government technical order verification/validation. There is no significant programmatic impact.

[redacted] G.E. ENGINE:	Initial Contract Price Target	Ceiling	Qty
General Electric, Cincinnati, OH F33657-81-C-2047, FFP Award: July 20, 1984 Definitized: July 20, 1984	$1387.6	N/A	368

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$1456.5	N/A	368	$1456.5	$1456.5

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

This is an FFP contract and CPR reporting is not required.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status --

(1) Percent Program Completed: 70.6% (12 yrs/17 yrs)

(2) Percent Program Cost Appropriated: 97.9% ($27090.2 / $27670.5)

b. [redacted] Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY81-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	3473.3	1.4	90.7	177.1	3742.5
Procurement	23553.0	62.5	214.9	97.6	23928.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	27026.3	63.9	305.6	274.7	27670.5

16c. ([redacted]) Program Funding Summary (Cont'd):

c. ([redacted]) Annual Summary --

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1981				208.1	217.3	217.3	217.3	11.9
1982				419.1	467.7	467.7	467.7	9.2
1983				636.8	743.8	743.8	743.8	4.9
1984				596.2	723.2	723.2	714.0	3.8
1985				347.1	435.3	435.3	425.2	3.4
1986				186.1	238.9	238.9	227.8	2.8
1987				89.1	118.3	118.3	113.0	2.7
1988				260.0	357.0	357.0	324.6	3.1
1989				117.9	168.6	168.6	109.1	4.2
1990				2.2	3.2			4.0
1991								3.9
1992				0.9	1.4			3.1
1993				55.4	90.7			3.3
1994				26.5	44.8			3.3
1995				34.3	60.0			3.3
1996				39.9	72.0			3.2
1997				0.2	0.3			3.2

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
Subtot				3019.8	3742.5	3470.1	3342.5	
Appropriation: 3010 Aircraft Procurement, Air Force								
1982	1	552.1	557.8	1319.1	1619.9	1619.9	1619.9	9.6
1983	7	786.7	1501.1	3041.6	3960.1	3960.1	3931.5	9.0
1984	10	819.6	1666.5	4376.0	5942.6	5942.6	5874.6	8.0
1985	34	760.7	3619.9	5127.7	7183.9	7183.9	7052.3	3.4
1986	48	372.2	4244.2	3316.6	4815.7	4815.7	4701.2	2.8
1987								
1988								
1989								
1990				5.9	10.0	9.0	3.2	4.0
1991				11.9	20.8	20.7	6.1	3.9
1992				34.5	62.5			3.1
1993				115.0	214.9			3.3
1994				8.6	16.5			3.3
1995				6.9	13.7			3.3
1996				19.0	39.1			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars Nonrec	Flyaway FY81 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
1997				13.3	28.3			3.2
Subtot	100	3291.3	11589.5	17396.1	23928.0	23551.9	23188.8	
Grand Total	100	3291.3	11589.5	20415.9	27670.5	27022.0	26531.3	

FY98 and FY99 funding for RWR rephased to Mod Program.

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1982	1	1	1	1
1983	7	7	7	7
1984	10	10	10	10
1985	34	34	34	34
1986	48	48	48	48

The funded delivery period is 5 months for FY84, 10 months for FY85 and 13 months for FY86.

17b. (U) **Production Rate Data (Cont'd):**

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	20500.0	-84.1	20415.9	-0.7	20416.6
(TY $)	29537.6	-1867.1	27670.5	-1.2	27671.7
PAUC Cost (BY $)	205.000	-0.841	204.159	-0.007	204.166
(TY $)	295.376	-18.671	276.705	-0.012	276.717

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JAN 82	0	JAN 82	N/A	JAN 82
Duration (in MON)	77	-2	75	0	75
End Date(MON YY)	JUN 88	-2	APR 88	N/A	APR 88

* In section 17b "Current Estimate" and "Maximum Economic" match due to the Air Force negotiating and completing multi-year procurement contracts at the maximum rate. All 100 aircraft in the production line have been completed and delivered to the field.

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	100/100

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) **Operating and Support Costs:**

18a. (U) Operating and Support Costs (Cont'd):

a. (U) Assumptions and Ground Rules --

The concept of operations for the B-1B is based on 84 Primary Authorized Aircraft (PAA) and 352 flying Hours/PAA/year. The costs are the direct costs to support the primary personnel and to operate the aircraft. The depot cost is a summary cost which includes interim contractor support airframe and engine overhaul, repair components, modification installation, airframe inspection, and software support. The sustaining investment consists primarily of replenishment spares and repair parts, support equipment replacement, and modification kits for prime equipment and support equipment. The other direct cost category includes cost for installation support non-pay items, such as rents and utilities plus medical supplies. The indirect costs are for general depot support.

Source and date of B-1B cost estimate: OC-ALC/FMFCC, 06 Feb 92

The concept of operations for the antecedent system has been normalized as much as possible so as to achieve an equitable comparison to the B-1B. The antecedent system figures are for the B-52 H model only and are based on 84 PAA with 392 flying hours/PAA/year.

Source and date of B-52H cost estimate: OC-ALC/FMFCC, 06 Feb 92

b. (U) Costs -- (FY 1981 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 84 PAA 352 FH/PAA/YEAR	Avg Annual Cost Per 84 PAA 392 FH/PAA/YEAR
Mission Personnel	112.6	130.5
O&S Consumables	112.3	106.0
Depot Maintenance	159.0	79.8
Sustaining Investment	29.2	25.3
Other Direct Costs	38.9	42.6
Indirect Costs	37.1	29.2
Total	489.1	413.4

18c. (U) Operating and Support Costs (Cont'd):

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	485.9	210.1	117.0	---	813.0
Industrial Fund	39.1	19.5	17.1	---	75.7
Total	525.0	229.6	134.1	---	888.7

N-33 PHOENIX

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: PHOENIX (AIM-54C)

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
PHOENIX (AIM-54C)

AS AMENDED
FOR OPEN PUBLICATION
MAR 20 1992

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
Program Executive Officer (PEO) (T) CAPT M. W. O'BAR
PMA-259 Assigned: March 1991
WASHINGTON, DC 20361-1259 AV 222-8228/2676
COMM (202) 692-8228/2676

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0604354N
PROCUREMENT:
APPN 1507 ICN 2212 (Navy)
MILCON:
PE 72031N

No Security Objection to Open Publication
(As Amended)
MAR 20 1992
Office of the Chief of
Naval Operations Dept. of the Navy

~~Classified by: OPNAVINST 5513.2A-95.1~~
~~Declassify on: Originating Agency Determination Required (OADR)~~
~~Downgrade Instructions: Not Subject to Automatic Downgrade~~

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5. Related Programs:
F-14A/B/D

6. Mission and Description:
The Phoenix Missile System is comprised of a long-range airborne weapons control system (WCS) with multiple target handling capabilities and long-range missiles utilizing semi-active midcourse guidance and active terminal guidance. The mission is to kill multiple air targets with conventional warheads. Six such missiles can be carried aboard the F-14A/D. Near simultaneous launch is possible against six targets in all weather, heavy jamming environments. The improved Phoenix, the AIM-54C, provides improved lethality, stream raid discrimination, ECCM performance, high and low altitude performance, and improved reliability and maintainability. As a result of these improvements, the missile has greater capability to counter the projected tactical aircraft and cruise missile threats. The Phoenix does not replace any other missile.

7. Program Highlights:

a. Significant Historical Developments —

The Phoenix AIM-54C is a major improvement over the AIM-54A which ended production in 1979. A major upgrade was required to meet a more sophisticated threat. In June 1986, Raytheon was selected as a winner of competition to second source the Phoenix missiles. Raytheon's second source procurement quantities included 10 validation units in FY1986, and 56 and 180 missiles in FY1987 and FY1988 respectively. Initial Operational capability was reached in December 1986. In April 1990, the Revised President's Budget changed the procurement strategy from a three year multi-year acquisition to terminating the program with the FY1990 procurement.

b. Significant Developments Since Last Report —
Production deliveries were completed against the FY 1988 Raytheon and FY 1989 Hughes contracts.
The AIM-54C Phoenix Missile System satisfies the mission requirement. This is the final SAR - 90.5% of the funds have been expended.

c. Changes Since As Of Date —
None.

8. Threshold Breaches:
There are curently no breaches to the 30 June 1989 Acquisition Program Baseline. There are no Nunn-McCurdy unit cost breaches.

9. [redacted] Schedule:

a. [redacted] Milestones —

	Development Estimate	Approved Program	Current Estimate
Approval for Service Use	N/A	MAR 75	MAR 75
Full Development Go-Ahead	OCT 76	N/A	OCT 76
Development Contract Award	SEP 77	SEP 77	SEP 77
Complete Section Integration Test	DEC 78	N/A	MAR 79
Pilot Prod Contract	JUL 79	N/A	SEP 79
First Low Rate Prod Contract	DEC 79	DEC 79	DEC 79
Delivery of EDM Msls	DEC 80	N/A	MAY 81
Complete Contractor Development	APR 81	N/A	MAY 82
Pilot Production Missile Deliveries	OCT 81	N/A	OCT 81
NAVY TECHEVAL			
Start	OCT 81	N/A	MAY 82
Complete	JUN 82	N/A	NOV 82
NAVY OPEVAL			
Start	JAN 83	N/A	MAR 83
Complete	MAR 84	N/A	JUN 84
Approval for Full Production (IIIB)	MAR 83	MAY 88	JAN 89
Begin Full Rate Prod	OCT 83	N/A	JAN 89
Establish Second Source	N/A	JUN 86	AUG 86
IOC	OCT 83	DEC 86	DEC 86

b. [redacted] Previous Change Explanations —

AIM-54C Section Integration Test slippage due to delay in component build-up caused by unanticipated design complexity. Award of Pilot Production Contract slippage caused by administrative delays. Navy Technical Evaluation slippage (start & complete) and Navy Operational Evaluation slippage (start & complete) due to delays in delivery of pilot production missiles and delay in completion of contractor development testing. Approval for Full Production delayed to August 1987 in order to evaluate ECCM engineering change (ECP-82) which was introduced with the 1984 production missiles; this was revised in the December 1986 SAR to May 1988 due to a slow ramp-up on the first 1984 production missiles and in the December 1988 SAR it was changed to January 1989 caused by a delay in the OT-IIIB testing. Begin Full Rate Production delayed until first year of competition between Hughes and Raytheon (1989). IOC was delayed from March 1986 to December 1986 due to a requirement to rework igniter safety mechanisms. The NPDM IIIB delayed from May 1988 to January 1989 due to delay in OT-IIIB testing. Approval for Full Rate Production revised to agree with the actual date.

9c. (U) **Schedule (Cont'd):**

c. (U) Current Change Explanations —

None.

d. (U) References —

(U) Development Estimate:
DCP dated November 21, 1980, subject "AIM-54 Improvement Program".

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 30 June 1989.

10. (b)(1) **Performance Characteristics:**

a. (U) Performance —

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

b. (U) Previous Change Explanations —

MTBF Current Estimate revised to reflect current test data.

c. (U) Current Change Explanations —

(CH-1) Current Estimate revised to reflect current test data and actual data compiled during Desert Storm.

10d. (U) Performance Characteristics (Cont'd):

d. (U) References —

(U) Development Estimate:
DCP dated November 21, 1980, subject "AIM-54 Improvement Program".

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 30 June 1989.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost —	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	73.8	123.1	123.1
Procurement	296.7	1382.0	1351.9
FLYAWAY	(231.6)		(1186.7)
Total Flyaway	(231.6)		(1186.7)
Other Weapon Sys	(56.9)		(140.8)
Total Other Wpn Sys	(56.9)		(140.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(8.2)		(24.4)
Construction (MILCON)	1.5	2.4	1.3
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 77 Base-Year $	372.0	1507.5	1476.3
Escalation	92.3	1639.9	1596.8
Development (RDT&E)	(11.4)	(48.7)	(48.7)
Procurement	(80.7)	(1589.5)	(1547.8)
Construction (MILCON)	(0.2)	(1.7)	(0.3)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	464.3	3147.4	3073.1

b. (U) Quantity —			
Development (RDT&E)	30	N/A	45
Procurement	705	2483	2483
Total	735	2483	2528

c. (U) Foreign Military Sales — None.

d. (U) Nuclear Costs —
None.

e. (U) References —

(U) Development Estimate:
DCP dated November 21, 1980, subject "AIM-54 Improvement Program".

11e. (U) Total Program Cost and Quantity (Cont'd):

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 30 June 1989.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3073.1	3074.0	3073.1
(2) Quantity	2528	2528	2528
(3) Unit Cost	1.216	1.216	1.216
b. (U) Current Procurement —	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

*** [redacted] ***

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	85.2	377.4	1.7	464.3
Previous Changes:				
Economic	+11.7	-560.9	+0.1	-549.1
Quantity	-	+4169.3	-	+4169.3
Schedule	+10.1	+507.4	-	+517.5
Engineering	+23.6	+322.8	-	+346.4
Estimating	+41.2	-2225.4	-0.2	-2184.4
Other	-	-	-	-
Support	-	+310.0	-	+310.0
Subtotal	+86.6	+2523.2	-0.1	+2609.7
Current Changes:				
Economic	-	-2.7	-	-2.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+19.1	-	+19.1
Other	-	-	-	-
Support	-	-17.3	-	-17.3
Subtotal	-	-0.9	-	-0.9
Total Changes	+86.6	+2522.3	-0.1	+2608.8
Current Estimate	171.8	2899.7	1.6	3073.1

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1977 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	73.8	296.7	1.5	372.0
Previous Changes:				
Quantity	-	+1313.6	-	+1313.6
Schedule	+3.0	+91.1	-	+94.1
Engineering	+16.0	+141.8	-	+157.8
Estimating	+30.3	-597.0	-0.2	-566.9
Other	-	-	-	-
Support	-	+100.1	-	+100.1
Subtotal	+49.3	+1049.6	-0.2	+1098.7
Current Changes:				
Quantity	-	+4.6	-	+4.6
Schedule	-	+0.3	-	+0.3
Engineering	-	+0.5	-	+0.5
Estimating	-	+6.8	-	+6.8
Other	-	-	-	-
Support	-	-6.6	-	-6.6
Subtotal	-	+5.6	-	+5.6
Total Changes	+49.3	+1055.2	-0.2	+1104.3
Current Estimate	123.1	1351.9	1.3	1476.3

b. (U) Previous Change Explanations --

RDT&E
Economic: RDT&E
Economic: revised escalation indices
Schedule: slippage due to technical problems in development
Engineering: guidance control and thermal conditioning changes
Estimating: higher prototype and R&D effort costs

PROCUREMENT
Economic: revised escalation indices
Quantity: revision of inventory objective, reducing the FY89 quantity (450 vs 403) and

13b. [redacted] Cost Variance Analysis (Cont'd):

cancelling FY91/92
Schedule: quantity shifts during the budget process
Engineering: guidance control and thermal conditioning changes
Estimating: reduction due to introduction of contract actuals into model. Increase due to change in strategy from multi-year to one year. Revised estimate to Congress; decrease in FY90 and prior year actuals. Correction of previous error.
Support: increased requirements for establishment of support NARF; additional support costs associated with additional quantity of missiles and multiyear/one-year strategy. Reassessment of spares and support equipment requirements and cancelling FY91/92. Decrease in prior year actuals. Correction of previous error.

MILCON
Economic: revised escalation indices
Estimating: based on contract actual costs
Support: additional effort for storage bunkers; cancellation of effort for storage bunkers.

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised Jan 92 ecalation rates. (Economic)	—	-2.7
Revised for prior year error in calculations. (Quantity)	4.6	—
Revised for prior year error in calculations. (Schedule)	0.3	—
Revised for prior year error in calculations. (Engineering)	0.5	—
Revised estimate to reflect prior year actuals. (Estimating)	6.8	19.1
Reduction resulting from prior year actuals and correction of $0.2M to Dec 1990 SAR (Support)	-6.6	-17.3
Total Changes	5.6	-0.9

14. [redacted] **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.632	-0.218	1.201	0.205	0.137	-0.857	—	0.116	0.584	1.216

15. ([redacted]) **Contract Information:** (Then-Year Dollars in Millions)

a. ([redacted]) Procurement —

[redacted] GUIDANCE CONTROL & AFRM:

RAYTHEON COMPANY, LOWELL, MA
N00019-86-C-0216, FPI
Award: May 15, 1986
Definitized: May 15, 1986

	Initial Contract Price		
	Target	Ceiling	Qty
	$185.4	$185.4	236

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$170.0	$188.5	236	$172.6	$174.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-9.1	$-10.7
Cumulative Variances To Date (11/30/91)	$-23.4	$-2.4
Net Change	$-14.3	$8.3

Explanation of Change:

Negative schedule variance due to lack of qualified hybrids. The deliveries slipped ten months. The contract schedule has been renegotiated.

[redacted] GUIDANCE CONTROL & AFRM::

RAYTHEON COMPANY, LOWELL, MA
N00019-89-C-0112, FFP
Award: January 19, 1989
Definitized: January 19, 1989

	Initial Contract Price		
	Target	Ceiling	Qty
	$140.3	N/A	208

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$140.3	N/A	208	$140.3	$140.3

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for this FFP contract.

[redacted] GUIDANCE CONTROL & ARFM:
HUGHES AIRCRAFT COMPANY, TUCSON, AZ
N00019-90-C-0069, FFP
Award: January 26, 1990
Definitized: January 26, 1990

Initial Contract Price		
Target	Ceiling	Qty
$201.6	N/A	420

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$201.6	N/A	420	$201.6	$201.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for this FFP contract.

[redacted] GUIDANCE CONTROL/AF::
HUGHES AIRCRAFT COMPANY, TUCSON, AZ
N00019-86-C-0283, FFP
Award: August 20, 1987
Definitized: August 20, 1987

Initial Contract Price		
Target	Ceiling	Qty
$249.3	$0.0	329

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$249.4	$0.0	329	$249.4	$249.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)
CPR information is not required for this FFP contract.

[redacted] ALL-UP-ROUND:

	Initial Contract Price		
	Target	Ceiling	Qty
HUGHES AIRCRAFT COMPANY, TUCSON, AZ N00019-89-C-0079, FFP Award: January 19, 1989 Definitized: January 19, 1989	$131.9	$0.0	195

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$131.9	$0.0	195	$0.0	$0.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for this FFP contract.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status —

(1) Percent Program Completed: 100.0% (14 yrs/14 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($3073.1 / $3073.1)

b. [redacted] Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY77-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	171.8	-	-	-	171.8
Procurement	2899.7	-	-	-	2899.7
MILCON	1.6	-	-	-	1.6
O&M	-	-	-	-	-
Total	3073.1	-	-	-	3073.1

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY77 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1977				9.2	9.5	9.5	9.5	2.6
1978				6.4	7.1	7.1	7.1	6.8
1979				19.1	23.5	23.5	23.5	8.4
1980				27.9	38.0	38.0	38.0	10.6
1981				23.9	35.4	35.4	35.4	10.6
1982				21.1	32.9	32.9	32.9	7.6
1983				14.0	22.8	22.8	22.8	4.9
1984				1.5	2.6	2.6	2.6	3.8
Subtot	45			123.1	171.8	171.8	171.8	
Appropriation: 1507 Weapons Procurement, Navy								
1979				7.7	10.7	10.7	10.6	8.7
1980	60	13.4	53.7	69.8	107.3	107.3	106.6	11.8
1981	60	10.5	59.7	77.5	132.9	132.9	128.6	11.6
1982	72	7.1	53.5	84.3	156.9	156.9	156.1	14.3
1983	108	20.4	72.5	113.2	222.9	222.9	220.6	9.0
1984	265	0.9	127.5	144.6	296.1	296.1	294.7	8.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY77 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1507 Weapons Procurement, Navy (Cont'd)								
1985	265	28.0	110.0	163.5	344.8	344.8	341.7	3.4
1986	265	23.9	98.7	133.7	291.7	291.7	286.7	2.8
1987	205	13.2	81.7	121.0	273.5	273.5	267.0	2.7
1988	360	8.9	141.5	145.8	342.3	342.3	288.5	3.0
1989	403	13.7	138.0	160.6	391.6	391.6	317.0	4.2
1990	420	3.0	106.9	130.2	329.0	328.5	191.0	4.0
Subtot	2483	143.0	1043.7	1351.9	2899.7	2899.2	2609.1	
Appropriation: 1205 Military Construction, Navy								
1978				1.3	1.6	1.6	1.6	7.7
Subtot				1.3	1.6	1.6	1.6	
Grand Total	2528	143.0	1043.7	1476.3	3073.1	3072.6	2782.5	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1980	60	60	60	60
1981	60	60	60	60
1982	72	72	72	72
1983	220	108	108	108
1984	307	265	265	265
1985	307	265	265	265
1986	307	265	265	265
1987	97	205	205	205
1988	0	430	360	360
1989	0	560	403	403
1990	0	560	420	420
1991	0	560	0	0
1992	0	560	0	0
1993	0	560	0	0
1994	0	560	0	0
1995	0	560	0	0
1996	0	560	0	0
1997	0	560	0	0
1998	0	434	0	0

17b. ([redacted]) Production Rate Data (Cont'd):

b. ([redacted]) Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	1709.4	-233.1	1476.3	0.0	1476.3
(TY $)	3671.1	-598.0	3073.1	0.0	3073.1
PAUC Cost (BY $)	0.237	0.347	0.584	0.000	0.584
(TY $)	0.510	0.706	1.216	0.000	1.216

c. ([redacted]) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	DEC 79	0	DEC 79	N/A	DEC 79
Duration (in MON)	177	-12	165	0	165
End Date(MON YY)	SEP 94	-12	SEP 93	N/A	SEP 93

CE and maximum economic rates are equal due to the program completion in FY 1990 and all cost being expended.

d. ([redacted]) Deliveries (Plan/Actual) —

	To Date
RDT&E	45/45
Procurement	1951/1862

e. ([redacted]) Approved Design-to-Cost Objective — N/A.

18. ([redacted]) Operating and Support Costs:

a. ([redacted]) Assumptions and Ground Rules —

Groundrules and Assumptions - December 1990 data
Dollars shown are constant FY86, showing an average annual cost based on the CAIG generic O&S Cost Structure.

Programmatic Estimating Parameters

18a. (U) Operating and Support Costs (Cont'd):
The Serviceable-In-Service-Time is 24 months.
Missile Inventory is 2000.
Live Firings are 20 per year.
Number of Deployed Squadrons is 14.
There are 12 Aircraft per Squadron.
There are 12 Captive Flights per Aircraft per Month.

Actual Historical Factors
Intermediate and Depot Level Workload Factors
Cost per Intermediate and Depot Level Maintenance Action
Live Fire Range Cost
Test Equip and Container Maintenance Cost
AUR and Section weights
Manpower Costs
Shipping Distances and Transportation Costs
There are no antecedent systems.

b. (U) Costs — (FY 1986 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per AIM-54C	Avg Annual Cost Per Unit
Handling and Inspection	1.0	N/A
Operational Training	0.5	N/A
Intermediate Maintenance	2.0	N/A
Depot Maintenance	4.0	N/A
Supply Support	0.2	N/A
Technical Support	4.0	N/A
Transportation	0.1	N/A
RSSI	0.4	N/A
Replenishment Spares	1.0	N/A
Total	13.2	N/A

18c. (U) Operating and Support Costs (Cont'd):

c. (U) Contractor Support Costs — (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M (Navy)	0.3	0.1	0.1	—	0.5
Industrial Fund	0.2	0.1	0.1	—	0.4
Total	0.5	0.2	0.2	—	0.9

AF-15 JTIDS

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: JTIDS

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
   Joint Tactical Information Distribution System (JTIDS)

2. (U) **DoD Component:** USAF

   Joint Participants:
   USA/USAF/USMC/USN

3. (U) **Responsible Office and Telephone Number:**
   JTIDS Joint Program Office (JPO)
   ESD/TD
   Hanscom AFB
   Bedford, MA 01731-5000

   Col BRUCE MILLS
   Assigned: August 31, 1989
   AV 478-9226 COMM 617-377-9226

4. (U) **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 0604771D (Shared) Project XP771
   PE 0604754F, 0205604N, 0604702A
   PE 0604232N (Shared) Project X1977

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FOR OPEN PUBLICATION
AS AMENDED
MAR 3 1992
DIRECTOR FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

~~Classified by: JTIDS Security Classification Guide, Dated 31 Jan 89~~
~~Declassify on: OADR~~
~~Downgrade Instructions: OADR~~

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5. (U) Related Programs:
E-3 (AWACS); NATO Airborne Early Warning and Control System; E-2C Hawkeye Carrier-Based Airborne Early Warning Aircraft; E-8 (JSTARS); Adaptable Surface Interface Terminal (ASIT); Tactical Air Operations Module (TACM); Modular Control Equipment (MCE); JTIDS Class 1 TDMA Terminal; Modular Tactical Air Control Center (MTACC); Airborne Battlefield Command and Control Center (ABCCC); F-14 Tomcat; Aircraft Carrier (CV); Guided Missile Cruiser (CG); Guided Missile Destroyer (DDG); Army Data Distribution System (ADDS); Forward Area Air Defense (FAAD); C2 Processor.

6. (U) Mission and Description:
The Joint Tactical Information Distribution System (JTIDS) Class 2 family of terminals will provide improved combat capability in fighter aircraft, command and control centers, and surface air defense units by providing near real-time, netted, jam-resistant, secure data and voice communications. Real-time, high capacity data transfer between weapons platforms and C3 systems is required for more effective management as the density of the air combat environment increases. The JTIDS Class 2 terminal development is a Joint Service Program with the Air Force as the lead Service. The family of JTIDS Class 2 terminals consists of the Class 2, the Class 2H (which includes a high powered amplifier group, typically for command and control platforms), and the Class 2M (smaller terminal for mobile Army platforms). The United Kingdom (UK) is buying Class 2 terminals for their air defense fighters and ships and both the UK and France are buying Class 2H terminals as part of their E-3 acquisition. The Class 2 terminals use the TADIL-J (NATO Link 16) message standard. The Class 2 Time Division Multiple Access (TDMA) terminal does not replace any existing DOD system.

The JTIDS SAR reflects only the RDT&E program. Production quantities and funding for the individual platforms are included in those specific programs.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
Following the DSARC IIA decision on 13 Jan 81, the Under Secretary of Defense authorized FSED of the Class 2 TDMA terminal and development of a comprehensive fighter integration program to identify cost effective integration options. An FSED contract was awarded to Singer-Kearfott Division on 14 Jan 81 for Class 2 TDMA terminals for the Air Force and Army test and evaluation.

A DSARC IIB in Jan 82 approved FSD for the Distributed Time Division Multiple Access (DTDMA) terminal and the Navy awarded a contract to Hughes and ITT.

On 16 Oct 85, the Secretary of the Navy approved procurement of Class

7a. [redacted] Program Highlights (Cont'd):

2 TDMA terminals for incorporation into the E-2C, F-14D, CG, CV and DDG. In Feb 86, the Navy funded Singer for a seven month study to assess the feasibility of integrating the Class 2 TDMA terminals into Navy platforms.

On 31 Dec 85, a contract was awarded to Singer for Class 2M development terminals for the Army and the Class 2H development terminals for the Air Force. Army milestones for the Class 2M were added and the Army program was rebaselined to meet the needs of the FAADC2I program.

In Apr 87, the Joint Program Office (JPO) completed the Multi-service Initial Operational Assessment (IOA). System performance was judged to be marginal with particular concern for terminal reliability. Preliminary and critical design reviews were conducted for the Navy Class 2 terminals. Contract modifications were awarded to Singer to procure long lead parts, interface units, and shipboard cabinets for the Navy Class 2.

In 1988, the JPO awarded contract modifications to Singer for Class 2 development terminals for E-2C, F-14D, and Ships, acquisition of Class 2 (F-15) and Class 2H (E-3) terminals for JSTARS integration, Class 2M terminals to meet test requirements, and a Class 2 terminal for MCE. A Navy Program Decision Meeting (NPDM) was conducted in Jun 88 to gain approval to proceed with a restructured program resulting from FY 88 funding reductions. On 1 Aug 88, the Navy was granted approval, subject to OSD funding availability, for follow-on acquisition of E-2C, F-14D, and Ship Class 2 development terminals. In Aug 88, Reliability Verification Test (RVT) #2 was completed successfully and demonstrated an instantaneous Mean Time Between Failure (MTBF) of 316.5 hours (lab). In Sep 88, Plessey Electronic Systems Corporation purchased Singer. PBD 252C fully funded our OSD program.

In 1989, the JPO completed Development/Operational Assessment (DT/OT). In Oct 89, approval was granted for a JTIDS Milestone IIIA Low Rate Initial Production (LRIP).

In 1990, the JPO implemented a Reliability Development/Growth Program and achieved the Class 2 terminal 400 hour MTBF reliability (lab) performance threshold. Production contracts were awarded to Plessey Electronic Systems Corporation (FSD leader) and Rockwell International Corporation (FSD follower) in Mar 90 for a total of 34 LRIP (Lot 1) terminals. First flight with a JTIDS Class 2 terminal occurred on three aircraft in 1990: E-8 (JSTARS) on 12 Jan 90; E-2C on 31 Jan 90; and F-14D on 29 Mar 90. The Navy Depot, North Island, San Diego, CA, was selected as the Joint Service Depot for the Class

7a. (U) Program Highlights (Cont'd):

2 terminal common items. In Nov 90, Plessey was renamed GEC-Marconi.

A Navy Program Decision Meeting (NPDM) was held 12 Mar 91 and approved LRIP for Navy F-14D, E-2C, and Ships. A revised Acquisition Program Baseline (APB) was signed 10 Jul 91. On 11 Jul 91, the Centralized Software Support Activity (CSSA) was awarded to Warner Robins Air Logistics Center (WR-ALC). Production contracts for Lot 2 were awarded on 12 Jul 91 to Rockwell Collins and GEC-Marconi for a total of 46 terminals. On 25 Jul 91, the Class 2M Reliability Growth Program successfully achieved an 836 hour MTBF based on 4025 hours of testing.

b. (U) Significant Developments Since Last Report —
In Oct 91, the Air Force, Navy, and Army jointly participated in a JTIDS network and successfully demonstrated the real purpose of JTIDS — interoperability. In Nov 91, the Class 2H Phase I Reliability Growth Test Program successfully achieved a 400 hour MTBF based on 5000 hours of testing. The first two JTIDS Tri-Service demonstrations were accomplished in Nov 91. An air/land/sea mission scenario was flown as part of the Multiservice Development Testing that included the USAF E-3 AWACS and F-15 Eagle, US Navy E-2C Hawkeye, F-14D Tomcat, and Cruiser USS Wainwright. On land, Navy ship simulator sites at Dam Neck and Wallops Island, VA and the US Army Class 2 and 2M JTIDS terminals at Tobyhanna Army Depot, PA also participated.

The JTIDS Class 2 TDMA terminal is expected to satisfy the mission requirements.

c. (U) Changes Since As Of Date —
None.

8. (U) Threshold Breaches:
There are no breaches to the 10 July 1991 Acquisition Program Baseline (APB). There are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones —

	Development Estimate	Approved Program	Current Estimate
Delivery of 1st FSD Terminal			
Class 2 (F-15)	JUL 83	JUN 84	JUN 84
Class 2 (F-14)	N/A	SEP 89	SEP 89

9a. [redacted] Schedule (Cont'd):

[redacted] Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Class 2H (E-3)	N/A	OCT 88	OCT 88
Class 2H (E-2)	N/A	DEC 89	DEC 89
Class 2H (Ships)	N/A	DEC 89	DEC 89
Class 2/2H (JSTARS)	N/A	NOV 87	NOV 87
Class 2/2H (MCE)	N/A	JUN 90	OCT 90
Class 2M (FAAD)	N/A	MAR 88	MAR 88
IOT&E/IOA Complete			
Class 2 (F-15)	JAN 86	APR 87	APR 87
Class 2 (F-14) (OPEVAL)	N/A	JUN 93	JUN 93
Class 2H (E-3)	N/A	SEP 91	FEB 92(Ch-1)
Class 2H (E-2) (OPEVAL)	N/A	JUN 93	JUN 93
Class 2H (Ships)	N/A	JUN 93	JUN 93
Class 2/2H (JSTARS)	N/A	SEP 95	SEP 95
Class 2/2H (MCE)	N/A	NOV 95	NOV 95(Ch-2)
Class 2M (FAAD)	N/A	MAY 92	MAY 92
Complete Multi-Service Operational Test	N/A	APR 93	APR 93
Milestone IIIA (Tri-Service DAB)			
Class 2 (F-15)	JUN 86	AUG 89	SEP 89
Class 2 (F-14)	N/A	AUG 89	SEP 89
Class 2H (E-3)	N/A	AUG 89	SEP 89
Class 2H (E-2)	N/A	AUG 89	SEP 89
Class 2H (Ships)	N/A	AUG 89	SEP 89
LRIP Contract Award			
Class 2	N/A	MAR 90	MAR 90
Class 2H	N/A	MAY 91	JUL 91
Delivery of 1st Production Unit			
Class 2	JUN 88	APR 92	APR 92
Class 2H 2/	N/A	MAY 93	MAY 93
Milestone IIIB (Tri-Service DAB)			
Class 2/2H	N/A	OCT 93	OCT 93
Milestone III			
Class 2M (FAAD)	N/A	SEP 93	OCT 93
Full Rate Contract Award			
Class 2/2H	N/A	FEB 94	FEB 94
Class 2M (FAAD)	N/A	FEB 94	FEB 94
Delivery of 1st Production Unit 2/			
Class 2M (FAAD)	N/A	JUN 96	JUN 96
IOC			
Class 2H	SEP 88	SEP 93	SEP 93
Class 2M (FAAD) 1/	N/A	DEC 93	DEC 93

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --

	Development Estimate	Approved Program	Current Estimate
Program Initiation	MAR 76	N/A	MAR 76
Class 2 TDMA ADM Delivery	AUG 78	N/A	AUG 78
Milestone II	JAN 81	N/A	JAN 81
TDMA Development Contract Award	JAN 81	N/A	JAN 81
Preliminary OT&E	JAN 81	N/A	JAN 82

Footnote:

1/ JTIDS First Unit Equipped (FUE) with R&D assets.

2/ Delivery due 24 months after contract award.

b. (U) Previous Change Explanations --

Actual delivery dates for the first FSD terminals for the Navy was Nov 89 and the Army was Mar 88. Milestone IIIA for the Air Force was delayed one month by the DAB committee to Sep 89. Proposal preparation and funding constraints delayed production contract award to Feb 90. Due to this delay, delivery of the first production unit for the Air Force (F-15) slipped to Apr 92. Full production for the Army Class 2M was delayed until Oct 92 due to program restructuring and Army funding constraints. LRIP contract award dates changed for E-3, JSTARS, MCE, and FAADC2I. These milestones are externally managed and no longer reported. Proposal preparation and staffing complexities delayed production contract award of Lots I and II as follows: F-15 to May 90, and Navy F-14, E-2, and Ships May 91. Milestone IIIB slipped to Oct 93 due to completion of exit criteria to the 11 Oct 89 JTIDS Milestone IIIA ADM. The Army Program was restructured changing Milestone IIIA to Sep 93 and Milestone IIIB to TBD. Based on ASD/C3I direction to rebaseline Milestone IIIB to Oct 93, full rate contract award dates slipped for AF E-3, JSTARS, and MCE to Feb 94. IOT&E milestones, externally managed platforms, slipped for E-3 to Sep 91, JSTARS to Sep 95, and MCE to Nov 95 due to reasons unrelated to the JTIDS terminal. The 1st FSD terminal for MCE was delivered in Oct 90 vs Jun 90. A revised Acquisition Program Baseline (APB) was signed 10 Jul 91. The host platform manager for E-3 informed the JPO that E-3 restructured and the IOT&E date slipped from Sep 91 to Dec 91. Milestones were combined to simplify reporting externally managed platforms by class of terminal versus by individual platform.

9c. (U) **Schedule (Cont'd):**

c. (U) Current Change Explanations --

(Ch-1) The E-3 IOT&E date has slipped from Dec 91 to Feb 92 due to rebaselining of the program.

(Ch-2) The MCE IOT&E date was erroneously reported in our last SAR.

d. (U) References --

(U) Development Estimate:
Secretary of Defense Decision Memorandum (SDDM), dated 16 January 1981, Subject: "JTIDS Milestone II Approval (Class 2 Terminal FSED)"; Decision Coordinating Paper (DCP), dated 31 March 1981.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 10 July 1991.

10. (U) **Performance Characteristics:**

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Coded Data Rate (double pulse Tx or Rx)(Kbps)	28.8	28.8 / 28.8	115.2	115.2
Voice Channels Per Net	3	3 / 1	2	2
Coded Message Error Probability	.01	.01 / .02	.01	.01
MTBF (hr)(Lab) Class 2	500	500 / 400	402C	500
(b)(1) [redacted]				
Communication Range (nm)	300	300 / 200	310/495A	300/500
MTBF (hr) (Field) Class 2	120	120 / 102	28B	120
MEAN Corrective Maintenance Time (min)	30	30 / 60	38	30

A - 310 NM was demonstrated in the normal range mode; 495 NM was demonstrated in the extended range mode.

10a. (U) Performance Characteristics (Cont'd):
B - April 1987 OT results. Qualitative assessment made in 1989 Pre-DAB OA indicated field reliability has improved, but insufficient operating hours limited any quantitative analysis.

C - Phase I Reliability Development/Growth Test (RD/GT) Mean Time MTBF of 402 lab hours was demonstrated.

ACRONYM:

MTBF = Mean Time Between Failure

b. (U) Previous Change Explanations --

Packed-4 messages (thus, yielding 115.2 kbps data rate) during Post-DAB Phase I DT&E (Oct 89 - Nov 90). 1200 nm relay range demonstrated. Based on the revised Aquisition Program Baseline (APB), dated 10 Jul 91, Numbers of Nets and Rel NAV Accuracy performance characteristics were deleted and Ranging Accuracy Below 150 nm was added.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
Secretary of Defense Decision Memorandum (SDDM), dated 16 January 1981, Subject: "JTIDS Milestone II Approval (Class 2 Terminal FSED)"; Decision Coordinating Paper (DCP), dated 31 March 1981.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 10 July 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost —	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	309.0	1499.9	1374.7
Procurement	0.0	829.8	0.0
Total Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 81 Base-Year $	309.0	2329.7	1374.7

11a. (U) Total Program Cost and Quantity (Cont'd):

	Development Estimate	Approved Program	Current Estimate
Escalation	73.5	1415.0	575.2
Development (RDT&E)	(73.5)	(658.9)	(575.2)
Procurement	(0.0)	(756.1)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	382.5	3744.7	1949.9

Approved program reflects Program Director (PD) controlled and non-PD controlled funding requirements (both procurement and RDT&E funding).

b. (U) Quantity --

Development (RDT&E)	0	N/A	0
Procurement	0	971	N/A
Total	0	971	0

Excludes 55 units from the SAR baseline and 168 from the current estimate that are not considered fully configured.

c. (U) Foreign Military Sales --

United Kingdom Royal Navy	$5.2M	$0	$0

Commitments to date are 3 development terminals for the United Kingdom Royal Navy.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
Secretary of Defense Decision Memorandum (SDDM), dated 16 January 1981, Subject: "JTIDS Milestone II Approval (Class 2 Terminal FSED)"; Decision Coordinating Paper (DCP), dated 31 March 1981.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 10 July 1991.

12. ([redacted]) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. ([redacted]) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1949.9	1952.5	1949.9
(2) Quantity	0	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	382.5	0.0	0.0	382.5
Previous Changes:				
Economic	-24.8	-	-	-24.8
Quantity	+740.9	-	-	+740.9
Schedule	+22.8	-	-	+22.8
Engineering	+352.7	-	-	+352.7
Estimating	+426.0	-	-	+426.0
Other	-	-	-	-
Support	+56.1	-	-	+56.1
Subtotal	+1573.7	-	-	+1573.7
Current Changes:				
Economic	-13.5	-	-	-13.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+7.2	-	-	+7.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-6.3	-	-	-6.3
Total Changes	+1567.4	-	-	+1567.4
Current Estimate	1949.9	-	-	1949.9

13a. ([redacted]) Cost Variance Analysis (Cont'd):

a. ([redacted]) Summary -- (FY 1981 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	309.0	0.0	0.0	309.0
Previous Changes:				
Quantity	+509.1	-	-	+509.1
Schedule	-1.5	-	-	-1.5
Engineering	+243.8	-	-	+243.8
Estimating	+270.7	-	-	+270.7
Other	-	-	-	-
Support	+38.6	-	-	+38.6
Subtotal	+1060.7	-	-	+1060.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+5.0	-	-	+5.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+5.0	-	-	+5.0
Total Changes	+1065.7	-	-	+1065.7
Current Estimate	1374.7	-	-	1374.7

b. [redacted] Previous Change Explanations --

RDT&E

Economic: Revised escalation rates.

Quantity: Revised for Air Force quantity increase from 15 to 19 development terminals; Air Force quantity increase from 19 to 37 to accommodate TADIL J efforts; Army increase from 6 to 33; increase of 29 in 1988; and 10 additional terminals for testing in 1989.

Schedule: Increase due to 6 month schedule slip of RDT&E; deletion of Army FY 85 test support funds.

Engineering: Increased scope of Software Support Facility, Contractor Software Support, F-15 Avionics Intermediate Shop, sustaining F-16 planning effort,

13b. (U) Cost Variance Analysis (Cont'd):

F-15 IOT&E, Class 2 Logistics, F-15 Group A; decrease in scope of F-16 and Bilingual Interface; added development of Class 2 terminal High Power Amplifier and interfaces for upgrade in E-3 and MCE platforms to TADIL J capability; F-15 PSE added to program; addition of Army budget for DT/OT IIA testing. MIDS FSD added to program.

Estimating: Original cost estimate included all future terminals, impact of revised indices for prior year dollars, Class 1 work removal, Undistributed Budget cuts; adjustments to correct errors in 31 Dec 83, 31 Dec 84, and 31 Dec 85 SARs; Gramm-Rudman cuts; out year inflation changes; reinstatement of Army funds managed at OSD; FY 87 and FY 89 Undistributed Budget cuts. Adjustments for Current and Prior Year Escalation; out year funding added; FY 90-94 increased to fund follow-on developments, testing, logistics, and program support. Program restructure reduced Navy effort. However, prior estimates did not include platform integration costs associated with terminals. FY 93-94 increase to fund USAF testing, integration, MIDS development, and support. In 1989 adjustment for current and prior year escalation; reduction of FY 90-94 AF and OSD funding; out year funding added for AF and Navy funding; MIDS transferred to Navy. In 1990, funding increased for preplanned product improvements; Navy restructured causing impact to FY 87-95 funding; release of withhold avoided stop work; reduction in JTIDS supportability, logistics, interoperability and product improvement due to funding constraints; and continue data link development into FY 95-97. In 1991, funding was added for ABCCC integration efforts.

Support: Develop, demonstrate, and evaluate direct link between E-3A and HIMAD elements using Class 2 terminals.

c. (U) Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Escalation Indices, 8 Jan 92	N/A	-13.5
Navy Revised Escalation (Economic)	N/A	-3.6
USAF Revised Escalation (Economic)	N/A	-2.4
OSD Revised Escalation (Economic)	N/A	-7.5
Adjustment for Current/Prior Year Escalation	4.5	6.8
Navy Current and Prior Adjustment (Estimating)	1.7	2.7
USAF Current and Prior Adjustment (Estimating)	0.7	1.0
OSD Current and Prior Adjustment (Estimating)	2.1	3.1
Program Restructuring due to Budget Decisions	0.5	0.4
Navy Restructuring due to Fiscal Constraints resulted in increased integration efforts in FY91-94 (Estimating)	1.2	1.6
USAF Fiscal Constraints resulted in reduced estimate of Preplanned Product Improvements, FY91-97 (Estimating)	-2.5	-4.4
OSD increase resulted from revised data link development costs. (Estimating)	1.8	3.2
Total Changes	5.0	-6.3

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Not Applicable.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E --

(U) DEVELOPMENT:

	Initial Contract Price		
	Target	Ceiling	Qty
GEC-MARCONI, TOTOWA, NJ F19628-86-C-0035, FFP Award: December 31, 1985 Definitized: December 31, 1985	$23.6	N/A	6

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$417.6	N/A	103	$417.6	$417.6

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

This is a Joint Air Force/Army/Navy/Marine Corps contract with Air Force as lead service. Changes since last report: a) Common Signal Processor ($7M); and b) Long-Lead credit ($-0.3).

Note: This is an FFP contract; therefore, no CPR reporting.

16. ([redacted]) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. ([redacted]) Program Status --

(1) Percent Program Completed: 77.3% (17 yrs/22 yrs)

(2) Percent Program Cost Appropriated: 82.7% ($1613.2 / $1949.9)

b. [redacted] Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY76-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	1448.0	165.2	108.1	228.6	1949.9
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1448.0	165.2	108.1	228.6	1949.9

16c. (U) **Program Funding Summary (Cont'd):**

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1976				0.1	0.1	0.1	0.1	6.6
197T								
1977				1.4	1.0	1.0	1.0	2.9
1978				1.0	0.8	0.8	0.8	2.6
1979				7.5	6.4	6.4	6.4	6.8
1980				4.6	4.3	4.3	4.3	9.4
1981				2.8	2.9	2.9	2.9	11.9
1982				10.9	12.2	12.2	12.2	9.2
1983				17.0	19.9	19.9	19.9	4.9
1984				17.6	21.3	21.3	21.3	3.8
1985				18.1	22.7	22.7	22.7	3.4
1986				10.8	13.9	13.9	13.9	2.8
1987								2.7
1988				3.1	4.2	4.2	4.2	3.0
Subtot				94.9	109.7	109.7	109.7	
Army				94.9	109.7	109.7	109.7	

Data is derived from Army Program Office records.

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1987				27.9	37.1	37.1	35.5	2.7
1988				75.4	103.5	103.5	98.9	3.0
1989				79.4	113.5	113.5	98.5	4.2
1990				58.1	85.8	85.8	78.4	4.0
1991				47.6	73.2	73.2	56.3	3.9
1992				39.5	62.7	18.7	2.5	3.1
1993				26.7	43.8			3.3
1994				5.4	9.1			3.3
Subtot				360.0	528.7	431.8	370.1	
Navy				360.0	528.7	431.8	370.1	

Obligations and expenditures reflect Navy Program Office records as of 23 January 1992.

Appropriation: 3600 Research, Development, Test + Eval, AF								
1980				5.8	5.5	5.5	5.5	9.4
1981				17.3	18.1	18.1	18.1	11.9
1982				32.0	35.7	35.7	35.7	9.2
1983				20.5	23.9	23.9	23.9	4.9

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1984				18.8	22.8	22.8	22.8	3.8
1985				46.6	58.4	58.4	58.4	3.4
1986								2.8
1987								2.7
1988				15.1	20.8	20.8	17.7	3.0
1989				34.1	48.7	48.7	43.7	4.2
1990				24.4	36.1	35.7	22.3	4.0
1991				24.1	37.1	35.6	14.5	3.9
1992				9.5	15.1	3.8		3.1
1993				10.1	16.5			3.3
1994				10.9	18.5			3.3
1995				8.1	14.2			3.3
1996				8.7	15.6			3.2
1997				8.4	15.7			3.2
Subtot				294.4	402.7	309.0	262.6	
USAF				294.4	402.7	309.0	262.6	

Obligations and expenditures reflect Program Office records as of 30 December 1991.

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 0400 RDT&E, Defense Agencies								
1986				154.4	198.3	198.3	198.3	2.8
1987				110.7	147.0	147.0	147.0	2.7
1988				57.2	78.6	78.6	67.2	3.0
1989				42.0	60.0	60.0	54.1	4.2
1990				46.8	69.2	68.3	39.1	4.0
1991				42.3	65.0	63.6	20.1	3.9
1992				55.1	87.4	41.5	2.2	3.1
1993				29.2	47.8			3.3
1994				22.8	38.5			3.3
1995				22.3	39.0			3.3
1996				21.6	38.9			3.2
1997				21.0	39.1			3.2
Subtot				625.4	908.8	657.3	528.0	
DoD				625.4	908.8	657.3	528.0	
Grand Total				1374.7	1949.9	1507.8	1270.4	

Obligations and expenditures reflect Program Office records as of 30 December 1991.

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1993	N/A	N/A	0	N/A

JTIDS SAR reflects only the RDT&E program. Production quantities and funding for the individual platforms are included in those specific programs.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	1374.7	N/A	N/A
(TY $)	N/A	N/A	1949.9	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	N/A	N/A	N/A
(TY $)	N/A	N/A	N/A	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	168/151
Procurement	0/0

17e. (U) Production Rate Data (Cont'd):

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

O&S costs were developed in support of the JTIDS Oct 89 DAB IIIA. The ground rules and assumptions used in the development of the O&S costs are as follows:

(1) O&S includes a 9-year Phase-in period and 11 years of steady state operation for a total span of 20 years beginning in FY92 with the first installation and going through FY11.

(2) Integration and Installation costs are included for TACM, E-2C, Navy Ships, and F-14D. Air Force costs (including Group A Procurement costs) are addressed only if they are not part of a platform block upgrade program or if they can be uniquely identified.

(3) Logistics Support is based on hardware depot at Army Sacramento (FY95 activation), software depot at Warner Robins (FY92 activation), and a peacetime deployment scenario.

(4) Terminal procurement quantities for production are based on the 14 August 1989 Buy Schedule.

The information provided above reflects costs associated with plaltforms that are externally managed and not within the control of the JPO. We expect to update the O&S cost estimate in support of our Oct 93 DAB IIIB.

The JTIDS Class 2 has no antecedent system.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1981 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per TOTAL SYSTEM	Avg Annual Cost Per Antecedent
Depot Maintenance	3.7	N/A
Depot Non-Maintenance	1.9	N/A
Unit Mission Personnel	0.7	N/A
Training	0.2	N/A
Sustaining Investment	2.0	N/A
Common Support Equipment	0.0	N/A
Software Support	2.7	N/A
Other Govt Costs (ISEA)	0.6	N/A
Total	11.8	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Maintenance & Spt	---	1.3	1.3	3.8	6.4
Total	---	1.3	1.3	3.8	6.4

A-19 KIOWA WARRIOR

91-067

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: OH-58D Kiowa Warrior

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
OH-58D Kiowa Warrior

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:

KIOWA WARRIOR PROGRAM
ATTN: SFAE-AV-ASH
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

COL JAMES T. HUEY
Assigned: April 1, 1988
AV 693-1360 COMM (314) 263-1360

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 64220 Project D518
PROCUREMENT:
APPN 2031 ICN AZ2200 (Army)
APPN 2031 ICN AA0961 (Army)

CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 23 1992
5
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

[redacted] Mounted Sight SCG
Declassify on: 25 February 1998
Downgrade Instructions: Regrade UNCLAS when separated from CLAS encls/pages

(THIS PAGE IS [redacted])

[redacted]

OASD(PA) DPOISR 92-T-0664

Concur in Classification as marked
23 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

5. (U) Related Programs:
OH-58D AHIP

6. (U) Mission and Description:
The Kiowa Warrior is a modification of the OH-58D Army Helicopter Improvement Program (AHIP) helicopter and includes Air-to-Air Stinger (ATAS) and Air-to-Ground (ATG) Weapons. The ATAS provides a self defense capability against airborne threats. The ATG weapons include Hellfire, Hydra 70 rockets, a .50 caliber machine gun to provide defense against ground threats and the ability to service high priority targets. In addition, Multipurpose Light Helicopter (MPLH) kits are being developed to provide limited troop transport (6 personnel), emergency medical evacuation (4 litters), 2000 pound external cargo hook capability and rapid deployment capability (15 minute flyaway from C-130 off-load). The Kiowa Warrior is a single engine, four-bladed main rotor light helicopter with a low light television, thermal imaging system and laser rangefinder/ designator incorporated into an above the rotor Mast Mounted Sight (MMS). It is designed to operate autonomously at stand-off ranges providing armed reconnaissance, command and control, target acquisition and designation under day/night, hot and adverse weather conditions. The Kiowa Warrior can designate for precision guided munitions, Apache aircraft and other airborne weapons platforms. Using the airborne target handover system, the Kiowa Warrior is capable of providing adjustment of conventional artillery as well as handing off targets to Apache aircraft and other airborne weapons platforms. The Kiowa Warrior will provide forward deployed air cavalry reconnaissance units and rapid deployment units with the ability to see, fight, and survive at night.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
On 30 November 1979, a Special Army Systems Acquisition Review Council (ASARC) reaffirmed the need for an Advanced Scout Helicopter (ASH) to incorporate day/night target acquisition/designation capabilities, improved Nap-of-Earth (NOE) and tactical communication and navigation, and an aircraft performance improvement which would permit operation with the AH-64 Apache in the hot-day, high altitude environment. A Required Operation Capability (ROC) document was approved on 9 January 1981, and on 21 September 1981, a Full Scale Engineering Development (FSED) contract was awarded to Bell Helicopter Textron, Incorporated (BHTI), for development and qualification of an improved scout helicopter to be identified as the OH-58D aircraft which entered formal Government Development Testing (DT) in July 1984. An ASARC was held on 23 July 1985 for the purpose of type classifying the OH-58D as Standard A and to proceed into full scale production. A Secretary of Defense Decision Memorandum (SDDM), signed 7 October 1985, approved the OH-58D for the field artillery aerial observer role. OH-58D Armed ASARC, 8 August 1989, recommended

7a. (U) Program Highlights (Cont'd):

approval for arming OH-58D aircraft with ATG weapons and a Secretary of the Army memorandum, dated 8 January 1990, approved the armed retrofit program to fully arm all 243 OH-58Ds. This memorandum identified Kiowa Warrior as the popular name for the OH-58D armed AHIP. On 30 May 1990, VCSA approved the concept of procuring MPLH kits for all active component Kiowa Warriors. Congress added $200M in FY 91 for procurement of 36 OH-58D helicopters for the Army National Guard.

b. (U) Significant Developments Since Last Report --
In FY 92, authorization by Congressional conferees provided $90.2M from funds available in the Desert Storm Supplemental Account to procure 12 OH-58D Kiowa Warrior aircraft to replace OH-58C's and OH-58D AHIPs lost during the Desert Shield/Desert Storm conflict.

(U) The OH-58D Kiowa Warrior aircraft is expected to satisfy mission requirements.

c. (U) Changes Since As Of Date --
None

8. (U) Threshold Breaches:
There is a schedule breach to the Approved Acquisition Program Baseline (APB), dated 28 December 1990. The breach was caused by added production procurements and late release of FY 91 RDT&E funds until Congressional questions concerning Hellfire and Stinger procurements were resolved. A revised APB is being staffed through the appropriate authorities. There are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Development Test II (DT II)	N/A	AUG 84	AUG 84
First Production Contract Award (LRIP) (16)(FY83/84)	OCT 84	SEP 84	SEP 84
Operational Test II (OT II)	JAN 85	FEB 85	FEB 85
Milestone III (DSARC III)	N/A	OCT 85	OCT 85
Second Production Contract Award (44) (FY85)	JUN 85	OCT 85	OCT 85
First Production Deliveries Start	N/A	DEC 85	DEC 85
Second Production Deliveries Start	N/A	JUN 86	JUN 86

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Third Production Contract Award (39) (FY86)	N/A	AUG 86	AUG 86
Production Verification Test Complete	N/A	OCT 86	OCT 86
First Unit Equipped (CONUS)	N/A	MAR 87	MAR 87
Initial Operational Capability	JUN 86	MAY 87	MAY 87
User Follow-on Test & Evaluation Army Aerial Scout Test	N/A	MAY 87	MAR 87
Production Reliability Scoring Conference	N/A	JUN 87	JUN 87
Third Production Deliveries Start	N/A	JUN 87	JUN 87
First Unit Equipped (USAREUR)	N/A	JUN 87	JUN 87
Fourth Production Contract Award (36) (FY87)	N/A	SEP 87	SEP 87
Production (RAMLOG) Scoring Conference	N/A	FEB 88	FEB 88
First Unit Equipped (EUSA)	N/A	APR 88	APR 88
Fourth Production Deliveries Start	N/A	JUL 88	JUL 88
Production (RAMLOG) Scoring Conference	N/A	AUG 88	AUG 88
Production (RAMLOG) Scoring Conference	N/A	OCT 88	OCT 88
Fifth Production Contract Award (36)(FY88)	N/A	DEC 88	DEC 88
RAM Assessment	N/A	JAN 89	JAN 89
Sixth Production Contract Award (36) (FY89)	N/A	JUN 89	JUN 89
Fifth Production Deliveries Start	N/A	JUL 89	JUL 89
ASARC IV/III Decision	N/A	AUG 89	AUG 89
Qualification Test Contract Award	N/A	DEC 90	APR 91(Ch-1)
Seventh Production Contract Award (36) (FY90) (Split buy-first KW)	N/A	JUN 90	JUN 90
Sixth Production Delivery Start	N/A	JUL 90	JUL 90
Qualification Test			
Start	N/A	JAN 91	JUN 91(Ch-1)
Complete	N/A	JUL 92	SEP 92
Seventh Production Delivery Start	N/A	JUL 91	JUL 91
PEO In-Process Review	N/A	SEP 91	MAY 92(Ch-2)
KW First Production Contract Award (Retrofit)	N/A	DEC 91	JAN 92(Ch-1)
KW First Production Delivery Start	N/A	SEP 92	JAN 93(Ch-3)
KW First Unit Equipped	N/A	NOV 92	MAR 93(Ch-4)
KW Second Production Contract Award (Retrofit)	N/A	DEC 92	DEC 92

9a. ([redacted]) Schedule (Cont'd):

([redacted]) Milestones (Cont'd) --

	Development Estimate	Approved Program	Current Estimate
KW Initial Operational Capability	N/A	MAY 93	MAY 93
KW Third Production Contract Award (Retrofit)	N/A	DEC 93	DEC 93
KW Fourth Production Contract Award (Retrofit)	N/A	DEC 94	DEC 94
Final Production Delivery	N/A	JUN 92	N/A (Ch-5)
KW Final Production Delivery	N/A	APR 96	AUG 96 (Ch-6)
KW Last Unit Equipped	N/A	MAY 96	SEP 96 (Ch-6)
Last Unit Equipped (CONUS)	N/A	JUL 92	N/A (Ch-5)

b. [redacted] Previous Change Explanations --

Full Production Contract award slipped from Jun 85 to Oct 85 due to a delay in the ASARC/DSARC process. IOC slipped from Jun 86 to May 87 due to VCSA decision requiring a follow-on evaluation to qualify the AHIP for attack and air cavalry roles. Seventh Production Contract award changed from N/A to Jun 90 and Seventh Production Delivery Start changed from N/A to Jul 91 when FY 90 funding for 36 OH-58Ds was restored.

c. [redacted] Current Change Explanations --

(Ch-1) Changes capture actual completion dates: Qualification Test Contract Award, April 1991 vs March 1991; Qualification Test Start, June 1991 vs May 1991; KW First Production Contract Award (Retrofit), January 1992 vs December 1991.

(Ch-2) The PEO In-Process Review has slipped from September 1991 to May 1992. FY 91 funding (RDTE and APA) was withheld from program officials until April 5, 1991, pending Congressionally requested response on Hellfire/Stinger procurement. The funding withhold subsequently delayed initiation of the testing program, which in turn caused the delay of the PEO In-Process Review.

(Ch-3) Date change from September 1992 to January 1993 corresponds with negotiated contract.

(Ch-4) Date adjusted from November 1992 to March 1993 based on HQDA decisions on how to field/train Kiowa Warrior units.

(Ch-5) Final Production Delivery and Last Unit Equipped milestones are not applicable because they are superseded by KW Final Production Delivery and KW Last Unit Equipped milestones.

9c. [redacted] Schedule (Cont'd):

(Ch-6) The KW Final Production Delivery date change from April 1996 to August 1996 reflects the extension of the contractor's production planning retrofit cycle. Because of this extension, the KW Last Unit Equipped date changed from May 1996 to September 1996.

d. ([redacted]) References --

([redacted]) Development Estimate:
SDDMs, 31 August 1982 and 7 October 1985, subject: "Army Helicopter Improvement Program (AHIP) for the Scout Helicopter."

([redacted]) Approved Program:
AAE Approved Acquisition Program Baseline dated 28 December 1990.

10. ([redacted]) Performance Characteristics:

(b)(1)

a. ([redacted]) Performance --

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Vertical Rate of Climb (ft/min)					
2000 ft & 70 deg F	650	650	/ 450	650	650
4000 ft & 95 deg F	500	250	/ HOGE	500	500
Forward Flight Speed (KTAS)	112	107	/ 100	118	118
Endurance (hrs)	2.4	2.4	/ 1.9	2.4	2.4

(b)(1)

[redacted]

10a. [redacted] Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demon-strated Perf	Current Estimate
Mean Time Between Mission Affecting Failure (hrs) (4 hr mission)	4.4	4.4	/ 4.4	8.7	8.7
Mean Time Between Failure (hrs) (Specification)	N/A	6.98	/ 6.98	7.2	7.2
Sortie Rate (Flight hours per month)					
Peacetime:	20	20	/ 20	20	20
Wartime:					
Initial Surge	112	112	/ 112	112	112
Sustained	65	65	/ 65	65	65
Maintenance Ratio (Manhours/Flight Hour)					
(AVUM)	3.0	2.2	/ 3	TBD	3.0
(AVIM)	N/A	1.5	/ 1.5	TBD	1.5
Mean Time to Repair (hrs) (AVUM and AVIM)	2.0	2.0	/ 2.0	2.0	2.0

b. [redacted] Previous Change Explanations --

Mean time between mission affecting failures defines reliability IAW Nov 84 ROC revision. The maintenance ratio for AVUM changed from 1.8 to 3.0 to reflect the higher maintenance manhours per flight hour of the OH-58D Kiowa Warrior vs the AHIP.

c. [redacted] Current Change Explanations --

None

d. [redacted] References --

([redacted]) Development Estimate:
SDDMs, 31 August 1982 and 7 October 1985, subject: "Army Helicopter Improvement Program (AHIP) for the Scout Helicopter."

([redacted]) Approved Program:
AAE Approved Acquisition Program Baseline dated 28 December 1990.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	213.5	241.0	231.9
Procurement	1454.4	1420.9	1479.0
Airframe	(329.7)		(385.8)
Engine	(67.6)		(71.9)
MMS/CDS	(559.1)		(465.5)
Other Avionics	(148.9)		(63.3)
Armament	(0.0)		(200.1)
Nonrecurring	(47.6)		(21.4)
Total Flyaway	(1152.9)		(1208.0)
Other Weapon Systems	(44.3)		(106.0)
Total Other Wpn Sys	(44.3)		(106.0)
Peculiar Support	(176.6)		(42.3)
Initial Spares	(80.6)		(122.7)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 82 Base-Year $	1667.9	1661.9	1710.9
Escalation	863.7	670.0	689.6
Development (RDT&E)	(14.6)	(26.8)	(22.3)
Procurement	(849.1)	(643.2)	(667.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2531.6	2331.9	2400.5

b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	578	239	255
Total	578	239	255

Excludes 5 RDT&E prototypes which are not considered fully configured end items.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --
None

e. (U) References --

(U) Development Estimate:
SDDMs, 31 August 1982 and 7 October 1985, subject: "Army Helicopter Improvement Program (AHIP) for the Scout Helicopter."

11e. ([redacted]) Total Program Cost and Quantity (Cont'd):

([redacted]) Approved Program:
AAE Approved Acquisition Program Baseline dated 28 December 1990.

12. [redacted] Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. [redacted] Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2400.5	2346.2	2400.5
(2) Quantity	255	243	255
(3) Unit Cost	9.414	9.655	9.414
b. [redacted] Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	228.8	228.8	105.5
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	228.8	228.8	105.5
(2) Quantity	12	12	0
(3) Unit Cost	19.067	19.067	N/A

Note: FY 92 funding authorized by Congressional conferees will procure 12 new OH-58D Kiowa Warrior aircraft. In addition to this procurement effort, the PMO will retrofit 28 OH-58D AHIP's to the armed configuration (Kiowa Warrior). The following is a breakout of the FY 92 program:

(FY 92)	CURRENT ESTIMATE
Current Procurement/Production Program	
Cost	90.2
Quantity	12
Unit Cost	7.517
Retrofit Program	
Cost	138.6
Quantity	N/A
Unit Cost	N/A

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	228.1	2303.5	0.0	2531.6
Previous Changes:				
Economic	-3.0	-290.5	-	-293.5
Quantity	-	-959.3	-	-959.3
Schedule	-	+185.9	-	+185.9
Engineering	+58.6	+625.5	-	+684.1
Estimating	-16.2	+237.8	-	+221.6
Other	-	-	-	-
Support	-	-24.2	-	-24.2
Subtotal	+39.4	-224.8	-	-185.4
Current Changes:				
Economic	+1.7	-15.8	-	-14.1
Quantity	-	+36.2	-	+36.2
Schedule	-	-	-	-
Engineering	-	+67.3	-	+67.3
Estimating	-15.0	+21.4	-	+6.4
Other	-	-	-	-
Support	-	-41.5	-	-41.5
Subtotal	-13.3	+67.6	-	+54.3
Total Changes	+26.1	-157.2	-	-131.1
Current Estimate	254.2	2146.3	-	2400.5

13a. ([redacted]) Cost Variance Analysis (Cont'd):

a. ([redacted]) Summary -- (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	213.5	1454.4	0.0	1667.9
Previous Changes:				
Quantity	-	-653.5	-	-653.5
Schedule	-	+75.0	-	+75.0
Engineering	+42.4	+379.3	-	+421.7
Estimating	-13.8	+179.3	-	+165.5
Other	-	-	-	-
Support	-	-7.2	-	-7.2
Subtotal	+28.6	-27.1	-	+1.5
Current Changes:				
Quantity	-	+22.3	-	+22.3
Schedule	-	-	-	-
Engineering	-	+38.2	-	+38.2
Estimating	-10.2	+14.5	-	+4.3
Other	-	-	-	-
Support	-	-23.3	-	-23.3
Subtotal	-10.2	+51.7	-	+41.5
Total Changes	+18.4	+24.6	-	+43.0
Current Estimate	231.9	1479.0	-	1710.9

b. ([redacted]) Previous Change Explanations --

RDT&E

Economic: Revised escalation rates.

Engineering: Inclusion of the Optical Improvement Program (OIP). Inclusion of the Kiowa Warrior and MPLH programs.

Estimating: Congressionally directed reduction in Total Risk Assessing Cost Estimate (TRACE). Revised computational method for FY 82 base year dollars. Turn-in of contract contingency funds and Gramm-Rudman-Hollings cuts. Correction of rounding error from 31 Dec 87 SAR. Adjustments to training device development and testing estimates.

13b. [redacted] Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic:	Revised escalation rates.
Quantity:	Reduction of aircraft from 578 to 135. Increase of aircraft from 135 to 195. Increase of aircraft from 195 to 375. Decrease in aircraft from 375 to 207. Increase of aircraft from 207 to 243.
Schedule:	Program stretched in the FY 86 - 90 POM by Army. Program stretchout into FY 92 due to POM restructuring and SDDM guidance. Budget actions result in schedule change in Kiowa Warrior retrofit program.
Engineering:	HQDA directed program changes: Single Channel Ground and Airborne System (SINCGARS), Global Positioning Satellite System (GPS). Inclusion of OIP, ATAS and memory upgrade for the MMS and Control Display System (CDS). Reduction in ATAS, Kiowa Warrior, and configuration changes to the airframe, MMS, CDS due to reduction in quantity. Increase in ATAS, Kiowa Warrior, and configuration changes to the airframe and CDS due to increase in quantity. Inclusion of MPLH. Correction of categorization from Estimating to Engineering due to quantity change. Inclusion of video tracker card, additional ANVIS Display Symbology System (ADSS) card.
Estimating:	Congressional cuts (IR&D), revised System Program Management (SPM) and Engineering Change Orders (ECO) and adjustments from learning curve differences. Change applicable to decrease from 375 to 207 aircraft. Change applicable to increase from 207 to 243 aircraft. Correction of categorization from Estimating to Engineering due to quantity change. Correction of categorization from Flyaway to Support change due to updated hardware information and adjustments to learning curve.
Support:	Inclusion of Warranty Risk requirement. Increased initial spares estimate based on refined configuration data, changing Logistics Support Analysis (LSA) results. Reduction and additions in initial spares based on changes in program quantities. Inclusion of Kiowa Warrior support equipment and initial spares. Requirement to facilitize depot sooner due to termination of production program. Correction of categorization from Flyaway to Support. Inclusion of total

13b. (U) Cost Variance Analysis (Cont'd):
package fielding requirements. Refinement of support requirements for Kiowa Warrior.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation rates (Economic)	N/A	1.7
Adjustment for current and prior inflation offset (Estimating)	-1.1	-1.7
Congressional withhold of RDTE funding caused schedule slippage resulting in PEO reprogramming of funds (Estimating)	-2.8	-3.9
Program cut reduced test program/MPLH development/2nd source development for .50 caliber machine gun (Estimating)	-6.3	-9.4
Total Changes	-10.2	-13.3

13c. [redacted] Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation rates (Economic)	N/A	-15.8
Adjustment for current and prior inflation offset (Estimating)	3.5	5.5
Increase of 12 aircraft (Quantity)	22.3	36.2
Armament and armament integration for 12 aircraft (Engineering)	7.1	11.5
Estimating changes applicable to increase of 12 aircraft (Estimating)	23.5	38.2
Support changes applicable to increase of 12 aircraft (Support)	2.6	4.3
Inclusion of engine reliability and maintainability enhancement program (Engineering)	31.1	55.8
Congressional action eliminating depot facilitization funds and definitization of support rqmts for Kiowa Warrior (Support)	-25.9	-45.8
Definitization of retrofit contract, contracting strategy change, and refinement of equipment requirements (Estimating)	-12.5	-22.3
Total Changes	51.7	67.6

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
4.380	-1.206	1.928	0.729	2.947	0.894	--	-0.258	5.034	9.414

15. ([redacted]) Contract Information: (Then-Year Dollars in Millions)

a.([redacted]) Procurement --

[redacted] 7TH PRODUCTION MMS:
MCDONNELL DOUGLAS, HUNTINGTON BEACH, CA
DAAJ09-90-C-0352, FFP
Award: August 31, 1990
Definitized: August 31, 1990

Initial Contract Price		
Target	Ceiling	Qty
$75.7	N/A	41

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$75.2	N/A	41	$75.2	$75.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR data is not required on this FFP contract.

[redacted] 7TH PRODUCTION BUY:
BELL HELICOPTER, DALLAS/FT.WORTH, TX
DAAJ09-90-C-0353, FFP
Award: September 30, 1990
Definitized: September 30, 1990

Initial Contract Price		
Target	Ceiling	Qty
$62.3	N/A	36

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$89.8	N/A	36	$89.8	$89.8

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR data is not required on this FFP contract.

Target Price for the Lot 7 Production Buy (DAAJ09-90-C-0353) includes $19.0M for provisions to the aircraft to accept armament modifications for the air-to-ground weapon capabilities which include Hellfire, Hydra 70 rockets, the .50-caliber machine gun and improved aircraft transmission.

Contract DAAJ09-88-C-A097 passed the 90% delivered mark and was omitted from the list of large active contracts. It no longer meets the SAR reporting criteria per DODI 5000.2.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 72.2% (13 yrs/18 yrs)

(2) Percent Program Cost Appropriated: 82.0% ($1969.5 / $2400.5)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY80-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	244.9	9.3	-	-	254.2
Procurement	1486.5	228.8	105.5	325.5	2146.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1731.4	238.1	105.5	325.5	2400.5

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY82 Dollars Nonrec	Flyaway FY82 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army								
1980			8.4	8.4	7.4	7.4	7.4	9.4
1981			26.5	26.5	25.6	25.6	25.6	11.9
1982			37.4	37.4	38.5	38.5	38.5	7.6
1983			68.8	68.8	73.9	73.9	73.9	4.9
1984			45.3	45.3	50.4	50.4	50.4	3.8
1985			17.7	17.7	20.3	20.3	20.3	3.4
1986			6.1	6.1	7.2	7.2	7.2	2.8
1987								
1988								
1989								
1990								
1991			15.3	15.3	21.6	19.7	16.0	3.9
1992			6.4	6.4	9.3			3.1
Subtot			231.9	231.9	254.2	243.0	239.3	
Appropriation: 2031 Aircraft Procurement, Army								
1983		2.4	24.6	30.1	36.3	36.3	36.3	9.0

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars Nonrec	Flyaway FY82 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2031 Aircraft Procurement, Army (Cont'd)								
1984	16	17.4	112.1	158.5	196.4	196.4	196.4	8.0
1985	44		141.3	181.4	231.7	231.7	231.7	3.4
1986	39		122.2	174.0	229.7	229.7	229.7	2.8
1987	36		102.6	132.7	179.1	179.1	179.1	2.7
1988	36		106.6	113.3	160.0	160.0	156.2	3.0
1989	36		134.6	155.3	229.6	229.6	173.6	4.2
1990	36		118.2	128.6	195.3	191.5	112.5	4.0
1991			8.9	18.1	28.4	14.6	1.3	3.9
1992	12	1.3	117.2	140.8	228.8			3.1
1993		0.3	50.8	62.9	105.5			3.3
1994			76.4	87.3	151.2			3.3
1995			56.1	65.7	117.5			3.3
1996			7.5	15.8	29.2			3.2
1997			7.5	14.5	27.6			3.2
Subtot	255	21.4	1186.6	1479.0	2146.3	1468.9	1316.8	
Grand Total	255	21.4	1418.5	1710.9	2400.5	1711.9	1556.1	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1984	21	21	16	21
1985	48	48	44	48
1986	56	39	39	56
1987	92	48	36	92
1988	120	32	36	120
1989	130	81	36	0
1990	120	116	36	0
1991	0	120	0	0
1992	0	82	12	0

The funded delivery period is nine months for FY 84 and 11 months for FY 85.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2094.4	-383.5	1710.9	+427.7	1283.2
(TY $)	2943.4	-542.9	2400.5	+768.9	1631.6
PAUC Cost (BY $)	3.568	3.141	6.709	+1.677	5.032
(TY $)	5.014	4.400	9.414	+3.015	6.398

17c. (U) Production Rate Data (Cont'd):

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	DEC 85	0	DEC 85	N/A	DEC 85
Duration (in MON)	83	11	94	38	56
End Date(MON YY)	NOV 92	11	OCT 93	N/A	AUG 90

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	5/5
Procurement	225/225

e. (U) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 578 - @ Peak Rate: 10.0/mo			
FY 82 Base-Year $	1.990	4.740	4.600
Then Year $	3.190	6.880	5.520
@ Qty 116 (1st three years) - @ Peak Rate: 10.0/mo			
FY 82 Base-Year $	2.800	4.240	5.290
Then Year $	3.820	5.400	6.100

Note: Current Estimate is costed at 4 per month.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

Sustainment costs are based on 240 Kiowa Warriors operating at a tempo of 240 peacetime flying hours per year with each aircraft operating for 20 years. Replenishment costs include aircraft spares and repair parts. Depot maintenance includes the cost of labor, material and transporation for maintenance performed at the depot level. The only Military Personnel Cost included is System Project Management. Sustainment Costs are based on the Armed AHIP Baseline Cost Estimate (BCE) of September 1990. The antecedent system for the Kiowa Warrior is the OH-58A.

18b. ([redacted]) Operating and Support Costs (Cont'd):

b. ([redacted]) Costs -- (FY 1982 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Flying Hour (Kiowa Warrior)	Avg Annual Cost Per Flying Hour (Antecedent)
Replenishment	1196.0	N/A
Petroleum, Oil & Lub	17.0	N/A
Ammunition	468.0	N/A
Depot Maintenance	64.0	N/A
Field Maintenance, Civ	53.0	N/A
Transportation	3.0	N/A
System Specific Repl Trn	179.0	N/A
Military Personnel	11.0	N/A
System Project Mgmt, Civ	16.0	N/A
Modification Kits	197.0	N/A
Life Cycle Software Supp	4.0	N/A
Total	2208.0	N/A

c. [redacted] Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	37.1	4.4	4.6	---	46.1
Total	37.1	4.4	4.6	---	46.1

Note 18b: Data for the antecedent system (OH-58A) is not available.

N-43 TRIDENT II SUB

91-0878

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: TRIDENT II SUBMARINE

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
OHIO Class Submarine

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
STRATEGIC SYSTEMS PROGRAMS
DEPARTMENT OF THE NAVY
WASHINGTON, DC 20376-5002
RADM JOHN T. MITCHELL
Assigned: April 26,1991
AV 327-0456 COMM (703) 607-0453

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0604363N Project J1546
PE 0606371N Project J1546
PROCUREMENT:
APPN 1611 ICN 01 01 1040 (Navy)

5. (U) Related Programs:
TRIDENT I Backfit and TRIDENT II (D-5) Missile, TRIDENT I Systems, SSN 21 (SEAWOLF), and SSN 688 Class Program.

Classified by: OPNAVINST [redacted] - Enclosure [redacted]
Declassify on: Not Subject to Automatic Downgrade
Downgrade Instructions: Originating Agency Determination Required (OADR)

(THIS PAGE IS [redacted])
- 1 -

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No Security Objection to Such Publication
AS AMENDED
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Naval Operations Dept. of the Navy

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FOR OPEN PUBLICATION
MAR 23 1992 22
DIRECTOR FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

DASD(PA) DFOISR 92-F-0650

6. [redacted] Mission and Description:
To provide an undersea strategic missile system to insure that the U.S. continues to maintain a credible, survivable deterrent independent of foreseeable threats. The nuclear-powered OHIO Class D-5 Capable Submarine has 24 missile tubes. Incorporation of state-of-the-art technologies in submarine quietness, mobility, and self-defense make the submarine highly survivable. The submarine can patrol, transit, or evade enemy search forces at higher speeds than previous SSBN's. It has an integrated radio room designed to enhance the survivability of communication links in a hostile electromagnetic environment, and carries the latest submarine defense systems.

7. [redacted] Program Highlights:
a. [redacted] Significant Historical Developments --
The Deputy Secretary of Defense's Program Decision Memorandum (PDM) of 2 October 1981 directed the Navy to fund development of the TRIDENT II (D-5) missile with a December 1989 IOC. The design characteristics of the TRIDENT II (D-5) missile required modifications to the OHIO Class Submarine. Efforts in FY 1982 included identification of the necessary subsystem changes to incorporate the TRIDENT II (D-5) missile in the OHIO Class Submarine baseline. Required weapon support system and component developments were initiated.

On 29 April 1982, SECNAV maintained the December 1989 IOC for TRIDENT II (D-5), while rephasing the introduction of the weapon system into the fleet. A decision was made to incorporate the D-5 Strategic Weapon System (SWS) starting with the ninth submarine (SSBN 734). The D-5 capability would be accomplished during initial construction of the ship, consequently the ninth ship delivery was extended one year. The schedules of the tenth (SSBN 735) and the eleventh (SSBN 736) were also extended. The twelfth (SSBN 737) and the subsequent ship construction periods were not affected by the change to TRIDENT II (D-5). On 1 June 1982 the SECDEF advised Congress of the decision to accelerate the rate of introduction of D-5 while maintaining the 1989 IOC.

In November 1982, the Navy executed modifications to the Electric Boat contract which incorporated the D-5 SWS into the SSBN 734 and SSBN 735 and revised their delivery dates to December 1988 and August 1989 respectively. On 21 November 1983 an option to acquire the SSBN 736 was exercised. A contemporaneous modification to incorporate D-5 and extend delivery to April 1990 was also executed. The contract for the SSBN 737 was awarded in August 1985. In March 1986 an option for the SSBN 738 was awarded. In May 1987 the SSBN 739 was awarded to Electric Boat. In January 1988 the SSBN 740 was competitively awarded to Electric Boat. In October 1988 an option for the SSBN 741 was awarded. In November 1988 the SSBN 734 was delivered and the SSBN 735 was delivered in August 1989. In

7a. [redacted] Program Highlights (Cont'd):

October 1989 an option for the SSBN 742 was awarded.

In March 1990 the SSBN 734 deployed and the SSBN 735 deployed in October 1990. In September 1990 the SSBN 736 was delivered and completed Post Shakedown Availability (PSA) in August 1991. In December 1990 the SSBN 743 (the eighteenth and final SSBN TRIDENT OHIO Class Submarine) was awarded to Electric Boat.

b. [redacted] Significant Developments Since Last Report --
In April 1991, the Navy executed contract modifications for SSBNs 739 through 742 to revise their delivery dates to 31 August 1993 through 1996, respectively, in order to accommodate an even distribution of Electric Boat's forecast workload.

The USS WEST VIRGINIA (SSBN 736) completed its Post Shakedown Availability (PSA) in August 1991 and deployed in September 1991. The USS KENTUCKY (SSBN 737) was delivered on 27 June 1991 and successfully completed its second Demonstration and Shakedown Operations (DASO) on 4 November 1991. The SSBN 737 will begin its PSA in February 1992 and will complete strategic loadout and deploy in the third quarter of FY 1992. The USS MARYLAND (SSBN 738) achieved Initial Criticality in late November and completed Power Range Testing 20 December 1991.

The Ohio Class D-5 Capable Submarine is expected to satisfy mission requirements.

c. [redacted] Changes Since As Of Date --
The Amended FY 1992/1993 President's Budget terminates the SSN 21 Program. This decision could result in significant impact on TRIDENT II construction program.

8. [redacted] Threshold Breaches:
There are currently no APB of December 31, 1988 threshold breaches and no Nunn-McCurdy unit cost breaches.

9. [redacted] Schedule:

a. [redacted] Milestones --

	Production Estimate	Approved Program	Current Estimate
Complete Baseline Design	MAR 72	MAR 72	MAR 72
Characteristics Approved	JAN 73	JAN 73	JAN 73
Complete Ship Contract Design	AUG 84	AUG 84	AUG 84

9a. ([redacted]) Schedule (Cont'd):

([redacted]) Milestones (Cont'd) --

	Production Estimate	Approved Program	Current Estimate
Production Contract Award	JAN 82	JAN 82	JAN 82
Construction Started:			
First Ship	JAN 82	JAN 82	JAN 82
Last Ship	JAN 88	JUN 92	DEC 90
Delivery:			
First Ship	DEC 88	DEC 88	NOV 88
Last Ship	DEC 93	APR 98	AUG 97
System IOC	DEC 89	DEC 89	MAR 90
Launch:		N/A	
First Ship	NOV 86	N/A	DEC 86
Last Ship	JUL 92	N/A	JUL 96
Acceptance Trials:		N/A	
First Ship	DEC 88	N/A	NOV 88
Last Ship	DEC 93	N/A	AUG 97

b. ([redacted]) Previous Change Explanations --

The start of construction, launch, acceptance trials, and delivery for the last ship was revised to reflect an increased number of submarines for the total program. Production Estimate included a total program of seven submarines.

The acceptance trials and delivery of the first ship was revised to reflect the completion of those milestones.

The system IOC was revised to reflect delays in the TRIDENT II (D-5) Missile.

The start of construction, launch, acceptance trials, and delivery for the last ship was revised in the December 31, 1990 SAR to reflect a total program of ten submarines vice thirteen in the December 31, 1989 SAR.

c. ([redacted]) Current Change Explanations -- None.

d. ([redacted]) References --

([redacted]) Production Estimate:
USD(R&E) Memo of July 22, 1981, subject OHIO Class Submarine Program.

([redacted]) Approved Program:
DAE approved Acquisition Program Baseline dated 31 Dec 88.

10. (U) Performance Characteristics:

a. (U) Performance --

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Length Overall (ft)	558	560	/ 560	560	560
Beam Max. (hull dia. in feet)	42	42	/ 42	42	42
Draft Navigation-ft	35.5	36.5	/ 36.5	36.5	36.5
Submerged Displacement (Tons)	18500	18700	/ 18700	18700	18700

(b)(1) [redacted]

Endurance
Armament

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Production Estimate:
USD(R&E) Memo of July 22, 1981, subject OHIO Class Submarine Program.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 31 Dec 88.

11. ([redacted]) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. ([redacted]) Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	49.3	62.1	64.3
Procurement	9980.0	14471.5	12021.5
Total Sailaway	(9743.3)		(11846.2)
Sailaway	(236.7)		(0.0)
			(175.3)
Total Other Wpn Sys	(236.7)		(175.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	519.6	424.6	424.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 83 Base-Year $	10548.9	14958.2	12509.8
Escalation (TY$-BY$)	3536.3	2925.1	1792.7
Development (RDT&E)	(3.6)	(4.6)	(5.8)
Procurement	(3416.8)	(2845.9)	(1711.7)
Construction (MILCON)	(115.9)	(74.6)	(75.2)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	14085.2	17883.3	14302.5
b. [redacted] Quantity --			
Development (RDT&E)	0	0	0
Procurement	7	13	10
Total	7	13	10

c. ([redacted]) Foreign Military Sales -- None.

d. ([redacted]) Nuclear Costs --
The Current Estimate for Procurement includes $1,410.3 (Then Year $ in millions) for Nuclear Propulsion costs.

e. [redacted] References --

[redacted] Production Estimate:
USD(R&E) Memo of July 22, 1981, subject OHIO Class Submarine Program.

[redacted] Approved Program:
DAE approved Acquisition Program Baseline dated 31 Dec 88.

12. ([redacted]) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. ([redacted]) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	14302.5	14276.4	14302.5
(2) Quantity	10	10	10
(3) Unit Cost	1430.25	1427.64	1430.25
b. ([redacted]) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	128.1	128.1	11.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	128.1	128.1	11.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

FY 1992 request includes Outfitting/Post Delivery and escalation to be applied to FY 1991 and prior year ships. FY 1993 request includes only Outfitting/Post Delivery.

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	52.9	13396.8	635.5	14085.2
Previous Changes:				
Economic	-2.9	-2714.4	-32.0	-2749.3
Quantity	-	+6288.6	-	+6288.6
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+20.2	-3152.8	-104.3	-3236.9
Other	-	-	-	-
Support	-	-111.2	-	-111.2
Subtotal	+17.3	+310.2	-136.3	+191.2
Current Changes:				
Economic	-0.1	-242.8	-8.7	-251.6
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+274.6	+8.7	+283.3
Other	-	-	-	-
Support	-	-5.6	-	-5.6
Subtotal	-0.1	+26.2	-	+26.1
Total Changes	+17.2	+336.4	-136.3	+217.3
Current Estimate	70.1	13733.2	499.2	14302.5

13a. ([redacted]) Cost Variance Analysis (Cont'd):

a. ([redacted]) Summary -- (FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	49.3	9980.0	519.6	10548.9
Previous Changes:				
Quantity	-	+4367.2	-	+4367.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+15.0	-2485.8	-96.1	-2566.9
Other	-	-	-	-
Support	-	-55.9	-	-55.9
Subtotal	+15.0	+1825.5	-96.1	+1744.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+221.5	+0.5	+222.0
Other	-	-	-	-
Support	-	-5.5	-	-5.5
Subtotal	-	+216.0	+0.5	+216.5
Total Changes	+15.0	+2041.5	-95.6	+1960.9
Current Estimate	64.3	12021.5	424.0	12509.8

b. ([redacted]) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Estimating: Transfer of certain efforts properly identified with D-5 capable SSBNs from the TRIDENT I program, reallocation of funds to TRIDENT II (D-5) Missile and increased estimates for completion of development efforts.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Six additional submarines through December 1989 SAR. Deletion of three submarines in December 1990 SAR.

13b. [redacted] Cost Variance Analysis (Cont'd):

Estimating: Revised estimates for shipbuilding and GFE costs, estimating changes applicable to deletion of three SSBNs from the program, and correction to sailaway costs in prior SARs.

Support: Correction to reconcile sailaway and support costs in prior SARs.

MILCON

Economic: Revised escalation indices.

Estimating: Revised construction estimates for Kings Bay.

c. [redacted] Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-0.1
Total Changes	--	-0.1
(2) PROCUREMENT		
Revised escalation indices. (Economic)	N/A	-242.8
Inflation offset for current and prior years. (Estimating)	201.1	248.3
Revised estimates based on latest contract experience. (Estimating)	20.4	26.3
Revised estimates. (Support)	-5.5	-5.6
Total Changes	216.0	26.2
(3) MILCON		
Revised escalation indices. (Economic)	N/A	-8.7
Inflation offset for prior years. (Estimating)	0.5	8.7
Total Changes	0.5	--

14. [redacted] Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

[redacted] Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2012.2	-300.1	25.2	--	--	-295.4	--	-11.7	-582.0	1430.3

For the OHIO Class D-5 Capable Submarine Program, the initial SAR estimate is the Current Baseline Estimate.

15. [redacted] Contract Information: (Then-Year Dollars in Millions)

a. [redacted] Procurement --

[redacted] SUBMARINE GROUP V SHIPS:	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL DYNAMICS, GROTON, CT N00024-85-C-2062, FPIF Award: August 13, 1985 Definitized: August 13, 1985	$1203.4	$1412.5	2

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1229.4	$1443.4	2	$1239.8	$1244.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$9.4	$-12.9
Cumulative Variances To Date (09/28/91)	$34.2	$-6.2
Net Change	$24.8	$6.7

Explanation of Change:

The first ship of this contract was delivered in June 1991.

The favorable cost and schedule variances are not significant and should not affect future program cost and schedule. Program Manager's estimate at completion remains within the Program Manager's budget.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

([redacted]) SUBMARINE GROUP VI SHIPS:

GENERAL DYNAMICS, GROTON, CT
N00024-87-C-2023, FPIF
Award: May 26, 1987
Definitized: May 26, 1987

Initial Contract Price		
Target	Ceiling	Qty
$611.9	$693.9	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$631.7	$716.3	1	$636.7	$640.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-6.2	$3.0
Cumulative Variances To Date (09/28/91)	$-8.0	$0.4
Net Change	$-1.8	$-2.6

Explanation of Change:

The changes in cost and schedule variances are not significant and should not affect future program cost and schedule. Program Manager's estimate at completion remains within the Program Manager's budget.

[redacted] SUBMARINE GROUP VII SHIP:

GENERAL DYNAMICS, GROTON, CT
N00024-88-C-2000, FPIF
Award: January 5, 1988
Definitized: January 5, 1988

Initial Contract Price		
Target	Ceiling	Qty
$1837.9	$2077.6	3

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1879.0	$2124.4	3	$1912.1	$1910.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-20.5	$14.4
Cumulative Variances To Date (09/28/91)	$-33.7	$-13.3
Net Change	$-13.2	$-27.7

Explanation of Change:

The changes in cost and schedule variances are not significant and should not affect future program cost and schedule. Program Manager's estimate at completion remains within the Program Manager's budget.

15. ([redacted]) Contract Information: Cont'd (Then-Year Dollars in Millions)

([redacted]) SUBMARINE (NUCLEAR):
GENERAL ELECTRIC, SCHENECTADY, NY
N00024-85-C-4011, CPFF
Award: December 3, 1984
Definitized: December 3, 1984

Initial Contract Price		
Target	Ceiling	Qty
$197.5	$0.0	0

Current Contract Price		
Target	Ceiling	Qty
$187.5	$0.0	0

Estimated Price At Completion	
Contractor	Program Manager
$187.5	$187.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Under Naval Nuclear Propulsion Program prime contracts about 90 percent of the contract value is subcontracted in fixed price type subcontracts. Because control of prime contract cost and measurement of planned vs. actual cost is exercised through detailed government and prime contractor surveillance of subcontract obligations the Navy has waived contract cost and schedule control system criteria requirements for Naval Nuclear Propulsion Program procurements. If excess funds are determined to be available, they are returned to the program for further use. Program Manager's estimate at completion remains within approved budget.

([redacted]) NUCLEAR PROPULSION:
DEPT OF ENERGY, GERMANTOWN, MD
N00024-67-F-5110, EAO
Award: July 1, 1977
Definitized: July 1, 1977

Initial Contract Price		
Target	Ceiling	Qty
$442.7	$0.0	0

Current Contract Price		
Target	Ceiling	Qty
$571.2	$0.0	0

Estimated Price At Completion	
Contractor	Program Manager
$571.2	$571.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

15. [redacted] Contract Information: Cont'd (Then-Year Dollars in Millions)

See above.

[redacted] SUBMARINE GROUP VIII SHP:	Initial Contract Price Target	Ceiling	Qty
General Dynamics, Groton, CT N00024-91-C-2120, FPIF Award: December 19, 1990 Definitized: N/A	$765.0	$876.0	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$768.3	$880.0	1	$773.6	$768.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (09/28/91)	$0.9	$2.2
Net Change	$0.9	$2.2

Explanation of Change:

Contract definitized: December 19, 1990.

This is the initial SAR report for this contract. The initial cost and schedule variances are not significant and should not affect future program cost and schedule. Program Manager's estimate at completion is within the Program Manager's budget.

16. [redacted] Program Funding Summary: (Current Estimate in Millions of Dollars)

a. [redacted] Program Status --

(1) Percent Program Completed: 70.6% (12 yrs/17 yrs)

(2) Percent Program Cost Appropriated: 99.5% ($14225.2 / $14302.5)

16b. ([redacted]) Program Funding Summary (Cont'd):

b. ([redacted]) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY81-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	66.2	1.0	1.0	1.9	70.1
Procurement	13530.7	128.1	11.0	63.4	13733.2
MILCON	499.2	-	-	-	499.2
O&M	-	-	-	-	-
Total	14096.1	129.1	12.0	65.3	14302.5

c. [redacted] Annual Summary --

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1982				24.6	24.6	24.6	24.6	7.6
1983								4.9
1984				9.0	9.5	9.5	9.5	3.8
1985				8.6	9.4	9.4	8.9	3.4
1986				7.8	8.8	8.8	8.6	2.8
1987				5.0	5.8	5.8	5.1	2.7
1988				5.0	6.0	6.0	5.9	3.0
1989				0.6	0.8	0.8	0.8	4.2

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1990				0.6	0.8	0.8	0.8	4.0
1991				0.4	0.5	0.5	0.5	3.9
1992				0.7	1.0			3.1
1993				0.7	1.0			3.3
1994				0.7	1.0			3.3
1995				0.6	0.9			3.3
Subtot				64.3	70.1	66.2	64.7	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1981	1		1360.1	1435.9	1463.6	1430.0	1375.3	9.6
1982				317.9	333.5	333.5	332.6	7.5
1983	1		1354.2	1172.6	1249.4	1234.9	1204.6	3.8
1984	1		1229.1	1443.9	1566.5	1565.2	1487.7	3.6
1985	1		1200.0	1180.0	1303.4	1235.8	1138.0	2.1
1986	1		1139.7	1047.0	1181.0	1092.1	930.1	1.1
1987	1		1151.4	1123.7	1294.5	1165.6	886.4	1.5
1988	1		1122.3	1117.0	1324.4	1137.3	743.4	2.3
1989	1		1094.6	1088.7	1328.5	1121.2	610.5	2.8

16c. [redacted] Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1990	1		1081.1	944.6	1186.2	907.0	269.3	1.3
1991	1		1113.7	1003.6	1299.7	949.9	53.4	1.3
1992				95.8	128.1			3.1
1993				8.0	11.0			3.3
1994				15.9	22.7			3.3
1995				12.0	17.7			3.3
1996				8.2	12.5			3.2
1997				6.7	10.5			3.2
Subtot	10		11846.2	12021.5	13733.2	12172.5	9031.3	
Appropriation: 1205 Military Construction, Navy								
1982				12.8	13.0	13.0	13.0	7.6
1983				14.0	14.8	14.8	14.8	4.9
1984				15.6	17.0	17.0	17.0	3.8
1985				85.6	96.1	96.1	96.1	3.4
1986				79.4	91.8	91.8	91.8	2.8
1987				109.7	131.1	131.1	131.1	2.7
1988				59.6	73.8	73.8	69.7	3.0

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1205 Military Construction, Navy (Cont'd)								
1989				28.5	36.7	32.5	23.6	4.2
1990				18.8	24.9	17.6	12.9	4.0
Subtot				424.0	499.2	487.7	470.0	
Grand Total	10		11846.2	12509.8	14302.5	12726.4	9566.0	

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- None.

Not required since production rates are less than six per year.

b. (U) Cost Variance -- None.

c. (U) Schedule Variance -- None.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

O&S data is not available at this time.

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- None.

N-42 TRIDENT II MSL 91-086

~~FORMERLY RESTRICTED DATA~~

~~SECRET~~

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: TRIDENT II MISSILE

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 24 1992 9
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. ([redacted]) **Designation and Nomenclature (Popular Name):**
Sea Launched Ballistic Missile-UGM 133A TRIDENT II (D-5) Missile

2. ([redacted]) **DoD Component:** Navy

3. ([redacted]) **Responsible Office and Telephone Number:**

STRATEGIC SYSTEMS PROGRAMS	RADM JOHN T. MITCHELL
DEPARTMENT OF THE NAVY	Assigned: April 2[illegible],1991
WASHINGTON, DC 20376-5002	AV 327-0456 COMM (703) 607-0453

4. ([redacted]) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604363N Project J0951
PE 0603371N Project J0951
PROCUREMENT:
APPN 1507 ICN 1150 (Navy)

No Security Objection to Open Publication
AS AMENDED
92-00483
MAR 23 1992
M. Newell
Office of the Chief of Naval Operations Dept. of the Navy

5. ([redacted]) **Related Programs:**
TRIDENT Submarine System, TRIDENT I (C-4) Missile Systems, Fleet Ballistic Missile System, and DOE Re-Entry Vehicle Development.

~~Classified~~ by: OPNAVINST S5513.5A - Enclosure (27)
~~Declassify on: Not Subject to Automatic Downgrade~~
~~Downgrade Instructions: Originating Agency Determination Required (OADR)~~

(THIS PAGE IS ~~UNCLASSIFIED~~)

~~*** SECRET ***~~

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OASD(PA) DPDFOR 92-T-0657

[redacted]

~~FORMERLY RESTRICTED DATA~~

6. [redacted] Mission and Description:
The TRIDENT II (D-5) Strategic Weapons System program developed an improved Sea Launched Ballistic Missile (SLBM) with greater accuracy and payload capability at equivalent ranges as compared to the TRIDENT I (C-4) system. TRIDENT II enhances U.S. strategic deterrence by providing a survivable sea-based system capable of engaging the full spectrum of potential targets. It enhances the U.S. position in strategic arms negotiation by providing a weapon system with performance and payload flexibility that accommodates various treaty initiatives. TRIDENT II's increased payload allows the deterrent mission to be achieved with fewer submarines.

7. [redacted] Program Highlights:
a. [redacted] Significant Historical Developments --
In March 1980 the Secretary of Defense described to Congress a Sea Launched Ballistic Missile Modernization Advanced Development Program leading to an end of FY 1983 Defense System Acquisition Review Council Milestone II decision to select a weapon system option which would achieve specific performance objectives with an IOC of CY 1989. The Secretary of Defense reaffirmed the need for an improved Sea Launched Ballistic Missile in his Decision Memorandum of 2 February 1981. The Deputy Secretary of Defense in his Program Decision Memorandum of 2 October 1981, directed the Navy to fund the development of a new higher yield Re-Entry Body for the TRIDENT II (D-5) Missile. The Deputy Secretary of Defense in his memorandum of 28 October 1983, authorized the Navy to proceed to full scale Engineering Development of the TRIDENT II (D-5) SWS and initial production, as necessary, to meet a December 1989 IOC. All major D-5 weapon system subsystem completion development contracts were awarded as of March 1984. The flight testing from the flat pad at Cape Canaveral was completed in January 1989. Fifteen flight tests were fully successful, one flight (the seventh) was a partial success, two flights (the ninth and the thirteenth) failed to meet test objectives, and one flight (the fifteenth) was terminated by the range safety officer and is a "no test." The first TRIDENT II (D-5) Performance Evaluation Missile (PEM) was launched from the SSBN 734 (USS TENNESSEE) on 21 March 1989. The missile experienced loss of control just after first stage (F/S) ignition and was subsequently auto-destructed by the onboard flight termination system (FTS).

The second PEM launched on 2 August 1989 was fully successful. The third PEM was launched on 15 August 1989 and experienced a control loss early in first stage flight, though all hardware that had been modified as a result of the first failure performed satisfactorily. PEM flight tests resumed in December 1989; six fully successful tests were conducted and the PEM flight test program completed in February 1990.

The SSBN 734 and SSBN 735 completed strategic loadout and deployed in

7a. [redacted] Program Highlights (Cont'd):

March 1990 and October 1990 respectively.

b. [redacted] Significant Developments Since Last Report --
The USS WEST VIRGINIA (SSBN 736) completed strategic loadout and deployed in September 1991. In October 1991, the FY 1992 Missile Follow-On Production contract was awarded to Lockheed (LMSC) for 51 missiles (28 U.S. and 23 U.K.). The USS KENTUCKY (SSBN 737) successfully completed its second Demonstration and Shakedown Operations (DASO) in November 1991. The SSBN 737 is scheduled to complete strategic outload and deploy in the third quarter of FY 1992.

The TRIDENT II (D-5) Missile is expected to satisfy mission requirements.

c. [redacted] Changes Since As Of Date -- None.

8. [redacted] Threshold Breaches:
There are currently no DAE Baseline of 15 July 1987 threshold breaches and no Nunn-McCurdy unit cost breaches.

9. [redacted] Schedule:

a. [redacted] Milestones --

	Production Estimate	Approved Program	Current Estimate
Milestone I (Initiate Concept Definition)	OCT 77	OCT 77	OCT 77
Commence Advanced Dev Phase	OCT 80	OCT 80	OCT 80
Milestone II (Commence FSD)	OCT 83	OCT 83	OCT 83
First Development Flight Test	JAN 87	JAN 87	JAN 87
Milestone III(Production Approval)/ Award Initial Missile Production Contract	APR 87	APR 87	APR 87
IOC (may be less than full msl outload)	DEC 89	DEC 89	MAR 90

b. [redacted] Previous Change Explanations --

The initial missile production contract was awarded April 8, 1987 (Milestone III A).

The first DASO and the IOC were delayed due to scheduled corrective action for the PEM failures and as a result of destruction of the Hercules Propellant Mix Building #2, used for casting second-stage missile motors. IOC was achieved with full missile outload.

9c. (U) Schedule (Cont'd):

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Production Estimate:
UNSECDEF Memorandum for SECNAV of June 4, 1987, subject TRIDENT II (D-5) Missile Program.
UNSECNAV Memorandum for DIRSSP of December 1, 1987, subject TRIDENT (D-5) Navy Program Review.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 15 July 1987.

10. (U) Performance Characteristics:

a. (b)(1) Performance --

	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

b. (U) Previous Change Explanations --

Latest estimate of military characteristics for the warhead for the TRIDENT II (D-5) MK-5 Re-Entry Body as cited by the joint DOD/DOE Military Liaison Committee in letter dated July 23, 1984.

Latest estimate of system reliability as provided in TRIDENT II (D-5) Decision Coordinating Paper (DCP) Update of February 24, 1987.

Maximum Range Full Payload and System CEP estimates are based on latest engineering estimate provided by the Navy to the Joint Chiefs of Staff with later revision based on available submarine launch data.

(b)(1)

10d. (U) Performance Characteristics (Cont'd):

d. (U) References --

(U) Production Estimate:
UNSECDEF Memorandum for SECNAV of June 4, 1987, subject TRIDENT II (D-5) Missile Program.
UNSECNAV Memorandum for DIRSSP of December 1, 1987, subject TRIDENT (D-5) Navy Program Review.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 15 July 1987.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	8434.9	8434.9	8420.7
Procurement	17588.5	17588.5	16580.3
Total Flyaway	(14471.2)		(13367.4)
Total Other Wpn Sys	(3082.9)		(3195.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(34.4)		(17.8)
Construction (MILCON)	532.9	532.9	494.3
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 83 Base-Year $	26556.3	26556.3	25495.3
Escalation (TY$-BY$)	8962.2	8962.2	11291.4
Development (RDT&E)	(1018.3)	(1018.3)	(998.7)
Procurement	(7808.4)	(7808.4)	(10125.7)
Construction (MILCON)	(135.5)	(135.5)	(167.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	35518.5	35518.5	36786.7
b. (U) Quantity --			
Development (RDT&E)	30	N/A	28
Procurement	815	815	779
Total	845	815	807

c. (U) Foreign Military Sales -- None.

(b)(1) [redacted]

11e. (U) Total Program Cost and Quantity (Cont'd):

e. (U) References --

(U) Production Estimate:
UNSECDEF Memorandum for SECNAV of June 4, 1987, subject TRIDENT II (D-5) Missile Program.
UNSECNAV Memorandum for DIRSSP of December 1, 1987, subject TRIDENT (D-5) Navy Program Review.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 15 July 1987.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	36786.7	37306.9	36786.7
(2) Quantity	807	807	807
(3) Unit Cost	45.585	46.229	45.585
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	1196.7	1196.7	989.0
Less CY Adv Proc	218.0	218.0	223.0
Plus PY Adv Proc	123.7	123.7	114.8
Net Total	1102.4	1102.4	880.8
(2) Quantity	28	28	21
(3) Unit Cost	39.371	39.371	41.943

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	9453.2	25396.9	668.4	35518.5
Previous Changes:				
Economic	-20.5	+2164.4	+15.6	+2159.5
Quantity	-48.0	-1480.5	-	-1528.5
Schedule	-	+1274.2	+25.6	+1299.8
Engineering	-	-	-	-
Estimating	+34.7	-573.1	-42.0	-580.4
Other	-	-	-	-
Support	-	+438.0	-	+438.0
Subtotal	-33.8	+1823.0	-0.8	+1788.4
Current Changes:				
Economic	-1.6	-605.2	-11.0	-617.8
Quantity	-	-	-	-
Schedule	-	+114.7	-	+114.7
Engineering	-	-	-	-
Estimating	+1.6	-17.2	+4.7	-10.9
Other	-	-	-	-
Support	-	-6.2	-	-6.2
Subtotal	-	-513.9	-6.3	-520.2
Total Changes	-33.8	+1309.1	-7.1	+1268.2
Current Estimate	9419.4	26706.0	661.3	36786.7

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	8434.9	17588.5	532.9	26556.3
Previous Changes:				
Quantity	-40.0	-501.6	-	-541.6
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+24.5	-646.0	-30.8	-652.3
Other	-	-	-	-
Support	-	+122.7	-	+122.7
Subtotal	-15.5	-1024.9	-30.8	-1071.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.3	+43.8	-7.8	+37.3
Other	-	-	-	-
Support	-	-27.1	-	-27.1
Subtotal	+1.3	+16.7	-7.8	+10.2
Total Changes	-14.2	-1008.2	-38.6	-1061.0
Current Estimate	8420.7	16580.3	494.3	25495.3

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Quantity: Deleted two development flight test missiles.

Estimating: Reclassification of costs as escalation for current and prior years. Adjustment to prior years and reallocation of funds from TRIDENT II Submarine. Congressional reductions. Revised estimates for incentive payments.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Additional 56 missiles required for two additional submarines and subsequent deletion of 92 missiles

13b. (U) Cost Variance Analysis (Cont'd):

from the program.

Schedule: Deferral of 21 missiles and 20 guidance systems from FY 1990 to FY 2002. Deferral of TRIDENT II (D-5) backfit program.

Estimating: Reclassification of costs as escalation for current and prior years and revised estimates. Increased cost due to missile production stretch-out.

Support: Reclassification of costs as escalation for current and prior years and revised estimates on support items. Increased support associated with stretch-out of missile production.

MILCON

Economic: Revised escalation indices.

Schedule: Deferral of West Coast D-5 capability.

Estimating: Reclassification of costs as escalation for current and prior years. Revised construction estimates.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation rates. (Economic)	N/A	-1.6
Offset for escalation in current and prior years. (Estimating)	1.3	1.6
Total Changes	1.3	--
(2) PROCUREMENT		
Revised economic escalation rates. (Economic)	N/A	-605.2
Deferral of 12 missiles from FY 1993/1994 to FY 2004. (Schedule)	--	114.7
Inflation offset for current and prior years. (Estimating)	39.3	56.1
Revised estimates based on latest contract experience. (Estimating)	4.5	-73.3
Revised estimates based on latest pricing. (Support)	-27.1	-6.2
Total Changes	16.7	-513.9

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(3) MILCON		
Revised economic escalation rates. (Economic)	N/A	-11.0
Revised estimates for West Coast TRIDENT II (D-5) capability. (Estimating)	-7.8	4.7
Total Changes	-7.8	-6.3

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Prod Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
50.934	-8.100	-2.000	0.400	--	0.800	--	--	-8.900	42.034

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
42.034	1.910	0.086	1.753	--	-0.733	--	0.535	3.551	45.585

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) Procurement --

(U) MISSILE FOLLOW-ON PROD.:	Initial Contract Price Target	Ceiling	Qty
LOCKHEED, SUNNYVALE, CA N00030-88-C-0088, CPIF Award: December 9, 1987 Definitized: N/A	$596.3	N/A	35

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$621.4	N/A	35	$615.0	$615.0

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$6.0	$-25.3
Cumulative Variances To Date (10/31/91)	$15.8	$-3.2
Net Change	$9.8	$22.1

Explanation of Change:

Contract definitized: October 18, 1988.

The cumulative-to-date cost variance is now a favorable $15.8M which reflects a $9.8M improvement since last report. The underrun is due to efficiencies at Joint Venture in rocket motor manufacturing and to a lesser extent to the manufacturing of a quality product which required less than planned problem analysis and corrective actions.

The cumulative-to-date schedule variance is now ($3.2M) behind, which reflects a $22.1M improvement. The improvement is due to material deliveries recovering to plan. This will be the last report on this contract.

(U) MISSILE FOLLOW-ON PROD.:	Initial Contract Price Target	Ceiling	Qty
LOCKHEED, SUNNYVALE, CA N00030-89-C-0089, CPIF Award: October 1, 1988 Definitized: N/A	$875.5	N/A	64

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$934.8	N/A	64	$949.2	$949.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$9.6	$-40.4
Cumulative Variances To Date (10/31/91)	$-6.7	$-15.0
Net Change	$-16.3	$25.4

Explanation of Change:

Contract definitized: March 13, 1989.

The cumulative-to-date cost variance is now ($6.7M) over budget. The variance is due to several problems in both manufacturing and material but especially subcontracted procurements. In manufacturing, in a layoff environment at Sunnyvale, personnel turnover and reclassification from union bumping lower priced labor

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) by more costly labor has had cost impact. Material problems with electronics, especially multi-layer boards, and nose cap manufacturing have caused higher than planned costs. Compounding these problems are greater than negotiated G&A overhead rates.

The cumulative-to-date schedule variance is now an unfavorable ($15M) which reflects a $25M improvement since the last report. The improvements are largely attributed to subcontracted supplier deliveries recovering to plan. A large schedule variance remains because a host of subcontractors continue to measure performance against an original schedule established prior to an authorized slip of deliveries by the prime. That resulted from the failure of PEMs 1 and 3 and an effort to smooth production gaps created by funding shortfalls. No impact from these late deliveries is foreseen and deliveries are meeting program requirements.

(U) MISSILE FOLLOW-ON PROD:	Initial Contract Price Target	Ceiling	Qty
LOCKHEED, SUNNYVALE, CA N00030-90-C-0090, CPIF/FF Award: October 1, 1989 Definitized: N/A	$879.6	N/A	44

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$883.3	N/A	44	$900.4	$900.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (10/31/91)	$-14.0	$-24.6
Net Change	$-14.0	$-24.6

Explanation of Change:

Contract definitized: October 1, 1990.

This is the first report for LMSC FY 1990 Production and Deployed Systems Support contract. The contracted effort is 55% complete. This contract includes funding for three D-5 missiles for the United Kingdom.

The cumulative-to-date cost variance is currently ($14M) over budget. The variance is partially due to unplanned rework of both Lockheed manufactured and subcontracted material. A more significant contributor to the variance is higher than planned direct labor rates and overhead. The program manager and contract manager are taking steps to alleviate this and other rate problems at Lockheed. However, some additional impact is likely at contract completion.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

The cumulative-to-date schedule variance is an unfavorable ($24.6M) due to production hardware deliveries being delayed while manufacturing difficulties were being resolved at Thiokol. Recovery will be accomplished over the next six months, without impact to tactical requirements.

(U) GUIDANCE PRODUCTION:
KEARFOTT GUIDANCE &, WAYNE, NJ
N00030-89-C-0058, FPI/FF
Award: January 1, 1989
Definitized: N/A

Initial Contract Price		
Target	Ceiling	Qty
$92.0	N/A	37

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$92.0	N/A	37	$78.5	$78.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (10/31/91)	$5.7	$0.2
Net Change	$5.7	$0.2

Explanation of Change:

Contract definitized: January 30, 1990.

The cumulative favorable cost variance is due to assembly efficiencies in building the Inertial Measurement Units. The schedule variance is within a normal range of variation.

(U) GUIDANCE PRODUCTION:
RAYTHEON COMPANY, SUDBURY, MA
N00030-90-C-0042, FPIF
Award: February 1, 1990
Definitized: N/A

Initial Contract Price		
Target	Ceiling	Qty
$131.4	N/A	170

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$134.1	N/A	170	$135.9	$135.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (10/31/91)	$-0.6	$7.1
Net Change	$-0.6	$7.1

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change:

Contract definitized: June 29, 1990.

The ($0.6M) unfavorable cost variance is the result of higher than planned quality assurance efforts. This is primarily due to the need to qualify new vendors to replace those no longer bidding on government works. The schedule variance is a result of the effort being replanned to take into account effects of reduced quantities in production buys.

(U) MISSILE FOLLOW-ON PROD:	Initial Contract Price Target	Ceiling	Qty
Lockheed, Sunnyvale, CA N00030-91-C-0091, CPIF/FF Award: October 1, 1990 Definitized: N/A	$1145.5	N/A	52

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$1146.6	N/A	52	$1146.1	$1146.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (10/31/91)	$-4.0	$1.7
Net Change	$-4.0	$1.7

Explanation of Change:

Contract definitized: September 30, 1991.

This is the first submission on the LMSC FY 1991 Missile Production and Deployed Systems Support contract. Thirty-five percent of the contracted effort is now complete.

The cumulative-to-date cost variance is now ($4M) over budget. The variance is primarily driven by higher than planned direct and indirect rates at LMSC and at the propulsion subcontractors. In spite of that, neither the government nor contractor program managers expect a variance at completion since steps are being taken to control costs.

The cumulative-to-date schedule variance is a positive $1.7M, which is within the normal tolerance of a cost/schedule control system.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 55.6% (15 yrs/27 yrs)

(2) Percent Program Cost Appropriated: 53.9% ($19837.2 / $36786.7)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY78-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2004)	Total
RDT&E	9406.8	2.2	10.4	-	9419.4
Procurement	8801.7	1196.7	989.0	15718.6	26706.0
MILCON	420.6	9.2	-	231.5	661.3
O&M	-	-	-	-	-
Total	18629.1	1208.1	999.4	15950.1	36786.7

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1978				5.0	5.0	5.0	5.0	6.8
1979				5.0	5.0	5.0	5.0	8.4
1980				25.6	25.6	25.5	25.0	10.6
1981				96.7	96.7	96.4	93.6	10.6
1982				198.4	198.4	197.6	193.6	7.6

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1983				343.9	351.0	346.6	341.2	4.9
1984				1368.5	1447.3	1446.9	1431.6	3.8
1985				1818.1	1982.6	1982.6	1973.3	3.4
1986				1731.3	1942.3	1942.3	1932.0	2.8
1987				1355.1	1565.3	1565.3	1550.8	2.7
1988				861.7	1028.6	1016.6	994.5	3.0
1989				439.4	546.5	546.5	541.8	4.2
1990				131.0	169.5	169.5	149.2	4.0
1991				32.1	43.0	43.0	18.9	3.9
1992				1.6	2.2			3.1
1993				7.3	10.4			3.3
Subtot	28			8420.7	9419.4	9388.8	9255.5	
Appropriation: 1507 Weapons Procurement, Navy								
1985				137.7	160.8	160.8	160.8	3.4
1986				420.7	508.4	508.4	495.9	2.8
1987	21		840.0	1075.7	1346.7	1342.9	1316.0	2.7
1988	66		1314.6	1563.3	2033.5	2033.5	1899.7	3.0

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1507 Weapons Procurement, Navy (Cont'd)								
1989	66		1174.2	1360.8	1838.9	1838.9	1739.8	4.2
1990	41		795.6	1000.2	1400.7	1383.3	939.4	4.0
1991	52		859.2	1045.8	1512.7	1344.6	458.4	3.9
1992	28		602.8	801.1	1196.7	637.5	30.7	3.1
1993	21		441.2	641.0	989.0			3.3
1994	48		798.2	890.8	1419.0			3.3
1995	44		818.7	908.9	1494.3			3.3
1996	47		837.6	889.8	1509.6			3.2
1997	36		734.0	804.0	1407.7			3.2
1998	48		811.2	932.7	1685.3			3.2
1999	48		793.3	887.2	1654.5			3.2
2000	48		740.2	803.6	1546.6			3.2
2001	48		692.9	873.6	1735.1			3.2
2002	48		477.2	517.1	1059.9			3.2
2003	48		442.8	497.8	1053.0			3.2
2004	21		193.7	528.5	1153.6			3.2
Subtot	779		13367.4	16580.3	26706.0	9249.9	7040.7	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1205 Military Construction, Navy								
1984				72.8	79.3	44.8	44.8	3.8
1985				73.4	82.4	80.6	80.4	3.4
1986				109.3	126.3	126.3	126.3	2.8
1987				17.6	21.0	21.0	21.0	2.7
1988				14.6	18.1	17.9	17.5	3.0
1989				12.0	15.4	15.3	14.6	4.2
1990				5.7	7.6	5.8	4.5	4.0
1991				51.6	70.5			3.9
1992				6.5	9.2			3.1
1993								3.3
1994				4.2	6.3			3.3
1995				0.9	1.4			3.3
1996				0.2	0.3			3.2
1997								3.2
1998				41.5	70.9			3.2
1999				37.6	66.3			3.2
2000				28.8	52.4			3.2
2001				13.2	24.8			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1205 Military Construction, Navy (Cont'd)								
2002				4.4	9.1			3.2
Subtot				494.3	661.3	311.7	309.1	
Grand Total	807		13367.4	25495.3	36786.7	18950.4	16605.3	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1987	27	21	21	27
1988	72	66	66	72
1989	72	66	66	72
1990	72	66	41	69
1991	72	72	52	72
1992	72	72	28	49
1993	72	72	21	45
1994	72	72	48	72
1995	72	72	44	68

17a. (U) Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1996	72	72	47	70
1997	35	72	36	60
1998	0	72	48	72
1999	0	20	48	31
2000	0	0	48	0
2001	0	0	48	0
2002	0	0	48	0
2003	0	0	48	0
2004	0	0	21	0
2005	0	0	0	0
2006	0	0	0	0

The 27 missiles in the Planning Estimate and Maximum Economic for FY 1987 funding were planned for delivery over a 5 month period. The 21 missiles in the Production Estimate and Current Estimate are planned for delivery over a 4 month period. The Current Estimate and Maximum Economic assume continued U.K. participation in the TRIDENT II (D-5) Missile Program.

17b. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	26556.3	-1061.0	25495.3	0.0	25495.3
(TY $)	35518.5	+1268.2	36786.7	+1508.5	35278.2
PAUC Cost (BY $)	31.428	0.165	31.593	0.000	31.593
(TY $)	42.034	3.551	45.585	+1.869	43.715

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	APR 87	0	APR 87	N/A	APR 87
Duration (in MON)	165	62	227	60	167
End Date(MON YY)	JAN 01	62	MAR 06	N/A	MAR 01

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	28/28
Procurement	140/140

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The Cost Elements are those included for Milestone II providing the Strategic Weapon System (SWS) subsystems' (launcher, fire control, navigation, test instrumentation, missile checkout, missile and guidance) average annual support costs by appropriation through FY 2025. The source of the costs displayed is the FY 1992/1993 Amended President's Budget through FY 1997 and extended through FY 2025. O&S costs and assumptions for the antecedent system TRIDENT I (C-4) have not previously been developed.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1983 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Weapon System	Avg Annual Cost Per
O&M,N	451.1	N/A
OPN	17.1	N/A
WPN	2.0	N/A
Total	470.2	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&MN	485.2	127.4	130.8	6796.1	7539.5
Total	485.2	127.4	130.8	6796.1	7539.5

N-13 ODG 51

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: DDG 51 DESTROYER

AS OF DATE: December 31, 1991

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AS AMENDED

OFFICIAL RELEASE FOR OPEN PUBLICATION
MAR 24 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
DDG 51 Guided Missile Destroyer; ARLEIGH BURKE CLASS

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
AEGIS PROGRAM MANAGER
NATIONAL CENTER BUILDING 2
2521 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VA 22202-5102

RADM G.A. HUCHTING, USN
Assigned: August 2, 1991
AV 332-7395 COMM (703) 602-7395

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0604307N Project 001337, 001447, 001937
PE 0604567N Project 000857, 001803
PE 0604303N Project 001776
PROCUREMENT:
APPN 1611 ICN 24222N (Navy)

No Security Objection to Publication
(As Amended)
92-T-0493
MAR 23 1992
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Office of the Chief of Naval Operations Dept. of the Navy
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5. (U) Related Programs:
CG 47, SM-2 (MR), TOMAHAWK, HARPOON, PHALANX, AN/SQQ-89, MK-46, LAMPS MK-I/MK-III, VERTICAL LAUNCH, and VERTICAL LAUNCH ASROC.

6. (U) Mission and Description:
- The DDG 51 is a multi-mission guided missile destroyer designed to operate offensively and defensively as units of Carrier Battle Groups and Surface Action Groups, in support of Underway Replenishment Groups and the Marine Amphibious Task Forces in multi-threat environments that include air, surface, and subsurface threats.

- The DDG 51 Class ships are designed with a gas turbine propulsion system. The design provides outstanding combat capability and survivability characteristics while considering procurement and lifetime support costs.

- The DDG 51 features the AEGIS Weapon System, which has quick reaction time, high firepower, and improved ECM capability in AAW. AEGIS also provides area coverage and command/control focus of the entire combat system.

- Structural features are an all steel exterior with vital areas located deep within the hull and a gas turbine propulsion system with CRP propellers similar to the CG 47 class.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --

Funding for the lead ship, ARLEIGH BURKE, was provided in FY 1985 with the lead ship construction contract awarded to Bath Iron Works (BIW), Bath, Maine in April 1985. The Navy established Ingalls Shipbuilding Incorporated (ISI) as the second source for DDG 51 Class construction by awarding ISI the DDG 52 construction contract in May 1987. Milestone IIIA which granted limited production approval through FY 1989 was approved in October 1986. Approval for limited production was amended in August 1989 and in January 1991 to include FY 1990 and FY 1991 ships and subsystems.

SECDEF's Major Warship Review validated the Navy requirement for the ARLEIGH BURKE Class, approved a procurement profile of four ships per year, and approved the introduction of Flight upgrades. Flight II will be incorporated in the last ship in FY 1992.

ARLEIGH BURKE performed superbly during the three part Builder's Trial. ARLEIGH BURKE completed a highly successful Trial Bravo (combat systems and ordnance firing). Accomplishment of major events included successful firing of all weapons systems. The Washington Board of Inspection and Survey (INSURV) conducted an acceptance trial (Trial Charlie) for DDG 51 at Bath, Maine. INSURV reported the ship

7a. (U) Program Highlights (Cont'd):

was clean, installed equipments performed satisfactorily, and combat systems and damage control survivability features operated as designed. ARLEIGH BURKE ship custody transfer occurred on 29 April 1991 and was commissioned on 4 July 1991.

b. (U) Significant Developments Since Last Report --

DDG 51 continued post delivery test and trials through October 1991. Combat System Ship Qualification Trials (CSSQT), Weapon System Accuracy Trial (WSAT), and Development Testing (DT-IIIA) were successfully completed. The ship thoroughly exercised all installed combat and HM&E systems and demonstrated capabilities against air, surface, and subsurface threats using some of the most difficult threat scenarios ever experienced by AEGIS ships. Threat representative targets were successfully engaged with Standard Missile, Harpoon, Tomahawk, MK 45 5"/54 caliber gun, and MK 46 torpedoes. Major test or demonstration events successfully completed are:

- Full power
- Power plant flexibility
- Replenishment at sea
- Steering control

An Operational Propulsion Plant Exam (OPPE) in DDG 51 was conducted in November 1991. A formal finding of satisfactory with an adjective grade of "ABOVE AVERAGE" was assigned in all areas. Above average is the highest grade used by the Fleet Propulsion Examining Board, and so this is considered an outstanding score. CINCLANTFLT Propulsion Examination Board's specific comments were, "The exam was characterized by enthusiasm and the achievement of well placed standards. Preservation and cleanliness have been maintained since commissioning."

Final Contract Trial was conducted the week of 9 December 1991 by President, INSURV, on ARLEIGH BURKE. All ship's systems were rigorously tested and evaluated. The ship and its systems performed well.

USS ARLEIGH BURKE (DDG 51) was awarded the Atlantic Fleet "Top Gun" award for her impressive naval gunnery in 1991 as measured in a series of competitive exercises.

DDG 51 Class construction has achieved numerous production milestones during the past nine months. They are:

DDG 57 fabrication started 22 April 1991
DDG 58 fabrication started 5 May 1991

7b. (U) Program Highlights (Cont'd):

DDG 52 launched 10 May 1991
DDG 55 keel laid 12 August 1991
DDG 56 keel laid 3 September 1991
DDG 59 fabrication started 27 September 1991
DDG 53 launched 26 October 1991
DDG 60 fabrication started 17 November 1991

DDG 51 is meeting all operational commitments and continues to receive favorable reports from ship's company and the ship's operational chain of command during test and trials.

c. (U) Changes Since As Of Date --
Operational Testing commenced for USS ARLEIGH BURKE (DDG 51) on 13 January 1992. The Commander, Operational Test and Evaluation Force is testing every system in the ship in an operational environment with realistic, threat representative scenarios.

DDG 51 Class production milestones achieved:

DDG 61 fabrication started 10 January 1992
DDG 52 AEGIS Light Off accomplished 13 January 1992

8. (U) Threshold Breaches:
There are currently no Acquisition Program Baseline (APB) (dated 9 October 1991) breaches or unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Production Estimate	Approved Program	Current Estimate
Complete Concept Design	N/A	DEC 80	DEC 80
DNSARC I	JUN 81	JUN 81	JUN 81
Complete Preliminary Design	N/A	MAR 83	MAR 83
DSARC II	DEC 83	DEC 83	DEC 83
Complete Contract Design	N/A	JUN 84	JUN 84
DDG 51 Contract Award	APR 85	APR 85	APR 85
Milestone IIIA	OCT 86	OCT 86	OCT 86
DDG 52 Contract Award	JAN 87	MAY 87	MAY 87
DDG 53 Contract Award	N/A	SEP 87	SEP 87
Lay Keel DDG 51	N/A	DEC 88	DEC 88
Launch DDG 51	N/A	SEP 89	SEP 89
DDG 51 Delivery	N/A	APR 91	APR 91
Launch DDG 52	N/A	MAR 91	MAY 91

DDG 51 DESTROYER, December 31, 1991

9d. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
OPEVAL		FEB 92	FEB 92
Milestone III		AUG 92	AUG 92
DDG 51 IOC	OCT 90	SEP 92	SEP 92
DDG 52 Delivery	N/A	MAY 92	OCT 92
DDG 53 Delivery	N/A	FEB 93	JUN 93
DDG 54 Delivery	N/A	N/A	SEP 93
DDG 55 Delivery	N/A	N/A	JAN 94
DDG 56 Delivery	N/A	N/A	FEB 94
DDG 57 Delivery	N/A	N/A	JUN 94
DDG 58 Delivery	N/A	N/A	JUL 94
DDG 59 Delivery	N/A	N/A	SEP 94
DDG 60 Delivery	N/A	N/A	DEC 94
DDG 61 Delivery	N/A	N/A	JAN 95
DDG 62 Delivery	N/A	N/A	APR 95
DDG 63 Delivery	N/A	N/A	MAY 95
DDG 64 Delivery	N/A	N/A	SEP 95
DDG 65 Delivery	N/A	N/A	NOV 95
DDG 66 Delivery	N/A	N/A	MAR 96
DDG 67 Delivery	N/A	N/A	MAY 96

J. (U) Previous Change Explanations --

DDG 51 scheduled milestones: Launch, Lay Keel, and IOC were rescheduled due to a 16 month adjustment to scheduled delivery.

DDG 51 scheduled milestones were further adjusted. Delivery was rescheduled from February 1991 to April 1991 and the IOC date rescheduled from February 1992 to September 1992. An extension to scheduled delivery was required to protect the government's interest and ensure the ship is completed to Navy standards at the earliest possible date. A seven month extension to the scheduled DDG 51 IOC provides the time necessary for lead ship operational testing.

DDG 52 launch and delivery was adjusted 8 months due to incorporating helicopter rearming and facilities upgrades, as recommended by Congress. The DDG 53 delivery was rescheduled from July 1992 to February 1993 to permit the shipbuilder to achieve greater production efficiency.

The Navy subsequently approved a two month rescheduling of the DDG 52 launch from March 1991 to May 1991 to facilitate increased ship and shipyard efficiency.

9. (U) Schedule (Cont'd):

c. (U) Current Change Explanations --

The DDG 52,53,55, and 57 delivery schedules were adjusted as follows:

	FROM	TO
DDG 52	May 92	Oct 92
DDG 53	Feb 93	May 93
DDG 55	Oct 93	Jan 94
DDG 57	Apr 94	Jun 94

DDG 53,54,56, and 60 delivery schedule adjustments are being proposed by the shipbuilder and are currently being reviewed by the Navy. The proposed adjustments are:

	FROM	TO
DDG 53	May 93	Jun 93
DDG 54	Aug 93	Sep 93
DDG 56	Jan 94	Feb 94
DDG 60	Nov 94	Dec 94

The schedule adjustments allow for the cost efficient introduction of changes which were discovered during the last phase of DDG 51 construction and post commissioning tests and trials. The Program Manager is encouraging the shipbuilder to propose schedule adjustments if production costs can be reduced. Cost control is the program's top priority.

d. (U) References --

(U) Production Estimate:
DCP #1337 Rev 1, Change 1 of 22 August 1986.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 9 October 1991.

10. (U) Performance Characteristics:

a. (U) Performance --

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
SHIP:					
Length (ft)	466	466	/ 466	466	466
Beam (ft)	59	59	/ 59	59	59
Navigational Draft (ft)	30.6	30.6	/ 30.6	30.6	30.6

Da. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Displacement (long tons)	8300	8315	/ 8315	8315	8315
Propulsion LM (Gas Turbine)	2500	2500	/ 2500	2500	2500
Accommodations	341	341	/ 341	341	341
Speed (knots)	30	30	/ 30	30	30

(b)(1)

[redacted]

100. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
(b)(1)					
SURVIVABILITY/ VULNERABILITY:					
Collective Protection (7)		PARTIAL	/ PARTIAL	PARTIAL	PARTIAL
(b)(1)					
Fragmentation Armor		(9)	/ (9)	(9)	(9)
AVAILABILITY:					
Probability of availability (overall)		0.75	/ 0.75		0.75
Combat System		0.85	/ 0.85	.98	0.85
Propulsion		0.88	/ 0.88	.96	0.88
Meantime between major/critical interrupts for AAW mission with SM-2 (hrs)		5.5	/ 5.5	7.0	5.5
Armament					
Anti-Submarine Warfare					
- ASW System	AN/SQQ-89	AN/SQQ-89	/ AN/SQQ-89	AN/SQQ-89(V)4	AN/SQQ-89
- ASROC	VLA	VLA	/ VLA		VLA
- Helo	SEAHAWK; LAMPS	SEAHAWK LAND, REARM REFUEL, LAMPS ELECTRONICS	/ SEAHAWK LAND, REARM REFUEL, LAMPS ELECTRONICS	SEAHAWK LAND, REFUEL, LAMPS ELECTRONICS	SEAHAWK LAND, REFUEL, & REARM; LAMPS ELECTRONICS
Anti-Air Warfare					

(U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
- Launchers	MK 41 VLS	MK 41 VLS	/ MK 41 VLS	MK41 VLS	MK41 VLS
- Missiles	SM-2 MR	SM-2 MR	/ SM-2 MR	SM-2 MR	SM-2 MR
- Missile Fire Control System	3 MK 99	3 MK 99	/ 3 MK 99	3 MK 99	3 MK 99
- Guns	2 PHALANX	2 PHALANX	/ 2 PHALANX	2 PHALANX	2 PHALANX
Anti-Surface/Strike Warfare					
- Guns	1 5"/54	1 5" 54	/ 1 5" 54	1 5"/54	1 5"/54
- Gunfire Control System	MK 160	MK 160	/ MK 160	MK 160	MK 160
- Anti-Ship Cruise Missile	HARPOON	HARPOON	/ HARPOON	HARPOON	HARPOON
- Cruise Missile	TOMAHAWK	TOMAHAWK	/ TOMAHAWK	TOMAHAWK	TOMAHAWK
Electronic Warfare	SLQ-32 SRBOC	SLQ-32 V(3), SRBOC, Combat DF	/ SLQ-32 V(3), SRBOC, Combat DF	SLQ-32 V(2), SRBOC	SLQ-32, V(3) SRBOC, Combat DF
Radars					
- Surface	SPS-67	SPS-67	/ SPS-67	SPS-67	SPS-67
- 3D	SPY-1D	SPY-1D	/ SPY-1D	SPY-1D	SPY-1D

(b)(1)

[redacted]

10. (U) Performance Characteristics (Cont'd):
8/ For structure and developmental systems.
9/ Level II for missile and 5"54 magazine and Level III for vital electronics.

b. (U) Previous Change Explanations --

Helicopter rearming and facilities upgrades were added to the DDG Class beginning with the DDG 52. Long ton displacement increased to 8315 LT as a result of increasing ship propulsion to 100,000 shaft horsepower.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Production Estimate:
DCP #1337 Rev 1, Change 1 of 22 August 1986.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 9 October 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

(U) Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	979.8	1305.4	1460.2
Procurement	15948.3	32522.9	33239.3
Basic Ship Costs	(5383.6)		(13734.8)
HM&E and Combat Systems	(9427.9)		(17667.8)
Other Costs	(621.9)		(566.0)
OF/PD	(514.9)		(1268.7)
Total Sailaway	(15948.3)		(33239.3)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	25.6	25.4	25.4
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 87 Base-Year $	16953.7	33853.7	34724.9
Escalation	3163.8	13525.0	11186.6
Development (RDT&E)	(-63.2)	(34.6)	(77.7)
Procurement	(3224.8)	(13488.0)	(11106.5)
Construction (MILCON)	(2.2)	(2.4)	(2.4)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	20117.5	47378.7	45911.5

11. (U) Total Program Cost and Quantity (Cont'd):
Costs do not include Development (RDT&E) costs for PE 0604303N Project S01776 - AEGIS Weapon System Modifications ($63.7M), which supports a backfit program.

b. (U) Quantity --

Development (RDT&E)	0	N/A	0
Procurement	23	49	49
Total	23	49	49

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Production Estimate:
DCP #1337 Rev 1, Change 1 of 22 August 1986.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 9 October 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(MAR 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	45911.5	47378.7	45911.5
(2) Quantity	49	49	49
(3) Unit Cost	936.97	966.91	936.97
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	4144.4	4144.4	3493.9
Less CY Adv Proc	88.5	88.5	147.3
Plus PY Adv Proc	1.6	1.6	6.3
Net Total	4057.5	4057.5	3352.9
(2) Quantity	5	5	4
(3) Unit Cost	811.50	811.50	838.23

The cost category "Less CY Adv Proc" includes $26.0 in FY92 and $124.2 in FY93 for Outfitting and Post Delivery. Also included is $54.4 in FY92 for escalation funding.

DDG 51 DESTROYER, December 31, 1991

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	916.6	19173.1	27.8	20117.5
Previous Changes:				
Economic	+9.5	+983.3	+0.2	+993.0
Quantity	-	+23516.0	-	+23516.0
Schedule	-	+657.0	-	+657.0
Engineering	-	+1081.3	-	+1081.3
Estimating	+413.9	-371.3	-	+42.6
Other	-	-	-	-
Support	-	+971.5	-0.2	+971.3
Subtotal	+423.4	+26837.8	-	+27261.2
Current Changes:				
Economic	-7.9	-2366.4	-	-2374.3
Quantity	-	-	-	-
Schedule	-	-143.2	-	-143.2
Engineering	-	-59.2	-	-59.2
Estimating	+205.8	+746.9	-	+952.7
Other	-	-	-	-
Support	-	+156.8	-	+156.8
Subtotal	+197.9	-1665.1	-	-1467.2
Total Changes	+621.3	+25172.7	-	+25794.0
Current Estimate	1537.9	44345.8	27.8	45911.5

1000 (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1987 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	979.8	15948.3	25.6	16953.7
Previous Changes:				
Quantity	-	+16337.2	-	+16337.2
Schedule	-	-	-	-
Engineering	-	+736.1	-	+736.1
Estimating	+325.6	-1150.2	-	-824.6
Other	-	-	-	-
Support	-	+651.4	-0.2	+651.2
Subtotal	+325.6	+16574.5	-0.2	+16899.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-48.1	-	-48.1
Estimating	+154.8	+662.0	-	+816.8
Other	-	-	-	-
Support	-	+102.6	-	+102.6
Subtotal	+154.8	+716.5	-	+871.3
Total Changes	+480.4	+17291.0	-0.2	+17771.2
Current Estimate	1460.2	33239.3	25.4	34724.9

b. (U) Previous Change Explanations --

RDT&E
Economic: revised escalation indices
Estimating: revised program funding requirements

PROCUREMENT
Economic: revised escalation indices
Quantity: addition of 26 ships (FY 1993-1999)
Schedule: change in acquisition profile (FY 1987-FY 1997)
Estimating: revised procurement estimates for ship construction and ship systems including the impact of acquisition strategy revisions and GFE savings
Support: revised outfitting and post delivery requirements due to schedule and quantity changes

DDG 51 DESTROYER, December 31, 1991

13. (U) Cost Variance Analysis (Cont'd):

MILCON
Economic: Revised indices
Support: Revised program funding requirements

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised December 1991 economic escalation rates (Economic)	N/A	-7.9
Revised program funding estimates (Estimating)	154.8	205.8
Total Changes	154.8	197.9
(2) PROCUREMENT		
Revised December 1991 economic escalation rates (Economic)	N/A	-2366.4
Change in the profile for the 49 ships previously submitted from 3,4,3,5,5 (FY95-FY99) to 4,4,4,4,4 (FY95-FY99) (Schedule)	N/A	-143.2
Combat DF removed from 4 FY92 ships (Engineering)	-48.1	-59.2
Revised Ship construction and GFE cost estimates (Estimating)	662.0	746.9
Revised outfitting and post delivery funding requirements (Support)	102.6	156.8
Total Changes	716.5	-1665.1

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Prod Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1217.1	-233.2	-263.2	15.1	-25.1	145.8	--	18.2	-342.4	874.7

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions) (Cont'd)

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
874.7	-28.19	15.81	10.49	20.86	20.31	--	23.02	62.30	937.0

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) Procurement --

(U) DDG 51 CONSTRUCTION:	Initial Contract Price		
	Target	Ceiling	Qty
BATH IRON WORKS, BATH, ME			
N00024-85-C-2144, FPI	$322.0	$399.1	1
Award: April 2, 1985			
Definitized: April 2, 1985			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
[redacted]58.9	$611.9	1	$681.9	$681.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-92.0	$-9.6
Cumulative Variances To Date (12/31/91)	$-97.2	$-5.2
Net Change	$-5.2	$4.4

Explanation of Change:

Cost variance is due to labor hour performance. Schedule variance is not significant since the contract is essentially complete.

Note: Estimated Price at Completion incorporates incentive arrangements, change orders, and escalation commitments which are not included in the contract target and ceiling prices ($71.4M).

(U) DDG 54,56,58 CONSTRUCT:	Initial Contract Price		
	Target	Ceiling	Qty
BATH IRON WORKS, BATH, ME			
N00024-89-C-2033, FPI	$670.4	$771.6	3
Award: December 13, 1988			
Definitized: December 13, 1988			

DDG 51 DESTROYER, December 31, 1991

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$686.6	$790.5	3	$820.4	$855.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-29.7	$28.0
Cumulative Variances To Date (11/30/91)	$-73.1	$25.2
Net Change	$-43.4	$-2.8

Explanation of Change:

Cost variance is due to labor and material performance. Schedule variance is due to material performance.

Note: Estimated Price at Completion incorporates incentive arrangements, change orders, and escalation commitments which are not included in the contract target and ceiling prices ($102.7M).

(U) DDG 55,57 CONSTRUCTION:
INGALLS SHIPBUILDING,INC., PASCAGOULA, MS
N[redacted]-89-C-2034, FPI
A[redacted] December 13, 1988
D[redacted]tized: December 13, 1988

Initial Contract Price		
Target	Ceiling	Qty
$503.4	$575.1	2

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$513.0	$586.2	2	$636.5	$662.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$3.4	$3.8
Cumulative Variances To Date (11/30/91)	$-1.7	$-6.1
Net Change	$-5.1	$-9.9

Explanation of Change:

Cost variance is due to material and labor performance. Schedule variance is due to material performance.

Note: Estimated Price at Completion incorporates incentive arrangements, change orders, and escalation commitments which are not included in the contract target and ceiling prices ($96.8M).

12. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) DDG 59,61,63,65,67 CONST:	Initial Contract Price Target	Ceiling	Qty
INGALLS SHIPBUILDING, INC., PASCAGOULA, MS			
N00024-90-C-2800, FPI	$1200.3	$1376.9	5
Award: February 22, 1990			
Definitized: January 16, 1991			

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$1203.6	$1380.6	5	$1517.4	$1596.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (11/30/91)	$-1.5	$43.0
Net Change	$-1.5	$43.0

Explanation of Change:

Cost variance is not significant. Schedule variance is due to material performance.

Note: Estimated Price at Completion incorporates incentive arrangements, change orders, and escalation commitments which are not included in the contract target and ceiling prices ($249.3M).

(U) DDG 60,62,64,66 CONSTRUC:	Initial Contract Price Target	Ceiling	Qty
BATH IRON WORKS, BATH, ME			
N00024-90-C-2801, FP1	$1117.8	$1293.8	4
Award: February 22, 1990			
Definitized: January 16, 1991			

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$1120.0	$1296.5	4	$1267.7	$1338.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-0.1	$0.0
Cumulative Variances To Date (11/30/91)	$-8.9	$42.7
Net Change	$-8.8	$42.7

Explanation of Change:

Cost variance is due to material performance. Schedule variance is due to material performance.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Note: Estimated Price at Completion incorporates incentive arrangements, change orders, and escalation commitments which are not included in the contract target and ceiling prices ($199.4M).

(U) AEGIS WEAPON SYSTEM:	Initial Contract Price Target	Ceiling	Qty
GENERAL ELECTRIC CO., MOORESTOWN, NJ			
N00024-89-C-5123, FPI	$618.3	$667.8	10
Award: November 22, 1989			
Definitized: November 22, 1989			

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$624.4	$681.7	10	$651.7	$651.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$8.6	$-12.5
Cumulative Variances To Date (11/30/91)	$11.8	$-3.4
Net Change	$3.2	$9.1

Explanation of Change:

[redacted]ost variance is due to performance in Production. Schedule variance [redacted]s due to performance in the Equipment category.

Note: Estimated Price at Completion incorporates change orders and amortization for special tooling and special test equipment which are not included in the contract target and ceiling prices ($35.7M).

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 50.0% (13 yrs/26 yrs)

(2) Percent Program Cost Appropriated: 40.7% ($18679.9 / $45911.5)

1. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY80-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2005)	Total
RDT&E	1026.7	92.3	89.9	329.0	1537.9
Procurement	13388.7	4144.4	3493.9	23318.8	44345.8
MILCON	27.8	-	-	-	27.8
O&M	-	-	-	-	-
Total	14443.2	4236.7	3583.8	23647.8	45911.5

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Flyaway FY87 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Obligated	Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1980				14.9	10.5	10.5	10.5	10.6
1981				45.1	35.3	35.3	35.3	10.6
1982				121.2	102.0	102.0	102.0	7.6
1983				170.8	150.7	150.7	150.7	4.9
1984				132.2	121.1	121.1	121.1	3.8
1985				146.5	138.8	138.4	138.4	3.4
1986				96.0	93.5	93.5	88.8	2.8
1987				100.4	100.4	100.4	100.0	2.7
1988				90.7	93.4	93.4	92.8	3.0
1989				48.7	52.3	52.3	52.3	4.2
1990				36.1	41.2	37.5	34.9	4.0
1991				74.0	87.5	84.6	43.1	3.9
1992				75.6	92.3	45.5	1.9	3.1
1993				71.3	89.9			3.3
1994				62.8	81.7			3.3
1995				45.4	61.0			3.3
1996				40.0	55.5			3.2

(U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1997				29.5	42.2			3.2
1998				29.5	43.6			3.2
1999				29.5	45.0			3.2
Subtot				1460.2	1537.9	1065.2	971.8	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1984					78.5	78.5	74.0	3.6
1985	1	307.1	867.4	1174.5	1139.4	1109.0	1044.4	2.1
1986					98.1	97.5	91.5	1.1
1987	3	139.5	2132.5	2274.5	2487.6	2237.8	1744.3	1.5
[illegible]				3.9	9.5	9.5	8.7	2.3
[illegible]	4		2457.0	2457.1	2791.9	2287.9	1149.1	2.8
[illegible]	5	11.2	3033.1	3053.6	3608.1	2961.7	718.6	1.3
1991	4	2.9	2527.1	2558.3	3175.6	2064.7	142.6	1.3
1992	5	29.6	3124.6	3177.6	4144.4	80.5	4.7	3.1
1993	4	4.0	2538.5	2650.6	3493.9			3.3
1994	3		1996.4	2132.2	2839.8			3.3
1995	4		2542.8	2643.1	3688.8			3.3
1996	4		2529.0	2680.5	3857.0			3.2
1997	4		2539.1	2675.5	3953.7			3.2
1998	4		2598.6	2695.7	4141.9			3.2
1999	4		2590.2	2672.7	4246.0			3.2
2000				84.7	121.6			3.2
2001				90.2	133.6			3.2
2002				93.7	143.3			3.2
2003				75.1	118.5			3.2
2004				44.7	72.8			3.2
2005				1.1	1.8			3.2
Subtot	49	494.3	31476.3	33239.3	44345.8	10927.1	4977.9	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1205 Military Construction, Navy								
1986				4.5	4.6	4.1	4.1	2.8
1987								2.7
1988				13.4	14.7	13.5	13.5	3.0
1989				7.5	8.5	8.5	8.5	4.2
Subtot				25.4	27.8	26.1	26.1	
Grand Total	49	494.3	31476.3	34724.9	45911.5	12018.4	5975.8	

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- None.

********** NOTE **********

The DDG 51 program is exempt from production rate reporting as there are less than six ships per year production.

b. (U) Cost Variance -- None.

c. (U) Schedule Variance -- None.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The O&S cost estimate assumes a service life of 40 years for each ship of this class with a crew size of 26 Officers and 315 Enlisted personnel. Operational tempo is a function of "split plant" ops with average steaming hours (underway) of 2932 per year.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1987 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SHIP	Avg Annual Cost Per
Personnel	7.8	N/A
Material	5.5	N/A
Purchased Services	0.4	N/A
Direct Depot Maint.	3.6	N/A
Direct Recurring Invest.	1.0	N/A
Indirect Costs	0.2	N/A
AEGIS Other Depot	4.1	N/A
Total	22.6	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	220.6	74.6	60.5	---	355.7
Industrial Fund	---	---	---	---	---
Total	220.6	74.6	60.5	---	355.7

Contractor Support Costs - The Contractor Support Costs are combined costs for both the CG 47 AEGIS Class Cruiser and the DDG 51 Class Destroyer programs.
-Funding for FY 1991 and prior includes FY 1989 through FY 1991 only.

AF-16 KC-135R

91-110E

OK

SAC(PA) DFOISR 92-T-0325

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(O&A)823)
PROGRAM: KC-135R Reengine

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
   KC-135R Modernization Program

2. **DoD Component:** USAF

3. **Responsible Office and Telephone Number:**
   OC-ALC/LACME Tinker AFB
   Modernization Management Section
   C/KC-135 Sys Prog Mgt Div
   Midwest City, OK 73145-5990

   Ms JOAN COLE
   Assigned: April 1, 1990
   AV 336-3064 COMM (405) 736-3064

4. **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 0101142F (Shared)
   PROCUREMENT:
   APPN 3010 ICN C13500 (Air Force) (Shared)
   O & M:
   PE 0702207F (Shared)

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5. **Related Programs:**
None.

6. **Mission and Description:**
The KC-135R is a modification to KC-135A strategic tanker aircraft being procured to provide increased aerial refueling capabilities. Modification includes four fuel efficient turbofan CFM56/F108 engines and strengthened main landing gear and other system improvements. The

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92-111 -T

[redacted]

6. Mission and Description (Cont'd):

reengined KC-135 is characterized by increased fuel off-load capability, improved fuel efficiency, enhanced takeoff performance, and reduced environmental impact compared to the KC-135A. This system replaced the KC-135A.

7. Program Highlights:

a. Significant Historical Developments --

In December 1977, Boeing Military Airplane Company was selected as prime contractor to provide technical and cost information for replacing engines and modernizing KC-135A tanker aircraft. In January 1980, the CFM56/F108 engine was selected and Boeing was awarded a contract leading to the design and production of hardware for converting KC-135A into KC-135R aircraft. In January 1981, the Government of France entered into agreement with the U.S. Government to provide a portion of the development funding and to fund conversion of French C-135F aircraft on the KC-135R modification line. The first modified aircraft was rolled-out on 22 Jun 1982. The first production contract for nine modification kits was awarded on 28 February 1982. KC-135R Development Test and Evaluation (DT&E) was conducted at Wichita, KS, and Edwards AFB CA, from 4 August 1982 to 5 April 1983, in a combined DT&E and Operational Test and Evaluation (OT&E) program. A total of 55 flights, 315.4 hours were flown. The KC-135R demonstrated satisfactory compliance with performance, flying qualifications, and propulsion specifications. In May 1984, Boeing Military Airplanes (BMA) was awarded a follow-on production contract for thirty shippable airframe kits. In July 1984, a contract for kit installation on one KC-135A airplane was awarded to Hayes International to establish a qualified competitive source for kit installation. The first modified KC-135R airplane was delivered to the U.S. Air Force on 29 June 1984. The PMRT from AFSC to AFLC for the airframe portion of the program occurred 30 October 1984. The installation contract for FY86 was awarded to Boeing in October 1985 as a result of competition with Hayes International. The PMRT from AFSC to AFLC for the F-108 engine occurred in March 1986. Due to the reliability of the F108 engine, the USAF was able to reduce their Regional Engine Maintenance Organization (REMO) requirement from three to one.

b. Significant Developments Since Last Report --

The number of aircraft delivered has been increased by forty-six for a total of two hundred sixty-eight aircraft. Main operating bases have been increased by one for a total of twelve. Modification kit procurement increased by twenty-six for a total of three hundred fifty-two. The KC-135R program has been reduced from 552 to 397 aircraft and program is planned for termination after FY93.

The KC-135R satisfies the mission requirement.

7b. Program Highlights (Cont'd):

c. Changes Since As Of Date —
None.

8. Threshold Breaches:
There are currently no Air Force Acquisition Executive (AFAE) approved Acquisition Program Baseline (APB) (dated 27 Nov 89) or Nunn McCurdy unit cost breaches.

9. Schedule:

a. Milestones —

	Production Estimate	Approved Program	Current Estimate
Program Initiation	MAR 77	MAR 77	MAR 77
Engine Source Selection	JAN 80	JAN 80	JAN 80
Contract Award (Production Certification A/C)	JAN 80	JAN 80	JAN 80
Milestone III (DSARC)	JUL 81	JUL 81	JUL 81
Contract Award (First Production Lot)	FEB 82	FEB 82	FEB 82
First Flight	AUG 82	AUG 82	AUG 82
DT&E/OT&E			
Start	SEP 82	SEP 82	SEP 82
Complete	MAY 84	MAY 84	MAY 84
First Delivery to SAC	JUN 84	JUN 84	JUN 84
IOC (1st KC-135R Squadron Deployed)	JUN 85	JUN 85	JUN 85
FOC (Last Aircraft Delivery)	NOV 03	N/A	JUL 95(Ch-01)

b. Previous Change Explanations —

Change in FOC (last aircraft delivery) due to schedule stretch out as a result of a decrease in annual quantities due to budget constraints.

c. Current Change Explanations —

(Ch-1) Change in FOC (last aircraft delivery) due to revised schedule as a result of a decrease in total quantity.

d. References —

Production Estimate:
Decision Coordination Paper (DCP), KC-135R Reengine Program, April 1, 1981 and Program Management Directive (PMD) (14)/0101142F, 31 August 1981

9d. **Schedule (Cont'd):**

Approved Program:
AFAE Approved Acquisition Program Baseline dated November 27, 1989.

10. **Performance Characteristics:**

a. Performance --	RDE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Mission Radius (nm)	2000	2000	/ 2000	2000	2000
Mission Offload (lb)	114000	114000	/ 114000	114000	114000
Takeoff Distance (ft)	9000	8100	/ 8100	8100	8100
Transportability Engine and Multipurpose Trailer	N/A	F108-CF100	/ F108-CF100	F108-CF100	F108-CF100
Fuel Load at Max Takeoff Gross Weight (lbs)	203300	203300	/ 203300	203300	203300
Maximum Gross Weight (lbs)	322500	322500	/ 322500	322500	322500
Cruise Speed (Mach)	N/A	.77	/ .77	.77	.77
Critical Field Length (ft)	11000	10400	/ 10400	10400	10400
Payload/Radius (2000 nm radius/lbs)	114000	114000	/ 114000	114000	114000
Engine Replacement (# of men in 2 clock hrs)	N/A	3	/ 3		
Constant Speed Drive Accessibility for Inspection (1 men in # of min)	N/A	5	/ 5	5	5
Fuel Efficiency (% more than J57)	N/A	27	/ 27	27	27
Aircraft/Engine Interfaces	N/A	Quick Disconnect	/ Quick Disconnect	Quick Disconnect	Quick Disconnect
Basic Structure (Engine)	N/A	All interchangeable	/ All interchangeable	All interchangeable	All interchangeable
Five Rotor Disc Brakes (same as)	N/A	RC/EC/KC-135R/E/B	/ RC/EC/KC-135R/E/B	RC/EC KC-135R/E/B	RC/EC KC-135R/E/B

10a. Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Landing Gear Attach Point Gear, with reduced max weight (No change KC-135 can use ____)	N/A	A	/ A	A	A
Turbine Engine Monitor System (TEMS) (same box different software)	N/A	A-10 & KC-135R	/ A-10 & KC-135R	A-10 & KC-135R	A-10 & KC-135R
Horizontal Stabilizers (identical to)	N/A	KC-135 E&B	/ KC-135 E&B	KC-135 E&B	KC-135 E&B
Life Cycle Parts Tracking Program (ASIP) Turbine Engine	N/A	TEMS	/ TEMS	TEMS	TEMS
Minimum Essential Maintenance Availability Requirements (%)					
Day-to-Day	N/A	80	/ 80	80	80
Specific Priority Missions	N/A	90	/ 90	96	96
Minimum Essential Operation Reliability (Min % for air fueling operations)	N/A	96	/ 96	96	96
Engine Replacement	N/A	N/A	/ N/A	3 Men in 2 Clock Hours	3 Men in 2 Clock Hours

b. Previous Change Explanations --

The demonstrated performance and current estimate of the critical field length and takeoff distance were changed from 11,000 ft to 10,400 ft and from 9,000 ft to 8,100 ft respectively based on actual experience during the test program.

Additional performance objectives/thresholds added per 27 Nov 89 baseline update.

10c. Performance Characteristics (Cont'd):

c. Current Change Explanations --

None.

d. References --

Production Estimate:
Decision Coordination Paper (DCP), KC-135R Reengine Program, April 1, 1981 and Program Management Directive (PMD) (14)/0101142F, 31 August 1981

Approved Program:
AFAE Approved Acquisition Program Baseline dated November 27, 1989.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	91.6	89.7	89.7
Procurement	4941.5	7352.4	4498.5
Airframe	(2033.0)		(1625.7)
Engine	(2348.0)		(2443.4)
Installation			(38.8)
Total Flyaway	(4381.0)		(4107.9)
Other Wpn Sys Costs	(208.0)		(174.7)
O&M FY91 and Out	(0.0)		(0.0)
Total Other Wpn Sys	(208.0)		(174.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(352.5)		(215.9)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	196.0	N/A	93.4
Total FY 81 Base-Year $	5229.1	7442.1	4681.6
Escalation	2600.1	4771.1	2429.3
Development (RDT&E)	(5.6)	(5.0)	(5.0)
Procurement	(2515.2)	(4766.1)	(2395.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(79.3)	(N/A)	(28.7)
Total Then-Year $	7829.2	12213.2	7110.9
b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	334	636	397
Total	334	636	397

11c. Total Program Cost and Quantity (Cont'd):

c. Foreign Military Sales --
FRANCE
Sales to date total eleven (11) for an estimated cost of $220,012,101 which includes two years of initial spares, support equipment, French peculiar design changes and eleven (11) installations.

d. Nuclear Costs --
None.

e. References --

Production Estimate:
Decision Coordination Paper (DCP), KC-135R Reengine Program, April 1, 1981 and Program Management Directive (PMD) (14)/0101142F, 31 August 1981

Approved Program:
AFAE Approved Acquisition Program Baseline dated November 27, 1989.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	7110.9	12055.1	7110.9
(2) Quantity	397	552	397
(3) Unit Cost	17.912	21.839	17.912
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	585.0	585.0	301.7
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	585.0	585.0	301.7
(2) Quantity	26	26	11
(3) Unit Cost	22.500	22.500	27.427

13. Cost Variance Analysis:

a. Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	O&M	TOTAL
Production Estimate	97.2	7456.7	275.3	7829.2
Previous Changes:				
Economic	-0.2	+330.7	+49.7	+380.2
Quantity	-	+3673.4	+181.4	+3854.8
Schedule	-	+930.9	+3.2	+934.1
Engineering	-	-	-	-
Estimating	-2.3	-1202.8	-365.3	-1570.4
Other	-	-	-	-
Support	-	+627.2	-	+627.2
Subtotal	-2.5	+4359.4	-131.0	+4225.9
Current Changes:				
Economic	-	-270.0	+5.0	-265.0
Quantity	-	-3875.8	-	-3875.8
Schedule	-	-20.0	-	-20.0
Engineering	-	-	-	-
Estimating	-	+106.1	-27.2	+78.9
Other	-	-	-	-
Support	-	-862.3	-	-862.3
Subtotal	-	-4922.0	-22.2	-4944.2
Total Changes	-2.5	-562.6	-153.2	-718.3
Current Estimate	94.7	6894.1	122.1	7110.9

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1981 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	O&M	TOTAL
Production Estimate	91.6	4941.5	196.0	5229.1
Previous Changes:				
Quantity	-	+2143.8	+105.0	+2248.8
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.9	-693.9	-192.2	-888.0
Other	-	-	-	-
Support	-	+233.6	-	+233.6
Subtotal	-1.9	+1683.5	-87.2	+1594.4
Current Changes:				
Quantity	-	-1778.4	-	-1778.4
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+55.5	-15.4	+40.1
Other	-	-	-	-
Support	-	-403.6	-	-403.6
Subtotal	-	-2126.5	-15.4	-2141.9
Total Changes	-1.9	-443.0	-102.6	-547.5
Current Estimate	89.7	4498.5	93.4	4681.6

b. Previous Change Explanations --

RDT&E
Economic: Revised economic escalation indices.
Estimating: Reduction of management reserve to cover approved reprogrammings and comply with approved funding levels.

PROCUREMENT
Economic: Revised economic escalation indices.
Quantity: Increased quantity of modification kits from 334 to 392 based on lower than anticipated costs for the kits and installation; decreased quantity from 392 to 389 to enable a constant six per month outyear production schedule; increased quantity by six

13b. Cost Variance Analysis (Cont'd):

based on outyear procurement rate of 50 per year; addition of 246 kits to include total planned for modification; decrease of 3 kits, 2 through attrition, 1 which was included in error; quantity decreased from 638 to 637, 1 aircraft lost to attrition, total engines decreased from 2,548 to 2,511, 34 excess engines to be used for installs, 3 free engines obtained through FY88 contract negotiations; quantity decreased from 637 to 633, 4 aircraft planned for reengining lost to attrition; Quantity decreased from 633 to 552, retired 81 KC-135 aircraft

Schedule: Procurement program stretchout; decrease due to early procurement of 14 kits; schedule change associated with an increase in procurement in FY88 (47 to 50) and FY89 (36 to 47), schedule change associated with program stretchout, 56 kits moved from FY90-FY94 to outyears; schedule change associated with program accaleration, procurement quantities increased in FY94 thru FY99 by a total of 38; schedule stretch due to fiscal constraints, 304 kits over 14 years vs 385 kits over 11 years

Estimating: Impact of revised economic escalation indices on current and prior years; decrease in kit price based on favorable firm fixed price contract proposals, estimating changes applicable to the kit reduction from 392 to 389; one-time change resulting from a correction to the methodology for computing inflation on programs with advance procurement funding; reduced estimate based on actual contract experience; recatagorization of engine production support from flyaway estimating to support, revised hardware estimate based on contract latest prices, increase in hardware costs due to re-engining of KC-135E to the KC-135R configuration, recatagorization of FY91 and out O&M funds to 3010 Procurement; increased hardware estimate based on latest contract prices and reduction of annual quantities,

Support: Reduced spare engine and support costs based on lower kit cost and refinement of the estimate; reduction and rephasing of initial spares estimate; increase and rephasing of the peculiar support equipment and tech data estimates; impact of revised economic escalation indices on prior year support cost; recategorization of engine production

13b. Cost Variance Analysis (Cont'd):

support costs from flyaway, definitization of prior year spares amounts, increase to data and product support from program stretchout, increase in spares due to latest requirements computations, decrease in support due to contract negotiations for reduced data and management support, increase in support due to data and increased support equipment associated with modification of KC-135E aircraft to KC-135R configuration; increase in support due to re-categorization of O&M for FY91 and out, reduction of initial spares due to latest requirements computations; increase due to latest contract prices for data and management support

O & M

Economic: Revised economic escalation indices

Quantity: Increased installation costs associated with the increase in quantity of modification kits from 334 to 392: reduced installation costs associated with the decrease in quantity of modification kits from 392 to 389; installation of 6 additional aircraft, increase of 246 aircraft; decrease of 3 aircraft, decreased installation costs associated with deletion of one aircraft from planned program; decreased installation costs associated with deletion of four aircraft from planned program.

Schedule: Installation schedule stretchout associated with kit procurement stretchout; decrease due to early procurement of 14 kits; installation schedule rephased to accommodate the kit procurement schedule change;

Estimating: Removal of interim contract support costs from the SAR; refinement of estimate based on contract negotiations; revised estimate of "Over and Above" contingency costs; estimating changes applicable to increase of six aircraft; adjustment for impact of revised economic indices of prior years; reduced cost based on contract experiences; installation costs corrected to include aircraft preparation costs; installation costs corrected to include additional costs for re-engining of the KC-135E; recatagorization of FY91 and out O&M installation funds to 3010 procurement funds

13c. Cost Variance Analysis (Cont'd):

c. Current Change Explanations —

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised economic escalation indices (Economic)	N/A	-202.7
Economic adjustment for negative program change (Economic)	N/A	-67.3
Total variance associated with decrease of 155 aircraft	-1757.0	-3832.2
Quantity decreased from 552 to 397 (Quantity)	-1778.4	-3875.8
Estimating change associated with quantity decrease (Estimating)	21.3	43.6
Schedule change associated with a decrease in procurement (Schedule)	N/A	-20.0
Current and prior year inflation offset (Estimating)	19.9	34.2
Increase in hardware estimate based on low quantity in last procurement year (Estimating)	14.3	28.3
Decrease in initial spares associated with decrease in program (Support)	-170.4	-373.7
Decrease in other weapon system cost associated with decrease in program (Support)	-105.9	-224.8
Decrease in installation associated with decrease in program (Support)	-127.3	-263.8
Total Changes	-2126.5	-4922.0
(2) O & M		
Revised Economic Escalation Indices (Economic)	--	5.0
Correction of December 1990 SAR for erroneous reporting of O&M funds. (Estimating)	-15.4	-22.2
Current and Prior year Inflation Offset (Estimating)		-5.0
Total Changes	-15.4	-22.2

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
23.441	0.290	-3.773	2.303	--	-3.757	--	-0.592	-5.529	17.912

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

FY89 ENGINE BUY:

CFMI INTERNATIONAL, CINCINNATTI, OH
F33657-89-C-2140, FFP
Award: September 15, 1989
Definitized: September 15, 1989

Initial Contract Price		
Target	Ceiling	Qty
$497.7	N/A	182

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$497.7	N/A	182	$497.7	$497.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

Contract is firm fixed price (FFP). Cost performance is not a contractual requirement and CPR data is not available.

FY89 AIRFRAME KIT BUY:

BOEING MILITARY AIRPLANES, WICHITA, KS
F34601-89-C-0575, FFP
Award: August 18, 1989
Definitized: August 18, 1989

Initial Contract Price		
Target	Ceiling	Qty
$185.1	N/A	50

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$184.6	N/A	50	$184.6	$184.6

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

Contract is firm fixed price (FFP). Cost performance is not a contractual requirement and CPR data is not available.

FY90 ENGINES BUY:
CFM INTERNATIONAL, CINCINNATI, OH
F33657-89-C-2140, FFP
Award: July 9, 1990
Definitized: July 9, 1990

Initial Contract Price		
Target	Ceiling	Qty
$318.1	N/A	108

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$318.1	N/A	108	$318.1	$318.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

Contract is firm fixed price (FFP). Cost performance is not a contractual requirement and CPR data is not available.

FY89/90 Airframe Kit Buy:
THE BOEING CO, WICHITA, KS
F34601-90-C-1772, FFP
Award: August 31, 1990
Definitized: August 31, 1990

Initial Contract Price		
Target	Ceiling	Qty
$140.5	$0.0	31

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$140.3	$0.0	31	$140.3	$140.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change: None.

Contract F34601-90-C-1772 is for a total quantity of 31 kits, two of which are for FY89 procurement and twenty-nine of which are for FY90 procurement.

FY91 ENGINE BUY:	Initial Contract Price Target	Ceiling	Qty
CFM INTERNATIONAL, CINCINNATTI, OH F33657-89-C-2140, FFP Award: April 30, 1991 Definitized: April 30, 1991	$317.5	$0.0	104

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$317.5	$0.0	104	$317.5	$317.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

Contract is firm fixed price (FFP). Cost performance is not a contractual requirement and CPR data is not available.

FY91 AIRFRAME KIT BUY:	Initial Contract Price Target	Ceiling	Qty
THE BOEING COMPANY, WICHITA, KS F34601-91-C-1328, FPI Award: September 16, 1991 Definitized: September 16, 1991	$120.0	$136.0	26

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$120.0	$136.0	26	$120.0	$120.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.2	$0.1
Net Change	$0.2	$0.1

Explanation of Change:

Cumulative to date variance reflects costs associated with long lead material.

16. **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 94.1% (16 yrs/17 yrs)

(2) Percent Program Cost Appropriated: 95.8% ($6809.2 / $7110.9)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY77-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	94.7	-	-	-	94.7
Procurement	6007.4	585.0	301.7	-	6894.1
MILCON	-	-	-	-	-
O&M	122.1	-	-	-	122.1
Total	6224.2	585.0	301.7	-	7110.9

O&M included in 3010 procurement from FY91 to end of program.

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1977				2.6	1.9	1.9	1.9	6.9
1978				3.3	2.6	2.6	2.6	6.8
1979				8.2	7.0	7.0	7.0	8.4
1980				10.6	10.0	10.0	10.0	9.4

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1981				15.5	16.2	15.9	15.7	11.9
1982				22.3	24.9	24.3	24.3	9.2
1983				21.8	25.5	24.8	20.3	4.9
1984				5.4	6.6	5.9	3.5	3.8
Subtot				89.7	94.7	92.4	85.3	
Appropriation: 3010 Aircraft Procurement, Air Force								
1980		4.7		4.7	5.0	5.0	5.0	9.7
1981	1	47.9	19.8	93.3	108.9	108.9	108.9	11.9
1982	9	31.7	154.2	189.4	232.6	232.6	232.6	9.6
1983	19	11.4	239.2	318.2	414.3	414.3	414.3	9.0
1984	30	4.7	330.3	398.9	541.7	541.7	541.7	7.9
1985	43	2.0	399.0	468.7	656.7	656.7	656.7	3.4
1986	46	1.1	398.8	438.3	636.4	636.4	636.4	2.8
1987	50	0.5	454.8	504.0	760.0	760.0	693.8	2.7
1988	50	0.3	448.5	450.8	713.2	713.2	676.6	3.1
1989	49		449.1	454.9	745.1	740.2	644.3	4.0
1990	32	0.1	327.9	337.7	571.1	495.0	177.1	4.0

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
1991	31	2.0	342.7	355.0	622.4	480.9		3.9
1992	26		284.9	323.2	585.0			3.1
1993	11		152.3	161.4	301.7			3.3
Subtot	397	106.4	4001.5	4498.5	6894.1	5784.9	4787.4	

Obligations/Expenditures are from Accounting/Finance records, as of 31 Dec 91.

Appropriation: 3400 Operation & Maintenance, Air Force								
1981								
1982				2.6	2.9	2.9	2.9	9.4
1983				2.1	2.4	2.4	2.4	4.6
1984				8.4	10.1	10.1	10.1	4.0
1985				15.9	19.8	19.8	19.8	3.4
1986				16.8	21.6	21.6	21.6	2.9
1987				16.0	21.2	21.2	21.2	2.7
1988				16.1	22.0	22.0	22.0	3.1
1989				15.5	22.1	22.1	21.5	4.2
Subtot				93.4	122.1	122.1	121.5	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3400 Operation & Maintenance, Air Force (Cont'd)								
Grand Total	397	106.4	4001.5	4681.6	7110.9	5999.4	4994.2	

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1981	1	1	1	1
1982	9	9	9	9
1983	19	19	19	19
1984	31	31	30	30
1985	65	65	43	43
1986	65	65	46	46
1987	72	72	50	50
1988	72	72	50	50
1989	0	0	49	49
1990	0	0	32	29
1991	0	0	31	31

17a. Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1992	0	0	26	30
1993	0	0	11	0

b. Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	5229.1	-547.5	4681.6	+144.3	4537.3
(TY $)	7829.2	-718.3	7110.9	+1216.2	5894.7
PAUC Cost (BY $)	15.656	-3.864	11.792	+0.363	11.429
(TY $)	23.441	-5.529	17.912	+3.063	14.848

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JUL 81	0	JUL 81	N/A	JUL 81
Duration (in MON)	98	70	168	91	77
End Date(MON YY)	SEP 89	70	JUL 95	N/A	DEC 87

d. Deliveries (Plan/Actual) —

	To Date
RDT&E	0/0
Procurement	268/268

e. Approved Design-to-Cost Objective — N/A.

Design to cost information not applicable.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

KC-135R Operating and Support (O&S) Ground Rules and Assumptions:

The following O&S costs for the KC-135R are based on a typical 13 PAA squadron using 302 flying hours per PAA. Manpower consists of 63 officers, 189 enlisted and 9 civilians. Logistics factors are taken from the July 1991 Air Force CAIG.

KC-135A Operating and Support (O&S) Ground Rules and Assumptions: (The KC-135A is the KC-135R antecedent system.)

The following O&S costs for the KC-135A are based on a typical 16 PAA squadron using 354 flying hours per PAA. Manpower consists of 76 officers, 292 enlisted and 13 civilians. Logistics factors are taken from the July 1991 AF CAIG.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1981 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SQUADRON	Avg Annual Cost Per SQUADRON ANTECEDENT
AVFUEL	5.3	10.3
DEPOT MAINTENANCE	1.4	4.6
CONSUMABLE SUPPLIES	0.8	1.1
DLRS	1.0	2.6
REPLACEMENT GSE	0.3	0.3
MILITARY PAY	6.3	8.9
CIVILIAN PAY	0.2	0.3
INSTALL SUP NON-PAY	1.0	1.5
PCS	0.3	0.5
CLASS IV MODS	1.5	1.1
MEDICAL PAY	0.1	0.1
PERSONNEL ACQ & TRAINING	2.8	3.5
Total	21.0	34.8

18c. Operating and Support Costs (Cont'd):

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M (AF)	79.2	13.5	13.4	---	106.1
Industrial Fund	115.7	30.7	42.4	---	188.8
Total	194.9	44.2	55.8	---	294.9

AF-2 AMRAAM

~~SECRET~~

91-092

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AMRAAM (AIM-120A)

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
MAR 12 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
AIM-120A Advanced Medium Range Air-to-Air Missile (AMRAAM)

2. (U) DoD Component: USAF

Joint Participants:
USAF/USN

3. (U) Responsible Office and Telephone Number:

AMRAAM Joint System Program Office
ASD/YM
EGLIN AFB, FL 32542-5000

SES HARRY SCHULTE
Assigned: August 30, 1991
AV 872-2307 COMM (904) 882-2307

PROGRAM EXECUTIVE OFFICER
(TACTICAL AIR) (PMA-268)
AMRAAM Joint Systems Program Office
EGLIN AFB, FL 32542-5000

CAPTAIN BILL WALKER
Assigned: May 13, 1991
DSN 872-2412 COMM (904) 882-2412

~~Classified By: AMRAAM SECURITY CLASSIFICATION GUIDE, 1 MAY 91~~
~~Declassify on: OADR~~
~~Downgrade Instructions: NOT SUBJECT TO AUTOMATIC DOWNGRADE~~

SAF/PAS
92-320 -T

(THIS PAGE IS UNCLASSIFIED)

~~SECRET~~

OASD(PA) DFOISR 92-T-0492

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0207163F, 0603316F, 0603370F, 0603370N, 0604314F
PE 0604314N Project E0981
PROCUREMENT:
APPN 1507 ICN 2206 (Navy) PE0204162N
APPN 1507 ICN 2206 (Navy) PE0206138M
APPN 3020 ICN MAMRAO (Air Force) PE0207163F

5. (U) Related Programs:
F-14, F-15, F-16, F/A-18, SEEK EAGLE, NATO Aircraft (UK Sea Harrier and German F-4F), Swedish Grippen, French Mirage 2000, NEFMA

6. (U) Mission and Description:
The AMRAAM Program provides for the acquisition of the next generation all-weather, all-environment medium range air-to-air missile system in response to USAF, USN, and NATO operational requirements for the 1989-2005 time period. The system is an active radar guided intercept missile with inherent electronic countermeasures capabilities for air-to-air applications against massed penetration aircraft and is designed to augment the AIM-7 Sparrow.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
In January 1979, DSARC (DAB) Milestone I validated the requirement for AMRAAM. In September 1982, DSARC (DAB) Milestone II authorized Full-Scale Development (FSD). In December 1981, the FSD contract was competitively awarded to Hughes Aircraft Company. In July 1982, Raytheon was selected as the follower contractor for eventual competitive production of AMRAAM. In 1986, Congress capped both the FSD and production programs. FSD was completed within the cost cap. Congressional funding actions increased the original production cost cap from $7.000B to $7.172B in FY87, and to $7.585B in FY88 (FY84$). In November 1989, cost and schedule breaches were identified, which led to a DAB review on December 4, 1989. The DAB approved a revised estimate of $9.3B (FY84$), a Nunn-McCurdy breach of total program acquisition unit cost. On April 13, 1990, the USD(A) certified the program to Congress. In January 1989, AMRAAM FSD (Hughes) flight testing and second-source qualification (Raytheon) testing were completed. The Live Fire test program was successfully completed in August 1989. In July 1989, a limited operational utility exercise was conducted which demonstrated that the AMRAAM provided a greatly increased mission effectiveness over the AIM-7 and dramatically increased aircraft survivability. In May 1990, four AMRAAM missiles were fired in less than 30 seconds from a single F-15 against four separate targets (4V4) protected by chaff and ECM jamming. The missiles, in flight simultaneously, selected and killed their

7a. (U) Program Highlights (Cont'd):

respective targets. The Missile Rail Launcher (MRL) achieved its IOC in May 1990 and supported employment of AIM-9 and AMRAAM missiles in Desert Storm. Deliveries of sufficient missiles to fully equip the first operational squadron were completed in early December 1990.

b. (U) Significant Developments Since Last Report --
The FY92 President's Budget reduced the AMRAAM procurement objective from 24,320 to 15,450 and stretched the program one year to 13 lots resulting in a second Nunn-McCurdy unit cost breach. The program was certified by the USD(A) to Congress on May 3, 1991. A preplanned product improvement (P3I) program was initiated in FY90 with a study effort preceding the Phase I contract which was awarded on March 15, 1991, to Hughes Aircraft Company with Raytheon as their primary subcontractor. On February 9, 1991, AMRAAM was deployed to Saudi Arabia in support of Operation Desert Storm. Although not fired, significant operational experience was gained and the missile achieved a mean time between maintenance (MTBM) of 1300 hours under actual combat conditions, greatly exceeding the mature (MTBM) requirement. On May 23, 1991, the DAB Milestone IIIB review was held and the program was authorized to continue with low rate production through Lot VI. Formal full rate production was withheld pending completion of the certification required under Public Law 101-189 and submission of reports required by 10 U.S.C. 2366 and 10 U.S.C. 2399. In addition, the program was tasked by the DAB to complete seven action items raised during the review. A follow-up DAB review is scheduled for April 23, 1992. On September 25, 1991, the 58th Fighter Squadron declared initial operational capability (IOC) of its AMRAAM equipped F-15s. This milestone culminated over 14 years of development and testing and signifies a significant advance in the capabilities of our tactical aircrews.

In October 1991, AFOTEC completed a 4202 hour (3201 hours F-15, 1001 hours F-16) reliability evaluation of Lot II AMRAAMs under extremely demanding test conditions. This evaluation demonstrated 463 hours MTBM on the F-15 wing stations, 169 hours MTBM on the fuselage stations and 125 hours MTBM on the F-16. The Navy has conducted operational testing accumulating 921 hours on the F/A-18 without a failure for an MTBM in excess of 921 hours. The F/A-18 and F-15 wing stations have exceeded their mature MTBM requirement.

Flight testing in 1991 showed excellent results as 53 of 57 or 92.9% of the missiles fired either scored a direct hit on or passed within lethal radius of the target. Included is the first shot from a German F-4F which resulted in a direct hit. Missile deliveries and production status has also shown substantial improvement with most production bottlenecks completely resolved. Both contractors delivered 30 or more missiles per month toward the end of 1991.

7b. (U) Program Highlights (Cont'd):

AMRAAM is expected to satisfy all mission requirements.

c. (U) Changes Since As Of Date --
Follow-on captive carry testing was conducted on the F-15 fuselage stations and is continuing on the F-16 with positive results. The follow-on test accumulated over 775 hours for both the F-15 fuselage stations and F-16 with cumulative MTBM of 305 (0 failures) and 468 (1 failure) hours respectively. On January 13, 1992, the 86th Fighter Wing declared full operational capability (FOC). This is the first fully operational F-16 unit.

8. (U) Threshold Breaches:
There are no breaches to the Acquisition Program Baseline (APB) dated January 17, 1992, and no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone I (DSARC)	N/A	NOV 78	NOV 78
Preliminary Design Review	AUG 82	N/A	SEP 82
Milestone II (DSARC)	NOV 82	SEP 82	SEP 82
Start DT&E/IOT&E	N/A	OCT 83	OCT 83
Certification	N/A	FEB 86	FEB 86
Milestone IIIA (DAB)	N/A	JUN 87	JUN 87
DAE Program Review	N/A	MAY 88	MAY 88
Start Production Deliveries	N/A	SEP 88	SEP 88
Complete D/IOT&E (Air Force)	N/A	JAN 89	JAN 89
Complete IOT&E/Captive Carry Reliability Program w/Lot 1 Assets (Air Force)	N/A	JUN 90	JUN 90
Initial Equippage	N/A	DEC 90	DEC 90
Initial Operational Capability (IOC) Air Force	SEP 86	MAR 91	SEP 91(Ch-1)
Milestone IIIB (DAB) (Lot IV Full Go-Ahead Rate Production)	N/A	APR 91	MAY 91(Ch-2)
DAB Program Review Full Rate Production Approval	N/A	MAR 92	MAR 92(Ch-3)
Full Operational Capability (FOC) 1st F-16 Unit Fully Operational w/AMRAAMs	N/A	MAR 92	JAN 92(Ch-4)
Complete FOT&E (OPEVAL) (Navy)	N/A	MAR 92	SEP 92(Ch-6)
Complete AF FOT&E Phase I	N/A	MAR 92	SEP 92(Ch-7)

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
P3I Phase 1 CDR Complete	N/A	OCT 92	OCT 92
Initial Operational Capability (IOC) (Navy)	N/A	SEP 92	DEC 92(Ch-8)
Joint Depot Activated	N/A	SEP 94	FEB 95(Ch-9)
P3I Phase I Flight Test Completed	N/A	DEC 94	DEC 94
Last Delivery	N/A	SEP 01	SEP 01

b. (U) Previous Change Explanations --

DSARC II date corrected to show date of actual meeting versus decision memorandum date. D/IOT&E date reflects completion with FSD assets and extended with Lot I assets. Pre-priced options for Lots I and II expired July 1984 and were not renegotiated. Milestones were updated to reflect the restructured program. IOC was delayed because of missile quantity reductions. Schedule slip (from April 1987 to June 1987 for DAB IIIA and March 1989 to April 1991 for DAB IIIB) is due to flight test delays, reliability test deficiencies and deployment of IOC squadron to Desert Storm. IOT&E was completed in June 1990 with Lot I assets. FOC slipped to March 1992 due to quantity reductions and revised deployment plan. Last delivery reflects program stretch in FY92/93 President's Budget.

c. (U) Current Change Explanations --

(Ch-1) - IOC slipped from March 1991 to September 1991 due to availability of a fully operational F-15 radar computer tape.

(Ch-2) - DAB IIIB slipped one month due to rescheduling.

(Ch-3) - Added milestone included in the January 17, 1992 approved APB.

(Ch-4) - FOC occurred two months early due to changes in the deployment schedule.

(Ch-5) - Change in Navy policy has deleted the NPDM requirement for AMRAAM.

(Ch-6) - Navy OPEVAL will complete late due to test delays.

(Ch-7) - AF FOT&E Phase I will complete late due to test priority changes.

9c. (U) **Schedule (Cont'd):**
(Ch-8) - IOC (Navy) slipped from Sep 92 to Dec 92 due to design change to the rail launcher.

(Ch-9) - OSD has directed the AMRAAM depot be moved from Alemeda Naval Air Station, CA to Letterkenny Army Depot, PA. A total of 17 systems will be moved to Letterkenny. The current estimate date of February 95 is tentative as depot activation planning for AMRAAM is not yet complete.

d. (U) References --

(U) Development Estimate:
SDDM dated November 3, 1982 #X22681.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 17 Jan 1992.

10. (U) **Performance Characteristics:**

a. (U) Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Weight (lbs)	327	327 / 350	344	345
Length (in)	143	N/A / N/A	143.9	143.9

(b)(1)

[redacted]

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate	
Availability (%)	86	86 / 82	N/A	93	
Captive-Carry (MBTM-Type I) (hrs)	600	600 / 450	282	450	
On Alert Storage MTBM	N/A	30000 / 22500	N/A	30000	
Aircraft Configure/ Load					
3 Man Load Crew					
Install 4 Rail Launchers (mins)	N/A	20 / 25	21	21	(CH-3)
Load 4 Missiles from trailer (mins)	N/A	15 / 20	18	18	(CH-3)
Load 4 Missiles from container (mins)	N/A	20 / 30	22	22	(CH-3)
Missile checks (mins)	N/A	1 / 5	1	1	(CH-3)
All Weather Capability	N/A	Day, Night, Rain, Clouds / Day, Night, Rain, Clouds	Day, Clouds	SAME AS OBJ	
(b)(1)					
Aircraft Compatibility	N/A	F-15, F-16, F-14, F/A-18 / F-15, F-16, F-14, F/A-18	F-15, F-16, F/A-18	SAME AS OBJ	
All-Up Round	N/A	Control Surfaces field instal-led / Control Surfaces field instal-led	SAME AS OBJ	SAME AS OBJ	

10a. (U) Performance Characteristics (Cont'd):

DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)	[redacted]		

(b)(1)



b. (U) Previous Change Explanations --

Stages I and II of the Captive Carry Reliability Program (CCRP) demonstrated an overall reliability of 90 hours for the eject stations and 203 hours for the pylon stations. The Stage III CCRP demonstrated an MTBM of 118 hours, based on 1764 flying hours. Missile weight increased due to a change in materials. The Pk continues to improve.

c. (U) Current Change Explanations --

(Ch-1) - Reflects the F-Pole value under the higher altitude conditions at White Sands Missile Range (see footnote 1/ above).

(Ch-2) - This parameter was added in addition to the F-pole as a more meaningful measure of performance.

(Ch-3) - The APB requirement was redefined without reference to a specific aircraft.

(Ch-4) - The APB requirement was redefined in terms of measurable parameters, estimated missile performance is unchanged.

d. (U) References --

(U) Development Estimate:
SDDM dated November 3, 1982 #X22681.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 17 Jan 1992.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	730.2	824.1	850.3
Procurement	4031.6	4628.7	4852.0
Flyaway	(3508.2)		(4615.7)
Total Flyaway	(3508.2)		(4615.7)
Other Weapon Cost	(264.0)		(173.8)
Other Procurements	(174.5)		(0.0)
ICS	(0.0)		(0.0)
Total Other Wpn Sys	(438.5)		(173.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(84.9)		(62.5)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 78 Base-Year $	4761.8	5452.8	5702.3
Escalation	6829.8	7659.6	7946.4
Development (RDT&E)	(447.9)	(526.5)	(560.8)
Procurement	(6381.9)	(7133.1)	(7385.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	11591.6	13112.4	13648.7
b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	24335	15450	15450
Total	24335	15450	15450

Excludes 169 non-fully configured RDT&E missiles in the development estimate, and 111 in the current estimate.

c. (b)(1) Foreign Military Sales --

(U) UNITED KINGDOM (UK-D-YCO)
$2.2M PURPOSE: SPT EQUIP

(U) UNITED KINGDOM (UK-D-NHU)
$.4M PURPOSE: LAUNCHERS

(U) UNITED KINGDOM (UK-O-YCW)
$21.1M PURPOSE: LOT II MISSILES AND ASSOCIATED EQUIPMENT

(U) GERMANY (GY-D-YDU)
$5.6M PURPOSE: LOT III MISSILES, ASSOCIATED EQUIPMENT & TEST SUPPORT

(U) UNITED KINGDOM (UK-D-NIT)

11c. (b)(1) [redacted]

(U) UNITED KINGDOM (UK-D-NIS)
$.9M PURPOSE: SUPPORT LEASE OF IMV AND ASSOCIATED EQUIPMENT

(U) SWEDEN (SW-D-NBD) Case signed February, 1991
$50K PURPOSE: SUPPORT OF AMRAAM BRIEFING TEAM AND AMRAAM GRIPEN/INTEGRATION

(U) UNITED KINGDOM (UK-D-NJM) Case signed March, 1991
$16.0M PURPOSE: SEA HARRIER FRS MK2 AMRAAM FIRING AND A/C ENVIRONMENTAL TRIALS

(U) TURKEY (TK-D-YDO) Case signed May, 1991
$74.2M PURPOSE: 96 AMRAAM AURs (Lot VII), 96 LAUNCHERS, PLUS ASSOCIATED EQUIPMENT

(U) PORTUGAL (PT-D-SAG)
$660K PURPOSE: 40 LAUNCHERS AND ASSOCIATED EQUIPMENT

(U) BELGIUM (BE-D-SVI)
$2.8M PURPOSE: 80 LAUNCHERS AND ASSOCIATED EQUIPMENT

(U) SOUTH KOREA (KS-D-YGL) Case signed Oct, 1991
$93.7M PURPOSE: 96 AMRAAM AURs (LOT VII), 560 LAUNCHERS, PLUS SUPPORT EQUIPMENT

(U) NETHERLANDS (NE-D-YMD)
$140K PURPOSE: 7 LAUNCHERS AND ASSOCIATED EQUIPMENT

(U) NATO EUROPEAN FIGHTER MANAGEMENT AGENCY (NEFMA) (M1-D-YAA)
Case signed Nov, 1991
$7.2M PURPOSE: 6 AAVIs (LOT VII)

Price and Availability (P&A) data has been submitted for the following additional cases:

(U) 1. UNITED KINGDOM (UK-D-YDJ) (P&A expired without signature)
210 AMRAAM AURs plus support (Lot VI)
$116.3M (with MOU benefits)
$141.7M (without MOU benefits)

(U) 2. GERMANY (GY-D-YEB) (P&A expired without signature)
600 AMRAAM AURs plus support (200 ea Lots VI, VII and VIII)
$391.7M (without MOU benefits, regular FMS case)

(U) 3. NORWAY (NO-D-YCV) (P&A expired without signature)
100 AMRAAM AURs plus support (Lot VI)

11c. (b)(1) [redacted]

(U) 4. SPAIN (SP-D-YDF) (Case expired without signature)
200 AMRAAM AURs support (Lot VII)
144 Launchers, LAU-127
$146.4M

(U) 5. UNITED KINGDOM (UK-D-YDR)(Replaces UK-D-YDJ)
(Case expired without signature)
210 AMRAAM AURs (Lot VII) plus support equipment
$149.6M

(U) 6. GERMANY (GY-D-YEB)(Replaces previous case)
110 AMRAAM AURs (Lot VII) plus support equipment
$80.4M

(U) 7. FINLAND (No case designator)
240 AMRAAM AURs (120 ea Lots VII and VIII) plus support equipment $171.6M

(U) 8. UNITED KINGDOM (MSAMS) (No case designator)
50/250/400 AMRAAM AURs (or Guidance and Warhead Sections)
$37.9M - $280.9M

(b)(1) [redacted]

d. (U) Nuclear Costs -- None.

e. (U) References —

(U) Development Estimate:
SDDM dated November 3, 1982 #X22681.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 17 Jan 1992.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	13648.7	13112.4	13648.7
(2) Quantity	15450	15450	15450
(3) Unit Cost	0.883	0.849	0.883
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	761.1	761.1	876.8
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	83.0	83.0	0.0
Net Total	844.1	844.1	876.8
(2) Quantity	821	891	1155
(3) Unit Cost	1.028	0.947	0.759

NOTE: The FY92 Appropriations Act provided $844.1M (combined Air Force and Navy funding, including initial spares) for the purchase of "approximately 900 missiles" (891 missiles in the Authorization Act). Included in the Air Force total funding (Plus PY Advance Procurement line above) is $83.0M reprogrammed from the sale of AIM-7s to Saudi Arabia. These funds were originally requested in FY91 and appear in the FY91 funding line in Section 16.

13. (U) Cost Variance Analysis:

a. (U) Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1178.1	10413.5	0.0	11591.6
Previous Changes:				
Economic	-31.4	-862.1	-	-893.5
Quantity	-39.2	-1999.4	-	-2038.6
Schedule	-19.1	+1894.4	-	+1875.3
Engineering	+203.9	+95.5	-	+299.4
Estimating	+58.3	+2837.9	-	+2896.2
Other	-	-	-	-
Support	-	-618.0	-	-618.0
Subtotal	+172.5	+1348.3	-	+1520.8
Current Changes:				
Economic	-4.8	-265.2	-	-270.0
Quantity	-	-	-	-
Schedule	-	+293.0	-	+293.0
Engineering	+64.4	+78.6	-	+143.0
Estimating	+0.9	+338.0	-	+338.9
Other	-	-	-	-
Support	-	+31.4	-	+31.4
Subtotal	+60.5	+475.8	-	+536.3
Total Changes	+233.0	+1824.1	-	+2057.1
Current Estimate	1411.1	12237.6	-	13648.7

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary — (FY 1978 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	730.2	4031.6	0.0	4761.8
Previous Changes:				
Quantity	-18.7	-673.8	-	-692.5
Schedule	-12.0	+103.4	-	+91.4
Engineering	+96.2	+46.5	-	+142.7
Estimating	+28.8	+1416.8	-	+1445.6
Other	-	-	-	-
Support	-	-295.9	-	-295.9
Subtotal	+94.3	+597.0	-	+691.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+58.7	-	+58.7
Engineering	+25.2	+28.7	-	+53.9
Estimating	+0.6	+127.2	-	+127.8
Other	-	-	-	-
Support	-	+8.8	-	+8.8
Subtotal	+25.8	+223.4	-	+249.2
Total Changes	+120.1	+820.4	-	+940.5
Current Estimate	850.3	4852.0	-	5702.3

4628.6

b. (U) Previous Change Explanations —

RDT&E

Economic: Revised economic indices.

Quantity: Reduction in the total number of evaluation missiles.

Schedule: Schedule adjustment due to quantity reduction.

Engineering: Addition of Pre-Planned Product Improvement (P3I) program and reduction in risk reduction efforts.

Estimating: Extension of the FSD program into FY88, and additional funding for live fire testing and USN integration and testing.

13b. (U) Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic: Revised economic escalation indices.

Quantity: Reduction of 8870 missiles

Schedule: Rephase of quantities due to Congressional Appropriation actions.

Engineering: Extension of production funds and deletion of the HAVE SPEAR program effort. Changes due to more severe than anticipated F-15 fuselage environment.

Estimating: Addition of warranty provisions, recategorization, revised estimating methodology, AMRAAM Producibility Enhancement Program (APREP) cost estimate revision, and learning curve and competition assumption changes.

Support: Rephase of support requirements caused by Congressional Appropriation actions, reevaluation and rephasing of AMRAAM initial spares, recategorization, rephase of the Joint Depot, and quantity reduction.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Application of revised escalation rates (Economic)		-4.8
Adjustment for current and prior escalation (Estimating)	0.6	0.9
Add'l funding for electronic counter-measure updates and lethality improvements to overcome the threat (Engineering)	25.2	64.4
Total Changes	25.8	60.5

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Application of revised escalation rates (Economic)		-265.2
Reduced annual buy rates reflecting FY92 Congressional reductions and extending the program one year (Schedule)	58.7	293.0
Additional requirements for non-recurring engineering to implement pre-planned product improvements (Engineering)	28.7	78.6
Added requirements for technical support from the associate contractor and extending engineering/testing (Estimating)	77.4	182.1
Adjustment for current and prior escalation (Estimating)	24.1	55.9
Estimate adjustment for increased contractor overhead rates and delay in implementing value engineering changes (Estimating)	61.1	196.0
Removal of Defense Business Operations Fund (Estimating)	-35.4	-96.0
Added interim contractor support previously funded in O&M (Support)	3.1	7.9
Additional spares (Support)	5.7	23.5
Total Changes	223.4	475.8

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.476	-0.075	0.142	0.140	0.029	0.209	—	-0.038	0.407	0.883

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) Procurement —

(U) HUGHES LOT III:
HUGHES AIRCRAFT COMPANY, TUCSON, AZ
F08635-89-C-0036, FFP
Award: December 13, 1988
Definitized: December 29, 1989

Initial Contract Price		
Target	Ceiling	Qty
$399.4	N/A	534

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$436.3	N/A	534	$436.3	$436.3

CPR information is not a requirement on this FFP contract.

The difference between initial and current target cost is addition of contract modifications.

(U) RAYTHEON LOT III:
RAYTHEON COMPANY, BEDFORD, MA
F08635-89-C-0037, FFP
Award: December 13, 1988
Definitized: December 22, 1989

Initial Contract Price		
Target	Ceiling	Qty
$270.6	N/A	372

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$302.9	N/A	372	$302.9	$302.9

CPR information is not a requirement on this FFP contract.

The difference between initial and current target cost is addition of contract modifications.

(U) HUGHES/LOT IV:
HUGHES AIRCRAFT COMPANY, TUCSON, AZ
F08635-90-C-0003, FFP
Award: December 28, 1989
Definitized: December 28, 1989

Initial Contract Price		
Target	Ceiling	Qty
$328.2	N/A	450

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$352.7	N/A	450	$352.7	$352.7

CPR information is not a requirement on this FFP contract.

The difference between initial and current target cost is addition of contract modifications.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) RAYTHEON/LOT IV:	Initial Contract Price Target	Ceiling	Qty
RAYTHEON COMPANY, BEDFORD, MA F08635-90-C-0004, FFP Award: December 22, 1989 Definitized: December 22, 1989	$333.7	N/A	450

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$335.6	N/A	450	$335.6	$335.6

CPR information is not a requirement on this FFP contract.

The difference between initial and current target cost is addition of contract modifications.

(U) HUGHES/LOT V:	Initial Contract Price Target	Ceiling	Qty
HUGHES AIRCRAFT COMPANY, TUCSON, AZ F08626-91-C-0038, FFP Award: June 28, 1991 Definitized: N/A	$359.2	N/A	540

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$359.2	N/A	540	$359.2	$359.2

CPR information is not a requirement on this FFP contract.

(U) RAYTHEON/LOT V:	Initial Contract Price Target	Ceiling	Qty
RAYTHEON COMPANY, BEDFORD, MA F08626-91-C-0093, FFP Award: June 28, 1991 Definitized: N/A	$186.1	N/A	270

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$186.1	N/A	270	$186.1	$186.1

CPR information is not a requirement on this FFP contract.

Contracts F08635-86-C-0201, F08635-87-C-0065, F08635-88-C-0093, and F08635-88-C-0116 are over 90% complete and are not reported in this submission.

16. (U) **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. (U) Program Status —

(1) Percent Program Completed: 66.7% (16 yrs/24 yrs)

(2) Percent Program Cost Appropriated: 44.1% ($6024.8 / $13648.7)

b. (U) Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY77-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2000)	Total
RDT&E	1154.3	32.9	38.3	185.6	1411.1
Procurement	4076.5	761.1	876.8	6523.2	12237.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	5230.8	794.0	915.1	6708.8	13648.7

c. (U) Annual Summary —

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1978				5.9	6.0	6.0	6.0	6.0
1979				16.3	18.3	18.3	18.3	8.4
1980				21.8	27.3	27.3	27.3	9.4
1981				17.5	24.2	24.2	24.2	11.9
1982				2.2	3.3	3.3	3.3	9.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1983				2.8	4.3	4.3	4.3	4.9
1984				4.5	7.3	7.3	7.3	3.8
1985				4.7	7.8	7.8	7.8	3.4
1986				2.5	4.2	4.2	4.2	2.8
1987				2.8	5.0	5.0	4.5	2.7
1988				12.2	22.3	22.3	9.4	3.0
1989				6.5	12.4	12.4	9.0	4.2
1990				3.5	6.9	6.9	6.0	4.0
1991				1.8	3.6	3.3	2.6	3.9
1992				1.2	2.6	0.3		3.1
1993				1.3	2.9			3.3
1994				1.2	2.6			3.3
1995				1.1	2.5			3.3
1996				1.0	2.4			3.2
1997				1.0	2.4			3.2
Subtot				111.8	168.3	152.9	134.2	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1507 Weapons Procurement, Navy								
1989	26	1.6	12.1	14.8	32.6	32.4	17.8	4.2
1990	85	6.2	31.8	40.7	92.3	71.4	29.3	4.0
1991	300	17.8	89.5	123.1	287.3	196.0	11.7	3.9
1992	191	11.1	53.9	89.1	214.7	0.6		3.1
1993	140	16.0	31.8	55.7	138.5			3.3
1994	225	10.2	49.0	66.2	170.1			3.3
1995	225	10.5	45.2	69.6	184.4			3.3
1996	240	9.8	49.0	68.2	186.7			3.2
1997	295	9.8	55.4	72.8	205.5			3.2
1998	850	8.1	144.8	160.0	466.2			3.2
1999	873	7.9	145.4	158.9	477.9			3.2
Subtot	3450	109.0	707.9	919.1	2456.2	300.4	58.8	
Navy	3450	109.0	707.9	1030.9	2624.5	453.3	193.0	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1977				5.0	4.8	4.8	4.8	
1978				6.6	6.7	6.7	6.7	6.0
1979				14.3	16.1	16.1	16.1	8.4

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1980				20.9	26.2	26.2	26.2	9.4
1981				16.5	22.9	22.9	22.9	11.9
1982				92.9	137.6	137.6	137.6	9.2
1983				135.2	209.5	209.5	209.5	4.9
1984				118.4	190.6	190.6	190.6	3.8
1985				122.2	203.3	203.3	203.3	3.4
1986				52.6	89.6	89.6	89.6	2.8
1987				21.4	37.7	37.7	30.1	2.7
1988				14.6	26.6	26.6	21.2	3.0
1989								4.2
1990				6.0	11.8	11.5	2.4	4.0
1991				8.8	18.0	17.3	7.5	3.9
1992				14.4	30.3	2.1	0.2	3.1
1993				16.3	35.4			3.3
1994				13.3	29.8			3.3
1995				12.0	27.8			3.3
1996				11.7	27.9			3.2
1997				11.3	27.9			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1998				12.0	30.6			3.2
1999				12.1	31.7			3.2
Subtot				738.5	1242.8	1002.5	968.7	
Appropriation: 3020 Missile Procurement, Air Force								
1984		15.2		15.2	27.8	27.8	27.8	8.0
1985		37.3		37.3	70.0	69.8	69.8	3.4
1986		72.6		101.5	199.1	199.1	190.9	2.8
1987	180	79.3	202.2	283.3	578.5	577.4	563.2	2.7
1988	400	85.3	248.4	320.0	679.1	662.7	613.9	3.0
1989	874	51.8	300.7	360.4	791.4	780.1	444.5	4.2
1990	803	40.1	253.6	305.5	692.2	643.5	143.9	4.0
1991	510	97.9	157.8	268.4	626.2	415.6	20.8	3.9
1992	630	36.9	179.8	226.8	546.4	26.5	0.1	3.1
1993	1015	53.0	230.8	296.7	738.3			3.3
1994	1015	47.8	222.4	280.0	719.0			3.3
1995	1168	26.5	235.8	273.3	724.6			3.3
1996	960	24.8	197.6	234.4	641.2			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force (Cont'd)								
1997	1200	27.3	227.0	260.7	735.9			3.2
1998	1100	33.9	189.7	232.0	675.8			3.2
1999	1100	30.0	185.6	224.0	673.7			3.2
2000	1045	3.5	204.2	213.4	662.2			3.2
Subtot	12000	763.2	3035.6	3932.9	9781.4	3402.5	2074.9	
USAF	12000	763.2	3035.6	4671.4	11024.2	4405.0	3043.6	
Grand Total	15450	872.2	3743.5	5702.3	13648.7	4858.3	3236.6	

The FY92 Appropriations Act provided $844.1M (combined Air Force and Navy funding, including initial spares) for the purchase of "approximately 900 missiles" (891 missiles in the Authorization Act). Included in the Air Force total funding is $83.0M reprogrammed from the sale of AIM-7s to Saudi Arabia. These funds were originally requested in FY91 and appear in the FY91 funding line.

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1985	249	0	0	N/A
1986	1067	0	0	N/A
1987	1964	180	180	180
1988	3000	400	400	400
1989	3000	1270	900	900
1990	3000	2550	888	900
1991	3000	2255	810	900
1992	3000	2420	821	1000
1993	3000	3000	1155	1400
1994	3055	3000	1240	1700
1995	0	3000	1393	1700
1996	0	3000	1200	1700
1997	0	3245	1495	1700
1998	0	0	1950	1700
1999	0	0	1973	1270
2000	0	0	1045	0

NOTES:
1. 1987 Current Estimate funded delivery period for Hughes is 16 months and Raytheon is 24 months.

2. 1988 Current Estimate funded delivery period for Hughes is 14 months and Raytheon is 16 months.

17d. (U) Production Rate Data (Cont'd):

3. 1989 Current Estimate funded delivery period for Hughes is 17 months and Raytheon is 15 months.

4. 1990 Current Estimate funded delivery period for Hughes is 8 months and Raytheon is 14 months.

5. 1991 Current Estimate and Maximum Economic funded delivery period is 10 months.

6. 1992 Current Estimate and Maximum Economic funded delivery period is 10 months.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	5102.3	+600.0	5702.3	+59.1	5643.2
(TY $)	11199.2	+2449.5	13648.7	+273.9	13374.8
PAUC Cost (BY $)	0.210	0.159	0.369	0.004	0.365
(TY $)	0.460	0.423	0.883	0.018	0.866

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	DEC 86	0	DEC 86	N/A	DEC 86
Duration (in MON)	157	32	189	12	177
End Date(MON YY)	JAN 00	32	SEP 02	N/A	SEP 01

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	111/111
Procurement	821/828

17e. (U) Production Rate Data (Cont'd):

e. (U) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 15450 - @ Peak Rate: 125.0/mo			
FY 78 Base-Year $	145.000	284.900	284.900
Then Year $	373.000	723.500	723.500
@ Qty 1468 (1st three years) - @ Peak Rate: 75.0/mo			
FY 78 Base-Year $	316.000	747.800	747.800
Then Year $	618.000	1576.800	1576.800

Dollars in Thousands

Development Estimate reflects a total 24,320 quantity/10 year program at a maximum rate of 250/month. The first three years contained 3640 missiles at a maximum rate of 200/month.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The AMRAAM concept of operation is an all-weather, radar-guided, all-environment tactical missile for use on F-14, F-15, F-16, and F/A-18 aircraft. The AMRAAM will augment and ultimately replace the AIM-7 and be integrated and maintained using existing support resources with no additional manpower requirements. The All-Up-Round (AUR) maintenance concept calls for aircraft loading/unloading, removal/replacement of wings and fins and Built-In-Test (BIT) within the missiles. A missile failing BIT will be sent to the Intermediate-Level Shop for test verification on the Missile Bit Test Set (MBTS). For the Navy, the missile will be downloaded/uploaded on a different station or aircraft to verify missile failure. Failed missiles, AF or Navy, will be returned to a Naval Weapons Station (NWS) for failure confirmation and isolation to the failed missile section. Defective sections will be returned to the AMRAAM depot for repair (Letterkenny Army Depot, PA).

The O&S costs are the direct costs for the tactical missile and the Load Trainer/Captive Carry Missile (LT/CCM) associated with operating, supporting, and maintaining the AMRAAM missile over a fifteen (15) year deployment phase starting in FY90 for the AF and FY92 for the Navy. The AF estimate covers base operations including Load Trainer/Captive Carry Missile (LT/CCM), AUR fault verification, operational firings, depot repairs (five (5) year Interim Contractor Support (ICS)), supply/item management, transportation, replenishment

18a. (U) Operating and Support Costs (Cont'd):
spares, and field software updates. The Navy estimate includes AMRAAM fleet operations and support, intermediate maintenance (NWS), depot rework (two (2) years ICS), technical support (fleet support, engineering services, quality surveillance, program management), supply support, replenishment spares, and contractor augmented support.

The O&S cost estimate is based on a Milestone IIIB program office estimate dated April 1991.

b. (U) Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per year	Avg Annual Cost Per year
Air Force	23.2	N/A
Navy	37.5	N/A
Total	60.7	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M (USAF)	2.2	2.3	---	---	4.5
Industrial Fund	---	---	---	---	---
Total	2.2	2.3	---	---	4.5

Dollars in thousands based on 15 year O&S. Source: HQ AFLC.

There is no antecedent system; the AMRAAM is designed to augment the AIM-7 Sparrow.

AF-13 IUS

[redacted]

OK 91-105

SELECTED ACQUISITION REPORT (RCS:DD-COMP(QA)823)
PROGRAM: SPACE SHUTTLE (IUS)

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
Inertial Upper Stage (IUS)

2. **DoD Component:** USAF

3. **Responsible Office and Telephone Number:**
Upper Stages Program Office
HQ Space Systems Division
P.O. Box 92960
Los Angeles, CA 90009-2960

Col Norman H. Buchanan
Assigned: September 30, 1988
AV 833-1013 COMM (310) 363-1013

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 0305171F (Shared), 0604411F (Shared), 0305138F, 0603411F (Shared)
PE 0305119F (Shared)
PROCUREMENT:
APPN 3020 ICN MLA SUP (Air Force) (Shared)
MILCON:
PE 0102449F (Shared)

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DEPARTMENT OF DEFENSE

10

5. **Related Programs:**
Space Transportation Systems (STS - NASA), Titan IV, Defense Satellite Communications System (DSCS), Defense Support Program (DSP), NASA scientific and communications satellites, Air Force Special Projects (SP)

92 0445

SAF/PAS
92-277 -T

[redacted]

6. Mission and Description:

The Inertial Upper Stage (IUS) is a two-stage, solid propellant, high altitude rocket booster. It can be used in conjunction with the Space Transportation System (Shuttle) or Titan IV launch vehicle. It is used to deploy payloads from low earth orbit to a higher energy mission orbit. These orbits are higher than the Space Shuttle or Titan IV rocket alone can provide. The primary users are NASA and DOD. The IUS replaced the Transtage as the Nation's primary upper stage vehicle.

7. Program Highlights:

a. Significant Historical Developments —

In April 1972, the Inertial Upper Stage was born as the NASA concept of the "Space Tug". By October 1973, the Air Force had assumed responsibility for what was then called the "Interim Upper Stage" with the agreement that NASA requirements would be accommodated. The concept validation phase began in 1975 and resulted in selection of the solid rocket motor (SRM) concept for the now designated Inertial Upper Stage. It was agreed that the IUS would support DOD/NASA missions in the 1980 - 1986 time frame. In 1976 Boeing Aerospace Company won the competition to develop the IUS, commencing the 18-month-long validation phase. In this time period, the IUS evolved from adapting an existing stage to developing a new generic upper stage to accommodate improved reliability parameters and increased mission requirements. The Program moved into Full-Scale Development in 1978 with Boeing Aerospace Company as the prime contractor. Component and vehicle qualification testing was completed in mid-1982, ending with 26 consecutive successful solid rocket motor firings. The contract was awarded for eight vehicles with heavy emphasis on reliability and system redundancy. At that time, poor cost and schedule performance as well as inexperience in procuring high qualification piece parts led to significant cost overruns and, subsequently, to two separate contract restructures. Eight of those FSD vehicles have been launched. In October 1982, a 3871-lb DSCS II/III satellite package launched on a Titan 34-D booster was completely successful. The second launch, in April 1983, was a NASA TDRS-A satellite in the first IUS/Shuttle mission. Although the payload reached nominal mission orbit, in-flight technical problems initiated the 'IUS Anomaly Recovery Plan' and led to the third restructure of the FSD contract. Eventually, the problem was successfully identified and resolved. The third FSD IUS launch was a NASA TDRS satellite from aboard the Space Shuttle "Challenger".

In September 1988 the fourth FSD vehicle deployed a NASA TDRS satellite from the STS marking an end to the two-and-a-half year standdown caused by the Challenger disaster. The most recent FSD vehicle launch successfully delivered a DoD payload aboard a Titan IV in 1990.

In 1983, the program entered into a follow-on production contract (F04701-82-C-0110). The total quantity to be produced was reduced

7a. Program Highlights (Cont'd):

from 18 to 10 and then to 6 because some payloads were transferred to the Centaur Upper Stage and other boosters. The procurement strategy was also changed to annual buy. Thus far, four of those production vehicles have flown payloads successfully to nominal mission orbits from the Space Shuttle park orbit. In 1985, the program began work on the second follow-on production and launch services contract (F04701-85-C-0101) to produce three IUS vehicles. Subsequently, NASA asked the Air Force to procure two additional IUS vehicles for its TDRS E & F spacecraft. Later, the Air Force also procured IUS vehicles for NASA's interplanetary missions--Galileo, Magellan, Ulysses. All three of these vehicles have been flown. On 28 January 1986, the Space Shuttle "Challenger" exploded moments after takeoff which caused the IUS and its NASA payload to be completely destroyed before deployment.

In December 1986, the IUS program was directed to compete the acquisition of five Upper Stage Vehicles (USV) for the Defense Support Program's (DSP) satellites 18-22. In July, the Inertial Upper Stage was selected, and negotiations began. The buy of five IUS vehicles intended for DSP satellites 18-22 was subsequently cancelled due to an initiative presented to the Secretary of the Air Force in October known as Atlas II. Direction was received to remove five Defense Satellite Communications System (DSCS) payloads (ten satellites) from the shuttle and to fly them on Atlas II. This allowed the IUS program to dedicate these IUS vehicles to DSP satellites 18-22. In FY88, the IUS program procured a user-funded IUS in a stand-alone buy of one vehicle. The contract was awarded to Boeing Aerospace.

In 1989, there were five successful IUS missions. One of the vehicles from the follow-on production contract (F04701-82-C-0110) launched a NASA TDRS satellite from the STS. In May and October two IUS's successfully launched the NASA interplanetary probes Magellan and Galileo, respectively. Also included in these missions was the successful first launch of an IUS from Titan IV launch vehicle. In 1990, there were three successful IUS missions flown, one being NASA's interplanetary mission (Ulysses). In addition, a new Integration and Launch Services contract was awarded in September 1990. The contract will be used to process and launch both DOD and NASA payloads. This contract is funded with the Operations and Maintenance (O&M), or 3400, appropriation and with NASA funds, and was therefore not previously reportable in the SAR baseline.

b. Significant Developments Since Last Report --

Since the last SAR was submitted, there have been two successful IUS missions flown, one being NASA'S TDRS-E, the other a DOD (DSP) satellite. Both payloads were deployed from the Shuttle and successfully placed in their desired mission orbit.

7b. Program Highlights (Cont'd):

The program is also procuring two IUS vehicles for DSPs 23-24 in FY95 with advance procurement in FY91 and FY92.

The Inertial Upper Stage system is expected to satisfy mission requirements.

c. Changes Since As Of Date --
None.

8. Threshold Breaches:
This are currently two breaches to the 10 Oct 90 Acquisition Program Baseline (APB) for Milestone III and Follow-on Production Contract. There is also a Nunn-McCurdy threshold breach of 22.7 percent.

9. Schedule:

a. Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone 0 (Concept Definition)	APR 75	APR 75	APR 75
Milestone I (DSARC)	OCT 76	OCT 76	OCT 76
Milestone II (DSARC)	MAR 78	MAR 78	MAR 78
Awarded Full Scale Development Contract (F04701-78-C-0040)	MAR 78	MAR 78	MAR 78
Milestone III (1st Production)	JUL 80	JUL 80	JUL 80
Awarded Production Contract (F04701-82-C-0110)	JUL 80	JUL 80	JUL 80
Engine Qualification Test		N/A	
(1) Titan Configured	OCT 82	N/A	OCT 82
(2) STS Configured	JAN 83	N/A	JAN 83
First Flight Vehicles		N/A	
(1) Titan Configured	OCT 82	N/A	OCT 82
(2) STS Configured	MAR 83	N/A	MAR 83
Initial Launch Capability		N/A	
(1) Titan Configured	OCT 82	N/A	OCT 82
(2) STS Configured	MAR 83	N/A	APR 83
First Production Contract Award	JAN 83	N/A	JAN 83
Delivery of First Production Contract Vehicle	NOV 83	N/A	JUN 84
Milestone III (2nd Production)	JUL 85	JUL 85	JUL 85
Awarded Production and Launch Support Contract (F04701-85-C-0101)	JUL 85	JUL 85	JUL 85
Follow-on Integration and Launch Support Contract (F04701-90-C-0070)	SEP 90	SEP 90	SEP 90

9a. Schedule (Cont'd):

Milestones (Cont'd) —	Development Estimate	Approved Program	Current Estimate
Milestone III (3rd Production)	DEC 91	DEC 91	DEC 92(Ch-1)
Follow-on Production Contract (F04701-90-R-0027)	DEC 91	DEC 91	DEC 92(Ch-1)

b. Previous Change Explanations --

The initial launch of an STS configured IUS was delayed from March 1983 to April 1983 due to Shuttle related technical problems. The first production vehicle delivery was delayed until after the anomaly investigation and subsequent design changes.

c. Current Change Explanations --

(Ch-1) Milestone III (3rd Production) and the Scheduled Award of Follow-on Production Contract were delayed from Dec 91 to Dec 92 until the uncertainty about the number of vehicles to be procured (i.e., NASA's TDRS-G) could be resolved. No impact to the program will occur, and user's requirements will be met.

d. References --

Development Estimate:
PMD R-S 5068(26), 2 December 1982, Space Transportation System; R-S 7123(10), 21 June 1982, Space Launch Support.

Approved Program:
AFAE Approved Acquisition Program Baseline, dated 10 October 1990.

10. Performance Characteristics:

a. Performance —	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Payload Weight to Geosynchronous Orbit (GSO) from:					
Titan IV (lb) (park orbit @ 62 x 130 n.m.i)	N/A	5304	/ 4800	5030	5030
Space Shuttle (park orbit @140 n.m.i)	N/A	5304	/ 4800	4962	4962
Reliability (%)					

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Titan IV	96.0	98.0	/ 96.0	100%	99.3%
Space Shuttle	96.0	98.0	/ 96.0	90.0%	98.5%
Accuracies					
GSO Position (n.m.i)	+/-92	+/-92	/ +/-92	+/-10.5	+/-91
GSO Velocity (fps)	+/-78	+/-78	/ +/-78	+/-7.8	+/-38
GSO Inclination (degrees)	+/-0.12	+/-0.12	/ +/-0.12	+/-0.078	+/-0.10
Payload Weight to GSO		N/A	/ N/A		
from Titan IV (park orbit @ 87 x 140 n.m.i.)	5300	N/A	/ N/A	N/A	N/A
from Space Shuttle (park orbit @ 175 n.m.i)	5000	N/A	/ N/A	N/A	N/A

1/ Development estimate for previous Titan IV for park orbit at 87x140nm was 5300 lbs.

2/ Development estimate for Space Shuttle park orbit of 175 nm was 5000.

All Objectives/Thresholds have been demonstrated. However, technical and operational performance parameters are highly dependent on specific mission requirements. The source for this approval is the AFAE Approved Baseline dated 10 October, 1990.

b. Previous Change Explanations --

Payload Wt. to GSO for the STS and Titan changed from 5000 to 5133 and from 4000 to 4008 respectively, due to an extendable exit cone on the second stage solid rocket motor that increases thrust, and weight reduction engineering changes. Reliabilities for the Titan and the STS changed from 96% to 99.3% and 96% to 98.5% respectively and reflect maximum use of high reliability piece parts, stringent test requirements, and redundancy. In addition, all probable single point failures have been eliminated. The 90.0% demonstrated performance for the STS reflected 9 of 10 missions being said to be 100% successful. Position, velocity and inclination first changed from +/- 92NM, 78 ft/s and 0.12 degrees to +/- 58NM, 50 ft/s and 0.055 degrees respectively, due to the use of sophisticated gamma guidance techniques. In 1985, they became +/- 28.0NM, 7.8ft/s and 0.02 degrees. The newer parameters were taken from STS missions as

10b. Performance Characteristics (Cont'd):

opposed to Titan 34D. The estimated payload weight to GSO from the Space Shuttle changed from 5089 pounds to 5002 pounds. There are two causes: 1. SRM-1 and SRM-2 specific impulses are approximately 0.5% lower than predicted (accounting for about 45 pounds). 2. Vehicle weight increased due to the IUS anomaly fix (accounts for about 40 pounds). The estimated payload weight to GSO on the Titan 34D changed from 4000 to 3924 to reflect the maximum predicted satellite payload weight. The SRM-1 and SRM-2 specific impulse change (see (1) above) accounts for about 35 pounds. The current estimate of 3853 pounds will still accommodate all payload requirements aboard Titan 34D. New entries for Titan IV were added. The Titan IV is a new expendable launch vehicle compatible with the IUS. The Titan IV missions flown were all successful. To compensate for the degradation of the Space Shuttle's park orbit, design enhancements will be implemented in order to achieve the current estimate of IUS performance (5250 lb from a park orbit of 216 n.m.i.). There are two reasons for the decrease of the current IUS-Titan IV performance estimate: (a) completion of booster analyses resulting in decreased Titan performance estimates, and (b) implementation of dual string Tracking, Telemetry, and Control avionics hardware on IUS. The IUS performance estimate has decreased from 5250 to 5137 due to degradation of the Shuttle's park orbit. The IUS-Titan IV current Performance estimate has decreased due to a degradation in the Titan IV performance estimate. As a result of booster performance degradations, the park orbit for Titan IV and the Space Shuttle were changed to 62 x 130 n.m.i. and 140 n.m.i., respectively, for payload weight to GSO.

c. Current Change Explanations -- None.

d. References --

Development Estimate:
PMD R-S 5068(26), 2 December 1982, Space Transportation System; R-S 7123(10), 21 June 1982, Space Launch Support.

Approved Program:
AFAE Approved Acquisition Program Baseline, dated 10 October 1990.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	424.2	433.8	434.0
Procurement	533.6	438.2	441.9
Flyaway	(437.0)		(346.6)
Total Flyaway	(437.0)		(346.6)
Other Wpn Sys Cost	(96.6)		(95.3)
Total Other Wpn Sys	(96.6)		(95.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	5.2	4.6	4.6
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 75 Base-Year $	963.0	876.6	880.5
Escalation	1049.3	932.4	953.7
Development (RDT&E)	(269.0)	(281.1)	(280.9)
Procurement	(777.2)	(648.6)	(670.1)
Construction (MILCON)	(3.1)	(2.7)	(2.7)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2012.3	1809.0	1834.2
b. Quantity --			
Development (RDT&E)	1	1	1
Procurement	17	11	9
Total	18	12	10

c. Foreign Military Sales -- None.

d. Nuclear Costs --
None

e. References --

Development Estimate:
PMD R-S 5068(26), 2 December 1982, Space Transportation System; R-S 7123(10), 21 June 1982, Space Launch Support.

Approved Program:
AFAE Approved Acquisition Program Baseline, dated 10 October 1990.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1834.2	1793.9	1834.2
(2) Quantity	10	12	10
(3) Unit Cost	183.42	149.49	183.42
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	61.3	61.3	59.7
Less CY Adv Proc	29.5	29.5	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	31.8	31.8	59.7
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
c. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (BY75$)	880.5	864.7	880.5
(2) Unit Cost	88.05	72.06	88.05
d. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (BY75$)	20.5	20.5	19.3
Less CY Adv Proc	9.8	9.8	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	10.7	10.7	19.3
(2) Unit Cost	N/A	N/A	N/A

e. Changes from the Baseline Report - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	33.928	22.70
(2) CPUC (TY$)	0.000	N/A
(3) PAUC Quantity	-2	-16.67
(4) PAUC (BY75$)	15.992	22.19
(5) CPUC (BY75$)	0.000	N/A

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

f. Changes from the Previous SAR - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	0.0	0.00
(2) CPUC (TY$)	0.0	N/A
(3) PAUC Quantity	0	0.00
(4) PAUC (BY75$)	0.0	0.00
(5) CPUC (BY75$)	0.0	N/A

g. Initial SAR (DEC 82)

(1) Program Acquisition Cost (TY$) -- 2012.3
(2) Program Acquisition Cost (BY$) -- 963.0

h. Unit Cost Changes.

(1) PAUC --

There are two basic reasons for the increase in the PAUC since the Dec 90 SAR. First, IUS production and launch schedules were changed to synchronize them with the changes made to the only remaining IUS DoD payload, DSP. Second, all space launch services will be funded with procurement funds starting in fiscal year 1993.

In synchronizing the IUS and DSP schedules and production, two events occurred. First, the two buy scheduled for fiscal year 1993 was moved to fiscal year 1995 to synchronize with the production and launch of the last two DSPs. Second, the two-buy in fiscal year 1997 was deleted because there is no requirement for them.

In the Dec 90 SAR, IUS space launch services were funded from the Operations and Maintenance (O&M) account and not reported in the SAR. Starting in fiscal year 1993, launch services have been transferred to the Missile Procurement account for all IUSs procured in this SAR. Therefore, the launch services funding is now included in calculating the PAUC starting with this SAR.

(2) CPUC --

There has been no change in the CPUC since the unit cost baseline was established.

i. Impact of Performance or Schedule Changes on Unit Cost.

The shift of the two buy in FY93 to FY95 resulted in a slight increase in the program acquisition unit cost.

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

j. Program Management and Control.

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k. Cost Control Actions.

Since the launch services funding was transferred from the O&M to the Procurement appropriation and the quantity of IUS vehicles to be acquired has been reduced by two vehicles, no special actions will be implemented as a result of this breach. These causes of increases in unit cost were external to program management and contractor performance.

l. Contract Information (In Millions of Then-Year Dollars) --

(1) Contractor(s): Boeing Aerospace Company
(2) Contract Title: PROD & LAUNCH SERVICES
(3) Contract Number:F04701-85-C-0101
(4) Actual Cost of Work Performed (ACWP) to date: 842.6
(5) Percent contract completed (BCWP/target cost): 94.25
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of 12/27/91	$-31.9/-4.20%	$-21.5/-2.70%
Previous SAR	N/A	N/A
Current values	$-31.9/-3.93%	$-4.9/-0.60%
Change from the baseline SAR	N/A/+0.27%	$+16.6/+2.10%
Change from the previous SAR	N/A	N/A

(7) Explanation of Variances. -

The cost variances are attributed to higher burden costs, unforeseen design and manufacturing problems, and the 1989 strike at Boeing.

(8) Impact of Variances on Contract. -

There is no significant impact from the variances on the contract.

(9) Impact of Variances on Unit Costs. -

There is no significant impact on unit costs.

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

(1) Contractor(s): Boeing Aerospace
(2) Contract Title: Integ & Launch Services
(3) Contract Number:F04701-90-C-0070
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): N/A
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of 12/27/91	N/A	N/A
Previous SAR	N/A	N/A
Current values	N/A	N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	N/A	N/A

(7) Explanation of Variances. -

This contract is for Launch Support Services (first time reported in the SAR), and is a Cost Plus Award Fee/Level Of Effort Contract. As such, it has no performance measurement baseline to produce cost or schedule variance.

(8) Impact of Variances on Contract. - None.

(9) Impact of Variances on Unit Costs. - None.

m. Contracts Exceeding Contract Cost Baseline Thresholds. — None.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	693.2	1310.8	8.3	2012.3
Previous Changes:				
Economic	-2.7	+14.1	-	+11.4
Quantity	-	-461.8	-	-461.8
Schedule	-	-	-	-
Engineering	+42.7	+67.4	-	+110.1
Estimating	-26.4	+157.3	-1.0	+129.9
Other	-	-	-	-
Support	+8.1	-16.1	-	-8.0
Subtotal	+21.7	-239.1	-1.0	-218.4
Current Changes:				
Economic	-0.6	-12.3	+0.1	-12.8
Quantity	-	-209.5	-	-209.5
Schedule	-	+10.5	-	+10.5
Engineering	-	-	-	-
Estimating	+0.6	+126.9	-0.1	+127.4
Other	-	-	-	-
Support	-	+124.7	-	+124.7
Subtotal	-	+40.3	-	+40.3
Total Changes	+21.7	-198.8	-1.0	-178.1
Current Estimate	714.9	1112.0	7.3	1834.2

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	424.2	533.6	5.2	963.0
Previous Changes:				
Quantity	-	-173.7	-	-173.7
Schedule	-	-	-	-
Engineering	+18.6	+23.2	-	+41.8
Estimating	-12.2	+47.9	-0.6	+35.1
Other	-	-	-	-
Support	+3.2	-4.7	-	-1.5
Subtotal	+9.6	-107.3	-0.6	-98.3
Current Changes:				
Quantity	-	-59.5	-	-59.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.2	+36.9	-	+37.1
Other	-	-	-	-
Support	-	+38.2	-	+38.2
Subtotal	+0.2	+15.6	-	+15.8
Total Changes	+9.8	-91.7	-0.6	-82.5
Current Estimate	434.0	441.9	4.6	880.5

b. Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices.

Engineering: Increase to implement design enhancements specific to the DSP satellite to improve performance.

Estimating: Changes to absorb the impact of revised inflation rates. Design changes due to on-orbit anomaly experienced in April 1983. Re-estimated development costs for software and hardware associated with the three new vehicles. Re-estimated IUS study costs due to termination of Flight Weight Engine Technology Program (XIR-132) funding. Adjustment for prior year escalation.

Support: Additional 2 years of technical effort (1991 and

13b. Cost Variance Analysis (Cont'd):
1992).

PROCUREMENT

Economic: Revised economic escalation indices.

Quantity: Deletion of ten vehicles. Increase of four vehicles. Deletion of four vehicles. Increase of three vehicles. Addition of 1 IUS vehicle.

Engineering: Engineering changes associated with ten deleted vehicles.
Engineering changes associated with IUS Useful Life Extension Program and Solid Rocket Motor unit upgrade. Real time telemetry tracking and data system hardware upgrade.

Estimating: Changed from multi-year to annual buy strategy. Engineering changes to second stage motors relating to on-orbit anomaly experienced in April 1983. Contractor reduced the unit cost of IUS vehicles to be more competitive with Centaur. Solid Rocter Motor replacement eliminated as a requirement. Adjustment for addition of Space Launch Recovery funds. Changes to reflect Congressional recissions based upon Shuttle Launch slips. Re-estimated funds for problems and upgrades. Changes to absorb the impact of revised economic rates in prior years.

Support: Support change associated with Quantity change. Federally funded Research Center support for extra years launches. Support category adjustment. Reduced IUS technical effort in FY 85-90 to a level consistent with an "Operational Program". Additional year of Aerospace Corporation support. Correction of categorization and costs reflected in error in the Dec 88 SAR. Deletion of funds due to the inability to upgrade the Systems Integration Laboratory (SIL). Re-estimated cost of Computer Operating System(COS) upgrade. Environmental testing for safe and arm devices.

MILCON

Estimating: Adjustment for prior year actuals.

13c. Cost Variance Analysis (Cont'd):

c. Current Change Explanations —

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Economic Escalation Indices (Economic)	--	-0.6
Revised Sustaining Efforts for new buy and launch profile (Estimating)	0.2	0.6
Total Changes	0.2	--
(2) PROCUREMENT		
Revised Economic Escalation Indices (Economic)	--	-12.3
Delete FY97 Buy of 2 Vehicles (Quantity)	-59.5	-209.5
Deferment of two vehicle buy from FY93 to FY95 (Schedule)	--	10.5
Revised Sustaining efforts for new buy and launch profiles (Estimating)	36.9	126.9
Conversion of Integration and Launch Services funds from Operations and Maint Appn to Missile Proc Appn (Support)	38.2	124.7
Total Changes	15.6	40.3
(3) MILCON		
Revised Economic Escalation Indices (Economic)	--	0.1
Adjustment to MILCON Estimate due to Revised Inflation Indices. (Economic)	--	-0.1
Total Changes	--	--

14. **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
111.794	-0.140	22.306	1.050	11.010	25.730	--	11.670	71.626	183.420

15. **Contract Information:** (Then-Year Dollars in Millions)

a. Procurement --

PROD & LAUNCH SERVICES:	Initial Contract Price		
	Target	Ceiling	Qty
Boeing Aerospace Company, Seattle, WA F04701-85-C-0101, FPIF/AF Award: July 3, 1985 Definitized: September 11, 1985	$373.7	$416.5	3

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$939.7	$1026.3	9	$939.7	$939.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-31.9	$-21.5
Cumulative Variances To Date (12/12/91)	$-31.9	$-4.9
Net Change	$0.0	$16.6

Explanation of Change:

Schedule variance -- The improvement in schedule variance was caused by delivery of several behind-schedule parts. No impact to program or contract.

Target and ceiling cost changes -- The Contract Target Price has decreased $3.2 million since the Dec 90 report; the Ceiling Price has increased $10.3M. The primary reason for these changes is settlement of a series of defective pricing cases as well as a credit proposal reflecting a change in the Mission Master Phasing Plan.

This contract is essentially complete and will no longer be reported in the SAR.

NOTE: Contract type should read FPIF/AF/PI.

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Integ & Launch Services:	Initial Contract Price Target	Ceiling	Qty
Boeing Aerospace, Seattle, WA F04701-90-C-0070, CP/AF Award: October 15, 1990 Definitized: July 5, 1991	$298.1	$304.7	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$298.1	$304.7	0	$304.0	$304.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	N/A	N/A
Net Change	$0.0	$0.0

Explanation of Change:

This is the first time this contract is reported in the SAR.

Contract type should read CPAF/LOE.

As an LOE contract, there are no cost or schedule variances.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 77.3% (17 yrs/22 yrs)

(2) Percent Program Cost Appropriated: 77.7% ($1424.4 / $1834.2)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY76-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	687.5	5.8	4.4	17.2	714.9
Procurement	662.5	61.3	59.7	328.5	1112.0
MILCON	7.3	-	-	-	7.3
O&M	-	-	-	-	-
Total	1357.3	67.1	64.1	345.7	1834.2

c. Annual Summary —

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1976				4.5	4.9	4.9	4.9	7.0
197T								
1977				21.9	25.7	25.7	25.7	7.4
1978				55.0	69.8	69.8	69.8	7.0
1979				74.7	103.3	103.3	103.3	8.4
1980				64.2	98.8	98.8	98.8	9.4
1981				63.4	108.0	108.0	108.0	11.9
1982				24.1	43.9	43.9	43.9	9.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1983				60.9	115.9	115.9	115.9	4.9
1984				18.1	35.8	35.8	35.8	3.8
1985				15.4	31.4	31.4	31.4	3.4
1986				5.3	11.1	11.1	11.1	2.8
1987				3.6	7.7	7.7	7.7	2.7
1988				1.7	3.9	3.8	3.8	3.0
1989				4.1	9.5	7.8	7.8	4.2
1990				5.4	13.0	13.0	7.9	4.0
1991				1.9	4.8	2.7	1.0	3.9
1992				2.2	5.8			3.1
1993				1.6	4.4			3.3
1994				1.6	4.3			3.3
1995				1.5	4.3			3.3
1996				1.5	4.3			3.2
1997				1.4	4.3			3.2
Subtot	1			434.0	714.9	683.6	676.8	

Obligated and expended amounts are based on program office records as of 31 Dec 91.

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3020 Missile Procurement, Air Force								
1978				0.7	1.0	1.0	1.0	7.0
1979				35.6	54.6	54.6	54.6	8.7
1980				24.0	41.9	41.9	41.9	9.7
1981				8.8	16.8	16.8	16.8	11.9
1982	2		59.5	38.2	78.4	78.4	78.4	9.6
1983	2		33.8	38.7	84.1	84.1	79.5	9.0
1984				30.4	68.8	68.8	62.4	8.0
1985				38.6	90.0	90.0	53.2	3.4
1986	3		81.4	42.8	104.3	104.3	79.9	2.8
1987				2.8	7.0	7.0	3.4	2.7
1988				24.9	65.8	65.0	47.7	3.0
1989								4.2
1990				9.5	26.7	18.5	12.9	4.0
1991		120.2		8.0	23.1	11.2	3.0	3.9
1992				20.5	61.3			3.1
1993				19.3	59.7			3.3
1994				18.3	58.5			3.3
1995	2		51.7	56.3	185.4			3.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force (Cont'd)								
1996				12.4	42.1			3.2
1997				12.1	42.5			3.2
Subtot	9	120.2	226.4	441.9	1112.0	641.6	534.7	

Obligated and expended amounts are based on program office records as of 31 Dec 91.

Appropriation: 3300 Military Construction, Air Force

1979				4.6	7.3	7.3	7.3	9.6
Subtot				4.6	7.3	7.3	7.3	
Grand Total	10	120.2	226.4	880.5	1834.2	1332.5	1218.8	

Obligated and expended amounts are based on program office records as of 31 Dec 91.

17. **Production Rate Data:**

a. Annual Production Rates -- None.

Since production is less than 6 units in any two years, production rate data is not required.

b. Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	880.5	N/A	
(TY $)	N/A	N/A	1834.2	N/A	
PAUC Cost (BY $)	N/A	N/A	88.050	N/A	N/A
(TY $)	N/A	N/A	183.420	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

No report. Production less than six per year.

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	1/1
Procurement	7/7

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs:**

18a. Operating and Support Costs (Cont'd):

a. Assumptions and Ground Rules --

The Inertial Upper Stage is not a truly "operational" system because the vehicles do not require maintenance, modification, refurbishment, spares, petroleum, oil, and lubricants, etc. as aircraft do.

All costs in this section are funded in the Air Force missile procurement appropriation (FY93-97); they do not include funds provided by NASA for launch support of their TDRS-F and -G spacecraft.

Costs are estimated on the basis of the most recent mission manifest. They do not allow for significant compression or extension of launch dates, addition of new spacecraft users, or a requirement to accommodate a new booster.

Costs -- Total costs for these elements over the five year period of interest are:

Cost Element	FY93 - 97, $M (TY)
Integration & Launch Services	163.5
Aerospace Corporation Support	44.3
Independent Verif. & Valid.	4.3
Propellants/Shipments	2.5
Depot Repair	25.6

Contractor Support Costs -- N/A

Average annual costs for each element are not provided. Because of low launch rates and NASA's significant contributions to launch costs during FY 94 & 95, any average annual costs would be misleading.

No antecedent system for the IUS system exists.

The "O&S" costs provided here are comprised of the following elements:

1) Integration -- This effort involves establishing and maintaining the interfaces between the IUS vehicle, the "payload" (or spacecraft), and the boost vehicle.

2) Launch Services -- For the Inertial Upper Stage, "Launch Services" includes prelaunch processing of the vehicle, ground and

18a. Operating and Support Costs (Cont'd):
flight operations during launch, logistics efforts associated with launch activities, postflight analyses (including anomaly resolution and evaluation of unexplained event reports). These elements are not separately priced in IUS contracts. Also included in launch services activities are Aerospace Corporation support, Independent Verification and Validation (IV&V) of flight software, propellants/fuels, and air shipment costs (for transporting IUS vehicles and motors from the manufacturing sites to the Eastern Launch Site).

3) Storage Costs -- Storage costs are not separately priced in the IUS contracts. These costs are part of G&A/overhead on the production contracts that purchased the vehicles.

4) Performance Incentives -- Associated with each IUS mission are positive and negative "mission success incentives," or MSIs. All vehicles currently in the inventory carry these incentives, though the value varies significantly from launch to launch. The costs are NOT included here, because the MSIs were funded (by the procurement appropriation) in the year in which each vehicle was purchased. This occurred most recently in FY 86.

5) Finally, the program spends about $5M a year for "depot repair" capability in support of integration and launch services.

b. Costs -- None.

c. Contractor Support Costs -- None.

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LANTIRN

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
   Low Altitude Navigation and Targeting Infrared System for Night (LANTIRN)

2. **DoD Component:** USAF

3. **Responsible Office and Telephone Number:**
   ASD/VL
   LANTIRN SYSTEM PROGRAM OFFICE
   AERONAUTICAL SYSTEMS DIVISION
   WPAFB, OH 45433-6503

   COL LESLIE FARR KENNE
   Assigned: August 6, 1990
   AV 785-7273 COMM (513)255-7273

4. **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 0603249F
   PE 0604249F Project 2693
   PROCUREMENT:
   APPN 3010 ICN NONE (Air Force)

SAF/PAS

92-160 -T

5. **Related Programs:**
   Infrared Maverick, F-16 Aircraft, F-15E Aircraft

6. **Mission and Description:**
   The LANTIRN system provides the Tactical Air Forces with the capability of conducting counter air and interdiction at night and under-the-weather using F-15E and F-16C/D Block 40/42 aircraft. The prime system consists of a separately attached navigation pod and a

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6. Mission and Description (Cont'd):

targeting pod used in conjunction with the aircraft's head up display (HUD) and head down display (HDD). The navigation pod has a Ku band terrain following radar, a wide field-of-view forward looking infrared (FLIR) sensor, and associated electronics to project the outside IR scene and terrain following commands onto the HUD for low altitude, high speed ingress and egress from the target area. The targeting pod provides a wide or narrow field-of-view target acquisition FLIR scene projected on the HDD, automatic tracker, laser designator/ranger, IR Maverick missile boresight correlator, associated electronics, and growth provisions for an automatic target recognizer.

The LANTIRN interface with the two aircraft (F-15E and F-16C/D Block 40/42) is through the 1553 data bus and the aircraft central computer. Integration of the system has been demonstrated on both aircraft, and further aircraft flight test integration/verification is ongoing.

In addition to prime mission hardware, the LANTIRN system consists of a complete maintenance capability at the organizational, intermediate, and depot levels. O-level fault isolation to the LRU level is performed with system resident Built-In-Test. I-level maintenance is performed in the LANTIRN Mobility Shelter Set (LMSS) that is designed for bare base deployment. The LANTIRN Depot Level Technical Repair Center (TRC), located at Warner Robins Air Logistics Center (WR-ALC), is currently in production. It will allow for complete fault isolation and repair, in an environment designated as the Paperless LANTIRN Automated Depot (PLAD), of all failed hardware not repaired at the organizational and intermediate levels. Pod software maintenance will be performed in the Avionics Integration Support Facility (AISF) at WR-ALC.

7. Program Highlights:

a. Significant Historical Developments --

Direction from HQ USAF for the LANTIRN Full Scale Development (FSD) program was issued in Dec 79. The Request for Proposal was issued in Feb 80 with a competitive source selection following from Apr-Sep 80. Marconi Avionics Ltd. was awarded the Head-Up Display (HUD) contract in Jul 80. Martin Marietta Corporation (MMC) was awarded the Fire Control System contract in Sep 80. In 1984, the program was restructured to match the revised President's Budget (PB) for FY85, 86, and 87. Recognizing that the targeting pod (TP) would require more development work and testing before production, the Air Force allowed a one-year delay for TP production in the restructure. During 1983 and 1984, the Navigation Pod (NP) successfully completed fifteen months of flight testing at Edwards AFB and two months flying over Canada, in a weather/terrain environment similar to Western

7a. Program Highlights (Cont'd):

Europe. The ability to fly very low at night and attack targets was fully demonstrated. In Feb 85, the NP received AFSARC IIIA production approval. The production contract, that included the firm fixed price basic contract plus 6 options, was awarded to MMC on 1 Apr 85. That contract was for 700 pod sets (NP and TP) plus 29 sets of intermediate level support equipment (ILSE). In Jul 85, the program received direction to transfer the HUD portion of the system to the F-16 Program Office. In Sep 85, a highly successful AFSARC update report on IOT&E deficiencies/fixes took place. As a result, the first production option was exercised in Dec 85 for an additional seven NPs and four sets of ILSE. In May 86, the AFSARC IIIA low rate production decision authority for an initial buy of 2 TPs was received. In Nov 86, the NP was approved for high rate production. In Nov 86, the LANTIRN system successfully demonstrated a dual Maverick Missile launch capability. By the end of 1986 the LANTIRN Full Scale Development (FSD) TP had successfully completed all Development Test and Evaluation (DT&E) and Independent Operational Test and Evaluation (IOT&E) flight testing. The first flight of a FSD NP on an F-15E took place in May 87. In Mar and Jun 87 respectively, the first and second production NPs were both delivered to the Air Force one month ahead of schedule. The LANTIRN system (NP and TP) underwent Follow-on Test and Evaluation (FOT&E) during May-Jul 87. The results presented by the Air Force Operational Test and Evaluation Center were positive. Flight test of the production NP on the F-16 started in Aug 87. No major problems were encountered. A high rate production decision for the TP was deferred until early FY89 to allow completion of the LANTIRN integration on the F-15E and weapons delivery testing on the F-16 aircraft. AFSARC IIIB authorization was received to enter TP full-rate production in Dec 88. First operational demonstration sorties were flown on the F-15E aircraft in May 89. The FY90 PB deleted 72 pod sets and 3 sets of ILSE. Air Force maintenance training was established at the Technical Training Center at Lowry AFB CO in Jan 89. Required Assets Available (RAA) for the NP was achieved at Seymour Johnson AFB NC in Sep 89. By 31 Dec 89 TAC had flown 138 F-16 LANTIRN sorties (165.6 hours) and 1481 F-15E LANTIRN sorties (1921.3 hours) and achieved 96.9% and 97.5% effectiveness rates respectively. By Dec 89 the first three acquisition phases of the LANTIRN computer integrated repair capability for Warner Robins ALC were awarded. The FY90-91 Amended PB reduced the program from 628 to 561 Pod Sets. With the exercise of the FY89 option, the 561 NP and 26 ILSE set acquisition program was completed and only 240 TPs remained to be acquired. The FY90 Option for 120 TPs was exercised in Dec 89. The FY91 PB deleted 55 of the final 120 TPs to be bought. In CY 1990 the contractor delivered 198 NPs (9 ahead of schedule), 14 sets of ILSE (4 ahead of schedule), and 22 TPs (on schedule). Rate production of 18 NPs/month was achieved in Jul 90 (1 month early). Technical and manufacturing

7a. Program Highlights (Cont'd):

problems on the TP necessitated a renegotiation of the delivery schedule in Dec 90 and slipped the TP RAA by three months and the final TP delivery by four months. An Operational Test and Evaluation "Quick Look" demonstration of the TP was performed at Nellis AFB with 99% mission effectiveness. F-15E and F-16 C/D Block 40/42 LANTIRN squadrons, equipped with the NP, and the ILSE, known as the LANTIRN Mobility Shelters Sets (LMSSs), to support those squadrons were deployed to Desert Shield. The final phases of the LANTIRN Computer Integrated Repair Capability for LANTIRN depot at Warner Robins ALC were awarded in 1990. A contract for the depot training program that included the Computer Based Technical Orders (CBTOs) and Paperless LANTIRN Automated Depot (PLAD) systems was awarded in Aug 90. The remaining technical order contracts were awarded in 1990. The TP RAA and the NP Program Management Responsibility Transfer milestone (PMRTM) events were achieved as scheduled in Dec 90.

b. Significant Developments Since Last Report —
January 1991 began with 96 F-16C and 48 F-15E aircraft deployed to Desert Shield with LANTIRN navigation systems. Twelve of those F-15E aircraft were also equipped with the first LANTIRN targeting systems delivered to TAC. During Desert Storm an additional eight LANTIRN targeting systems were deployed for the F-15Es. The LANTIRN system performed extremely well with the LANTIRN equipped F-16Cs flying over 7600 combat hours and the F-15Es flying over 7000 hours. The LANTIRN navigation system had a Desert Storm fully mission capable (FMC) rate of 96 percent, while the newly-fielded LANTIRN targeting system had an FMC rate of 78 percent. An Air Force Systems Command Product Support Team consisting of two contractor targeting system technicians and a program office liaison officer deployed to the Gulf theater for additional support to the newly deployed targeting system. During CY 1991 the contractor delivered 222 navigation pods, 19 ahead of schedule; and 79 targeting pods, 41 behind schedule. The 26th and final LANTIRN Mobility Shelter Set (LMSS) was delivered in April 1991 (4 months ahead of schedule). The first Pathfinder pod (essentially a navigation pod without the terrain following radar) was delivered in May 1991 for the Egyptian Foreign Military Sales (FMS) program. The targeting system was successfully deployed at Osan AB, Korea, in August 1991, eight months early, in order to provide a precision guided munitions capability for PACAF. Production of a state-of-the-art paperless LANTIRN automated depot (PLAD) repair capability has progressed well. The organic Air Force depot repair capability for the navigation system, using the PLAD, is scheduled for activation in February 1992. Although the targeting pods being delivered performed well, the contractor, (Martin-Marietta Electronics Systems (MMES) of Orlando, FL,) was unable to sufficiently eliminate variability in the production process to achieve rate production. Consequently, the MMES Company President

7b. Program Highlights (Cont'd):

took over LANTIRN program management responsibility in July to provide the emphasis and resources to improve producibility. Additionally, the Air Force program office implemented a proactive "process variability reduction initiative" with government process experts to assist the contractor in improving targeting system producibility and achieving rate production. The major benefits of the process variability reduction efforts will be realized in mid-92. Meanwhile the contractor continued to deliver targeting system slower than desired, therefore, progress payments were reduced in October.

The LANTIRN system is expected to satisfy the mission requirement.

c. Changes Since As Of Date -- None.

8. Threshold Breaches:
There are currently no Acquisition Program Baseline (APB), dated 31 Jan 1992, breaches or Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --	Development Estimate	Approved Program	Current Estimate
Program Initiation	DEC 79	DEC 79	DEC 79
FCS Program Restructure	SEP 81	SEP 81	SEP 81
HUD F-16 Flight Test Complete	DEC 82	DEC 82	DEC 82
First FSD Navigation Pod Delivery	FEB 83	FEB 83	FEB 83
HUD F-16 Production Decision	JAN 83	DEC 84	DEC 84
Complete DT&E/IOT&E			
Navigation Pod	DEC 84	SEP 85	SEP 85
Targeting Pod	DEC 84	MAR 86	MAR 86
Production Decision/AFSARC IIIA			
Navigation Pod	FEB 85	MAR 85	MAR 85
Targeting Pod	FEB 85	MAY 86	MAY 86
AFSARC IIIB			
Navigation Pod	N/A	OCT 86	OCT 86
Targeting Pod	N/A	DEC 88	DEC 88
First Navigation Pod Delivery	AUG 87	APR 87	APR 87
Complete FOT&E	N/A	SEP 87	SEP 87
First Targeting Pod Delivery (Paired Delivered Navigation & Targeting Pods equates to Fire Control System)	AUG 87	JUN 88	JUN 88
F-15E OT&E -- (F-15 PD Controlled)			

9a. Schedule (Cont'd):

Milestones (Cont'd) —	Development Estimate	Approved Program	Current Estimate
Start	N/A	DEC 88	DEC 88
Complete	N/A	DEC 89	DEC 89
F-16 OT&E — (F-16 PD Controlled)			
Start	N/A	OCT 89	MAY 89
Complete	N/A	DEC 89	OCT 89
F-15E/Blk40/42 F-16 FOT&E — (TAC Controlled) start at Nellis AFB	N/A	NOV 89	NOV 89
RAA Nav Pod	N/A	SEP 89	SEP 89
F-15E LANTIRN Trials Period			
Start	N/A	JUL 90	JUL 90
Complete	N/A	SEP 90	SEP 90
RAA - Target Pod	N/A	SEP 90	DEC 90
PMRT - Nav Pod	N/A	FEB 91	MAY 91
PMRT - Target Pod & Support Equipment	N/A	N/A	N/A (Ch-1)
Organic Depot — Nav Pod	N/A	MAR 92	MAR 92
Last Delivery — Nav Pod	N/A	JUN 92	MAY 92
Organic Depot — Target Pod	N/A	OCT 93	OCT 93(Ch-2)
Last Delivery — 506th Target Pod	N/A	SEP 94	SEP 94(Ch-2)
Contract Award (HUD)	JUL 80	N/A	N/A
Contract Award (FCS)	SEP 80	N/A	N/A
HUD A-10 Flight Test Complete	DEC 82	N/A	N/A
HUD A-10 Production Decision	MAY 83	N/A	N/A
First FSD Target Pod Delivery	JUL 83	N/A	N/A
Auto Target Recognizer Adv Dev Tech Eval	OCT 84	N/A	N/A
Competitive TGT Pod Fly Off	DEC 84	N/A	N/A
FCS F-15E Flight Test Complete (FSD)	MAY 88	N/A	N/A
FCS A-10 Flight Test Complete	SEP 87	N/A	N/A
First FSC Production Delivery	AUG 87	N/A	N/A

Complete DT&E/IOT&E for Navigation Pod and Targeting Pod for the Development Estimate has a date of Dec 84. These 2 milestones should be represented as N/A because they were not a part of the Development Estimate.

b. Previous Change Explanations —

Automatic Target Recognizer deleted. HUD F-16 Production Decision was delayed from Jan 83 to Feb 85 to reflect actual need, then changed to Dec 84. F-16 flight testing extended to allow additional time for flight test improvements. The Aug 84 restructure delayed targeting pod (TP) program one year. F-15E was added to program scope. A-10 aircraft program changed to meet 1991

9b. Schedule (Cont'd):
TAC IOC. A-10 aircraft requirement deleted. Additional time was required for flight test improvements. Date of actual production decision slipped from Feb 85 to Mar 85. Completion of IOT&E changed from Feb 86 to May 86. Changed IOC date for navigation pod (NP) from TBD to FY89, and for TP from TBD to FY90 to reflect current contractual commitment. Changed First FCS Production Delivery (FFCSPD) for NP and TP from TBD to Apr 87 and Jul 88 respectively to reflect contractual commitment. Completion of DT&E on F-15E aircraft by both contractor and Air Force changed from Aug 88 to Mar 89. Changed FFCSPD on NP to reflect actual delivery of the NP one month early (Mar 87 vs Apr 87). Production decisions for NP and TP adjusted to reflect USD(A) baseline approval. TP FFCSPD updated to reflect actual delivery one month early. "FCS F-16 Flight Test Complete" title was modified for both NP and TP (FSD added) to more accurately identify the milestone. The milestone title FCS F-16 Flight Test Complete was changed to Complete DT&E/IOT&E to comply with APB guidance. The milestone title Production Decision was changed to AFSARC IIIA. The following items were added to the SAR milestones: AFSARC IIIB, F-15E OT&E, F-16 OT&E, F-15E/Blk 40/42 F-16 FOT&E, F-15E LANTIRN Trial Period, PMRT, Organic Depot, and Last Delivery Tgt Pod. The milestone titles Navigation Pod and Targeting Pod were changed to First Navigation Pod Delivery and First Targeting Pod Delivery, respectively. The milestone title IOC was changed to RAA. The last 10 milestones beginning with "Contract Award (HUD)" are no longer tracked in the APB.

c. Current Change Explanations --

(CH-1) Due to the merger of AFSC and AFLC to create AFMC, there will no longer be target pod and support equipment PMRT. This item will be deleted in future SARs.

(CH-2) The Current Estimate for Organic Depot--Target Pod changed from Mar 93 to Oct 93 and Last Delivery--506th Target Pod changed from Jan 94 to Sep 94. This is because the contractor will reach rate production later than currently scheduled.

d. References --

Development Estimate:
Secretary of the Air Force Review 18 Nov 82. Original PMD R-Q0023(1)/63249F, 21 Dec 79.

Approved Program:
AFAE approved Acquisition Program Baseline dated 31 Jan 92.

10. **Performance Characteristics:**

a. Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
System Maximum Weight including 2 pods (lbs)	985	999 / 999	953	975 (CH-1)
Terrian Following Altitude (ft)	N/A	200 / 200	N/A	N/A
MTBF FCS Mature Requirement (10,000 hrs)	N/A	34 / 34	29.2	34
Targeting Pod	N/A	N/A / N/A		
Navigation Pod	N/A	N/A / N/A		
Max Total A/C Power KVA	10.8	14.9 / 14.9	14.9	14.9
HUD-NAVIGATION POD				
Total Instantaneous Field of View (degrees)				
Horizontal	25	25 / 25	30	N/A
Vertical	20	20 / 20	20	N/A
HUD-TARGET POD				
Wide FOV (WFOV) (degrees)				
Horizontal	8	6 / 6	6	6
Vertical	8	6 / 6	6	6
Narrow FOV (NFOV) (degrees)				
Horizontal	1.7	1.7 / 1.7	1.7	1.7
Vertical	1.7	1.7 / 1.7	1.7	1.7
Automatic IR Maverick Handoffs Per Pass	N/A	1 / 1	2	2
Detectivity (D*) BB				
Navigation Pod	N/A	1.3 x 10 ** 10 cm (HZ) ** 1/2 / W / 1.3 x 10 ** 10 cm (HZ) ** 1/2 / W	1.3 x 10 **10 cm (HZ)** 1/2 /W	1.3 x 10(CH-2) **10 cm (HZ)** 1/2 /W
Targeting Pod	N/A	1.8 x 10 ** 10 cm (HZ) ** 1/2 / W / 1.8 x 10 ** 10 cm (HZ) ** 1/2 / W	1.8 x 10 **10 cm (HZ)** 1/2 /W	1.8 x 10(CH-2) ** 10 cm (HZ)** 1/2 /W
Angular Resolution				

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Navigation Pod	N/A	1.02 mrad (6 deg) 290 microrad (1.7 deg) 82.5 microrad	/ 1.02 mrad (6 deg) 290 microrad (1.7 deg) 82.5 microrad	1.02 mrad (6 deg) 290 microrad (1.7deg) 82.5 microrad	1.02 mrad (6 deg) 290 microrad (1.7deg) 82.5 microrad
Target Acquisition Range NM	N/A	4	/ 4	4	4

b. Previous Change Explanations --

Automatic Target Recognizer deleted. The Navigation Pod Field Projection Interim Threshold development estimate was 13.2 hours and demonstrated performance from IOT&E was 11.2 hours. Operational HUD Horizontal Total Field of View and Instantaneous Field of View development estimate was 25 degrees and demonstrated performance was 30 degrees. FCS MTBF modified to reflect field projection. HUD weight revised to measured value. HUD MTBF revised to reflect impact of DT&E/IOT&E performance. Navigation and Targeting Pod reliability data was added as a result of separating procurement of these two pods. Additional weight allowed in specifications for F-15E integration. Prior estimate was 978. Target Pod reliability growth curve restructured in March 1985. Development estimate was 28.5. Demonstrated performance from IOT&E on the Target Pod Field Projection increased from 26.3 to 40.1. Demonstrated performance for auto IR Maverick Handoffs per pass increased from 1 to 2. A-10 requirement deleted. Weight changed from 990 to 999 as a result of minor redesign for compatability with F-15E flight environment. Maximum power changed to 14.8 to provide additional power for the Environmental Control Unit to handle the F-15E flight environment. Adjusted to reflect USD(A) baseline approval. Adjusted to reflect items not previously reported. Updated to reflect latest information on delivered production pod set weight. The correct value for Max Total A/C Pwr is 14.9KVA. Automatic IR Maverick Handoffs Per Pass was added to the APB, so the Approved Program was changed to reflect that value (1). The last 41 characteristics beginning with "HUD Transmissivity (%)" are no longer tracked in the APB.

10c. Performance Characteristics (Cont'd):

c. Current Change Explanations --

(CH-1) The Current Estimate for System Maximum Weight reflects the latest information on maximum production pod set weights.

(CH-2) This corrects data erroneously reported in last SAR (Dec 90).

d. References --

Development Estimate:
Secretary of the Air Force Review 18 Nov 82. Original PMD R-Q0023(1)/63249F, 21 Dec 79.

Approved Program:
AFAE approved Acquisition Program Baeline dated 31 Jan 92.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	420.4	403.6	405.5
Procurement	1681.7	1874.6	1873.5
Total Flyaway	(1297.9)		(1390.4)
Total Flyaway	(1297.9)		(1390.4)
Other Weapon Systems Cost	(105.0)		(174.9)
Total Other Wpn Sys	(105.0)		(174.9)
Peculiar Support	(206.7)		(224.1)
Initial Spares	(72.1)		(84.1)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 80 Base-Year $	2102.1	2278.2	2279.0
Escalation	1721.1	1523.1	1540.5
Development (RDT&E)	(128.5)	(124.7)	(126.9)
Procurement	(1592.6)	(1398.4)	(1413.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	3823.2	3801.3	3819.5

b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	1316	1067	1067
Total	1316	1067	1067

There are 12 Development (RDT&E) units in this program. They are not fully configured end items and are not part of the Air Force

11b. Total Program Cost and Quantity (Cont'd):
inventory, so they were not included in this section. Quantity includes targeting and navigation pods.

c. Foreign Military Sales --

ISRAEL	56.4	0.0	0.0
EGYPT	122.7	0.0	0.0
KOREA	104.0	0.0	0.0
KOREA II	152.9	0.0	0.0
TURKEY	185.5	0.0	0.0

The Israel case changed from 56.0 to 56.4, this includes AFLC/ILC support costs. The Egypt case changed from 107.8 to 122.7 because of an increase for support equipment, spares, program management, and a class IV mod to the aircraft. The Turkey case changed from 188.4 to 185.5 because of a decrease in support equipment. Korea had a follow-on buy of 18 navigation pods and 19 targeting pods.

d. Nuclear Costs --
None.

e. References --

Development Estimate:
Secretary of the Air Force Review 18 Nov 82. Original PMD R-Q0023(1)/63249F, 21 Dec 79.

Approved Program:
AFAE approved Acquisition Program Baeline dated 31 Jan 92.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3819.5	3822.7	3819.5
(2) Quantity	1067	1067	1067
(3) Unit Cost	3.580	3.583	3.580

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. Current Procurement —	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	5.3	5.3	4.1
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	5.3	5.3	4.1
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. Cost Variance Analysis:

a. Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	548.9	3274.3	0.0	3823.2
Previous Changes:				
Economic	-12.5	-275.8	-	-288.3
Quantity	-	-265.0	-	-265.0
Schedule	+28.5	+24.5	-	+53.0
Engineering	-67.7	+38.4	-	-29.3
Estimating	+18.4	+322.3	-	+340.7
Other	-	-	-	-
Support	+18.0	+170.4	-	+188.4
Subtotal	-15.3	+14.8	-	-0.5
Current Changes:				
Economic	-0.2	-15.1	-	-15.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.0	+1.5	-	+0.5
Other	-	-	-	-
Support	-	+11.6	-	+11.6
Subtotal	-1.2	-2.0	-	-3.2
Total Changes	-16.5	+12.8	-	-3.7
Current Estimate	532.4	3287.1	-	3819.5

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1980 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	420.4	1681.7	0.0	2102.1
Previous Changes:				
Quantity	-	-140.8	-	-140.8
Schedule	+19.8	+8.0	-	+27.8
Engineering	-49.0	+18.9	-	-30.1
Estimating	+5.6	+205.6	-	+211.2
Other	-	-	-	-
Support	+9.3	+92.9	-	+102.2
Subtotal	-14.3	+184.6	-	+170.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.6	+0.8	-	+0.2
Other	-	-	-	-
Support	-	+6.4	-	+6.4
Subtotal	-0.6	+7.2	-	+6.6
Total Changes	-14.9	+191.8	-	+176.9
Current Estimate	405.5	1873.5	-	2279.0

b. Previous Change Explanations --

RDT&E

Economic: Revised economic and OSD inflation/escalation indices.

Schedule: A-10 slipped to out years to compensate for FY84 program reductions.

Engineering: Funding and technology for the ATR deleted from the program. Adjustment for prior year escalation. A-10 Aircraft removed from program.

Estimating: Program restructure due to FY84 congressional cuts and increased test requirements. Also adjusted for changes in current and prior year escalation indices. Corrected error from 31 Dec 84 SAR. Reestimate of program. Refinement of estimate.

13b. Cost Variance Analysis (Cont'd):

Increase in FY91 funding for completion of software DT&E efforts.

Support: Support equipment program restructured to reflect $30M FY84 congressional cut.

PROCUREMENT

Economic: Revised economic and OSD inflation/escalation indices.

Quantity: Change in the number of pod sets from 700 to 628 (1400 pods to 1256 pods). Decrease in number of pods by 189 pods (67 NAV & 122 TGT).

Schedule: Target pod production start date delayed by one year. Total buy schedule extended one year. Moved production up from FYs 90-91 to FYs 88-89.

Engineering: Additional funds for Eye Safe Laser and F-15E Compatibility.

Estimating: Adjustment for current and prior year escalation. Corrected error from 31 Dec 84 SAR. Include additional R&M/Warranty requirements. Restoration of FY88-91 FFP Contract. Reestimate of ECO requirements. Refinement of estimate based on actual contractual negotiations.

Support: Reestimate of spares requirement. Added 4 Support Equipment and revised initial spares in FY83 SAR. Subsequently, SE sets have been reduced from 40 to 29 based on user requirements. Restoration of FY88-91 FFP contract. Adjustment for current and prior year escalation. Reestimate of spares and PSE requirements. PSE sets reduced from 29 to 26. Redefined estimate of Other Government Costs. PSE adjusted based on actual contractual negotiations. Reestimate of Depot requirements due to increases for repair equipment, AISF software and quality/efficiency initiatives. Reestimate of initial spares requirements.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices (Economic)	N/A	-0.2
Decrease in FY90 to fund PRAM and C-17 unfunded requirements and expiring funds. (Estimating)	-0.6	-1.0
Decrease in FY92 because of assessments for CAAS, ANSER, FFRDC. (Estimating)	-0.2	-0.2
Adjustment for current and prior year escalation. (Estimating)	0.2	0.2
Total Changes	-0.6	-1.2
(2) PROCUREMENT		
Revised economic escalation indices. (Economic)	N/A	-15.1
Decrease due to an EPA adjustment. (Estimating)	-7.3	-13.6
Adjustment for current and prior year escalation. (Estimating)	8.1	15.1
Increase in Other Government Costs (OGC) because the EPA adjustment. (Support)	5.4	9.7
Decrease in OGC because a payback of prior reprogramming in FY90. (Support)	-1.5	-2.9
Increase in OGC for Interim Contractor Support (ICS) change from 3400 APPN to 3010 APPN. (Support)	0.6	0.9
Adjustment for current and prior year escalation. (Support)	1.9	3.9
Total Changes	7.2	-2.0

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.905	-0.285	0.430	0.050	-0.027	0.320	—	0.187	0.675	3.580

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E —

LANTIRN DEVELOPMENT:
Martin Marietta Corp., Orlando, FL
F33657-80-C-0441, FFP
Award: September 1, 1980
Definitized: September 1, 1980

Initial Contract Price		
Target	Ceiling	Qty
$94.0	$0.0	12

Current Contract Price		
Target	Ceiling	Qty
$428.5	$0.0	12

Estimated Price At Completion	
Contractor	Program Manager
$428.5	$428.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

This contract is over 90% complete and will not be reported in future SARs.

The development contract is a firm fixed price (FFP) contract and no CPR is received, consequently there is no data for variance analysis.

b. Procurement —

LANTIRN PRODUCTION:
Martin Marietta, Orlando, FL
F33657-84-C-0004, FFP
Award: April 1, 1985
Definitized: April 1, 1985

Initial Contract Price		
Target	Ceiling	Qty
$87.3	$0.0	2

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$3079.8	$0.0	1067	$3112.5	$3112.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

The Current Target Price has changed to reflect withdrawals for EPA adjustments, deobligation of FMS funds (Peace Aladdin) to be put on a separate FMS contract, and Engineering Change Proposal (ECP) activity.

NOTE: The Current Contract Price includes all obligations as of 31 Dec 91 on this contract. The Estimated Price at Completion includes all obligations and projected ECPs. The production contract is a firm fixed price (FFP) contract and no CPR is received, consequently there is no data for variance analysis.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status —

(1) Percent Program Completed: 87.5% (14 yrs/16 yrs)

(2) Percent Program Cost Appropriated: 99.8% ($3811.1 / $3819.5)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY79-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94)	Total
RDT&E	527.3	1.8	1.8	1.5	532.4
Procurement	3276.7	5.3	4.1	1.0	3287.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3804.0	7.1	5.9	2.5	3819.5

c. Annual Summary —

Fiscal Year	Qty	Flyaway FY80 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1979				11.2	10.6	10.6	10.6	8.4
1980				30.0	31.7	31.7	31.7	9.4
1981				35.4	41.4	41.4	41.4	11.9
1982				68.9	86.1	86.1	86.1	9.2
1983				76.4	99.8	99.8	99.8	4.9
1984				42.2	57.3	57.3	57.3	3.8
1985				69.6	97.7	97.7	97.7	3.4
1986				25.6	36.8	36.8	36.8	2.8

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY80 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1987				25.5	37.9	37.4	32.5	2.7
1988				12.6	19.3	19.0	18.8	3.0
1989				2.8	4.5	4.1	4.0	4.2
1990				1.5	2.5	2.3	2.3	4.0
1991				1.0	1.7	1.4	1.1	3.9
1992				1.0	1.8	0.2	0.1	3.1
1993				1.0	1.8			3.3
1994				0.8	1.5			3.3
Subtot				405.5	532.4	525.8	520.2	
Appropriation: 3010 Aircraft Procurement, Air Force								
1981		0.8		0.8	1.0	1.0	1.0	11.9
1982		3.6		3.6	5.0	5.0	5.0	9.6
1983								
1984								
1985	2	31.1	25.4	57.4	90.0	89.4	89.4	3.4
1986	9	102.5	99.3	260.9	423.9	420.6	418.8	2.8
1987	150	107.1	223.2	476.0	803.5	803.5	753.1	2.7

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY80 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
1988	250	30.8	264.5	445.8	789.0	788.3	614.3	3.0
1989	471	8.1	312.5	387.2	709.7	706.5	629.4	4.2
1990	120	16.5	100.7	138.8	262.6	250.0	12.7	4.0
1991	65	1.3	63.0	97.9	192.0	169.6	44.8	3.9
1992				2.6	5.3	1.5		3.1
1993				2.0	4.1			3.3
1994				0.5	1.0			3.3
Subtot	1067	301.8	1088.6	1873.5	3287.1	3235.4	2568.5	
Grand Total	1067	301.8	1088.6	2279.0	3819.5	3761.2	3088.7	

The Obligated and Expended values reflect the Program Office records as of 31 Dec 91.

17. **Production Rate Data:**

a. Annual Production Rates —

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1985	4	2	2	2
1986	28	9	9	9
1987	284	150	150	150
1988	752	250	250	250
1989	768	471	471	471
1990	1044	379	120	120
1991	0	139	65	65

NOTE: The following breakout of Production Rate Quantity for navigation pod/targeting pod are provided below.

FISCAL YEAR	DEVELOPMENT ESTIMATE	PRODUCTION ESTIMATE	CURRENT ESTIMATE	MAXIMUM ECONOMIC
1985	2/2	2/0	2/0	2/0
1986	14/14	7/2	7/2	7/2
1987	142/142	143/7	143/7	143/7
1988	376/376	169/81	169/81	169/81
1989	384/384	240/231	240/231	240/231
1990	522/522	139/240	NA/120	NA/120
1991	NA	NA/139	NA/65	NA/65

The funded delivery period in months is as follows:

FY	Navigation Pod	Targeting Pod
85	4	0
86	12	4
87	17	14
88	13	19
89	15	24
90	0	8
91	0	7

17b. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2457.6	-178.6	2279.0	0.0	2279.0
(TY $)	4108.6	-289.1	3819.5	0.0	3819.5
PAUC Cost (BY $)	1.755	0.381	2.136	0.000	2.136
(TY $)	2.935	0.645	3.580	0.000	3.580

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	APR 85	0	APR 85	N/A	APR 85
Duration (in MON)	101	12	113	0	113
End Date(MON YY)	SEP 93	12	SEP 94	N/A	SEP 94

NOTE: The following breakout of the Schedule Variance for the navigation pod and the targeting pod respectively is provided below. The navigation pod production buys were made in FY85 thru FY89, while the targeting pod production buys were made in FY86 thru FY91.

ITEM	PRODUCTION ESTIMATE	VAR	CURRENT ESTIMATE	VAR	MAXIMUM
START DATE (Month/Yr)	4/85 5/86	0	4/85 5/86	0	4/85 5/86
DURATION (In Months)	89/88	+4	89/92	0	89/92
END DATE (Month/Yr)	9/92 9/93	+4	9/92 9/94	0	9/92 9/94

17d. Production Rate Data (Cont'd):

d. Deliveries (Plan/Actual) —

	To Date
RDT&E	12/12
Procurement	627/605

NOTE: The following is a breakout of the navigation/targeting pod deliveries.

DELIVERIES (PLAN/ACTUAL):	navigation pod	targeting pod
RDT&E:	6/6	6/6
Procurement:	487/506	140/99

e. Approved Design-to-Cost Objective — N/A.

18. Operating and Support Costs:

a. Assumptions and Ground Rules —

Current Estimate: Feb 85 Independent Cost Analysis (ICA).

This estimate documents those costs incurred in support of LANTIRN equipment after all weapon platforms have been modified and all group B kits are installed. Cost elements include Depot Maintenance, Second Destination Transportation, Unit Mission Personnel, Installation Support Personnel, Indirect Personnel Support, Personnel Acquisition and Training, Sustaining Investment, and Avionics Integration Support Facility (AISF). Unit level consumption was not calculated because it did not apply to this system since there will not be an increase in consumable supplies over what is already programmed for flightline maintenance.

18b. Operating and Support Costs (Cont'd):

b. Costs — (FY 1980 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Total Deliveries	Avg Annual Cost Per Antecedent
Depot Maintenance	1.7	N/A
Second Destination	0.2	N/A
Unit Mission Personnel	8.6	N/A
Installation Support Per	1.7	N/A
Indirect Personnel Supt	3.0	N/A
Personnel Acq & Training	3.7	N/A
Sustaining Investment	9.9	N/A
AISF	1.2	N/A
Total	30.0	N/A

c. Contractor Support Costs — (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	16.3	4.4	1.0	—	21.7
INDUSTRIAL FUNDS	—	—	—	—	—
Total	16.3	4.4	1.0	—	21.7

NOTE: (Section 18b) Numbers reported in 31 Dec 90 SAR for Antecedent system were in error. There is no antecedent system for LANTIRN.

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*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: ADDS: EPLRS/JTIDS

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
ARMY DATA DISTRIBUTION SYSTEM (ADDS)

CLEARED
FOR OPEN PUBLICATION

MAR 20 1992

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
PROJECT MANAGER ADDS
PEO - COMMUNICATIONS
ATTN: SFAE-CM-ADD
FORT MONMOUTH, NJ 07703-5216

COL LELAND H. HEWITT
Assigned: January 9, 1989
AV 992-4251 COMM (908) 532-4251

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 63713 Project D370
PROCUREMENT:
APPN 2035 ICN BU1400 (Army)
APPN 2035 ICN BA9102 (Army) (Shared)
APPN 2035 ICN BA9620 (Army) (Shared)
APPN 2035 ICN BA970A (Army) (Shared)
APPN 2035 ICN TO1600 (Army) (Shared)
APPN 2035 ICN TO3200 (Army) (Shared)
APPN 2035 ICN TO6200 (Army)
APPN 2035 ICN TO6400 (Army)

No SECURITY Objection TO PUBLIC RELEASE
20 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

5. **Related Programs:**
Position Location Reporting System (PLRS), Joint Tactical Information Distribution System (JTIDS), and Army Tactical Command & Control

*** [redacted] *** OASD(PA) DFOISR 92-T-0598

5. Related Programs (Cont'd):

System (ATCCS).

6. Mission and Description:
The Army Data Distribution System (ADDS) is a Command, Control and Communications (C3) network consisting of the Enhanced Position Location Reporting System (EPLRS) and the Army portion of the Joint Tactical Information Distribution (JTIDS). EPLRS is a direct outgrowth of the USMC PLRS and will provide Battlefield Commanders combat information on the position of their forces in addition to supporting the majority of the data needs of the multitude of computers to be fielded as part of the Army Tactical Command and Control System (ATCCS). JTIDS supports the unique data communications needs of very high volume users with inter-service requirements. ADDS will be fielded to the Active Forces (4 Corps, 12 Divisions).

The EPLRS consists of a Net Control Station (NCS-E) which is used to manage up to 250 EPUUs. The Enhanced PLRS User Unit (EPUU) is a radio that can be configured as Manpack Unit (MPU), a Surface Vehicle Unit (SVU) and an Airborne Vehicle Unit (AVU). The Army portion of the JTIDS consists of a shelterized unit that is deployed as a network control element (NCS-J) that manages other shelters that are employed as relay units (DJRUs). The Class 2M JTIDS Terminals are radios integrated into host operational facilities (OPFACS) to provide necessary high volume data communication capability, all of which are managed by the NCS-J.

7. Program Highlights:
a. Significant Historical Developments --
On 8 August 1979 the Under Secretary of Defense for Research and Engineering authorized the Army to proceed with development of the PLRS/JTIDS Hybrid (PJH) (now EPLRS). In July of 1980 the Training and Doctrine Command (TRADOC) approved an Operational and Organizational (O&O) Concept, which established PJH (now EPLRS) as a Division-based system and identified fielding requirements for sixteen (16) Army divisions. In September 1982, the Army System Acquisition Review Council (ASARC) approved PLRS production and endorsed the accelerated, overlapping five-phase development strategy for PJH (now EPLRS). In August 1984, TRADOC approved a revised O&O Plan which established PJH (now EPLRS) as a Corps-based system instead of a Division-based system and expanded the fielding requirement to eighteen (18) Divisions and five (5) Corps. In February 1985, the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (ASD-C3I) approved the development of the downsized version of the JTIDS Terminal, the Class 2M. In March 1985, the Under Secretary of the Army approved continued development of the EPLRS. Concurrent approval was given

7a. **Program Highlights (Cont'd):**

for development of Very High Speed Integrated Circuit (VHSIC) technology in the Enhanced PLRS User Unit (EPUU), and downsizing of the Net Control Station (NCS). In the September to December 1985 timeframe, the Combined Arms Center conducted the Battlefield Command and Control System Review (BC2SR). The BC2SR determined that the Army Air Defense community was the only user requiring JTIDS terminals. On 7 October 1986, the Army approved a Required Operational (ROC) for ADDS. On 16 October 1986 a revised O&O Plan was approved by TRADOC for use in support of PJH system development and to supersede the PJH O&O Plan date 20 August 1984. In May 1988 Milestone IIIA for EPLRS Pre-Planned Product Improvement (P3I) was successfully completed. EPLRS Technical Test conducted January thru March 1989 revealed several system anomalies in software and hardware. A decision was made to minimize the government risk by restructuring the program to include correction of system deficiencies, removal of the concurrency in the schedule, and by limiting near term procurement quantities to units necessary for operational test only. On 22 August 1989 the rebaselined, restructured program was presented to the OSD C3I Committee chaired by the ASDC3I. The committee accepted the restructure and agreed that the Army should proceed. In January 1990, the EPLRS LRIP Basic contract was awarded. Option 1 was exercised in July 1990. Due to Army Force structure changes, PM ADDS will support 12 Divisions/4 Corps rather than the 18 Divisions/5 Corps original requirement. Funding reductions eliminated JTIDS Full Scale Production and deferred VHSIC Technology program.

b. Significant Developments Since Last Report --
The Army plans to integrate the Very High Speed Integrated Circuit (VHSIC) into EPLRS Initial Full Scale Production in FY 95. EPLRS Option 2 will be awarded 2nd Qtr FY 92.

This system will satisfy mission requirements.

c. Changes Since As Of Date --
The EPLRS Option 2 contract was awarded on 16 January 1992.

8. **Threshold Breaches:**
There are currently no breaches to the approved Acquisition Program Baseline (APB) dated March 8, 1991 and no Nunn-McCurdy unit cost breaches.

ADDS: EPLRS/JTIDS, December 31, 1991

9. **Schedule:**

a. Milestones --	Planning Estimate	Approved Program	Current Estimate
Enhanced Position Location Reporting System (EPLRS)			
Required Operational Capability Approval	JUL 84	SEP 86	SEP 86
P3I Phase A Software Contract Award	SEP 86	FEB 88	FEB 88
Milestone IIIA	SEP 87	MAY 88	MAY 88
Follow-on Test & Eval	N/A	AUG 97	AUG 97
IOC 1/	N/A	FEB 97	FEB 97
Technical Test Start	AUG 87	MAY 88	MAY 88
P3I Phase B Hardware/Firmware Contract Award	N/A	JUN 88	JUN 88
Technical Test Phase 2	N/A	MAR 89	MAR 89
Prod System Verification Award	N/A	SEP 89	SEP 89
P3I Phase C Basic Award	N/A	JAN 90	JAN 90
Prod System Verification Demo	N/A	MAY 90	MAY 90
P3I Phase C Option 1 Award	N/A	JUL 90	JUL 90
P3I Phase C Option 2 Award	N/A	N/A	JAN 92(Ch-1)
P3I First Prod Delivery	N/A	JUL 92	JUL 92
Technical Test III			
Start	N/A	MAY 93	MAY 93
Complete	N/A	JUL 93	JUL 93
Operation Test & Eval	AUG 87	APR 94	APR 94
P3I First Unit Equipped (Conditional)	N/A	MAY 94	MAY 94
Milestone IIIB	N/A	SEP 94	SEP 94
Full Scale Production Contract Award	JUL 88	N/A	DEL
P3I First Unit Equipped (FUE)	SEP 88	N/A	DEL
Production Award	N/A	NOV 94	NOV 94
First Full Rate Production Delivery	N/A	NOV 96	NOV 96
Joint Tactical Information Distribution System (JTIDS)			
Technical Test			
Start	N/A	JUN 90	JUN 90
Complete	N/A	DEC 90	MAR 91
System Tech Test/Initial Op Assessment 2/			
Start	N/A	OCT 91	OCT 91
Complete	N/A	MAY 92	MAY 92
Milestone III	N/A	SEP 93	SEP 93
First Unit Equipped 1/	N/A	SEP 93	SEP 93
Production Award	N/A	DEC 93	DEC 93
Production Delivery	N/A	JUN 96	JUN 96

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate
IOC	N/A	FEB 98	FEB 98

1/ Research and development assets.

2/ Consists of the JTIDS Class 2M Terminal and the NET Control Station - JTIDS/Dedicated JTIDS Relay Unit.

b. Previous Change Explanations --

All PLRS and EPLRS historical milestones not in the ADDS DAE Program Baseline have been deleted. With the approval of the ADDS DAE Program Baseline, milestones in the Approved Program and Current Estimate columns reflecting "N/A" have been deleted from the SAR and are not reflected in the ADDS Approved Baseline. The P3I contract is shown in Phases A, B, and C. Dates for OT&E and all subsequent milestones directly related to them changed because of complications with the completion of Technical Test (TT). EPLRS Milestone IIIA occurred MAY 88 versus APR 88. EPLRS Milestone IIIB was an added milestone to occur MAY 93. JTIDS milestones have been added because the ADDS system includes both EPLRS and JTIDS. EPLRS TT conducted JAN - MAR 1989 revealed several system anomalies in software and hardware. A program rebaselining effort was undertaken to include correction of system deficiencies, removal of the concurrency in this highly accelerated program schedule, and reduction of the near term procurement quantities to units necessary for operational test only. System anomalies revealed during EPLRS TT, funding decrements, and the delayed award of Phase C have caused a complete program restructure. The restructure caused the following changes to schedule milestones: P3I First Production Delivery changed from JUN 91 to JUL 92, Operational Test and Evaluation (OT&E) changed from APR 90 to APR 94, Milestone IIIB changed from SEP 90 to SEP 94, and First Production Delivery will occur in FEB 93 versus OCT 91. Based upon successful EPLRS Production System Verification (PSV) testing, and recommendations by the test community, EPLRS Technical Test Phase 3 was eliminated. EPLRS Technical Test III to start in MAY 93 and complete in JUL 93 were added to more accurately reflect the existing EPLRS test schedule. EPLRS Follow-On Test & Evaluation was changed from NOV 95 to AUG 97 based upon the recommendation of the TIWG to conduct the test when production assets are available. EPLRS First Unit Equipped (FUE) was changed to Initial Operational Capability (IOC). EPLRS and JTIDS IOC are added milestones. JTIDS Technical Test Complete was changed from DEC 90 to MAR 91 due to non-availability of required quantity of Class 2M Terminals needed

9b. Schedule (Cont'd):

for testing. JTIDS Operational Test & Evaluation - Start and End were changed to System Technical Test/Initial Operation Assessment (TT/IOA) Start and Complete to allow a greater system test IAW the testers' desires. The test will consists of the JTIDS CL2M Terminal and the Net Control Station-JTIDS and the Dedicated Relay Unit (NCS-J/DJRU). JTIDS Milestone III and First Unit Equipped (FUE) were changed to Sep 93 because funding did not support FY 92 or FY 93 production decision/award. JTIDS Full Scale Production was changed to Production Award and First Production Delivery was changed to Production Delivery.

c. Current Change Explanations --

Ch 1 This milestone is reinstated. Funding of $27M has been received for award of EPLRS Option 2.

d. References --

Planning Estimate:
SDDM, dated 8 August 1979.

Approved Program:
DAE Approved Acquisition Program Baseline dated 08 March 1991.

10. Performance Characteristics:

a. Performance --	PE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
Mean Time Between Failure (lower limit/confidence level)(hrs)				
NCS-E	100	125(80%) / 100(80%)	79(80%)	125(80%)
EPUU	500	700(80%) / 500(80%)	TBD	500(80%)
JTIDS Class 2M Terminal	120	400(70%) / 400(70%)	TBD	400(80%)
Mean Time to Repair (unit level)(min)				
NCS-E	30	30 / 30	TBD	30
EPUU	30	15 / 15	TBD	15
JTIDS Class 2M Terminal	30	30 / 30	TBD	30
Size (LxWxH)				
NCS-E Shelter-280C (ft)	12x7.3x7	12x7.3x7 / 12x7.3x7	TBD	12x7.3x7

10a. **Performance Characteristics (Cont'd):**

	PE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
Downsized NCS-E Shelter-250C (ft)	7x6.5x6	N/A	N/A	N/A
EPUU (in)	10.1x 10.7x4	14.7x / 14.7x 10.5x5.1 / 10.5x5.1	TBD	14.7x 10.5x5.1
JTIDS Class 2M Terminal (in)	N/A	25x15x10 / 25x15x10	TBD	25x15x10
Weight (upper limit) (lbs) 1/				
NCS-E Shelter-280C	6200	6300 / 6300	TBD	6300
Downsized NCS-E Shelter-250C	2300	N/A	N/A	N/A
EPUU/Manpack 2/	17	28 / 28	TBD	28
JTIDS Class 2M Terminal	N/A	88 / 94	TBD	94
Power Requirements				
NCS-E Voltage (AC)	115-208	115-208 / 115-208	TBD	115-208
NCS-E Frequency (Hz)	50-60	60 / 60	TBD	60
EPUU Voltage (DC)	20-28	20-28 / 20-28	TBD	20-28
JTIDS Voltage (DC)	22-28	22-28 / 22-28	TBD	22-28
Channels				
EPUU	8	8 / 8	TBD	8
JTIDS Class 2M Terminal	128	51 / 51	TBD	51
Frequency Band (MHz)				
NCS-E	420-450	420-450 / 420-450	TBD	420-450
EPUU	420-450	420-450 / 420-450	TBD	420-450
JTIDS Class 2M Terminal	960-1215	960-1215 / 960-1215	TBD	960-1215
Message Length (bits)- Speed of Service (secs) for selected users	80-4	80-4 / 80-4	TBD	80-4

1/ Weight does not include the interface Control Panel and interconnecting cables.

2/ EPUU/Manpack configuration includes an EPUU, User Read Out, cable assembly, two BA5590 batteries, battery box and antenna.

b. Previous Change Explanations --

MTBF for JTIDS Class 2M Current Estimate reflects contractual requirements. MTTR changed to reflect consistency with performance

10b. **Performance Characteristics (Cont'd):**
characteristics in the NCS-E System Segment Specification and the ADDS ROC. JTIDS Class 2M Voltage is DC versus AC. Frequency requirements are grouped separately to more accurately reflect technical characteristics. The JTIDS Class 2M terminal size was changed based on 27 May 88 system specification. The power requirement for the NCS-E is 60 Hz. The MTTR for the EPUU is 15 minutes. The JTIDS Class 2M development contract specifies frequency hopping-51 frequencies, 3 MHZ band width and a non-nodal network management capability of 128 net capacity. The user has stated through the Program Deviation Review Panel that a reduction in the NCS MTBF from 186 to 125 hours is acceptable for interim field use. An NCS-E modernization (downsizing) project is planned to run parallel with P3I to provide for higher reliability and to meet other Required Operational Capability (ROC) requirements that the current NCS-E does not meet. The width of the EPUU has not changed. The EPUU uses the same housing unit as the PLRS Basic User Unit (BUU). The dimensions of the BUU (width 10.5 inches) have not changed since the PLRS contract award in 1983. The ADDS ROC, published in Oct 1986 incorrectly stated the width of the EPUU as 10.2 inches. The JTIDS weight changed from 88 to 94 lbs. The user has stated that the 94 lb. weight of the JTIDS EDM Terminal is acceptable for operational use.

c. Current Change Explanations -- None.

d. References --

Planning Estimate:
SDDM, dated 8 August 1979.

Approved Program:
DAE Approved Acquisition Program Baseline dated 08 March 1991.

ADDS: EPLRS/JTIDS, December 31, 1991

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost --	Planning Estimate	Approved Program	Current Estimate
Development (RDT&E)	175.3	286.0	290.0
Procurement	1806.2	1227.5	1298.0
NCS	(229.7)		(184.7)
Other Components	(1270.6)		(897.2)
Total Flyaway	(1500.3)		(1081.9)
Other Weapon Systems	(121.3)		(110.1)
Total Other Wpn Sys	(121.3)		(110.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(184.6)		(106.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 83 Base-Year $	1981.5	1513.5	1588.0
Escalation	1056.7	1145.6	1103.3
Development (RDT&E)	(13.7)	(51.9)	(51.9)
Procurement	(1043.0)	(1093.7)	(1051.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	3038.2	2659.1	2691.3

b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	85	108	102
Total	85	108	102

Excludes three (3) RTD&E units that are not considered fully configured end items.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Planning Estimate:
SDDM, dated 8 August 1979.

Approved Program:
DAE Approved Acquisition Program Baseline dated 08 March 1991.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2691.3	2853.6	2691.3
(2) Quantity	102	108	102
(3) Unit Cost	26.385	26.422	26.385
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	44.2	44.2	27.3
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	44.2	44.2	27.3
(2) Quantity	0	0	N/A
(3) Unit Cost	N/A	N/A	N/A

Program Acquisition Quantity - Due to the many components of the ADDS, a representative network consisting of one Net Control Station - EPLRS and associated EPLRS User Units and JTIDS Class 2M Terminals is used as the unit of measure for the PAQ. Reductions in the Army Force Structure from 18 Divisions and 5 Corps to 12 Divisions and 4 Corps have reduced the number of representative networks from 120 to 102. Significant cuts to JTIDS program for JTIDS Class 2M Terminals have changed the composition of the representative network from 1 NCS-E, 150 EPUU's, and 3 JTIDS Class 2M Terminals to 1 NCS-E, 109 EPUUs, and .2 JTIDS Class 2M Terminals.

ADDS: EPLRS/JTIDS, December 31, 1991

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	189.0	2849.2	0.0	3038.2
Previous Changes:				
Economic	-5.8	-206.8	-	-212.6
Quantity	-	-663.8	-	-663.8
Schedule	+38.0	+498.1	-	+536.1
Engineering	+139.5	-510.3	-	-370.8
Estimating	-22.2	+613.8	-	+591.6
Other	-	-	-	-
Support	-	-65.1	-	-65.1
Subtotal	+149.5	-334.1	-	-184.6
Current Changes:				
Economic	-0.2	-62.6	-	-62.8
Quantity	-	-13.2	-	-13.2
Schedule	-	-69.6	-	-69.6
Engineering	-	-	-	-
Estimating	+3.6	-32.8	-	-29.2
Other	-	-	-	-
Support	-	+12.5	-	+12.5
Subtotal	+3.4	-165.7	-	-162.3
Total Changes	+152.9	-499.8	-	-346.9
Current Estimate	341.9	2349.4	-	2691.3

13a. **Cost Variance Analysis (Cont'd):**

a. Summary -- (FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	175.3	1806.2	0.0	1981.5
Previous Changes:				
Quantity	-	-408.2	-	-408.2
Schedule	+26.0	-	-	+26.0
Engineering	+104.8	-369.0	-	-264.2
Estimating	-19.6	+387.6	-	+368.0
Other	-	-	-	-
Support	-	-98.5	-	-98.5
Subtotal	+111.2	-488.1	-	-376.9
Current Changes:				
Quantity	-	-6.3	-	-6.3
Schedule	-	-5.9	-	-5.9
Engineering	-	-	-	-
Estimating	+3.5	-16.6	-	-13.1
Other	-	-	-	-
Support	-	+8.7	-	+8.7
Subtotal	+3.5	-20.1	-	-16.6
Total Changes	+114.7	-508.2	-	-393.5
Current Estimate	290.0	1298.0	-	1588.0

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Schedule: Schedule stretchout due to technical Test Extension.

Engineering: New work - 1553 interface, Continuity of Operations, Dedicated JTIDS Relay Unit (DJRU), Intermediate Forward Test Equipment and DATABASE Command and Control. ADA software Conversion for NCS-E Downsizing, GFE for Standard Integrated Command Post - (SICP) for NCS-J. The NCS-E did not meet the MTBF in the ROC or air transportability requirement. Downsizing of the NCS was required which utilizes a smaller shelter and current

13b. **Cost Variance Analysis (Cont'd):**

computer technology using the ADA language.

Estimating: These dollars were included in both ADDS and JTIDS SARs. Additional funds needed for Phase 5 contract award. Adjusted prior year allocations to reflect actual program. Adjusted BY dollars for FY 81-89 in the December 89 SAR. Refined NCS-E Downsizing estimate and included USMC cost sharing.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Change due to NCS quantity from 4 per Division to 5 and from 6 per Corps to 8. Change in EPUU quantity from 24,875 in the previous SAR to 22,103 and in NCS quantity reduction of the NCS from 140 to 123, and the EPUU from 22,103 to 14,518. Due to changes in the Army Force structure and funding adjustments, the following quantities have changed in Dec 90 SAR: NCS-E from 120 to 108, EPUU from 14518 to 12022, and JTIDS CL2M Terminals from 586 to 23.

Schedule: Schedule stretchout due to funding decrements. Program extended to meet user's equipment requirements.

Engineering: Change due to NCS downsizing and to JTIDS Class 2M being substituted for Class 2 terminal; elimination of PLRS Steerable Null Antenna Processor (PSNAP); removal of the JTIDS CL2 terminal and PSNAP from NCS. Added PM checktest to be conducted prior to Technical Test. Added testing and Manprint improvements which are required for the EPLRS restructured program. Budget cuts eliminated VHSIC effort.

Estimating: Estimating error in calculating the first unit cost in Dec 85 and Sep 86 SARs. Interface Unit was erroneously omitted from Dec 85 SAR. Change in Acquisition strategy for EPUUs to single source. Spares cost increase due to increase in operating tempo from 300 hours to 1300 hours EPUU. Change in acquisition strategy for the JTIDS Class 2M terminal from single source to Leader/Follower. Increase in Post Deployment Software Support due to a change in data base used for the estimating model. Shift in years of procurement of initial spares (support). Adjusted computation of BY dollars for FY 86-88 in the Dec 89 SAR. Newly developed First Unit Cost for JTIDS CL2M Terminal was used. Corrected previous cost variance changes miscategorization.

13b. Cost Variance Analysis (Cont'd):

Support: Reduction in initial Spares due to quantity reductions. Spares and Other Weapon Systems Costs were changed to reflect new quantities. Adjusted Total Package Fielding Cost and New Equipment Training (NET) for FY 98 - FY 11. Increased due to transfer of funds from OMA to OPA for PM salaries and operating costs (travel, training, equipment, supplies, etc.). Corrected previous cost variance changes miscategorization.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	--	-0.2
Adjustment of prior year allocations to reflect actual program. (Estimating)	3.5	3.8
Current & prior Inflation Offset. (Estimating)	--	-0.2
Total Changes	3.5	3.4
(2) PROCUREMENT		
Revised escalation indices. (Economic)	--	-62.6
Porce structure change and funding adjustments, quantities changed: NCS-E to 102; EPUU to 11152; JTIDS to 20. (Quantity)	-6.3	-13.2
Quantity reductions and changes in production rates compressed the program to complete in FY2008 vs FY2011. (Schedule)	-5.9	-69.6
Estimating error in learning curve slope in previous SARs. (Estimating)	-36.4	-71.9
Correction to previous cost variance changes miscategorization (Estimating)	-19.8	-39.0
Current and prior Inflation Offset. (Estimating)	--	-0.1
Correction to previous cost variance changes miscategorization. (Support)	19.8	39.1
Changes in spares due to new quantities, new method of calculation and addition of surcharge. (Support)	28.9	59.8
Adjustment for total Package Fielding. (Support)	-0.4	-8.2
Total Changes	-20.1	-165.7

ADDS: EPLRS/JTIDS, December 31, 1991

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
35.74	-2.70	-12.60	4.57	-3.64	5.51	--	-0.52	-9.38	26.39

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

EPLRS LRIP:	Initial Contract Price Target	Ceiling	Qty
HUGHES AIRCRAFT COMPANY, FULLERTON, CA DAABO7-83-C-J031, FPI Award: February 1, 1988 Definitized: February 1, 1988	$2.7	$3.1	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$207.1	$233.8	8	$207.1	$207.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.9	$-2.9
Cumulative Variances To Date (12/12/91)	$3.5	$-3.1
Net Change	$2.6	$-0.2

Explanation of Change:

The $2.6M positive cost variance, achieved from December 90 to November 91, is the result of intensive management effort by PM ADDS and Hughes Aircraft Company to control and monitor the EPLRS LRIP contract.

"Initial Contract Price" refers to Phase A only.

"Current Contract Price" refers to Phase A, B, and C.

ADDS: EPLRS/JTIDS, December 31, 1991

16. **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 42.9% (12 yrs/28 yrs)

(2) Percent Program Cost Appropriated: 23.8% ($639.6 / $2691.3)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY81-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2008)	Total
RDT&E	268.6	22.5	13.4	37.4	341.9
Procurement	304.3	44.2	27.3	1973.6	2349.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	572.9	66.7	40.7	2011.0	2691.3

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1981				17.1	15.8	15.8	15.8	10.6
1982				17.6	17.3	17.3	17.3	7.6
1983				33.3	34.1	34.1	34.1	4.9
1984				21.6	22.9	22.9	22.9	3.8
1985				21.8	23.9	23.9	23.9	3.4

ADDS: EPLRS/JTIDS, December 31, 1991

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1986				31.9	36.0	36.0	36.0	2.8
1987				36.8	42.6	42.6	42.6	2.7
1988				21.3	25.6	25.6	25.5	3.0
1989				15.6	19.5	19.5	18.2	4.2
1990				11.8	15.3	15.3	12.5	4.0
1991				11.6	15.6	15.6	10.8	3.9
1992				16.2	22.5	2.0	0.2	3.1
1993				9.3	13.4			3.3
1994				9.4	14.0			3.3
1995				5.6	8.6			3.3
1996				4.2	6.6			3.2
1997				2.9	4.7			3.2
1998				2.0	3.5			3.2
Subtot				290.0	341.9	270.6	259.8	
Appropriation: 2035 Other Procurement, Army								
1986		3.0	5.8	18.0	21.1	21.1	21.1	2.8
1987		15.8	33.1	60.0	73.5	73.5	69.1	2.7

ADDS: EPLRS/JTIDS, December 31, 1991

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	

Appropriation: 2035 Other Procurement, Army (Cont'd)

1988	4	20.5	63.6	92.7	118.8	118.6	23.4	3.0
1989	4	6.7	51.3	61.8	82.0	82.0	46.1	4.2
1990								
1991			6.2	6.3	8.9	8.9	3.7	3.9
1992			28.9	30.3	44.2	3.9	0.1	3.1
1993			17.6	18.1	27.3			3.3
1994		3.0	29.9	37.4	58.1			3.3
1995		11.9	29.4	46.7	74.9			3.3
1996	2	1.0	32.4	35.6	58.9			3.2
1997	4	1.7	32.9	38.7	66.1			3.2
1998	10	1.3	61.1	77.2	136.1			3.2
1999	10	2.8	59.3	69.9	127.1			3.2
2000	10	0.4	87.5	97.9	183.7			3.2
2001	11	0.5	88.1	102.8	199.2			3.2
2002	12	0.1	94.1	110.7	221.4			3.2
2003	12	3.2	92.4	112.8	232.8			3.2
2004	11	0.1	90.4	111.1	236.5			3.2
2005	12		104.1	123.8	272.0			3.2

ADDS: EPLRS/JTIDS, December 31, 1991

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)

Appropriation: 2035 Other Procurement, Army (Cont'd)

2006			0.6	20.5	46.6			3.2
2007			0.6	25.2	58.9			3.2
2008			0.6	0.5	1.3			3.2
Subtot	102	72.0	1009.9	1298.0	2349.4	308.0	163.5	
Grand Total	102	72.0	1009.9	1588.0	2691.3	578.6	423.3	

Flyaway Costs are reported by year based on procuring the many components of the ADDS, not just the unit of measure (See Section 12b).

ADDS: EPLRS/JTIDS, December 31, 1991

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1986	1	0	0	0
1987	3	1	0	0
1988	6	4	4	4
1989	9	0	4	4
1990	9	4	0	0
1991	10	4	0	0
1992	12	0	0	0
1993	15	0	0	0
1994	20	0	0	0
1995	0	0	0	0
1996	0	0	2	6
1997	0	0	4	11
1998	0	4	10	11
1999	0	4	10	11
2000	0	6	10	11
2001	0	6	11	11
2002	0	8	12	11
2003	0	9	12	11
2004	0	10	11	11
2005	0	10	12	0

ADDS: EPLRS/JTIDS, December 31, 1991

17a. **Production Rate Data (Cont'd):**

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
2006	0	10	0	0
2007	0	10	0	0
2008	0	10	0	0
2009	0	10	0	0
2010	0	10	0	0

The "Development Decision" column reflects the Planning Decision quantities.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2049.8	-461.8	1588.0	+345.0	1243.0
(TY $)	2828.8	-137.5	2691.3	+485.5	2205.8
PAUC Cost (BY $)	17.082	-1.513	15.569	+3.382	12.186
(TY $)	23.573	2.812	26.385	+4.760	21.625

17c. **Production Rate Data (Cont'd):**

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JAN 90	0	JAN 90	N/A	JAN 90
Duration (in MON)	146	72	218	12	206
End Date(MON YY)	MAR 02	72	MAR 08	N/A	MAR 07

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	3/3
Procurement	0/0

e. Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 140 - @ Peak Rate: 0.0/mo			
FY 83 Base-Year $	0.000	0.000	0.000
Then Year $	0.000	0.000	0.000
@ Qty 4 (1st three years) - @ Peak Rate: 0.0/mo			
FY 83 Base-Year $	0.000	0.000	0.000
Then Year $	0.000	0.000	0.000

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules --

The system definition, ADDS, for unit equivalent is 102 units based on the quantity of Net Control Stations-EPLRS (NCS-E) to be deployed for Division/Corps complements. The operating hours for the system is given as 20-24 hrs/day. Uniform costs are assumed over a 28 year period. Cost categories are given in the table 18b. Personnel reflects the costs to support the operation and maintenance personnel. POL is the consumable portion indicating the petroleum, oil and lubricants cost. The Direct Depot Maintenance includes the interim contractor support and depot labor/material costs. The Spares and Parts reflects the costs of replenishment spares, repair parts and modifications/kits. Other Direct Costs reflects transportation, additional system program management civilians and field maintenance civilian labor. Indirect Costs reflects the

18a. Operating and Support Costs (Cont'd):
permanent change of station, replacement of station, replacement personnel and additional sustaining costs. The source of the cost estimate is the ADDS Baseline Cost Estimate, July 1991. There is no antecedent system for ADDS.

b. Costs -- (FY 1983 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per NCS-E	Avg Annual Cost Per (Antecedent)
Personnel	0.3	N/A
POL	0.0	N/A
Direct Depot Maintenance	0.0	N/A
Spares/Parts/Mod Kits	0.4	N/A
Other Direct Costs	0.0	N/A
Indirect Costs	0.0	N/A
Total	0.7	N/A

c. Contractor Support Costs -- None.

N-31. MK 50 TORPEDO

91-146

*** ~~SECRET~~ ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: MK 50 TORPEDO

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
Torpedo, MK 50 (MK 50 Torpedo)

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**
MK 50 TORPEDO PROGRAM OFFICE — SES Mr.T.E. Douglass
PEO, SURFACE SHIP ASW SYSTEMS — Assigned: May 12, 1989
PMO 406 Crystal Park One, Room 1102 — AV 744-3020 COMM (703) 746-3020
WASHINGTON, DC 20362-5101

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604610N Project V0199
PE 0603610N Project S1873, V1873
PROCUREMENT:
APPN 1507 ICN 3118 (Navy)
MILCON:
PE 0702096N

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DIRECTORATE FOR FREEDOM OF INFORMATION
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DEPARTMENT OF DEFENSE

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OASD(PA) DFOISR R.T. 0655

5. (U) Related Programs:
LAMPS MK III; CV HELO; P-3C; SH-2F; ASW Ship In-Service Programs.

6. (U) Mission and Description:
- The MK 50 TORPEDO will provide the fleet with a lightweight torpedo primarily for air and surface delivery to combat current and projected submarine threats.

- The MK 50 TORPEDO will have superior performance (speed, depth, endurance, detection range, and warhead) characteristics capable of countering the ALFA, OSCAR, TYPHOON, and follow-on submarine classes.

- The improvement in Russian submarine performance and countermeasures capability and the evolving threat from the third world necessitate having an advanced anti-submarine warfare torpedo available as a replacement for the lightweight MK 46 TORPEDO.

- The MK 50 TORPEDO is made up of several major subsystems which include: a sonar for target detection and classification, a command and control unit for interpreting information received from the sonar to guide the torpedo to its target, an advanced warhead and a closed cycle, stored chemical energy propulsion system.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
The Mk-50 program started with a technology assessment phase in 1975 to review various conceptual designs from industry. DSARC I was held in July 1979 and an Advanced Development began with two competitive designs. In January 1981, competition was terminated and Honeywell was selected as the single remaining D&V contractor. The D&V phase was completed and a DSARC milestone II review on January 20, 1984 approved proceeding into Full Scale Development (FSD). FSD proceeded with in-water testing and fabrication of the first fleet prototypes. Warhead lethality tests were continued and the warhead design was finalized. In 1987 the program was restructured and the FSD phase was extended by 21 months. Sea run tests using all launch platforms have demonstrated prototype lot torpedo technical performance and have provided initial tactical evaluation. COMOPTEVFOR conducted independent testing (OT-IIA) and concluded that the MK-50 had the potential to be operationally suitable and effective. In FY-87 a second source qualification contract was awarded to Westinghouse Electric Corporation. In May, 1989 Milestone IIIA approval was granted and the torpedo entered Low Rate Initial Production (LRIP). TECHEVAL was completed in June 1990. OPEVAL started in July 1990 with the first of a series of 158 planned test firings, and was scheduled to end in June 1991. In October 1990, Honeywell spun off its defense

7a. (U) Program Highlights (Cont'd):

and marine systems business units and a wholly independent company, Alliant Techsystems, Inc., was formed. The FY-91 contracts were competitively awarded to Westinghouse Electric Corporation (165 torpedoes) and Alliant Techsystems, Inc. (100 torpedoes) in February 1991. This was the first competition between the two contractors and the first year of Firm Fixed Price contracts. There are a total of 615 torpedoes presently under contract, including 10 qualification torpedoes produced by Westinghouse. OPEVAL, under the control of COMOPTEVFOR, continued and a total of 174 in-water runs were conducted. This was up from the 158 planned runs with the increase due to faulty range test equipment during some of the original testing.

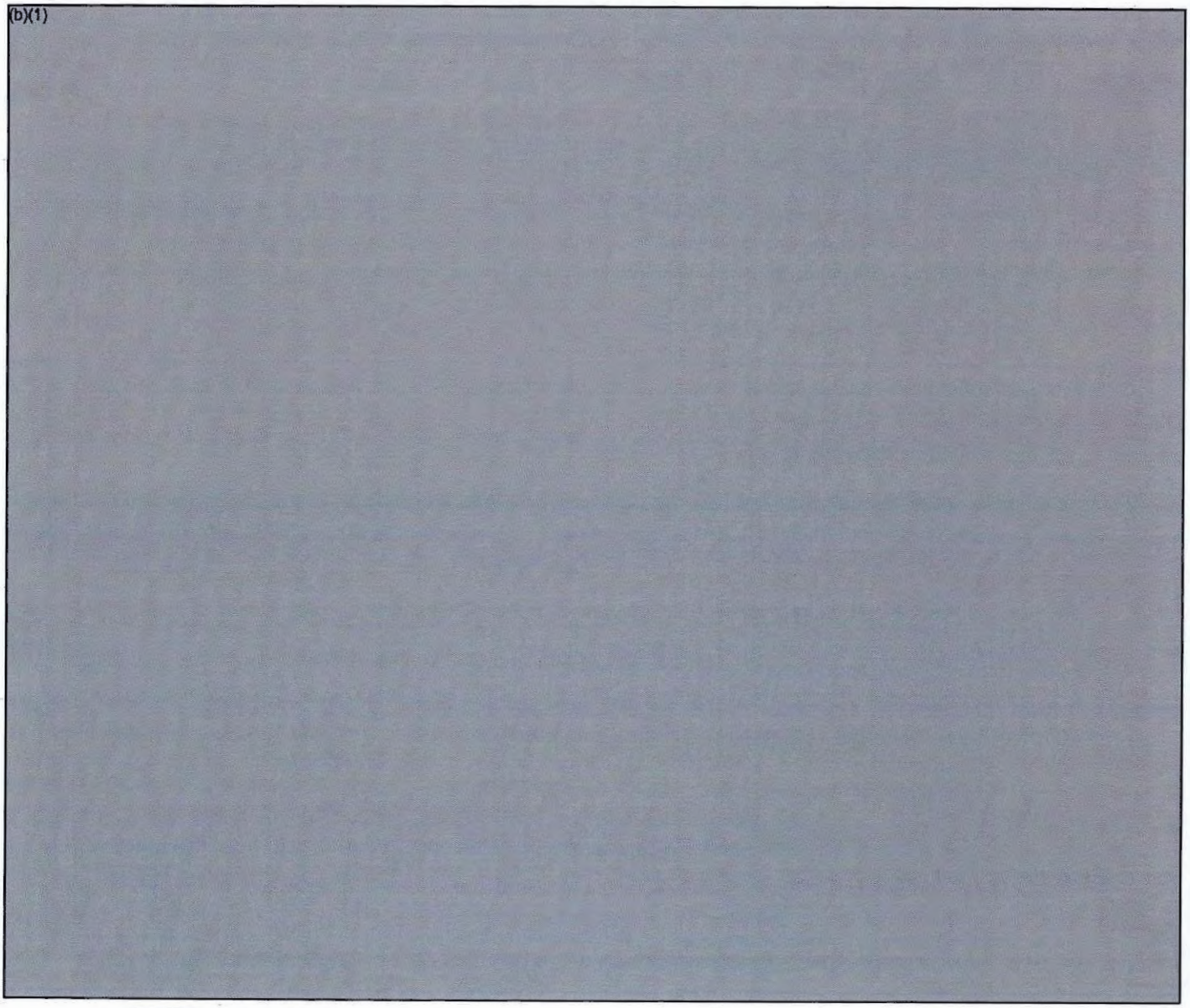
b. (U) Significant Developments Since Last Report --
In June of 1991, after completing 174 in water runs, COMOPTEVFOR placed the weapon in deficiency status pending resolution of a software problem affecting terminal homing placement. This was not a torpedo hardware problem and it did not affect torpedo production deliveries or cost since the software is GFI. Corrective action was completed and successfully demonstrated in-water in December 1991.

The MK-50 TORPEDO is expected to satisfy mission requirements.

c. (U) Changes Since As Of Date --
After extensive testing of the revised software, PEO-SSAS recertified the weapon for OPEVAL Phase II on 7 January 1992. OPEVAL testing, under the control of COMOPTEVFOR resumed on 8 January. Twenty-five additional firings have since been conducted. OPEVAL is expected to complete in the spring of 1992. A Milestone IIIB review by the Defense Acquisition Board (DAB) is planned for August and approval for full rate production is anticipated.

8. (U) Threshold Breaches:
There is a technical breach against the Acquisition Program Baseline (APB 8 March 91) maintenance turnaround goal and objective. The breach consists of a difference in measuring IMA performance in that the original specification was a measure of "wrench-on" time only and not total system performance. A Program Deviation Report/Baseline Change Request (PDR/BCR), submitted on 14 January 1992, proposes adding a new parameter to the APB since the original parameter (wrench-on time) is not normally measured. This breach will not cause any problems in the ability of the fleet IMAs to effectively support maintenance requirements. There is also a breach of the Milestone IIIB schedule in that the delay from the approved date of September 1991 to the planned date of August 1992 exceeds 180 days. This breach is also covered in the PDR/BCR addressed above.

(b)(1)



c. (b)(1) Current Change Explanations --

(U) CH-1-The actual dates for past events highlighted have been revised to correct errors in the last SAR submission.

(U) CH-2-The change from June 1991 to April 1992 is the result of two primary issues. First, delays in the original OPEVAL testing resulting from the need to conduct additional in-water runs due to faulty range test equipment and second, the requirement to conduct a Phase II of OPEVAL. Phase II was necessary in order to correct some software problems discoverd during initial testing and to prove

9c. (b)(1) **Schedule (Cont'd):**
through an additional 53 in-water tests, under COMOPTEVFOR control, that the problems have been corrected.

(b)(1) [redacted]

Both changes have been formally requested in a Program Deviation Report/Baseline Change Request.

d. (U) References --

(U) Development Estimate:
DCP 173 (12/83) dated 6 Jan 84 and SDDM dated 15 Mar 1984; MK-50 TORPEDO FSD APPROVAL.

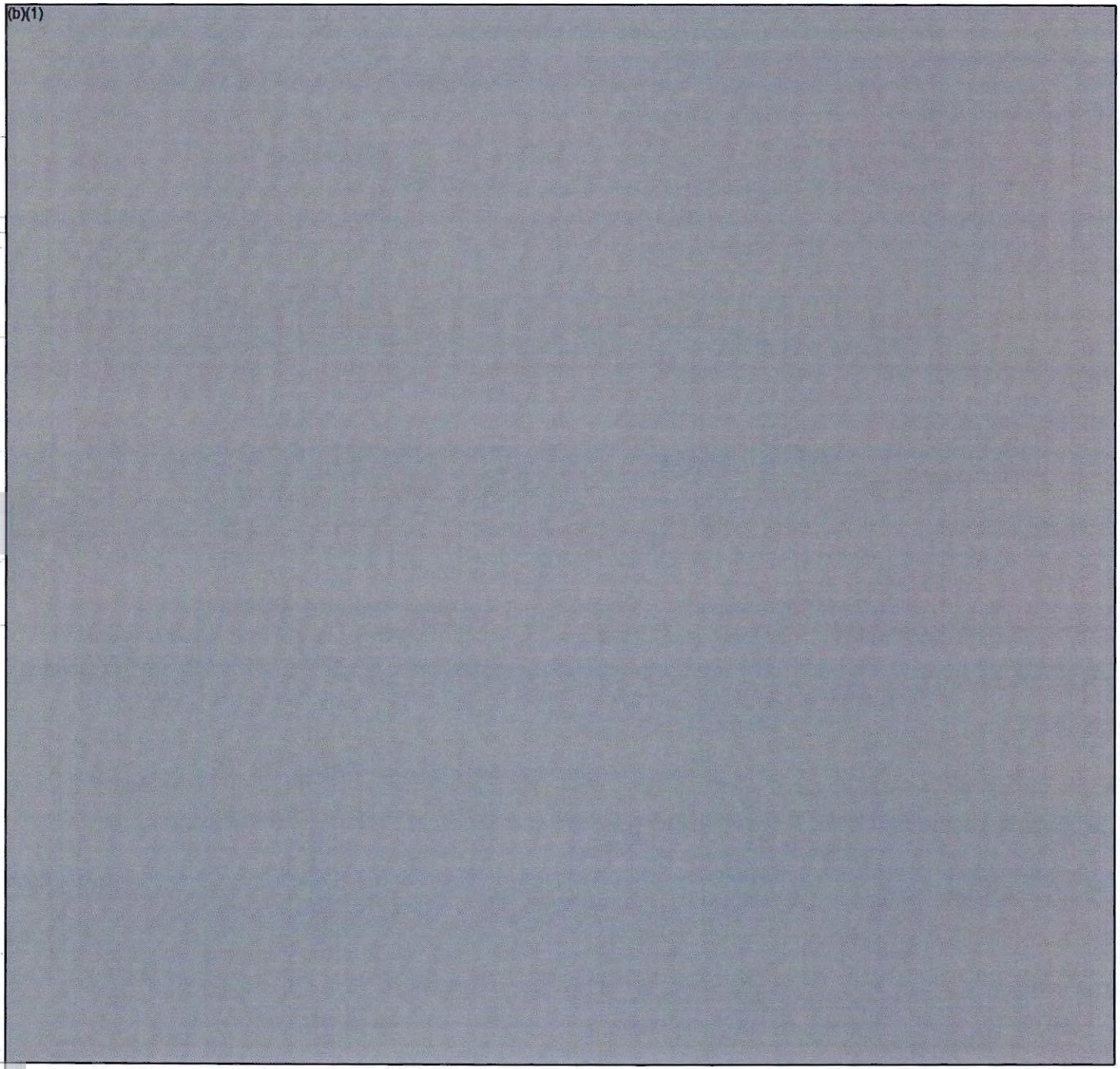
(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 91.

10. (U) **Performance Characteristics:**

a. (U) Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Acoustic Acquisition Range (yds) - 50% Probability of Acquisition				
For Water Depth > 600 ft and Target Depth > 200 ft				
(b)(1) [redacted]				
For Water Depth < 600 ft and Target Depth < 200 ft				

10a. (U) Performance Characteristics (Cont'd):

(b)(1)



10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Maximum Length (in) with Air Launch Accessories, less Nose cap	115.5	115.5	/ 115.5	111.5	115.5
Maximum Weight (lb) with Air Launch Accessories, less Nose Cap	798	798	/ 798	748	798
Maximum Diameter (in)	12.75	12.75	/ 12.75	12.75	12.75
Probability of Hit Scenarios U.S. Submarines and (b)(1) Targets Nominal t					

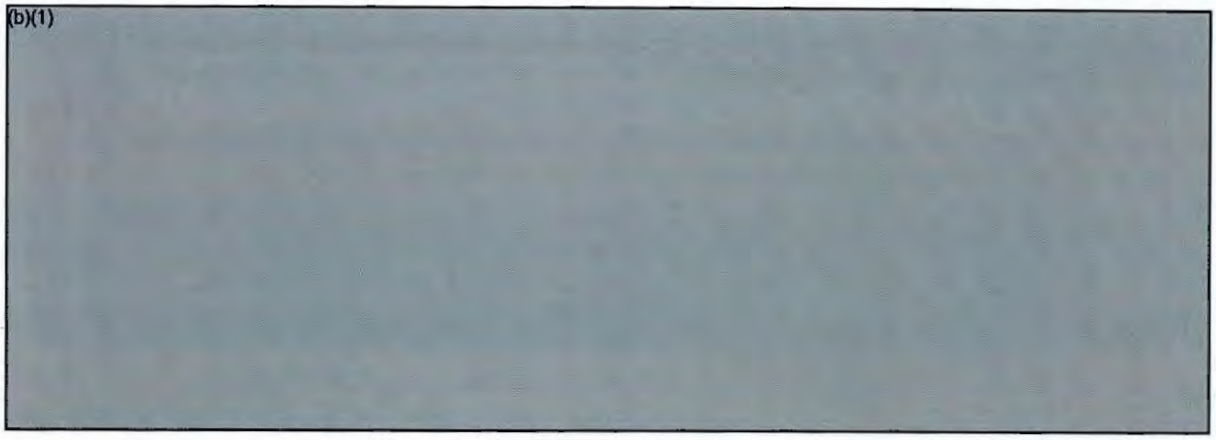
(b)(1)

MK 50 TORPEDO, December 31, 1991

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

(b)(1)



c. (U) Current Change Explanations --

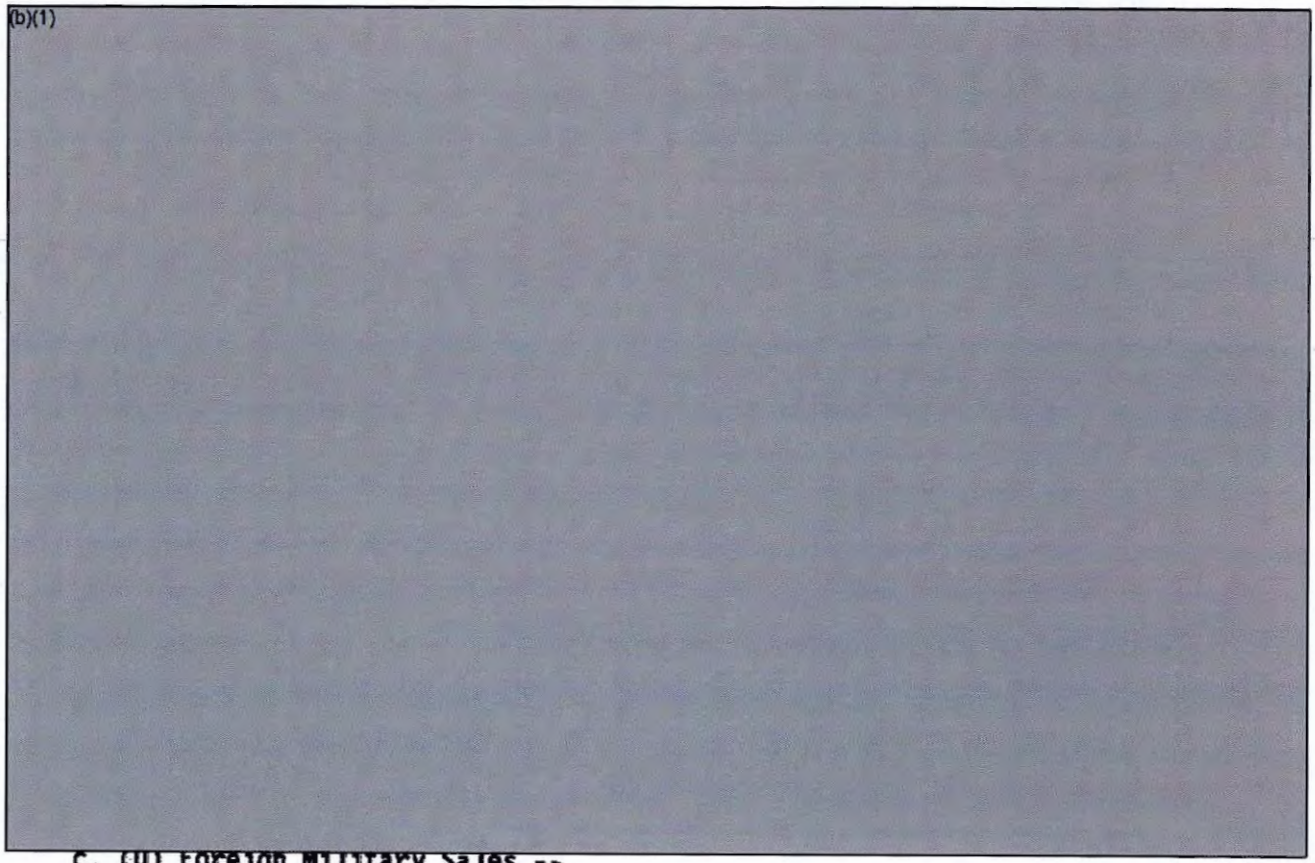
Change 1 - The change in IMA maintenance turnaround time from 70/48 to 50/24 reflects a change in the parameters for measurement of maintenance turnaround time. The 70/48 estimate was based on early techeval data; subsequent information indicates that the original estimate of 50/24 is still valid and was included in the original contract as a design specification. This parameter reflects wrench-on maintenance time only which does not represent the manner in which we actually measure IMA performance. A proposed change to the baseline, which will add a new parameter called IMA System Process Time, has been submitted. This new parameter is more reflective of the way we actually measure IMA performance and includes all logistics delays.

d. (U) References --

(U) Development Estimate:
DCP 173 (12/83) dated 6 Jan 84 and SDDM dated 15 Mar 1984; MK-50 TORPEDO FSD APPROVAL.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 91.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)



c. (U) Foreign Military Sales --
No FMS is currently planned.

d. (U) Nuclear Costs --
There are no nuclear costs for the MK-50 Torpedo.

e. (U) References --

(U) Development Estimate:
DCP 173 (12/83) dated 6 Jan 84 and SDDM dated 15 Mar 1984; MK-50 TORPEDO FSD APPROVAL.

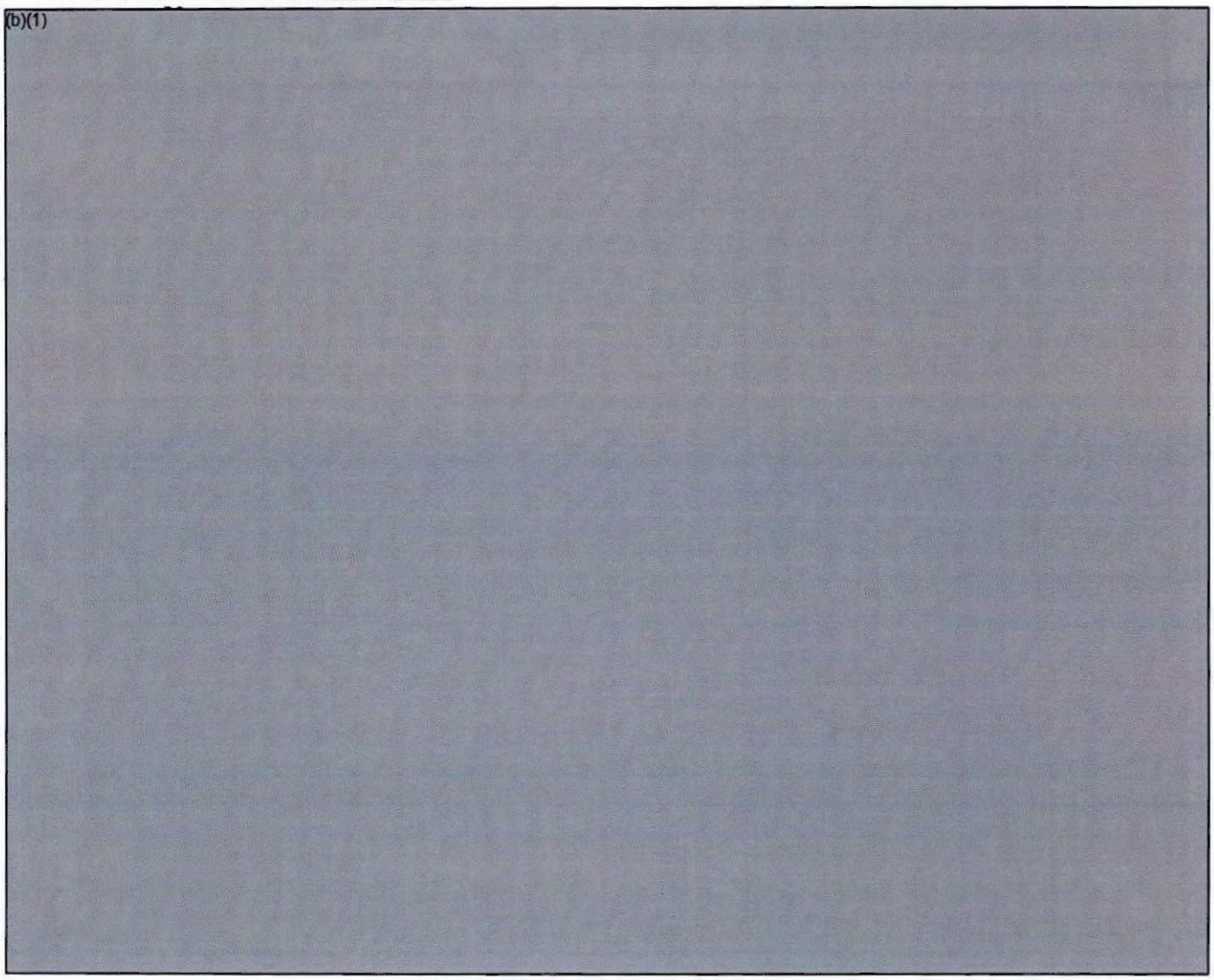
(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 91.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
(b)(1)			

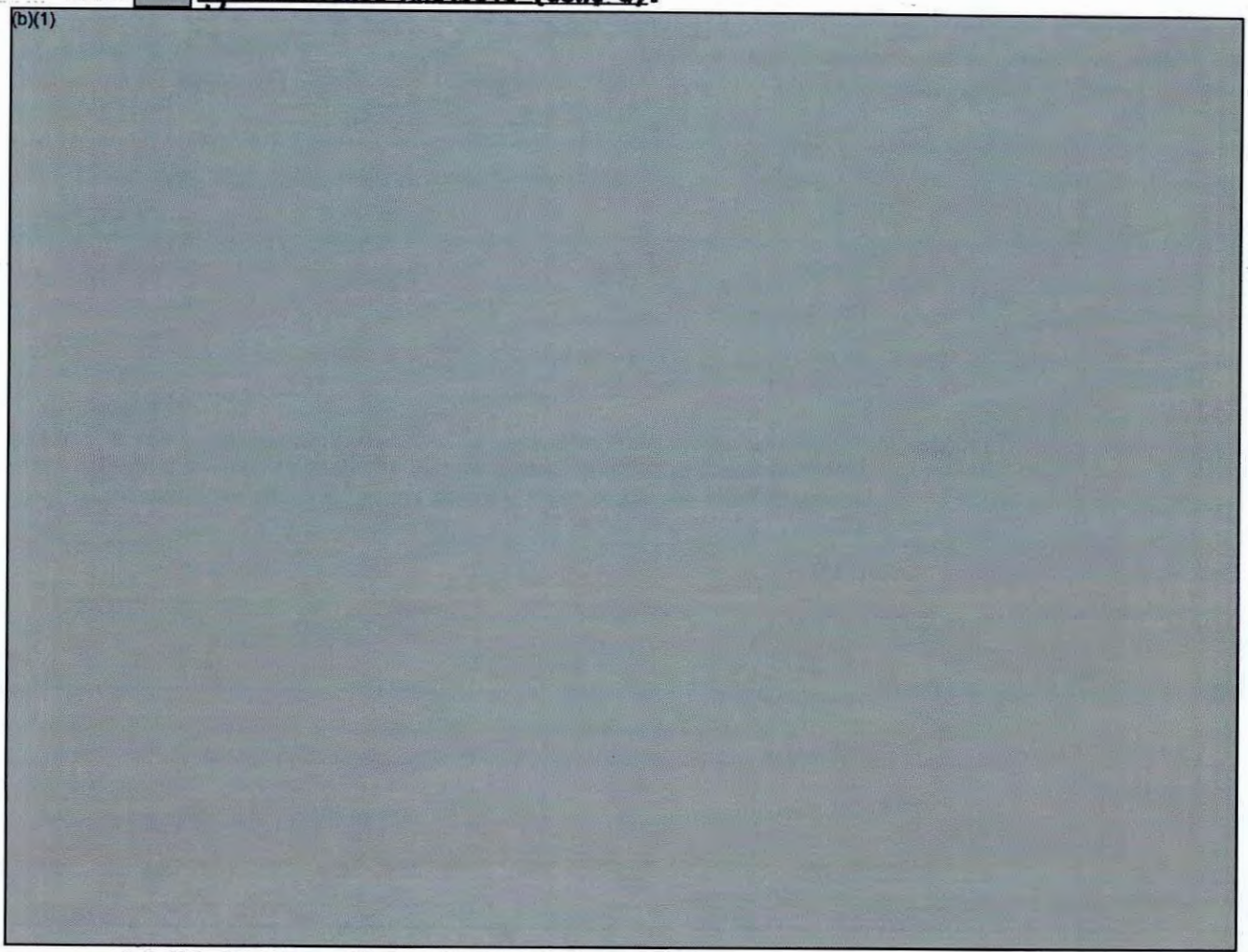
13. (U) Cost Variance Analysis:

(b)(1)



13a. (b)(1) Cost Variance Analysis (Cont'd):

(b)(1)



b. (U) Previous Change Explanations --

RDT&E

Economic:	Revised Escalation Indices.
Quantity:	Reduction and subsequent restoration of 41 prototype torpedoes to accommodate testing requirements.
Schedule:	Thirty-three month delay. Twenty-one due to program restructure and twelve due to previous slippage in RDT&E.
Engineering:	Increased Reliability and Test Equipment Effort. Establishment of Engineering Qualification Test Program to allow increased reliability testing. Correction of afterbody anomalies.
Estimating:	Change to "True" FY 84 Constant $ and general

13b. (U) Cost Variance Analysis (Cont'd):

reduction by House Appropriations Committee. Addition of P3I Program for Advanced Warhead, subsequently deleted until threat defined.

FY 88 Appropriation Act Reductions.

Projected Honeywell Over Target Cost; addition of funds compensates for prior reduction.

Projected Government Cost Increases.

Support: Navy Industrial Fund Adjustment/CSS Reduction.

Navy laboratory support of increase testing program.

PROCUREMENT

Economic: Revised Escalation Rates.

Schedule: Stretch out of approximately 6 years due to reduced annual procurement quantity from 1,260 to 800 and slowed production ramp up.
A subsequent revision to the program increased production ramp up and annual production quantity from 800 to 1000. This resulted in shortening the production schedule by one year.

Movement of 119 torpedos to out years resulting from decreased procurement quantities in FY91-FY94 due to increased escalation.

Estimating: Change in First Unit (T1) Cost and Learning Curve assumptions and rate effects based on actual data from Prime Contractor and proposed data from Second Source.

Started competition earlier resulting in more torpedoes produced under full competition with resultant savings.

Changes based on negotiated values of torpedo and support equipment in the Honeywell and Westinghouse LRIP Contracts.

Support: Navy Industrial Fund/CSS Reduction and reduction of initial spares requirements based on required initial outfitting requirements for IMA.

Shift of Spares requirements from FY 88/89 to out years.

13b. (U) Cost Variance Analysis (Cont'd):

MILCON
Quantity: Change of 5 IMA facilities for MK 50 from dual use to system specific.
Estimating: Change to "True" FY 84 Constant $.
Support: Addition of Intermediate Maintenance Activity at Charleston, S.C.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
New inflation indices (Economic)	--	0.5
Change due to OPEVAL extension and the inclusion of 6.3 R&D funding not previously reported (Estimating)	54.0	64.6
Total Changes	54.0	65.1
(2) PROCUREMENT		
New Inflation indices (Economic)	--	-229.9
Decrease in unit cost due to revised inflation indices permits higher production quantities in early years (Schedule)	--	-702.5
Change in learning curves used in the cost estimate based on actual contract experience (Estimating)	-796.6	-551.3
Increase in support cost allocation due to new work breakdown structure with concomitant reduction in swimaway cost (Support)	367.9	519.0
Total Changes	-428.7	-964.7
(3) MILCON		
Changes due to reduced facility requirements based on a decrease in planned turnarounds (Estimating)	-9.4	-11.8
Total Changes	-9.4	-11.8

(b)(1)



15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) Procurement --
(U) MK 50 TORPEDO LRIP I:
ALLIANT TECHSYSTEMS INC., HOPKINS, MN
N00024-89-C-6040, FPI
Award: October 6, 1988
Definitized: October 6, 1988

	Initial Contract Price		
	Target	Ceiling	Qty
	$173.2	$189.1	76

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$179.9	$188.9	76	$179.7	$183.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-9.7	$-7.8
Cumulative Variances To Date (12/01/91)	$-15.4	$-0.8
Net Change	$-5.7	$7.0

Explanation of Change:

The change in schedule variance is the result of the contract being virtually complete. All but one torpedo has been delivered and that torpedo is awaiting one part before it can be completed and shipped. The cost variance change is the result of increases incurred in the guidance and control section, project management and the MK-644 System Test Set.

Alliant has completed and delivered 75 of the 76 torpedoes on this production contract. The final delivery is being delayed by the receipt of one part, this torpedo is expected to be delivered in February 1992.

Cost variance has declined since the last report and schedule has been almost fully recovered. Most of the cost growth is attributable to the Command and Control system ($-3.6M), Test Equipment ($-5.7M), and project management ($-3.3M) which account for over 80% of the

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) total. The variance at completion is projected by the contractor to be somewhat lower at approximately $-11.4M. The contractor estimated that several one-time savings will bring the price in at a level closer to his estimate than the program office's. This will be closely monitored. The contract is budgeted to target and any growth will have to be charged to the expired funds accounts. The contractor has requested increases in billing prices for CLINs under this contract and the program office is attempting to obtain expired FY-89 funds to allow a contract modification to be made. Since this contract will complete prior to the next SAR submission, this will be the last report.

(U) MK 50 TORPEDO QUAL/LRIPI:	Initial Contract Price		
	Target	Ceiling	Qty
WESTINGHOUSE ELEC. CORP., CLEVELAND, OH			
N00024-87-C-6378, FFP/FPI	$125.5	$142.3	74
Award: December 15, 1988			
Definitized: December 15, 1988			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$142.9	$152.3	74	$142.9	$148.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-21.4	$-23.1
Cumulative Variances To Date (11/18/91)	$-28.3	$-10.9
Net Change	$-6.9	$12.2

Explanation of Change:

The increase in cost variance since the last report is the result of continued cost growth on this FPI contract. The major changes were in the area of the afterbody which is now showing a variance of $-5.3M, the warhead at $-1.4M and systems test and evaluation at $-1.7M.

The schedule variance changes occurred in the areas of test equipment which improved by $1.0M, guidance and control better by $3.0M, the afterbody variance decreased by $1.5M. The other improvements were distributed over several areas. With all but one torpedo completed, the variance is due to some remaining work not directly involving torpedo production hardware.

This contract is now over 94% complete, the vast majority of production hardware has been built and 60 of the required 74 units have been delivered. Of the remaining hardware, 13 torpedoes are built and are awaiting clearance of constraints prior to delivery. The last torpedo is an Integration and Interchangeability (I&I) unit

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) comprised of components from both Alliant and Westinghouse, one remaining part is required to complete assembly. The total variance includes approximately $-3.2M which occurs in fixed price contract line items (CLINs); the government is not responsible for any portion of the overruns on these items. The Program Manager continues to monitor this contract very closely. Westinghouse has completed delivery of the qualification hardware at the subassembly and main assembly level, this material is undergoing testing at NUWC Keyport and full qualification is expected in the Spring of 1992. Production torpedo deliveries are also expected to complete this Spring. Since this contract will complete prior to the next SAR submission, this will be the last report.

(U) MK-50 TORPEDO LRIP II:
ALLIANT TECHSYSTEMS INC., HOPKINS, MN
N00024-90-C-6024, FPI
Award: November 6, 1989
Definitized: November 6, 1989

Initial Contract Price		
Target	Ceiling	Qty
$122.5	$135.6	100

Current Contract Price		
Target	Ceiling	Qty
$129.3	$142.0	100

Estimated Price At Completion	
Contractor	Program Manager
$129.3	$130.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$-6.1
Cumulative Variances To Date (12/01/91)	$-1.5	$-12.0
Net Change	$-1.5	$-5.9

Explanation of Change:

The change in cost variance is driven by two major items: (1) the forebody at $-1.6M, and (2) the fleet exercise system at $-.7M. The schedule variance is driven by the forebody ($-4.1M) and the fleet exercise system ($-2.3M), support equipment ($-2.3M), and the warhead ($-2.3M). The contractor is taking aggressive action to resolve the schedule variance and is expected to recover by late summer of 1992.

Cost variance has grown to $-1.5M since the last SAR, this represents a 2.1% growth over anticipated costs for work performed to date. Analysis indicates that the cost is likely to grow by a further $1.5M by completion which would translate to an increased price to the government of $3.0M over the contract target price.

Schedule variance has grown significantly since the last report and is primarily attributable to the torpedo afterbody with the forebody and fleet exercise system also making up a considerable part. Recovery of schedule is anticipated by the summer of 1992 and,

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) although initial deliveries have been delayed, the contract is expected to complete on time.

(U) MK-50 TORPEDO LRIP II:
WESTINGHOUSE ELEC. CORP., CLEVELAND, OH
N00024-90-C-6017, FPI
Award: January 30, 1990
Definitized: January 30, 1990

Initial Contract Price		
Target	Ceiling	Qty
$124.3	$140.7	100

Current Contract Price		
Target	Ceiling	Qty
$119.9	$130.7	100

Estimated Price At Completion	
Contractor	Program Manager
$119.6	$121.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-1.3	$-7.4
Cumulative Variances To Date (11/18/91)	$-1.6	$-19.3
Net Change	$-0.3	$-11.9

Explanation of Change:

The cost variance changes were minimal and were distributed over a range of cost elements. The schedule variance worsened by $11.9M since the last SAR with the major portions of the increase coming in guidance and control up by $5.2M, the torpedo afterbody up by $5.3M and project management up by $.9M.

This contract is now 52% complete and initial deliveries are expected to begin in February after completion of the last LRIP I delivery. The schedule variance is driven by the afterbody at approximately $-5.2M; command and control at about $-4.0M; the sonar system at $-2.9M with the remaining variance distributed between project management, test equipment and "other" factors. Cost variance is driven by the afterbody at $-1.5M; command and control at $-1.2M; and sonar at $-.9M with offsetting positive variances in project management of $2.1M. The total variance of $1.572M includes $-.433M in the fixed price portion of the contract for which the government is not liable.

(U) MK-50 TORPEDO LRIP III:
ALLIANT TECHSYSTEMS INC., HOPKINS, MN
N00024-91-C-6006, FFP
Award: February 7, 1991
Definitized: February 7, 1991

Initial Contract Price		
Target	Ceiling	Qty
$99.5	N/A	100

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$99.5	N/A	100	$99.5	$99.5

CPR information is not a requirement on this FFP contract.

This is a Firm Fixed Price contract and data provided as required under the terms of the contract indicates that the contractor's performance to date is in accordance with his original spend plan. There is no reason to believe that the contractor will not be able to perform as required by the terms, conditions and price of the contract.

(U) MK-50 TORPEDO LRIP III:
WESTINGHOUSE ELEC. CORP., CLEVELAND, OH
N00024-91-C-6105, FFP
Award: February 7, 1991
Definitized: February 7, 1991

Initial Contract Price		
Target	Ceiling	Qty
$134.0	N/A	165

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$134.0	N/A	165	$134.0	$134.0

CPR information is not a requirement on this FFP contract.

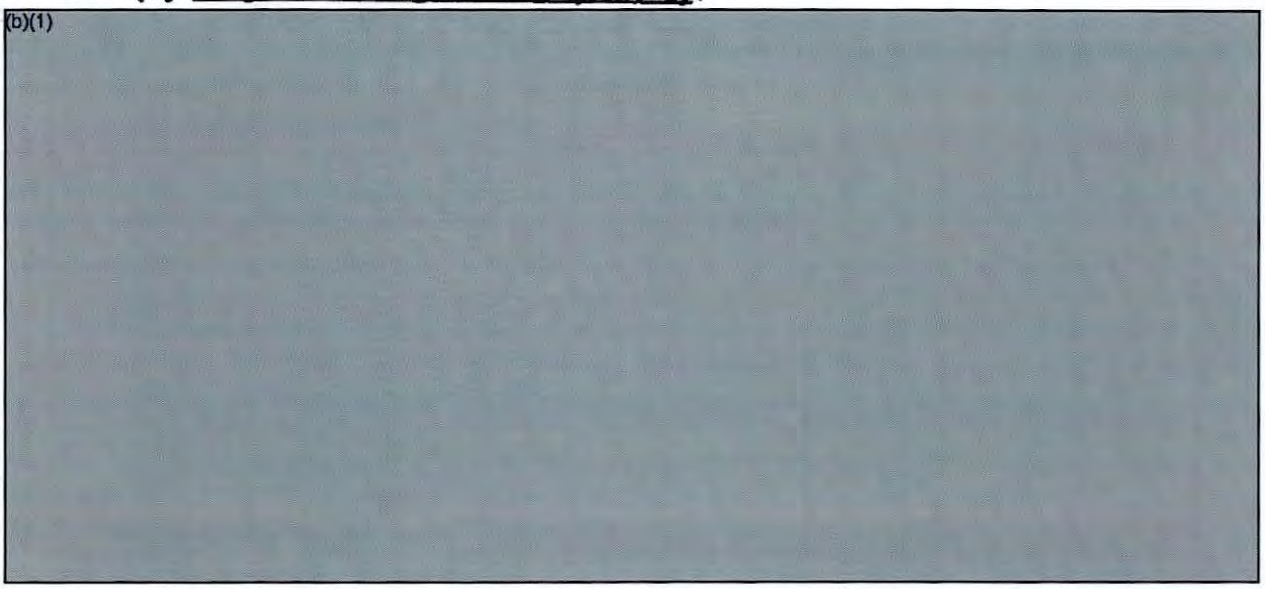
This is a Firm Fixed Price contract and data provided as required under the terms of the contract indicates that the contractor's performance to date is in accordance with his original spend plan. There is no reason to believe that the contractor will not be able to perform as required by the terms, conditions and price of the contract.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

(b)(1) [redacted]

16b. (U) Program Funding Summary (Cont'd):

(b)(1)



c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1975				3.8	1.8	1.8	1.8	10.9
1976				19.1	9.5	9.5	9.5	6.6
197T				6.0	3.1	3.1	3.1	2.9
1977				33.5	17.8	17.8	17.8	2.6
1978				42.4	24.3	24.3	24.3	6.8
1979				69.9	44.2	44.2	44.2	8.4
1980				85.6	59.9	59.9	59.9	10.6
1981				129.5	98.8	98.8	98.8	10.6

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1982				129.5	104.0	104.0	104.0	7.6
1983				136.9	114.9	114.9	114.9	4.9
1984				164.6	143.1	143.1	143.1	3.8
1985				164.5	147.5	147.5	147.5	3.4
1986				164.6	151.8	151.8	151.8	2.8
1987				182.1	173.0	173.0	172.7	2.7
1988				142.6	140.0	140.0	139.7	3.0
1989				133.2	136.2	136.2	135.9	4.2
1990				59.5	63.3	63.3	56.7	4.0
1991				42.3	46.6	46.5	34.0	3.9
1992				11.1	12.6	3.1	0.3	3.1
1993				7.8	9.2			3.3
1994				6.8	8.2			3.3
1995				6.5	8.1			3.3
1996				6.3	8.2			3.2
1997				6.2	8.3			3.2
Subtot	108			1754.3	1534.4	1482.8	1460.0	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
(b)(1)								

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	

Appropriation: 1507 Weapons Procurement, Navy (Cont'd)

2005	(b)(1)		193.5	244.6	435.5			3.2
2006			211.5	266.3	489.2			3.2
2007								3.2
2008								3.2
2009								3.2
2010								3.2
2011								3.2
2012								3.2
2013								3.2

(b)(1)

The $2.3M of recurring costs for FY-87 were incurred during the familiarization phase of the contract with Westinghouse, no quantity is shown because the contract required the delivery (for test purposes) of only torpedo components not torpedo main assemblies.

Westinghouse Production Qualification Units (Refers to WPN quantity for FY 1988).

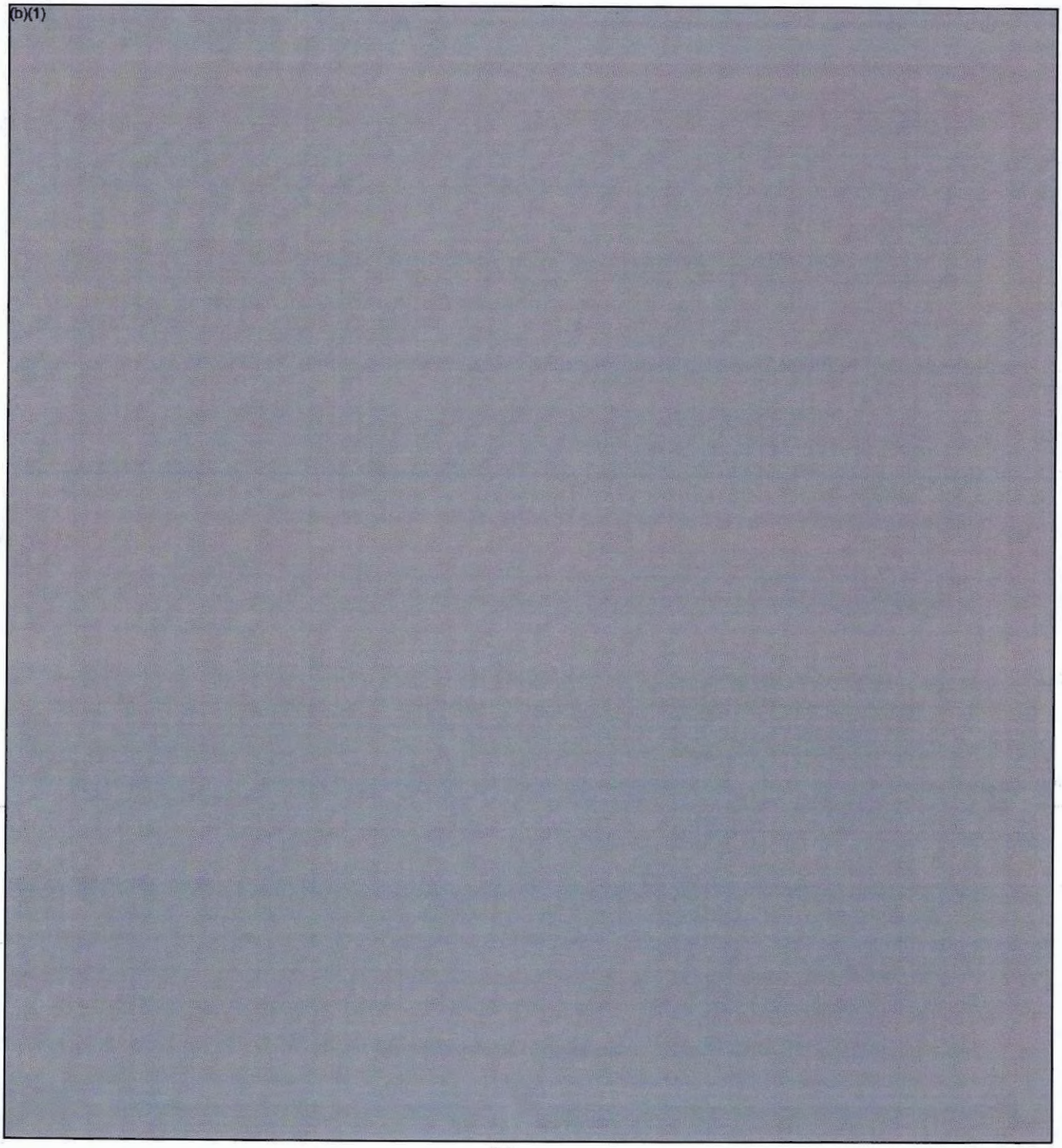
16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1205 Military Construction, Navy								
1982				10.6	8.9	8.9	8.9	7.6
1983								4.9
1984								3.8
1985								3.4
1986								2.8
1987								2.7
1988								3.0
1989				3.7	3.9	3.9	3.3	4.2
1990								4.0
1991								3.9
1992				8.2	9.8			3.1
1993								3.3
1994								3.3
Subtot				22.5	22.6	12.8	12.2	

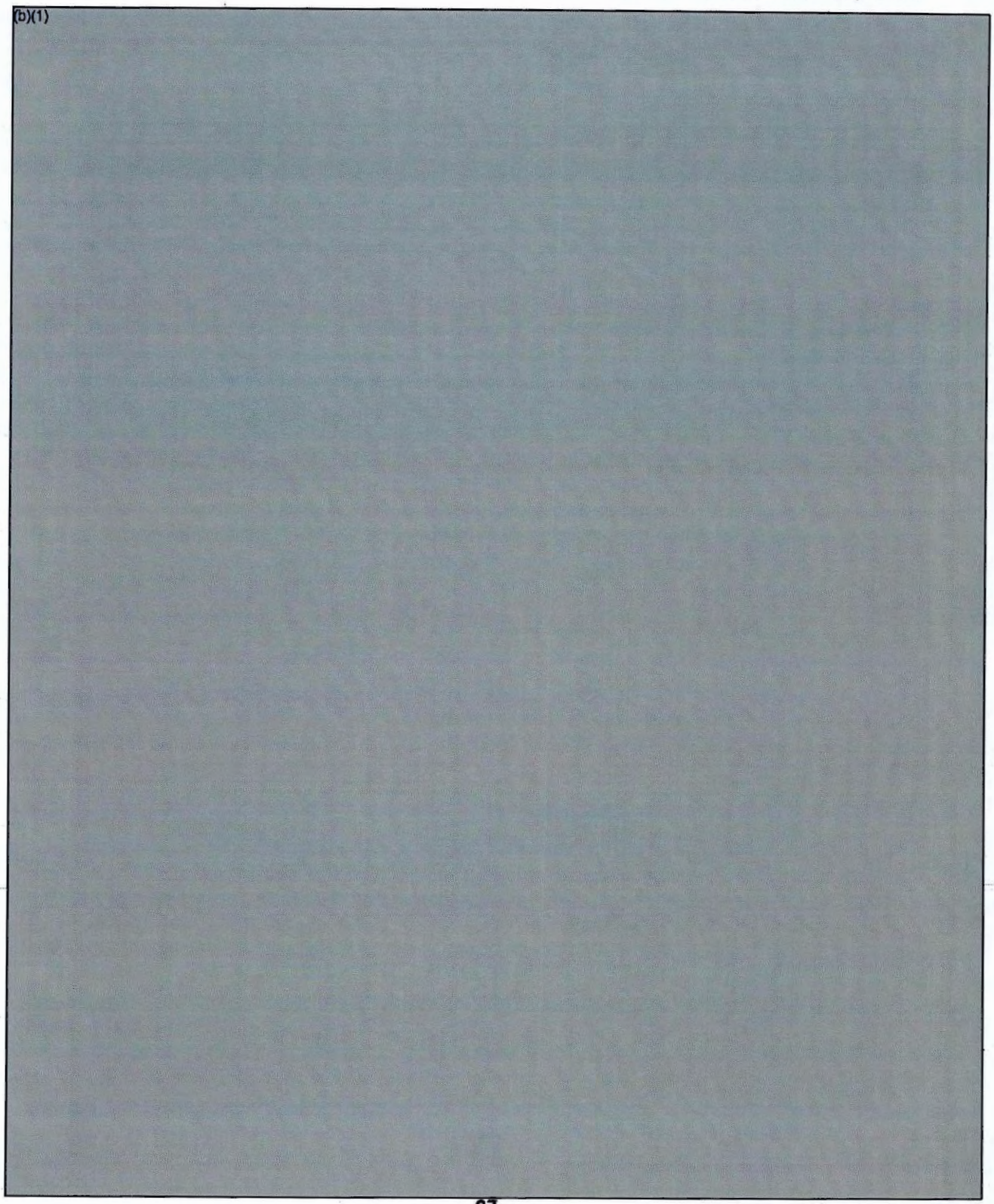
(b)(1) [redacted]

17. (U) Production Rate Data:

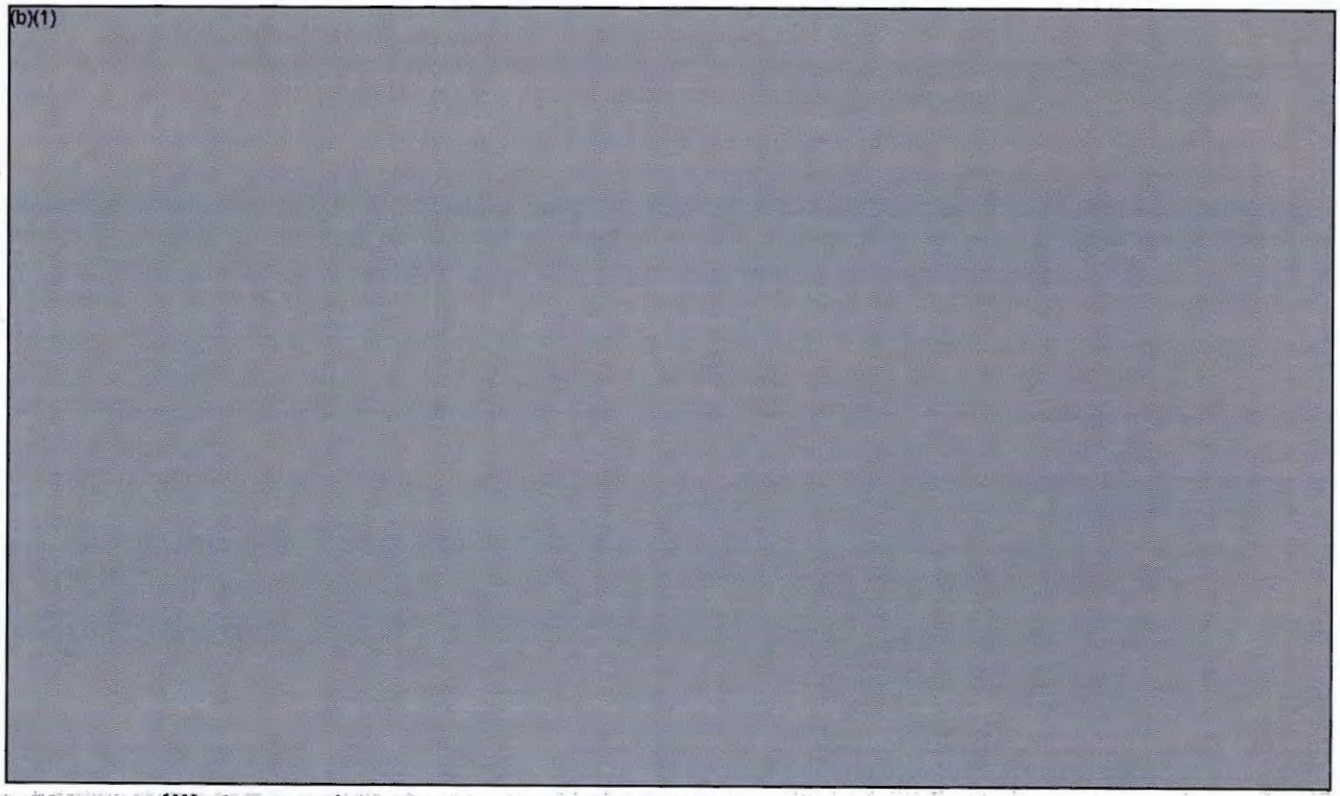
(b)(1)



(b)(1)



(b)(1)



e. (U) Approved Design-to-Cost Objective --

	(Average Unit Flyaway Cost) Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 1000 - @ Peak Rate: 83/mo			
FY 89 Base-Year $	0.4	0.6	0.4
Then Year $	0.5	0.8	0.5
@ Qty 0 (1st three years) - @ Peak Rate: 0/mo			
FY 89 Base-Year $	0.0	0.0	0.0
Then Year $	0.0	0.0	0.0

Current estimate is based on the same methodology as was used to calculate the development estimate. In the current estimate, however, it takes five years of production to attain 1000 units whereas in the development estimate it took only one. The reason for the extra years of production to achieve 1000 units is the dramatic reduction in procurement funding and the resultant lower annual quantities. The peak rate attained in the development estimate (83/MO) is never achieved in the current estimate (peak rate is only 50 units/month).

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

These appropriations include MPN, O&MN, WPN AND OPN. Costs contained herein were developed using the MK-50 Torpedo Life Cycle Cost Model with the most current data available. This cost estimate was prepared in accordance with the program submitted as the FY-93 President's budget. This is the same method used to develop the O&S Costs previously briefed to the OSD Cost Analysis Improvement Group (CAIG) in February of 1989. This same methodology will be employed in preparing for the next CAIG review in support of the Milestone IIIB DAB.

b. (U) Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per MK-50 INVENTORY	Avg Annual Cost Per
Operations	5.4	N/A
IMA Maintenance	10.7	N/A
Depot Maintenance	1.0	N/A
Sustaining Investment	5.6	N/A
Depot Supply Support	1.0	N/A
Total	23.7	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M,N	0.8	0.2	0.2	4.2	5.4
Total	0.8	0.2	0.2	4.2	5.4

Increase in IMA maintenance costs due to requirement to fund military personnel costs at NIF operated facilities.

18. (U) Operating and Support Costs (Cont'd):

No changes are planned for the CSS structure in support of the O&S phase of the program.

N-1 ASPJ

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91-119

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: ASPJ (AN/ALQ-165)

AS OF DATE: December 31, 1991

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AS AMENDED

CLEARED FOR OPEN PUBLICATION

MAR 23 1992 9

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
AN/ALQ-165 (Airborne Self-Protection Jammer)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
TACTICAL AIR PROGRAMS — CAPT S. M. SMALL
PMA-272 — Assigned: August 2, 1988
WASHINGTON, DC 20361-1272 — AV 222-5480 COMM 703 692-5480

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0604270F Project 2712, 2719
PE 0604270N Project W0619, W0638, E0619

5. (U) Related Programs: None.

No Security Objection to Open Publication (AS AMENDED)
MAR 20 1992
Office of the Chief of Naval Operations Dept. of the Navy

Classified by: OPNAVINST 5513.8(31)
Declassify on: Originating Agency Determination Required (OADR)
Downgrade Instructions: Not Subject to Automatic Downgrade

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OASD(PA) DFOISR 92-T-0624

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6. (U) Mission and Description:
The Airborne Self-Protection Jammer (ASPJ), AN/ALQ-165(V), is an effective, state-of-the-art Defensive Electronic Countermeasure (DECM) system for the self-protection of tactical aircraft. The system will meet tactical aircraft DECM needs into the 21st century. ASPJ will be fully integrated with aircraft avionic and weapon systems (Radar, RWRs, HARM, AMRAAM, etc.). The system is modularly designed with reprogrammable software. Modular construction and software controlled system management allows airframe users to install the level of capability required depending upon the radar cross-section of the platform to be protected, the airframe installation and/or tactical need. Computer programs developed for the ASPJ system are fully modular in design and will be segmented to cover separate operational functions or control separate hardware elements.

There are two current configurations for ASPJ: (1) Basic System and (2) Common System. All applications use combinations of the same six unique Weapons Replaceable Assemblies (WRA). The only equipment unique to each aircraft is the rack that houses the standard WRAs to interface with the aircraft. An ASPJ Pre-Planned Product Improvement (P3I) program will upgrade the system with the capability to counter projected new threats and improve its capability against known threats.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
The program was started in 1969 as a traveling wave tube component development effort. In 1976, the Director of Defense Research and Engineering directed that this program (renamed ASPJ) and the Air Force lightweight, low cost countermeasure program be combined with the Navy designated as lead service. Major design changes were funded to achieve 100% commonality between Navy and Air Force systems. All twelve ASPJ Full-Scale Development (FSD) prototype models were delivered and fielded for testing. A 10 December 1986 decision memorandum approved an ASPJ acquisition to include a Production Verification (PV) phase of 6 units with an option for 24 additional units. The basic ASPJ PV contract for 6 units was awarded on 31 August 1987, and an option for 14 units was exercised on 31 August 1988. Operational testing to support the MSIIIA decision began in July 1988 and continued through March 1989. The Defense Acquisition Board (DAB) approved the award of limited production contracts in August 1989. Two Low-Rate Initial Production contracts were awarded in October 1989 for a total of 100 systems, 50 from each contractor. The FY 91 Amended Budget Submit removed all FY 90 and subsequent unobligated Air Force funds from the program. A total of 15 PV systems were delivered through 1990. Contractor testing, government lab tests, and F/A-18C DT-IIE began in 1990 on the PV systems.

7a. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report --
The PV phase is concluding with favorable results and improvements from the FSD phase. All twenty PV systems have been accepted by the government and have undergone laboratory testing at the contractor's facilities using government approved test plans. ASRJ successfully completed integration and DT flight testing as well as combined DT/OT phases at the Radio Frequency Simulator System and the Electronic Combat Systems Evaluation Laboratory. Operational testing began on 12 August 1991 with an estimated completion of 31 March 1992. System reliability growth testing has accumulated 903 hours of testing which have been reviewed by the government. A DAB was held on 24 June 1991. The Acquisition Decision Memorandum of 1 July 1991 approved a Lot II award split between the two contractors with a cap of $90M. Two Lot II contracts were awarded on 12 July 1991 for a total of 36 systems. The Navy was directed to request proposals with priced options for variable quantities up to the total remaining inventory objective. These proposals shall be used to make a downselect decision within 12 months. Foreign Military Sales case KS-D-SIK includes 40 ASRJ systems as part of the Government of Korea's Letter of Offer and Acceptance to procure USAF F-16's. Chief of Naval Operations (OP-05) Memo 501E/1U097 dated 19 June 1991 increased the ASRJ inventory objective to 739 systems which increased the total procurement cost and production completion date.
ASRJ is expected to satisfy the mission requirement.

c. (U) Changes Since As Of Date --
System reliability growth testing has accumulated 1175 hours of testing reviewed by the government in January 1992 with a Mean Time Between Failure Instantaneous (MTBFi) of 116 hours.

8. (U) Threshold Breaches:
There is a baseline breach in Schedule parameter Production Complete, The current estimate is APR 02 vs. the threshhold of APR 00. A baseline change is being prepared for the Milestone IIIB decision which will occur in Jun 92. There is no Nunn-McCurdy cost breach.

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program/PdE	Current Estimate
Production Award Lot 1	N/A	OCT 89	OCT 89
Milestone IIIA	N/A	MAY 91	JUN 91(Ch-1)

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program;PdE	Current Estimate
Op Test (OT-IID)			
Start	N/A	JUL 91	AUG 91(Ch-2)
Complete	N/A	DEC 91	MAR 92(Ch-3)
Lot 1 Deliveries (100 units)			
Start	N/A	DEC 91	DEC 91
Complete	N/A	NOV 92	NOV 92
(b)(1) [redacted]			
Navy Spt Date	N/A	JUL 95	AUG 95(Ch-7)
Production Complete	N/A	OCT 99	APR 02(Ch-8)
Complete Phase I	AUG 81	N/A	FEB 81
Contract Award, Phase II	DEC 81	N/A	AUG 81
Combined DT-IIC/OT-IIA (Start)	APR 86	N/A	MAR 88
Combined DT-IIC/OT-IIA (Comp)	N/A	N/A	JUL 88
DAB III (A)	AUG 86	N/A	JUN 89
Limited Production Contract	NOV 86	N/A	OCT 89

Milestone IIIA which occurred in June 91 was actually Milestone IIIA'. DAB III (A) which occurred in June 89 was Milestone IIIA.

b. (U) Previous Change Explanations --

DAB III(A) (MS IIIA), contract award and IOC delayed due to technical problems encountered during FSD development/operational testing; problems have been resolved; fixes in place have been tested satisfactorily in DT and are being tested in OT-IID.

c. (b)(1) Current Change Explanations --

(U) (CH-1) The actual Milestone IIIA' decision did not occur until Jun 91 due to administrative delays.

(U) (CH-2) The start of OT-IID was delayed until Aug 91 based on administrative delays.

(U) (CH-3) The completion of OT-IID will be delayed until Mar 92 to allow for testing with the F/A-18 91C software release.

(U) (CH-4) Milestone IIIB will be delayed until Jun 92 to allow for completion of OT-IID and submission of OT report.

(b)(1)

9c. Schedule (Cont'd):

(b)(1)

[redacted]

(U) (CH-7) Navy Support Date has changed from Jul 95 to Aug 95 based on the Physical Configuration Audit schedule.

(U) (CH-8) Production will not be completed until Apr 02 due to an increase in inventory objective.

d. (U) References --

(U) Development Estimate:
Deputy Secretary of Defense Decision Memorandum (SDDM), 24 February 1982 and Under Secretary of Defense (USD) (C3I0 Decision Memorandum (DM), 20 March 1984.

(U) Approved Program;PdE:
DAE Approved Acquisition Program Baseline dated 2 December 1991.

10. (U) Performance Characteristics:

a. (U) Performance --	DE	Approved Program;PdE Objective/Threshold		Demonstrated Perf	Current Estimate
Operational Availability (Ao)					
Basic	.93	.93	/ .92	N/A	.92
Common	N/A	.90	/ .88	N/A	.88
Mission Reliability (1.75 hr mission)					
Basic	.96	.96	/ .95	N/A	.95
Common	N/A	.95	/ .94	N/A	.94
Maintenance Demand (hrs)					
Mean Flight Hrs Between Maintenance Action					
Basic	8.6	8.6	/ 6.8	N/A	6.8
Common	N/A	6.8	/ 5.6	N/A	5.6
Direct Maintenance Manhours/Maintenance Action					
Basic	.95	.95	/ 2.18	N/A	2.18
Common	1.2	1.2	/ 2.65	N/A	2.65

[redacted]

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program;PdE Objective/Threshold		Demonstrated Perf	Current Estimate	
Mean Time to Repair (hrs)						
0 Level	N/A	.5	/ .75	N/A	0.75	
I Level	N/A	1.5	/ 1.5	N/A	1.5	
Logistics Demand						
Mean Flight Hrs Between Repair						
Basic	21.5	21.5	/ 17.0	N/A	17.0	
Common	N/A	17.0	/ 14.0	N/A	14.0	

(b)(1)

[redacted]

Reliability (Mean Time Between Failure) (hrs) 1/						
Basic	N/A	103	/ 103	N/A	103	(CH-1)
Common	N/A	78	/ 78	N/A	78	(CH-2)
ASRJ vs. AN/ALQ-126B 2/ T1=SASRJ/SALQ-126B	N/A	T1 >= 1	/ T1 >= 1		T1>=1	
ASRJ vs. No ECM (Dry) 3/ T2=SASRJ/SDRY	N/A	T2 >= 1.3	/ T2 >= 1.3		T2>=1.3	

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program;PdE Objective/Threshold	Demonstrated Perf	Current Estimate
Direct Maintenance Manhours per Maintenance Action				
Basic	N/A			***
Augmented	N/A			***

(b)(1) NOTE:

(b)(1)

[redacted]

(U) *** See Direct Maintenance Manhours/Maintenance Action above for Basic, Augmented will not be produced.

(b)(1)

[redacted]

10a. (U) Performance Characteristics (Cont'd):

PN is the probability of exactly N shots occurring(PN=RN/R)
RN is the number of runs for which N shots were observed
R is the total number of runs made in each senario
N is the number of shot opportunities for a particular run
SN is the total number of shots in rund with the same N
K is the maximum number of shots observed per run
HN is the total number of hits for all runs having the same N
All values of "S" are aggregate values as determined in par ID2c of ASPJ TEMP No. M082(Rev 3).

b. (b)(1) Previous Change Explanations --

(b)(1) [redacted]

(U) Revised estimate frequency coverage (GHz) based upon demonstated system performance.
(U) Revised estimate output pulse power (dBm) based upon demonstated system performance.
(U) Revised estimate output CW/noise (dBm) based upon demonstated system performance.
(U) Revised estimate throughput time (ns) based upon demonstated system performance.

c. (U) Current Change Explanations --

(CH-1) The MTBF thresholds for the basic (5-box) configuration will be verified during Production Reliabilty Acceptance Testing (PRAT) evaluation of Lot 3 units.
(CH-2) The MTBF thresholds for the common (7-box) configuration will be verified during PRAT evaluation of Lot 3 units.

d. (U) References --

(U) Development Estimate:
SDDM, 24 February 1982, and USD C3I DM, 20 March 1984.

(U) Approved Program;PdE:
DAE Approved Acquisition Program Baseline dated 2 December 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program;PdE	Current Estimate
a. (U) Cost —			
Development (RDT&E)	227.7	582.0	549.4
Procurement	0.0	1060.0	0.0
Total Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	227.7	1642.0	549.4
Escalation	8.7	403.0	11.6
Development (RDT&E)	(8.7)	(28.0)	(11.6)
Procurement	(0.0)	(375.0)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	236.4	2045.0	561.0

Approved Program Baseline includes production estimates which are included in the host aircraft Selected Acquisition Reports.

b. (U) Quantity —			
Development (RDT&E)	0	N/S	0
Procurement	0	510	N/A
Total	0	510	0

Twelve non-fully configured R&D units were procured.

c. (U) Foreign Military Sales —
Commitments to date are 40 ASPJ systems and related hardware and support for the Government of Korea for a total cost of $117M. (Based on FMS case KS-D-SIK)

d. (U) Nuclear Costs — None.

e. (U) References —

(U) Development Estimate:
SDDM, 24 February 1982 and USD C3I DM, 20 March 1984.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 2 December 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	561.0	610.0	561.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

b. (U) Current Procurement —	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	236.4	0.0	0.0	236.4
Previous Changes:				
Economic	+2.6	-	-	+2.6
Quantity	-	-	-	-
Schedule	+25.4	-	-	+25.4
Engineering	+52.1	-	-	+52.1
Estimating	+293.5	-	-	+293.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+373.6	-	-	+373.6
Current Changes:				
Economic	-2.6	-	-	-2.6
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-46.4	-	-	-46.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-49.0	-	-	-49.0
Total Changes	+324.6	-	-	+324.6
Current Estimate	561.0	-	-	561.0

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary — (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	227.7	0.0	0.0	227.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	+21.8	-	-	+21.8
Engineering	+40.8	-	-	+40.8
Estimating	+292.0	-	-	+292.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+354.6	-	-	+354.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-32.9	-	-	-32.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-32.9	-	-	-32.9
Total Changes	+321.7	-	-	+321.7
Current Estimate	549.4	-	-	549.4

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised Escalation Rates
Correction of prior SAR

Schedule: Delay of aircraft integration
Change per JRMB directed test plan

Engineering: Required technical improvement initiatives FY 89-92
Re-assessment of Pre-Planned Product Improvement requirements

Estimating: Allocation of adjustments (FY 88 and prior)
Restructure of P3I Plan
Removal of Air Force funds
Re-allocation of prior years (FY 88 and prior) unobligated balances

13b. (U) Cost Variance Analysis (Cont'd):
Continuation of Air Force testing program
Correction of prior SAR

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 Escalation Rates (Economic)	N/A	-2.2
Economic Adjustment for Negative Program Change (Economic)	N/A	-0.4
Current & Prior Inflation Offset (Estimating)	0.7	1.0
FY 92-97 Adjustment to Navy P3I Program (Estimating)	-33.6	-47.3
Prior Adjustment for Actuals (Estimating)	--	-0.1
Total Changes	-32.9	-49.0

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Not Applicable.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E --
(U) ASRJ FSD:

	Initial Contract Price Target	Ceiling	Qty
Joint Venture, ITT/WEC, Nutley,NJ/Balt, MD, N00019-81-C-0369, Award: N/A Definitized: August 27, 1981	$80.8	N/A	12

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$176.6	$140.0	12	$176.6	$258.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (11/30/88)	N/A	N/A
Net Change	$0.0	$0.0

Explanation of Change: None.

A FSD contract cap was negotiated in November 1984, which established a maximum government liability of $140M. As a part of the contract

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) cap agreement, Cost Performance Reports were no longer required; therefore cost and schedule variance information is not available for reporting.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 75.0% (15 yrs/20 yrs)

(2) Percent Program Cost Appropriated: 93.3% ($523.4 / $561.0)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY78-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	521.9	1.5	7.5	30.1	561.0
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	521.9	1.5	7.5	30.1	561.0

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1978				3.9	2.6	2.6	2.6	6.8
1979				21.0	15.6	15.6	15.6	8.4
1980				16.1	13.2	13.2	13.2	10.6

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1981				31.1	27.8	27.8	27.7	10.6
1982				25.4	23.9	23.9	23.7	7.6
1983				32.3	31.8	31.8	31.7	4.9
1984				39.6	40.3	40.3	39.9	3.8
1985				31.8	33.4	32.4	32.4	3.4
1986				20.3	21.9	21.9	20.2	2.8
1987				8.6	9.6	9.6	8.3	2.7
1988				13.8	15.9	15.9	15.0	3.0
1989				6.6	7.9	7.9	7.2	4.2
1990				5.5	6.9	6.9	6.2	4.0
1991				8.8	11.4	10.9	7.2	3.9
1992				1.1	1.5			3.1
1993				5.5	7.5			3.3
1994				6.5	9.2			3.3
1995				6.7	9.8			3.3
1996				3.8	5.7			3.2
1997				3.5	5.4			3.2
Subtot				291.9	301.3	260.7	250.9	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
Navy				291.9	301.3	260.7	250.9	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1979				6.5	4.8	4.8	4.8	8.4
1980				11.1	9.1	9.1	9.1	10.6
1981				13.6	12.2	12.2	12.2	10.6
1982				57.8	54.4	54.4	54.4	7.6
1983				50.6	49.8	49.8	49.8	4.9
1984				40.9	41.7	41.7	41.7	3.8
1985				23.1	24.3	24.3	24.3	3.4
1986				7.9	8.5	8.5	8.5	2.8
1987				10.6	11.8	10.2	10.2	2.7
1988				13.2	15.2	14.6	10.7	3.0
1989				8.3	10.0	8.6	7.0	4.2
1990				2.3	2.9	2.4	1.8	4.0
1991				11.6	15.0	3.0	0.1	3.9
1992								3.1
Subtot				257.5	259.7	243.6	234.6	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
USAF				257.5	259.7	243.6	234.6	
Grand Total				549.4	561.0	504.3	485.5	

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- None.

b. (U) Cost Variance -- None.

c. (U) Schedule Variance -- None.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

Average annual cost for all fielded systems.
Based on 484 USN systems.
Estimate dated May 1991.
No antecedent.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per all fielded systems	Avg Annual Cost Per
All fielded systems	30.0	N/A
Total	30.0	N/A

c. (U) Contractor Support Costs -- None.

Cost decreased from $40M to $30M due to decreased number of systems and sites. O&S estimate will be updated for the MSIIIB decision in June 1992.

AF-6 C-17A

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: C-17

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
C-17A/Direct Delivery Airlift Aircraft

2. **DoD Component:** USAF

3. **Responsible Office and Telephone Number:**
C-17 SYSTEMS PROGRAM OFFICE
AERONAUTICAL SYSTEMS DIVISION
WRIGHT-PATTERSON AFB
DAYTON, OH 45433-6503

B/GEN KENNETH G. MILLER
Assigned: July 15, 1991
AV 785-1545 COMM 513-255-1545

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604227F (Shared), 0604231F, 0604609F (Shared)
PROCUREMENT:
APPN 3010 ICN C017AD (Air Force)
MILCON:
PE 0401130F

OASD(PA) DFOISR 92-T-0426

SAF/PAS
92-272 -T

5. **Related Programs:**
None.

6. **Mission and Description:**
The purpose of the C-17 aircraft is to modernize the airlift fleet and improve the overall capability of the U.S. to rapidly project, reinforce and sustain combat forces worldwide. The aircraft will augment the C-5 and C-141 in intertheater deployment and the C-130

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6. Mission and Description (Cont'd):

with intratheater operations. Because the C-17 will be capable of carrying outsize cargo over intertheater ranges into austere airfields, it introduces a direct deployment capability that will significantly improve airlift responsiveness. This improved responsiveness will, in turn, dramatically improve the mobility of our general purpose forces.

Significant features of the multi-engine C-17A include: supercritical wing design and winglets to reduce drag and increase fuel efficiency and range; receiver inflight refueling capability to increase range; externally blown flap configuration, direct lift control spoilers and high impact landing gear system, all of which contribute to the aircraft's capability to operate into and out of small austere airfields; forward and upward directed thrust reverser system that provides backup capability, reduces the aircraft ramp space requirements, and minimizes interference of dust and debris on the activities of ground personnel; cargo door, ramp, airdrop and cargo restraint systems that are operable by a single loadmaster and permit immediate equipment offload without special handling equipment; two man cockpit with cathode ray tube (CRT) displays that reduce complexity and improve reliabililty; maximum use of built-in test (BIT) features to reduce maintenance and troubleshooting times; and walk-in avionics bays that improve accessibility. The end result is significantly reduced maintenance manhours per flight hour.

7. Program Highlights:

a. Significant Historical Developments --

A SECDEF decision during the FY81 budget review directed funding for a new aircraft which places increased emphasis on strategic airlift capability. The initial C-X Program Management Directive (PMD) was issued on 10 Dec 1979. The requirements for the C-17A aircraft were formalized by the C-X Mission Element Need Statement (MENS), dated 28 Nov 1980. In August 1981, SECAF announced Douglas Aircraft Company as the winner of the C-X source selection.

On 23 July 1982, the FSED contract that had been negotiated during the C-X source selection was awarded to Douglas with a restructure clause inserted to limit the scope of the contract to a 15 month modestly paced program.

A revised PMD was issued in July 1983 which directed the continuation of C-17 design effort and the initiation of activities leading to an FSD start by FY85, a production start by FY88, and an initial operational capability of 12 aircraft in FY92.

On 15 February 1985, the Secretary of Defense approved FSED contingent on second source certification. The program office and Douglas Aircraft Company completed negotiations on the C-17 contract

7a. Program Highlights (Cont'd):

restructure on 31 October 1985. Secretary of the Air Force, the Honorable Mr. Rourke, signed the C-17 second source certification to Congress on 30 December 1985, and the restructured contract was issued the following day.

In 1986, the On-Board Inert Gas Generating System (OBIGGS) was incorporated in the C-17 program.

In Jan 88, the first competitively-priced production option for two aircraft was exercised, along with long lead for the second production option for four aircraft. The first F117 engine was delivered in May 88. It is being used for ground test. Air Vehicle CDR was accomplished in Aug 88. Production Readiness Review #3, completed in Aug 88, indicated that the transition to production was proceeding with no "show stoppers". Assembly start for the first test aircraft occurred at Douglas Aircraft Company (DAC), Long Beach, on 24 Aug 88. A DAB review for Milestone IIIA approval for low rate initial production (FY89-92) was held on 5 Dec 88. Another Defense Acquisition Board (DAB) program review was scheduled prior to release of FY91 and 92 production funds.

The Dec 88 SAR and the funding therein reflected a Multiyear Procurement Strategy for FY93-96.

Milestone IIIA approval was received on 18 January 1989 for the next two lots of C-17s (4 in FY89 and 6 in FY90) plus advance procurement for 10 aircraft planned in FY91. Congressional cuts in FY90 and 91 procurement (4 versus 6 and 6 versus 10 aircraft) have resulted in a restructure of the buy profile.

Honeywell was terminated as Electronic Flight Control System (EFCS) subcontractor on 28 July 1989. General Electric Aircraft Control Systems in Binghamton, New York is the new EFCS subcontractor.

In July 1989, DAC signed a Memorandum of Agreement (MOA) with DELCO, the Mission Computer subcontractor, making DAC responsible for Mission Computer software management. DELCO continues to perform software development/integration with DAC as the overall manager. Action has been taken to streamline the development process.

C-17 completed a Conventional Systems Committee (CSC) and DAB program review on 30 October 1989. The review covered impacts of program schedule slippage and Congressional action to slow low-rate initial production. Both the CSC and DAB approved proceeding with the program.

In September 1990, the contract was modified to reflect the revised

7a. Program Highlights (Cont'd):

schedule (June 1991 first flight).

The SECDEF directed Major Aircraft Review (MAR) resulted in the reduction of the total aircraft buy for this program from 210 to 120 therein precipitating a cost increase in excess of 25% per unit (PAUC). The cost estimate reflected in the 30 September 90 SAR represents the Air Force's best effort to cost this new program in accordance with the SECDEF decision.

A September 1990 SAR was submitted to provide details on a Nunn-McCurdy unit cost breach based on the MAR decision. It also incorporated multi-year assumptions, specifically 24 aircraft per year (FY 95-97) with EOQ (economic order quantity) funding beginning in FY94.

In October 1990, Honeywell successfully completed qualification testing of the first flight software build for the Inertial Reference Unit (IRU). This software was then installed in the Engineering and Flight Development Units.

All four engines were installed on T-1 by 2 Nov 90. The T-1 Fan Reverser Assemblies were delivered from LTV and installed on the aircraft in early December 1990.

All major Static Test airframe components were in position and ready for major join on 11 November 1990.

On 5 December 1990, the Flight Hardware Simulator was powered up to support system level avionics and flight control system testing.

The Software design review of the Mission Computer production software was successfully completed on 7 December 1990.

In late December 90, DAC announced that Mr. Dave Swain had become the new C-17 program manager. Mr. John Capellupo resumed his position as Deputy President of DAC.

On December 21, 1990, DAC completed the assembly of the T-1 aircraft, a major program milestone and prerequisite for the award of the next production contract. Negotiations on the Lot III contract had started on 17 December 1990.

The government has reviewed the Contractor's cost status and estimate to complete for the prime contract. Progress payments were made in October and November 1991 based on the government's estimate at completion.

7b. Program Highlights (Cont'd):

b. Significant Developments Since Last Report --
The Government reached contractual settlement with DAC on Lot III and the Lot II restructure on 30 July 91. This agreement allowed the C-17 program to continue without a production break.

P-1 aircraft was moved to the airload facility Mar 91. Airload calibration was successfully completed in Aug 91.

A joint Air Force team comprised of AFSC, ASD, DPRO, and DCAA personnel completed a C/SCSC Surveillance Review at DAC 26-29 Aug 91. Results of this review indicated that DAC cost/schedule control system has substantially improved during 1991.

The C-17 FSED aircraft (P-1) Flight Test Program was initiated with the accomplishment of T-1 first flight (2.4 hours) on 15 Sep 91 at the Air Force Flight Test Center (AFFTC), Edwards AFB, California. T-1 has accomplished 31 sorties for a total of 88.3 flight hours (15 Sep - 31 Dec 91).

C-17 assembly line streamlining efforts continue with ever increasing successes. The Full scale static FSED test article completed assembly and was delivered to the test facility on 15 Oct 91. The year ended with P-1 and P-2 in final assembly, durability FSED test article and P-3 in major join, and P-4 and P-5 in half join.

The FY92 Appropriation Bill reflected a buy profile change in FY92 to 4 versus 6. Douglas Aircraft Company is in the process of revising their cost proposal for Lot 4 to reflect this change.

The C-17 is expected to satisfy mission requirements as revalidated by the Air Force Chief of Staff-directed requirements review in December 1989.

c. Changes Since As Of Date --
T-1 has accomplished 38 sorties for a total of 109.8 flight hours as of 31 January 1992.

8. Threshold Breaches:
There are currently schedule breaches of the Acquisition Program Baseline (APB) dated 20 Feb 92. There are no Nunn-McCurdy Unit cost breaches. A program deviation report and baseline change request have been submitted for approval.

9. Schedule:

a. Milestones --	Production Estimate	Approved Program	Current Estimate
Source Selection Decision	AUG 81	N/A	AUG 81
Contract Award	JUL 82	N/A	JUL 82
Start FSED	FEB 85	N/A	FEB 85
Milestone II (DSARC)	NOV 87	FEB 85	FEB 85
First Full Funded Production Lot	JAN 88	JAN 88	JAN 88
Milestone IIIA (DAB)	NOV 87	JAN 89	JAN 89
Low-Rate Initial Production	N/A	JAN 89	JAN 89
First Flight	JUN 91	N/A	SEP 91(Ch-1)
T-1 First Flight	N/A	JUN 91	SEP 91
IOC (Delivery of 12 A/C to sqdn) 1/	JUN 93	SEP 94	SEP 94
Complete DT&E/IOT&E	JUN 93	N/A	MAR 94(Ch-2)
DT&E			
Start	N/A	JUN 91	SEP 91
Complete	N/A	AUG 93	DEC 93
IOT&E			
Start	N/A	JAN 93	MAY 93
Complete	N/A	AUG 93	NOV 93
Full Rate Production Contract Award		MAR 94	TBD
RM&AE (Formerly ORE)	N/A	NOV 94	OCT 94
Milestone IIIB	SEP 93	TBD	TBD (Ch-2)
FOC	SEP 01	SEP 01	JUL 01(Ch-2)

- Milestone IOC: Reflects delivery of 12th aircraft (P-16) to initial squadron.

1/ Same as Material Support Date. IOC includes the Organizational and Intermediate level maintenance to support initial squadron operations.

b. Previous Change Explanations --

First Flight, IOT&E and DT&E, and Milestone IIIB FOC dates changed due to a rephasing of the C-17 assembly line. Delayed delivery of aircraft P-3 and P-4 to the test fleet will slip completion of test program, which supports the Milestone IIIB review (IOC changed from Jul 94 to Sep 94, Complete DT&E/IOT&E changed from Jun 93 to Aug 93, Milestone IIIB changed from Oct 94 to Dec 93, and FOC changed from Aug 99 to Feb 01).

c. Current Change Explanations --

(Ch-1) First Flight changed from Jun 91 to Sep 91 based on the actual date of T-1 first flight.

9c. **Schedule (Cont'd):**
(Ch-2) Complete DT&E/IOT&E, Milestone IIIB and FOC dates changed due to a rephasing of the C-17 assembly line and program restructure. The resulting delayed delivery of aircraft to the test fleet and a change in the interpretation of "DT&E Complete" to include completion of all all-weather testing changed the DT&E/IOT&E Complete date to Mar 94. The completion of the test program supports the Milestone IIIB review.

d. References --

Production Estimate:
Program Management Directive 0020(22), dated 10 May 89. Amended FY91 President's Budget.

Approved Program:
DAE approved Acquisition Program Baseline dated February 20, 1992.

10. **Performance Characteristics:**

a. Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Maintenance Manhours Per Flying Hour (Air Vehicle)	14.6	18.6	/ 20.0	N/A	16.25	(CH-1)
Mean Time Between Maintenance Inherent (hrs) (MTBMI)	1.69	1.61	/ 1.55	N/A	1.87	(CH-1)
Mean Time Between Maintenance Corrective (hrs) (MTBMC)	.83	.78	/ .75	N/A	.83	
Mean Time Between Removal (hrs) (MTBR)	5.37	2.8	/ 2.5	N/A	4.83	(CH-1)
Mean Manhours to Repair (hrs)	4.51	7.35	/ 7.35	N/A	5.91	(CH-1)
Maximum Take-off Gross Weight (lbs) (TOGW)	580000	580000	/ 580000	N/A	580000	
Maximum Payload (lbs)	172200	172200	/ 172200	N/A	172200	
Payload at Range (lbs @ 2400 nm) 1/	167006	160000	/ 160000	N/A	160909	(CH-2)
Range Unrefueled (nm)	2372	N/A	/ N/A	N/A	2400	
Landing Field Length (ft) 2/	2541	2650	/ 2650	N/A	2572	(CH-3)
Takeoff Field Length (ft) 3/	7370	7600	/ 8500	N/A	7380	(CH-4)

10a. Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Cruise Speed (Mach) (450 KTAS)	.77	.77	/ .74	N/A	.77
Backup Capability (% grade) 4/	2	2	/ 1.5	N/A	2
Mission Completion Success Probability (%)	94	93	/ 92	N/A	.94

- The Current Estimate is based on the latest operating weight and drag and an engine which meets its specification requirements. There is some uncertainty that the engine will meet its Specific Fuel Consumption (SFC) requirement. The engine vendor has taken action to implement corrections and the systems contractor is identifying additional weight reductions to offset any negative impact.

- Reliability and maintainability is based on 100,000 fleet flying hours for Mission Completion Success Probability, Maintenance Manhours Per Flying Hour (Air Vehicle), Mean Time Between Maintenance Inherent (Hrs) (MTBMI), Mean Time Between Maintenance Corrective (Hrs) (MTBMC), Mean Time Between Removal (Hrs) (MTBR), and Mean Man Hours to Repair (HRS).

- Maximum Takeoff Gross Weight (TOGW) (LBS) reflects current design capability, not specification requirements.

- Specifications for Payload Range is to carry 160,000 lbs payload for 2400 nm at a maneuver load factor of 2.25G on a standard day using C-X fuel reserves.

- Approved Program Objective/Threshold: The C-17 program has requirements and goals, not thresholds. Requirements and goals are established in the specifications. Formal MAC thresholds have been approved by CSAF and SAF. Requirements are shown in the "Threshold" column.

FOOTNOTES:

1/ Unrefueled, 2.25G maneuver load factor, standard day which includes C-17 reserve fuel requirements (enroute, alternate, holding approach and landing reserves).

2/ Maximum Effort Landing Field Length, with 3 engine idle reverse,

10a. Performance Characteristics (Cont'd):
124,039 lb payload, fuel to fly a 500 NM mission with zero payload, sea level, 90 degree F day. Threshold

3/ Takeoff critical field length at gross weight to carry a payload of 167,027 lbs for a range of 2400 NM, sea level, 90 degree F day.

4/ Backup capability with a 167, 027 lb payload and fuel to fly 1000 NM, sea level, 90 degree F day.

NOTE: In the February 1988 acquisition program baseline, the C-17 had objectives and thresholds (requirements) which reflected the contract specifications. Formal MAC thresholds were established in the C-17 requirements review in December 1989 and published in the SCRD approved on June 5, 1991. These MAC thresholds are shown in the threshold column for Change 2 in place of the contract requirements of the February 1988 baseline.

b. Previous Change Explanations --

The current estimates for the Reliability, Maintainability and Availability parameters have been changed to account for the latest analyses and aircraft design.

Payload weight requirements have been changed to show that the payload for the program has been decreased to account for government directed changes to the design of the C-17 aircraft. The current estimate for the payload/range has been adjusted to account for the latest projected operating weight and drag. The reported payload/range is 5314 lbs short of specification requirements using the specification ground rules. The contractor has been notified of this deficiency and is implementing a performance recovery program which addresses weight, drag, and Specific Fuel Consumption improvements.

Payload weight requirements have been changed to show that the payload for the program has been decreased to account for government directed changes to the design of the C-17 aircraft. The current estimate for the landing distance has been adjusted to account for the latest projected operating weight.

Cruise speed of 450 KTAS is approximately equal to .77 MACH. The actual specification requirement is .77 MACH at 28,000 ft.

c. Current Change Explanations --

(Ch-1) The current estimates for the Reliability, Maintainability and Availability parameters have been changed to account for the latest analyses and aircraft design.

10c. Performance Characteristics (Cont'd):

(Ch-2) The current estimate for the payload/range has been adjusted to account for the latest projected operating weight and drag. The reported payload/range is 909 lbs above the specification requirements as reflected by ECP 79 using the specification ground rules. In this and future reporting of payload/range deficiencies, we will be focusing on payload at the fixed range of 2400 NM.

(Ch-3) Payload weight requirements have been changed to show that the payload for the program has been decreased to account for government directed changes to the design of the C-17 aircraft. The current estimate for the landing distance has been adjusted to account for the latest projected operating weight.

(Ch-4) Refined estimate based on current data.

d. References —

Production Estimate:
Program Management Directive 0020(22), dated 10 May 89. Amended FY91 President's Budget.

Approved Program:
DAE approved Acquisition Program Baseline dated February 20, 1992.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost —	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	3755.5	3913.3	3913.3
Procurement	18425.7	15084.0	15084.0
Flyaway	(15420.7)		(0.0)
Airframe			(10791.6)
Engines			(1435.3)
Avionics			(603.9)
Total Flyaway	(15420.7)		(12830.8)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(1213.6)		(1085.9)
Initial Spares	(1791.4)		(1167.3)
Construction (MILCON)	214.1	265.2	265.2
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 81 Base-Year $	22395.3	19262.5	19262.5

11a. Total Program Cost and Quantity (Cont'd):

	Production Estimate	Approved Program	Current Estimate
Escalation	~~19502.9~~	16274.3	16539.5
Development (RDT&E)	(1585.4)	(1661.1)	(1661.1)
Procurement	(17667.2)	(14679.2)	(14679.2)
Construction (MILCON)	164.0 ~~(250.3)~~	199.2 ~~(=66.0)~~	(199.2)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	41898.2	35536.8	35802.0

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	210	120	120
Total	210	120	120

- Excludes one nonfully-configured RDT&E unit.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Production Estimate:
Program Management Directive 0020(22), dated 10 May 89. Amended FY91 President's Budget.

Approved Program:
DAE approved Acquisition Program Baseline dated February 20, 1992.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	35802.0	35274.4	35802.0
(2) Quantity	120	120	120
(3) Unit Cost	298.35	293.95	298.35

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	1811.6	1811.6	2898.7
Less CY Adv Proc	172.4	172.4	205.6
Plus PY Adv Proc	159.3	159.3	172.4
Net Total	1798.5	1798.5	2865.5
(2) Quantity	4	4	8
(3) Unit Cost	449.62	449.62	358.19

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	5340.9	36092.9	378.1	41811.9
Previous Changes:				
Economic	+8.1	+375.9	+2.5	+386.5
Quantity	-	-11039.0	-	-11039.0
Schedule	-	+1579.3	-	+1579.3
Engineering	-	+21.9	-	+21.9
Estimating	+225.2	+4088.4	-53.4	+4260.2
Other	-	-	-	-
Support	+21.1	-1767.5	-	-1746.4
Subtotal	+254.4	-6741.0	-50.9	-6537.5
Current Changes:				
Economic	-32.2	-708.2	-11.1	-751.5
Quantity	-	-	-	-
Schedule	-	+305.1	-	+305.1
Engineering	-	-	-	-
Estimating	+19.2	+366.6	+148.3	+534.1
Other	-	-	-	-
Support	-7.9	+447.8	-	+439.9
Subtotal	-20.9	+411.3	+137.2	+527.6
Total Changes	+233.5	-6329.7	+86.3	-6009.9
Current Estimate	5574.4	29763.2	464.4	35802.0

13a. Cost Variance Analysis (Cont'd):

a. Summary — (FY 1981 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	3755.5	18425.7	214.1	22395.3
Previous Changes:				
Quantity	-	-4778.3	-	-4778.3
Schedule	-	-	-	-
Engineering	-	+10.7	-	+10.7
Estimating	+134.0	+1941.5	-28.6	+2046.9
Other	-	-	-	-
Support	+11.7	-924.4	-	-912.7
Subtotal	+145.7	-3750.5	-28.6	-3633.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+17.1	+236.1	+79.7	+332.9
Other	-	-	-	-
Support	-5.0	+172.7	-	+167.7
Subtotal	+12.1	+408.8	+79.7	+500.6
Total Changes	+157.8	-3341.7	+51.1	-3132.8
Current Estimate	3913.3	15084.0	265.2	19262.5

The following footnotes pertain to Section 13c, Procurement.

* The increase in estimating changes applicable to a buy profile change and a decrease in Multiyear Procurement savings due to a change from a 4-2 Multiyear Procurement strategy to a 3-2.

** PSE is an abbreviation of Peculiar Support Equipment.

b. Previous Change Explanations --

RDT&E

Economic:

Revised economic escalation indices.

Estimating:

Reestimate of prime contract costs at ceiling for

13b. Cost Variance Analysis (Cont'd):

Air Vehicle, Test and System Engineering/Program Management and other government costs based on a comprehensive Annual Estimate completed prior to the MAR.

Adjustment for current and prior year escalation change. Increase in FY92 to fund the FSD portion of the 2108 contract to ceiling. Decreased funding IAW FY91 Defense Appropriations Act.

Support:

Reestimate of prime contract costs at ceiling for Training, Data and Peculiar Support Equipment and other government costs (Training and Data) based on a comprehensive Annual Estimate completed prior to the MAR.

Adjustment for current and prior year escalation change. Revised requirements for the Maintenance Training Device and revised/rephased requirements based upon a new activation schedule for the C-17 Simulator. Revised Prior Year support requirements.

PROCUREMENT

Economic:

Revised economic escalation indices.

Quantity:

Deletion of 90 aircraft.

Schedule:

Schedule changes applicable to stretch-out of program.

Engineering:

Added Defensive Systems (Defensive Avionics capability) to the C-17.

Estimating:

Estimating changes applicable to a slower build-up rate and a revised Multiyear Procurement Strategy. Estimating changes applicable to deletion of 90 aircraft and a revised Multiyear Procurement Strategy. Reestimate of Air Vehicle (Airframe, Engine and Avionics) costs and an extension of the Multiyear Procurement Strategy based on a comprehensive Annual Estimate completed prior to the Major Aircraft Review (MAR).

Adjustment for current and prior year recurring escalation change. Estimating changes applicable to a slower build up rate included in the revised

13b. Cost Variance Analysis (Cont'd):

schedule. Increase in Recurring Airframe Multiyear Savings due to a change from a 3 year Multiyear Procurement strategy to a 4 year followed by a 2 year buyout. Increase in Recurring Air Vehicle due to increase in subcontracts and manufacturing hours. Increase to Airframe due to addition of Defense Business Operations Fund. Decrease to Airframe and Non-recurring due to Prior Year adjustments and rephasing of requirements.

Support:

Deletion of Peculiar Support Equipment, Training, Data and Initial Spares in addition to a revised Multiyear Procurement Strategy associated with the quantity reduction of 90 aircraft. Reestimate of Peculiar Support Equipment, Training, and Data due to revised requirements in comprehensive Annual Estimate completed prior to the MAR. Decrease in Airframe, Avionics and Engine Spare parts factor for estimating Initial Spares based on a comprehensive Annual Estimate completed prior to the MAR. Inclusion of Multiyear Procurement Strategy to Initial Spares estimate detailed in comprehensive Annual Estimate completed prior to the MAR.

Adjustment for current and prior year escalation change. Increase in Initial Spares Multiyear Procurement Savings due to a change from a 3 year Multiyear Procurement Strategy to a 4 year followed by a 2 year buyout. Support changes applicable to stretchout of program schedule. Increase to Initial Spares due to addition of Defense Business Operations Fund. Net impact of rephasing PSE, Training, Data and Initial Spares requirements.

MILCON

Economic:

Revised economic escalation indices.

Estimating: Decrease in Military construction projects applicable to the deletion of 90 aircraft.

Adjustment for current and prior year escalation change. Increase due to rephased buy and delivery schedule.

13c. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices (Economic)	N/A	-32.2
Adjustment for current and prior year escalation change (Estimating)	15.8	23.7
Adjustment for current and prior year escalation change (Support)	1.7	2.5
Congressional delay of new DBOF activities which realigned funds from users to service agencies. (Estimating)	-3.8	-6.3
Congressional funding reduction for Contractor Advisory and Asst Services (CAAS), Contractor Travel, and FFRDC. (Estimating)	-3.6	-5.7
Revised estimate of Air Vehicle, Systems Test and Evaluation, Site Activation, and Industrial Facilities (Estimating)	8.7	7.5
Revised estimate of Peculiar Support Equipment, Simulator, Training and Data (Support)	-6.7	-10.4
Total Changes	12.1	-20.9

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised economic escalation indices (Economic)	N/A	-708.2
Adjustment for current and prior year escalation change (Estimating)	36.6	64.1
Adjustment for current and prior year escalation change (Support)	9.9	17.3
Revised schedule for FY92 and FY93 from 6/12 to 4/8. (Schedule)	--	229.4
Recategorization of variance in the December 90 SAR (Schedule)	--	75.7
Recategorization of variance in the December 90 SAR (Estimating)	--	-75.7
Revised estimate for total flyaway applicable to the buy profile change. (Estimating)	206.1	429.9
Revised estimate due to a change from a 4-2 multiyear procurement strategy to a 3-2 multiyear strategy. (Estimating)	40.7	67.3
Reestimate of the total flyaway based on the Annual Estimate and funding adjustments. (Estimating)	91.1	155.6
Total flyaway decrease due to delay of new DBOF activities and realignment of funds from users to service agencies. (Estimating)	-133.4	-264.7
Decrease in total flyaway due to decreased funding to support CAAS and Contractor Travel. (Estimating)	-5.0	-9.9
Revised support requirements associated with the revised schedule. (Support)	23.0	62.6
Decrease in Initial Spares due to the impact of the Appropriation Bill.	-14.6	-27.3

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(Support)		
Incorporation and rephasing of Initial Spares stock funding (Support)	-31.4	--
Increase in Initial Spares due to the deletion of Multiyear Procurement for all years. (Support)	22.0	59.6
Reestimate of Peculiar Support Equip, Training, Data and Spares requirements based on the Annual Est & funding adj. (Support)	-31.9	-66.2
Initial spares decrease due to delay of new DBOF activities and realignment of funds from user to service agencies. (Support)	-9.6	-18.8
Decrease to Initial Spares due to decrease in funding for Contractor Advisor Assistant Services (CAAS). (Support)	-0.7	-1.3
Increase in Support requirements due to realignment of ICS funds from O&M to Procurement. (Support)	134.0	279.2
Increase in Initial Spares due to requirements for war readiness spares kits (WRSK). (Support)	72.0	142.7
Total Changes	408.8	411.3
(3) MILCON		
Revised economic escalation indices (Economic)	N/A	-11.1
Adjustment for current and prior year escalation change (Estimating)	2.1	3.3
Realignment of funding for support activities to the C-17 program. (Estimating)	77.6	145.0
Total Changes	79.7	137.2

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Prod Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
189.30	-16.62	--	5.04	1.82	13.77	---	5.80	9.81	199.11

b. Initial Baseline Estimate to Current Estimate - -

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
199.52	-3.04	56.93	15.70	0.18	39.95	—	-10.89	98.83	298.35

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15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

FSED:	Initial Contract Price		
	Target	Ceiling	Qty
MCDONNELL DOUGLAS, LONG BEACH, CA F33657-81-C-2108, FPIF Award: July 23, 1982 Definitized: December 31, 1985	$31.6	$31.6	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$4244.4	$4913.0	1	$5315.8	$5493.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-1340.0	$-155.3
Cumulative Variances To Date (11/24/91)	$-1561.6	$-65.2
Net Change	$-221.6	$90.1

Explanation of Change:

COST VARIANCE: The cumulative cost variance is due to the underestimation of assembly tool design, weight reduction measures, rework & engineering changes. The assembly tools for the C-17 program require much more sophisticated technology than past

15. Contract Information: Cont'd (Then-Year Dollars in Millions)
programs. Thus, there was no prior history on which to base an estimate. The weight reduction measure caused redesign of the structures area and also caused DAC to implement a significant amount of supplier change. Weight reduction measures also caused the use of overtime to minimize schedule impact. The rework and engineering changes were caused by design, software definition problems, and other areas related to performance specifications. The majority of the current cost variance occurred in overhead. This was caused by a variance in labor hours to which different overhead rates are applied. Additional contributors to the current overrun are rework on slats and flaps, structural test support and software development.

SCHEDULE VARIANCE: The cumulative schedule variance is due to the delayed receipt of over 20 systems in Instruments and Special Equipment, late receipt of Flight Test Support Equipment and Flight Test Spares, late availability of airframes for Durability and Static, and rework and engineering changes. The current schedule variance was mainly caused by Flight Test. Fewer flight hours than planned were completed because of repair on fuel tanks and adverse weather conditions. Additional schedule problems resulted from budget phasing not coinciding with late airframe deliveries.

IMPACT: The cost variance is indicative of this effort exceeding ceiling as reflected in the program manager's estimate. However, the government liability is budgeted to the combined contract ceiling of $6648.1M. The cumulative schedule variance is indicative of the overall late condition of aircraft deliveries and has been the major contributor to the delayed flight test schedule.

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- The target price is the negotiated cost plus the authorized unpriced work at cost plus profit. This value does not reflect the target price as estimated in the contractor's Cost Performance Report. The Current Contract Target Price has changed since the last SAR due to increases in scope.

- The ceiling price is imputed value for informational purposes only. The contractor reports an estimated ceiling price allocated to FSED/Lot I and Lot II based on his EAC on the Cost Performance Report. This imputed value was not previously reported since the contract has one ceiling for FSD, Lot I and Lot II.

- The Contractor's Estimated Price at Completion has changed due to their Annual Comprehensive Estimate at Completion along with monthly updates reflected in their Cost Performance Report.

15. Contract Information: Cont'd (Then-Year Dollars in Millions)
- The Program Manager's Estimated Cost is the unconstrained estimate of the FSED program based on the SPO's 1990/91 Annual Estimate as updated in December 91.

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b. Procurement --

C-17 Lot I:	Initial Contract Price Target	Ceiling	Qty
MCDONNELL-DOUGLAS, LONG BEACH, CA F33657-81-C-2108, FPIF Award: January 20, 1988 Definitized: January 13, 1988	$656.3	N/A	2

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$655.4	$756.6	2	$847.7	$871.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-176.8	$-73.4
Cumulative Variances To Date (11/24/91)	$-268.2	$-33.0
Net Change	$-91.4	$40.4

Explanation of Change:

COST VARIANCE: The cumulative cost variance is caused by out-of-position work, changes and rework above that planned in the Production area. There was significantly more permanent work diversion over what was planned. Capacity and manufacturing constraints required replanning. Additionally in the Product Center Operations area, rework of large volumes of unplanned demand on material for weight reduction and producibility changes contributed to the overrun. Overhead continues to aggravate the cost overrun with variances in labor hours. Currently, the cost variance is being driven by performance under plan due to nonscheduled work, rework, lack of drill templates which causes the use of conventional hand lay-out and drilling, and overtime, work-around plans and new mechanics. Also, unplanned demand for Raw Materials and Purchased Parts in support of P-1 and P-2 contributed.

SCHEDULE VARIANCE: The cumulative schedule position is caused by previous shortages of manpower, shortages of shop floor control personnel and scrap and rework from inexperienced personnel. Part shortages, engineering changes, make-it-fit and out-of-position work are major contributors also. The delay of the basic design definition of the Nacelle structure in FSED is causing a delay in the Production lots. There are also schedule variances spread throughout

15. Contract Information: Cont'd (Then-Year Dollars in Millions) major subcontractors, secondary and composite structures, and non-system hardware, all resulting from Supplier Change Proposals. Accomplishments on P-1 include completion of engine build-up and installations and start of On Aircraft Test Procedures. Accomplishments on P-2 include completion of aft cargo ramp floor installations, aft cargo ramp to major join, aft cargo door to major join, and proof pressure.

IMPACT: The cost variance is indicative of this effort exceeding ceiling as reflected in the Program Manager's Estimate. However, the government liability is budgeted to the combined contract ceiling of $6648.1M. The cumulative schedule variance is indicative of the overall late condition of aircraft deliveries. Since P-1 - P-4 will be used as flight test aircraft, late delivery of these aircraft may impact the flight test program. Late delivery of the remaining production aircraft may also impact initial squadron deployment.

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- The target price is the negotiated cost plus authorized unpriced work at cost plus profit. This value does not reflect the target price as estimated in the contractor's Cost Performance Report. The Current Contract Target Price has changed since the last SAR due to increases in scope.

- The ceiling price is the imputed value for informational purposes only. The contractor reports an estimated ceiling price allocated to FSED/Lot I and Lot II based on his EAC on the Cost Performance Report. This imputed value was not previously reported since the contract has one ceiling for FSD, Lot I and Lot II.

- The Contractor's Estimated Price at Completion has changed due to their Annual Comprehensive Estimate at Completion along with monthly updates reflected in their Cost Performance Report.

- The Program Manager's Estimated Cost is the unconstrained estimate of the Lot I program based on the SPO's 1990/91 Annual Estimate as updated in December 91.

C17 Lot II Prod:	Initial Contract Price Target	Ceiling	Qty
MCDONNELL-DOUGLAS, LONG BEACH, CA F33657-21-C-2108, FPIF Award: July 28, 1989 Definitized: July 28, 1989	$757.3	N/A	4

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$846.5	$978.5	4	$952.8	$1089.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-98.4	$-124.1
Cumulative Variances To Date (11/24/91)	$-218.1	$-100.3
Net Change	$-119.7	$23.8

Explanation of Change:

COST VARIANCE: The net cost variance is due to the realignment of the engineering effort which was identified as production related from FSED to Lots I and II with insufficient budget available to cover the effort. Unplanned demand for Raw Materials and Purchase Parts in support of critical path items on earlier shipsets is also impacting Lot II. Scope changes for weight reduction form, fit and function, rework and expending extra effort to recover schedule have had a negative effect on the cumulative cost variance from the Intercomponents (ICWO) area.

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SCHEDULE VARIANCE: The cumulative effect of the prioritization of T-1 and P-1 vehicles since the inception of Lot II has been the primary driver behind the cumulative schedule position. The contractor has concentrated effort on recovering schedule and has improved by 23.8M since last report. The delay in delivery of instruments and special equipment hardware such as the Mission Computer, EFCS, and the Warning & Caution Computer in Supplier Management and the overall late condition of earlier shipsets in Production is the primary driver of the existing behind schedule condition.

IMPACT: The cost variance is indicative of this effort exceeding ceiling as reflected in the Program Manager's Estimate. However, the government liability is budgeted to the combined contract ceiling of $6648.1M. The cumulative schedule variance is indicative of the overall late condition of aircraft deliveries. Since P-1 - P-4 will be used as flight test aircraft, late delivery of these aircraft may impact the flight test program. Late delivery of the remaining production aircraft may also impact initial squadron deployment.

- The target price is the negotiated cost plus the authorized unpriced work at cost plus profit. This value does not reflect the

15. Contract Information: Cont'd (Then-Year Dollars in Millions) target price as estimated in the contractor's Cost Performance Report. The Current Contract Target Price has changed since the last SAR due to increases in scope.

- The ceiling price is the imputed value for informational purposes only. The contractor reports an estimated ceiling price allocated to FSED/Lot I and Lot II based on his EAC on the Cost Performance Report. This imputed value was not previously reported since the contract has one ceiling for FSD, Lot I and Lot II.

- The Contractor's Estimated Price at Completion has changed due to their Annual Comprehensive Estimate at Completion along with monthly updates reflected in their Cost Performance Report.

- The Program Manager's Estimated Cost is the unconstrained estimate of the Lot II program based on the SPO's 1990/91 Annual Estimate as updated in December 91.

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C17 Lot III Prod:	Initial Contract Price Target	Ceiling	Qty
McDonnell-Douglas, Long Beach, CA F33657-21-C-0001, FPIF Award: July 1, 1991 Definitized: July 1, 1991	$1026.2	$1215.0	4

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$1026.2	$1215.0	4	$1094.0	$1128.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (11/25/91)	$-12.3	$-24.3
Net Change	$-12.3	$-24.3

Explanation of Change:

COST VARIANCE: The baseline is not yet complete pending finalized negotiations with subcontractors causing a decreased amount of performance being taken. A condition known as "no fit", "no work", which means that when a part is presented for assembly and doesn't fit, the effort is halted until a satisfactory part is assessed, imposed on the fabrication effort caused a portion of the early cost variance in Lot III. Additionally, the unplanned demand for raw materials and purchased parts in support of critical path items on earlier ships contributed to the cost variance.

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

SCHEDULE VARIANCE: The overall late condition of earlier ships in flow is impacting the schedule along with the cumulative effect of unplanned engineering changes and priority work on T-1 flaps. The late delivery of P-8 and P-9 ribs and bulkheads due to the first time manufacture of fracture critical "Asley" caps (16 of 94 require gradual cooling) has a negative impact as well.

IMPACT: The cost variance is not causing an impact at this early stage in the Lot III effort. As schedule is recovered in the earlier production lots, the schedule variance in Lot III should improve.

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- The December 91 SAR marks the first time that the Lot III contract information has been reported.

- The target price is the negotiated cost plus the target profit.

- The ceiling price is the negotiated ceiling on the contract plus any authorized unpriced work estimated at 135% of target cost.

- The contractor's Over Target Baseline (OTB) was approved and is included in the contractor's estimate at completion.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 52.2% (12 yrs/23 yrs)

(2) Percent Program Cost Appropriated: 30.2% ($10805.5 / $35802.0)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY81-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2003)	Total
RDT&E	4890.7	375.8	211.1	96.8	5574.4
Procurement	3613.4	1811.6	2898.7	21439.5	29763.2
MILCON	37.9	76.1	31.6	318.8	464.4
O&M	-	-	-	-	-
Total	8542.0	2263.5	3141.4	21855.1	35802.0

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1981				32.0	33.4	33.4	33.4	11.9
1982								
1983				51.0	59.6	59.6	59.6	4.9
1984				22.1	26.8	26.8	26.8	3.8
1985				96.5	121.0	121.0	121.0	3.4
1986				272.9	350.4	350.4	350.4	2.8
1987				471.0	625.5	625.5	625.5	2.7
1988				803.8	1103.6	1103.6	1103.0	3.0

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1989				652.8	933.5	933.5	920.6	4.2
1990				607.2	897.5	896.8	868.8	4.0
1991				481.1	739.4	738.0	278.5	3.9
1992				236.9	375.8	2.0	0.5	3.1
1993				128.9	211.1			3.3
1994				55.4	93.8			3.3
1995				1.7	3.0			3.3
Subtot				3913.3	5574.4	4890.6	4388.1	
Appropriation: 3010 Aircraft Procurement, Air Force								
1987		16.1	23.0	39.1	59.0	59.0	59.0	2.7
1988	2	56.8	356.6	427.3	676.0	676.0	663.2	3.0
1989	4	9.5	538.5	678.6	1111.5	1109.7	717.4	4.2
1990	4	41.9	648.7	891.1	1506.9	1327.7	215.4	4.0
1991		0.2	34.0	148.3	260.0	58.8	0.3	3.9
1992	4	49.0	846.8	1000.9	1811.6	98.2		3.1
1993	8	105.9	1217.6	1550.9	2898.7			3.3
1994	12	10.5	1758.0	2061.5	3976.6			3.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
1995	18		1894.1	2107.1	4195.3			3.3
1996	18		1533.7	1812.6	3724.8			3.2
1997	18		1381.4	1597.9	3389.1			3.2
1998	18		1498.7	1686.9	3692.6			3.2
1999	14		809.8	947.5	2140.3			3.2
2000				66.5	155.1			3.2
2001				43.1	103.8			3.2
2002				18.3	45.5			3.2
2003				6.4	16.4			3.2
Subtot	120	289.9	12540.9	15084.0	29763.2	3329.4	1655.3	
Appropriation: 3300 Military Construction, Air Force								
1989				2.3	3.4	3.4	3.4	4.2
1990				3.2	5.0	4.4	2.5	4.0
1991				18.9	29.5	0.6	1.1	3.9
1992				47.2	76.1			3.1
1993				19.0	31.6			3.3
1994				51.8	89.0			3.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY81 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3300 Military Construction, Air Force (Cont'd)								
1995				41.0	72.8			3.3
1996				22.4	41.1			3.2
1997				19.7	37.3			3.2
1998				19.8	38.6			3.2
1999				19.9	40.0			3.2
Subtot				265.2	464.4	8.4	7.0	
Grand Total	120	289.9	12540.9	19262.5	35802.0	8228.4	6050.4	

- Obligations and expenditures reflected in Section 16c are as of 31 December 1991.

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1988	2	2	2	2
1989	4	4	4	4
1990	10	6	4	4
1991	20	10	0	0
1992	25	20	4	4
1993	25	29	8	8
1994	25	29	12	12
1995	25	29	18	18
1996	25	29	18	18
1997	25	29	18	18
1998	24	23	18	18
1999	0	0	14	14

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	22395.3	-3132.8	19262.5	0.0	19262.5
(TY $)	41811.9	-6009.9	35802.0	0.0	35802.0
PAUC Cost (BY $)	106.644	53.877	160.521	0.000	160.521
(TY $)	199.104	99.246	298.350	0.000	298.350

17c. Production Rate Data (Cont'd):

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	SEP 91	7	APR 92	N/A	APR 92
Duration (in MON)	121	-10	111	0	111
End Date(MON YY)	OCT 01	-3	JUL 01	N/A	JUL 01

- The funded delivery period for the current estimate and maximum economic estimate is as follows: FY88-3, FY89-7, FY90-6, FY91-0, FY92-7, FY93-15, FY94-12, FY95-12, FY96-12, FY97-12, FY98-12, FY99-10.

d. Deliveries (Plan/Actual) —

	To Date
RDT&E	1/1
Procurement	0/0

e. Approved Design-to-Cost Objective -- N/A.

18. Operating and Support Costs:

a. Assumptions and Ground Rules —

The concept of operations is eight Active/Reserve Associate airlift operational squadrons, flying each mission aircraft an average of 1,432 hours per year, providing the capability to direct deliver U.S. combat forces and outsize/oversize cargo to main operating bases and forward operating locations. The system will be based at four MAC bases. Aircraft maintenance will be done under a modified three-level concept. This estimate is based on an average of the eight C-17 Active/Reserve Associate squadrons and the flying training squadron. The estimate includes direct, indirect, and acquisition and training costs, as detailed below.

Direct Costs: Primary mission personnel includes primary program element personnel. O&S consumables costs are the fuel and base maintenance supplies required to operate the aircraft. Depot costs include interim contractor support, airframe and engine overhaul, repair of component parts, modification kit installation, airframe inspection, and software support. Sustaining investment costs are primarily replenishment spares and repair parts, support equipment

18a. Operating and Support Costs (Cont'd):
replacement, and class IV modification kits.

Indirect Costs: Installation support personnel costs include base operating support, real property maintenance, and medical people. Indirect personnel support category includes medical O&M non-pay, permanent change of station, and miscellaneous O&M costs. Depot non-maintenance summarizes general depot support costs and second destination transportation charges.

Personnel Acquisition and Training Category Costs: Includes personnel acquisition, maintenance trainer contract support, aircrew training system contracted support, individual and specialty training.

b. Costs — (FY 1981 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Squadron	Avg Annual Cost Per Antecedent
Unit Mission Personnel	15.4	N/A
O&S Consumables	44.9	N/A
Depot Level Maintenance	8.1	N/A
Sustaining Investment	14.7	N/A
Install. Supt. Personnel	2.0	N/A
Indirect Personnel Supt.	3.8	N/A
Depot Non-Maintenance	3.9	N/A
Personnel Acq & Training	5.2	N/A
Total	98.0	N/A

18c. Operating and Support Costs (Cont'd):

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M (AF)	4.0	10.5	0.7	---	15.2
Industrial Fund	---	---	---	---	---
Total	4.0	10.5	0.7	---	15.2

- The average annual O&S cost per squadron based on the FY91 Program Office estimate briefed in July 91 was developed by dividing the lifecycle O&S estimate by 34 years (9 years phase-in plus 25 years steady state) and then dividing by 9 squadrons (8 Active/Reserve Associate and 1 training).

- There is no antecedent system for the C-17 program. The C-17 will augment the C-5 and C-141 in intertheater development and the C-130 with intratheater operations.

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: DMSP

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
DMSP Block 5D-2 Improved/5D-3/Defense Meteorological Satellite Program

2. (U) DoD Component: USAF

3. (U) Responsible Office and Telephone Number:
DMSP Office
Space Systems Division/MI
P.O. Box 92960
Los Angeles AFB, CA 90009-2960
Col John Goyette
Assigned: March 30, 1990
AV 833-4333 COMM (310) 336-4333

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0305160F
PROCUREMENT:
APPN 3020 ICN MS0554 (Air Force)
APPN 3080 ICN 833340 (Air Force)

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DEPARTMENT OF DEFENSE

OASD(PA) DFOISR 92-T-0447

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Declassify on: OADR
Downgrade Instructions: With page 8 withdrawn, document is unclassified

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4. (U) Program Elements/Procurement Line Items (Cont'd):

MILCON:
PE 0305160F

5. (U) Related Programs: None.

6. (U) Mission and Description:
The mission of DMSP is to provide an enduring and survivable capability, through all levels of conflict consistent with the survivability of the supported forces, to collect and disseminate global visible and infrared cloud data and other specialized meteorological, oceanographic, and solar-geophysical data required to support worldwide DoD operations and high-priority programs. Timely data are supplied to Air Force Global Weather Central, the Navy Fleet Numerical Oceanography Center, and to deployed tactical terminals worldwide. The DMSP system is the only DoD meteorological satellite system. It consists of two three-axis stabilized satellites in 450 nautical mile sun-synchronous polar orbits (98.7 degrees inclination), command readout stations, command and control facilities, strategic data processing facilities, worldwide fixed and mobile tactical terminals, and communication satellite links. The DMSP Block 5D-2 Improved (S11-14)/5D-3 (S15-20) systems replace the Block 5D-2 system which has completed production and is operational.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
The Defense Meteorological Satellite Program is a Joint-Service program in accordance with the Memorandum of Agreement on Joint Service Management and Operations, dated 15 December 1976. The program supports all military services. This is a continuing program. RDT&E funding will allow evolutionary development of spacecraft and sensors as necessary to support new requirements of the special strategic missions, the Joint-Service mission, and the Joint Chiefs of Staff. In Sep 83, DMSP awarded a multiyear procurement contract for 5D-2 Improved spacecraft S11-14; a second multiyear procurement contract for the four primary sensors 5D-3 Operational Linescan Systems (OLS) was awarded in Jan 84. Delivery of satellites S11-14 was completed in Nov 90; delivery of the four OLSs was completed in May 89. In FY 85, Headquarters Air Force directed that an additional 5D-3 production spacecraft (S-20) be procured. A contract was awarded for 5D-3 development spacecraft (S-15) in Jul 86; Critical Design Review (CDR) was completed in Dec 87. In Sep 88 a contract for five 5D-3 Operational Linescan Systems was awarded; Preliminary Design Review (PDR) and Mission Readiness Review (MRR) for the OLS hardware were completed in Mar 90. The Bench Test Model for OLS units 17 through 21 was delivered in Dec 90. Congressional approval for the multiyear procurement of five 5D-3 spacecraft was received in Sep 88; the contract was awarded in Jun 89; the "fact of

7a. (U) Program Highlights (Cont'd):

life" delta CDR for spacecraft S16-20 occurred in Jun 90. Congress approved transition from Atlas to Titan II with Titan II initial launch capacity in Oct 90; Titan II Pathfinder was successfully completed in Jul 90. Four microwave imager sensors and one magnetometer were delivered in CY 89. In Mar 89 a contract for the Special Sensor Microwave/Imager Sounder (SSMIS) was awarded; System Design Review (SDR) was completed in Jun 89; in May 90 the hardware PDR for the Special Sensor Microwave Imager Sounder was held. In Jan 86, the Fairchild Satellite Operations Center (FSOC) contract was awarded; the FSOC building was accepted by the Corps of Engineers in Dec 86; certification for the start of IOT&E occurred in Mar 89 and AFSPACECOM declared IOC in Aug 89; Program Management Responsibility Transfer (PMRT) to AFLC occurred in Oct 89. The Satellite Data Handling System (SDHS) was turned over to Air Force Global Weather Central (AFGWC) in FY 86; a contract for shared processing for the SDHS was awarded in Sep 88; SDHS Site III turnover was accomplished in May 89. C3 Sites I, II, and V were turned over to AFSPACECOM. PMRT of Mark IIa and IIIs occurred in Jul 87; PMRT of the C3 system occurred in Oct 88. The Multi-Purpose Satellite Operations Center (MPSOC) upgrade was placed on contract in Sep 88 and CDR occurred in Aug 89. In Feb 90, AFSCN/DMSP Internet installation was completed at the FSOC and MPSOC; Interim Satellite Operations Center (ISOC) installation at MPSOC was completed in Mar 90. The Mark IV was turned over to MAC in Mar 88 and PMRT of the Mark IV Tacterms occurred in Apr 88. PMRT to MAC of the SDHS and the Data Reconstruction Site occurred in Nov 89. This completed the turnover and transfer of all operational assets to the operating and supporting commands and thus makes DMSP the first "normalized" major space program. The contract for Mark IVB Tactical Terminals was awarded in Oct 88; SDR occurred in Mar 89, PDR in Jul 89, and CDR in Nov 89. The first antenna for the Mark IVB Tactical Terminals was delivered by the subcontactor and the first imagery through the system was accomplished in Jun 90. The New Hampshire Command Readout Station (NHS/BOSS) modification to the remote tracking station to allow receipt and relay of DMSP data and bent-pipe commanding of DMSP satellites was awarded in Aug 89; CDR was completed in Nov 89. In Nov 90, two contracts for the procurement of Rapid Deployment Imagery Terminals (RDIT) were awarded; first article delivery occurred in Jan 91; a follow-on contract option for the production of five more RDITs was exercised in Feb 91. RDIT was a High Gear program in support of Desert Storm.

b. (U) Significant Developments Since Last Report —
On 28 Nov 91, Satellite F-11 (S-12) was launched from Vandenberg AFB. F-11, the first of the Block 5D-2 Improved satellites, achieved a near perfect orbit and was turned over to AFSPACECOM on 17 Dec 91. Included in the sensor complement was the first water vapor profiler

7b. (U) Program Highlights (Cont'd):

to be placed on orbit. On 6 Dec, S-15, the first of the Block 5D-3 satellites, was delivered. In Dec 91, funding was provided for the build of satellites S-19 and S-20 on the multiyear procurement contract. In Sep 91, CDR for the special sensor microwave imager sounder (SSMIS) was completed; the Manufacturing Readiness Review was completed in Nov 91. Two new space environmental sensors passed design milestones. The Special Sensor Ultraviolet Spectrographic Imager (SSUSI) successfully completed System Design Review (SDR) in Feb 91; the Special Sensor Ultraviolet Limb Imager (SSULI) successfully completed Preliminary Design Review (PDR) in May 91. Two DMSP acquisitions proved invaluable in Desert Storm; the Rapid Deployment Imagery Terminal, developed and delivered within a four month acquisition cycle, and the Mark IV Transportable Tactical Terminal. Both acquisitions provided meteorological data to support both the ground and air assaults. On 15 Dec, the stability tests for the developmental Mark IVB Tactical Terminal were successfully completed and Formal Qualification Test was initiated. On 3 Jul, the Multipurpose Satellite Operations Center (MPSOC) and the Internet terrestrial communications system were turned over to AFSPACECOM for operational use; Program Management Responsibility Transfer (PMRT) to AFLC followed on 1 Oct. In May 91, a competitive contract to provide independent software verification and validation was awarded.

The DMSP expects to meet its directed operational force structure and mission requirements.

c. (U) Changes Since As Of Date --
On 15 Jan 92, the Formal Qualification Test for the Mark IVB Tactical Terminal was completed.

8. (U) Threshold Breaches:
Currently there is a cost breach against the AFAE baseline, dated June 22, 1991, caused by the conversion of Operations and Maintenance funded effort to Missile Procurement funded effort. There are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Production Estimate	Approved Program	Current Estimate
Block 5D-2 Improved Production Start (S-11)	SEP 83	SEP 83	SEP 83
S-15 Design Contract Award	NOV 85	N/A	JUL 86

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
Satellite Delivery			
S-11	JUL 87	DEC 88	DEC 88
S-12	N/A	NOV 89	OCT 89
S-13	N/A	AUG 90	AUG 90
S-14	N/A	NOV 90	NOV 90
S-15 (Block 5D-3)	N/A	SEP 91	DEC 91(Ch-1)
Satellite Availability			
S-11	N/A	DEC 89	TBD
S-12	N/A	SEP 90	TBD
S-13	N/A	JUN 91	TBD
S-14	N/A	JUN 92	TBD
S-15 (Block 5D-3)	N/A	SEP 93	TBD
Award of Block 5D-3 Multiyear Procurement	N/A	MAY 89	JUN 89
Initial Titan II Capability	N/A	OCT 90	OCT 90
IOC 1/			
Block 5D-2 Improved (S-11)	TBD	N/A	DEC 91(Ch-2)
Block 5D-3 (S-15)	TBD	N/A	TBD
Primary Sensor			
Design Contract Award (S-11)	SEP 82	SEP 82	SEP 82
Production Contract Award (S12-S15)	JAN 84	JAN 84	JAN 84
Production Contract Award (S16-S20)	N/A	SEP 88	SEP 88
S-16 Primary Sensor Delivery	N/A	SEP 92	NOV 92(Ch-3)
Ground Systems			
(1) Operational	SEP 87	N/A	FEB 88
(2) Deactivate Loring CRS	SEP 88	N/A	APR 90
Fairchild Satellite Operations Center (FSOC) Operational	SEP 87	MAY 89	AUG 89
Award Mark IVB Contract	N/A	OCT 88	OCT 88
Mark IVB IOT&E	N/A	OCT 91	MAR 92(Ch-4)
Begin Mark IVB Production	N/A	JAN 92	JUN 92(Ch-5)
Final Mark IVB Delivery	N/A	SEP 97	SEP 97
System			
DMSP System Milestone IV	N/A	SEP 97	JUN 93(Ch-6)

1/ IOC for Block 5D-2 Improved/Block 5D-3 will occur 30 days after launch (completion of on-orbit checkout). As DMSP launches on demand, no firm estimate is currently available.

NOTE: Ground Systems Operational Milestone is the same as the former "Thule Command Readout Station" (CRS) milestone.

9a. (U) Schedule (Cont'd):
1/ This capability is "operational."
2/ 30 days after launch.

b. (U) Previous Change Explanations --

Fairchild Satellite Operations Center IOC slipped from Sep 88 to May 89 due to delay in contract award. Spacecraft S-15 design contract award slipped from May 86 to Jul 86 when additional technical evaluation of the proposal was required. S-11 delivery slipped from Jul 87 to Dec 88 due to materials problems, late delivery of piece-parts, diversion of manpower to support two launches, and late delivery of Government furnished equipment. Thule Command Readout Station (CRS) slipped from Sep 87 to Feb 88 due to S-Band Downlink Capability modification. Deactivation of Loring CRS slipped from Sep 88 to Apr 90 by determination of AFSPACECOM. Delivery dates for Spacecraft S12-15 adjusted due to increased satellite on-orbit lifetime. FSOC Operational slipped from May 89 to Aug 89 due to the non-availability of critical spares. Award of the 5D-3 multiyear contract slipped from Mar 89 to Jun 89 due to protracted negotiations. Required Availability deleted from the baseline. Satellite S-12 delivered a month ahead of estimate due to efficient test cycle. Begin Mark IVB IOT&E slipped from Sep 90 to Oct 91 due to PMD amendment adding Mission 22 and development problems; this delay has caused Mark IVB Production Start to slip from Feb 91 to Jan 92 and Final Delivery to slip from Sep 95 to Sep 97. Milestone IV slipped from Sep 93 to Sep 97 due to delay of program.

c. (U) Current Change Explanations --

(Ch-1) Delivery of satellite S-15 slipped from Sep 91 to Dec 91 due to manufacturing and test problems.

(Ch-2) IOC for Block 5D-2 was changed from TBD to Dec 91 because the first satellite in the block became operational.

(Ch-3) S-16 Primary Sensor delivery slipped from Sep 92 to Nov 92 due to late subcontractor piece parts deliveries.

(Ch-4) Mark IVB IOT&E slipped from Oct 91 to Mar 92 due to software integration problems impacting system stability.

(Ch-5) Mark IV Production Start has slipped from Jan 92 to Jun 92 as a result of the IOT&E delay.

(Ch-6) DMSP Milestone Mark IVB was accelerated from Sep 97 to Jun 93. This was due to an Air Force determination that Milestone IV was more appropriately held prior to significant risk reduction activity (FY93) versus prior to Engineering Development (FY97).

9d. (U) Schedule (Cont'd):

d. (U) References --

(U) Production Estimate:
PMD R-S 3015 (20), dated May 31, 1983, subject "DMSP".

(U) Approved Program:
AFAE Approved Acquisition Program Baseline, dated 22 June 1991.

10. (U) Performance Characteristics:

a. (U) Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Altitude (+/-20 nm)	450	N/A		N/A	450	
Inclination (+/-.15 degrees)	98.7	N/A		N/A	98.7	
Mean Mission Duration (months)						
5D-2 Improved	33	48	/ 30	N/A	39	(CH-1)
5D-3	42	60	/ 30	N/A	42	
Early Orbit Checkout (days)						
5D-2 Improved	30	30	/ 30	19	30	
5D-3	30	30	/ 30	N/A	30	
Primary Sensor						
Global Resolution (km)	2.78	2.78	/ 2.78	2.78	2.78	
Theater Resolution (km)	.56	.56	/ .56	.56	.56	
Mark IV B Transportable Tactical Terminals						
Mean Time Between Corrective Maintenance Actions (MTBCMA) (hrs)	720	705	/ 705	N/A	705	
Mean Time to Repair (MTTR) (hrs)	1	1	/ 1	N/A	1	
Mean Time Between False Alarm (MTBFA) (hrs)	20000	20000	/ 20000	N/A	20000	
Mean Time Between Critical Failures (MTBF) (hrs)	2000	1945	/ 1945	N/A	1945	

10a. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Maintenance Manhours per Operating Hour (MMH/OH)	.0233	.0233	/ .0233	N/A	.0233
Inherent Availability	.9995	.9995	/ .9995	N/A	.9995
Fraction of Failures Isolated by Built-In Test (%)	90	90	/ 90	N/A	90
Survivability					
(b)(1)					
Autonomous Operation (days)	N/A	60	/ 7	N/A	7

The current estimate for the technical parameters represents anticipated values based on current on-orbit satellite performance. Mean mission duration for both the 5D-2 Improved and 5D-3 spacecraft represent anticipated values and are based on current on-orbit performance of similar satellites.

1/ The altitude parameter is 450 nautical miles with a difference between apogee and perigee of no more than 30 nautical miles.

b. (U) Previous Change Explanations --

Previous entry for Early Orbit Checkout allowed up to 90 days in a transfer orbit for Space Shuttle launch; program has transitioned to an ELV. Survivability parameters are included to reflect the DAE Baseline. Mark IVB data replaced Mark IV data in the 30 Jun 89 SAR. Mean Time Between Corrective Maintenance Actions and Mean Time Between Critical Failures for the Mark IVB system decreased from 720 to 705 hours and 2000 to 1945 hours, respectively, due to the addition of Mission 22.

c. (U) Current Change Explanations --

(Ch-1) The Block 5D-2 Improved Mean Mission Duration estimate increased from 33 to 39 months based on historical experience with similar satellites.

10d. (U) Performance Characteristics (Cont'd):

d. (U) References --

(U) Production Estimate:
PMD R-S 3015 (20), dated May 31, 1983, subject "DMSP".

(U) Approved Program:
AFAE Approved Acquisition Program Baseline, dated 22 June 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	224.5	224.9	238.2
Procurement	491.6	500.1	545.0
Launch Vehicle	(26.0)		(7.2)
Spacecraft	(201.3)		(222.1)
Primary Sensor	(79.6)		(85.2)
Mission Sensors	(57.1)		(70.7)
Support	(48.9)		(64.5)
Total Flyaway	(412.9)		(449.7)
Ground System	(58.0)		(85.0)
Field Level Support	(19.8)		(0.0)
Total Other Wpn Sys	(77.8)		(85.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.9)		(10.3)
Construction (MILCON)	2.6	3.0	2.7
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 75 Base-Year $	718.7	728.0	785.9
Escalation	1160.3	1090.1	1292.3
Development (RDT&E)	(318.1)	(299.6)	(341.1)
Procurement	(839.1)	(787.2)	(948.2)
Construction (MILCON)	(3.1)	(3.3)	(3.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1879.0	1818.1	2078.2
b. (U) Quantity --			
Development (RDT&E)	1	N/A	1
Procurement	8	10	9
Total	9	10	10

c. (U) Foreign Military Sales -- None.

11d. (U) Total Program Cost and Quantity (Cont'd):

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Production Estimate:
PMD R-S 3015 (20), dated May 31, 1983, subject "DMSP".

(U) Approved Program:
AFAE Approved Acquisition Program Baseline, dated 22 June 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2078.2	1845.2	2078.2
(2) Quantity	10	10	10
(3) Unit Cost	207.82	184.52	207.82
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	114.1	114.1	47.6
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	116.1	116.1	0.0
Net Total	230.2	230.2	47.6
(2) Quantity	2	2	0
(3) Unit Cost	115.10	115.10	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	542.6	1330.7	5.7	1879.0
Previous Changes:				
Economic	-17.5	-88.9	-0.2	-106.6
Quantity	-	+190.2	-	+190.2
Schedule	-	+1.9	-	+1.9
Engineering	-13.6	-70.4	-	-84.0
Estimating	+32.1	-120.1	-	-88.0
Other	-	-	-	-
Support	+31.1	+21.4	+0.2	+52.7
Subtotal	+32.1	-65.9	-	-33.8
Current Changes:				
Economic	-5.9	-14.1	-	-20.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+8.6	+195.0	-	+203.6
Other	-	-	-	-
Support	+1.9	+47.5	-	+49.4
Subtotal	+4.6	+228.4	-	+233.0
Total Changes	+36.7	+162.5	-	+199.2
Current Estimate	579.3	1493.2	5.7	2078.2

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary — (FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	224.5	491.6	2.6	718.7
Previous Changes:				
Quantity	-	+61.2	-	+61.2
Schedule	-	-	-	-
Engineering	-5.2	-24.8	-	-30.0
Estimating	+3.6	-56.3	-	-52.7
Other	-	-	-	-
Support	+11.7	+4.1	+0.1	+15.9
Subtotal	+10.1	-15.8	+0.1	-5.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+2.8	+56.7	-	+59.5
Other	-	-	-	-
Support	+0.8	+12.5	-	+13.3
Subtotal	+3.6	+69.2	-	+72.8
Total Changes	+13.7	+53.4	+0.1	+67.2
Current Estimate	238.2	545.0	2.7	785.9

b. (U) Previous Change Explanations —

RDT&E

Economic: Revised escalation indices.

Engineering: Developed satellite autonomy capability; added new wind sensor technology effort but requirement later withdrawn; de-scoped survivability of 5D-3 spacecraft (S-15); increased vacuum ultraviolet (SSUV) sensor development authorized, but authority later withdrawn.

Estimating: Adjustments to correct current & prior year escalation; adjustments to current & prior years to reflect actuals; definitized Titan II ELV contract as 5D-3 booster; definitized 5D-3 development spacecraft (S-15) contract; re-estimate of 5D-3

13b. (U) Cost Variance Analysis (Cont'd):

development effort and performance incentives; additional development for wind measuring sensor; reduction resulting in delay of spacecraft (S-15) and primary and missions sensors and decrease in technical support; added funding for Titan II launch vehicle integration; revised estimate for spacecraft and sensor support and service effort; decreased estimate of program management and technical support; decrease in spacecraft and sensor studies; revised estimate for microwave imager/sounder development; extension of support and service activities for two years due to delay of follow-on program.

Support: Increase in Automated Weather Product Driver System application; deleted Shuttle-Launch Base requirement; upgrade of deployed DMSP tactical terminals and development of a new combat tactical terminal added; increase to C3 and DMSP tactical terminal upgrade requirements; revised estimate for development of new combat tactical terminal; increased cost for launch and on-orbit checkout for spacecraft S-15 and related launch and on-orbit costs; adjustment to Mark IVB development effort; launch facility improvements due to space policy security requirements; revision to system engineering support for ground systems; reprioritization of Tactical Data Processing requirements by user; re-estimate of small tactical terminal development.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Add one 5D-3 satellite (S-20) due to extension of Block 5D-3 program.

Schedule: Restructure of multiyear procurement of Block 5D-3 spacecraft S16-20.

Engineering: Descoped survivability and added [redacted] sensor to S16-20 spacecraft; added requirement for solar x-ray imager sensor (SXI); funding for SXI withdrawn.

Estimating: Adjustments to correct current and prior year escalation; adjustments to current & prior years to reflect actuals; funding reallocated to complete spacecraft S8-10 which are not included in SAR; extension of 5D-3 program; transition to Titan II ELV as 5D-3 booster; funding for Titan II launch vehicle refurbishment for DMSP S16-20 transferred to Space Boosters Program (PE 35119F); fully funded

13b. (U) Cost Variance Analysis (Cont'd):

buy of S16-20 and associated primary sensors restructured as a multiyear procurement; revised estimate of OLS and spacecraft (for S16-20) using Jun 85 cost data; upgraded production/test equipment model for primary sensor (OLS 13-21); integration funding for this added in FY 87; descoped merger of two mission sensors and re-estimated mission sensor mix in Jun 85 for S16-20; acceleration of water vapor profiling capability; loss of advance material buy funding for primary sensor; restructure of primary sensor buy from multiyear procurement to fully funded annual buy; revised estimate for technical support and mission sensor contingency; refinement of estimate for restructuring multiyear procurement of Block 5D-3 spacecraft S16-20; definitization of procurement of primary sensor OLS 17-21; re-estimate of special sensor buy as a competitive procurement; refinement of estimate for procurement of space and environmental sensors; definitization of multiyear procurement of spacecraft S16-20; adjustment of spacecraft and primary sensor incentives to projected year of payment; extension of Block 5D program due to follow-on delay.

Support: Adjustments to correct current and prior year escalation; adjustments to current and prior years to reflect actuals; refinement of Multi-Purpose Satellite Operations Center (MPSOC) upgrade requirement; revised estimate of initial spares requirement; increased cost for replacement of out-dated site equipment; definitization of DMSP tactical terminal upgrade requirements; re-estimate for DMSP connectivity to New Hampshire tracking station; reprogramming of spares funding; refined estimate for Mark IVB site prep/shelter procurement; revised estimate for replacement of site equipment using off-the-shelf equipment; revised estimate of Small Tactical Terminal procurement; adjustment to FFRDC funding.

MILCON

Economic: Revised escalation indices.

Support: Adjustments to correct current and prior year escalation; adjustments to prior year to reflect actuals.

13c. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation rates (Economic)	N/A	-5.9
Current and prior year adjustment for actuals (Estimating)	1.1	2.8
Adjustment for current and prior year escalation (Estimating)	0.5	1.4
Increase for system engineering (Estimating)	0.3	1.3
Adjustment of on-orbit performance incentives for projected launch (Estimating)	-0.9	-2.5
Revised estimate of sensor calibration/validation costs (Estimating)	1.6	5.1
Adjustment to launch vehicle conversion costs (Estimating)	0.2	0.5
Revised estimate of ground system engineering studies (Support)	-0.2	-0.8
Re-estimate of launch facility improvement costs (Support)	-1.5	-4.2
Adjustment to tactical terminal development estimate due to design problems (Support)	2.5	6.9
Total Changes	3.6	4.6

13c. (U) **Cost Variance Analysis (Cont'd):**

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised economic escalation rates (Economic)	N/A	-14.1
Adjustment to current and prior year escalation (Estimating)	2.8	7.9
Current and prior year adjustment for actuals (Estimating)	-0.3	-1.2
Revised estimate of FFRDC technical support (Estimating)	-1.7	-6.4
Adjustment of on-orbit performance incentives to projected year of launch (Estimating)	0.7	2.3
Directed transfer of support and launch effort funding from operations and maintenance to missile procurement (Estimating)	55.2	192.4
Directed transfer of ground system support efforts from operations and maintenance to missile procurement (Support)	2.2	7.8
Adjustment to current and prior year escalation (Support)	0.3	0.9
Current and prior year adjustment for actuals (Support)	-3.4	-9.3
Tactical terminal cost growth (Support)	3.7	11.8
Re-estimate of small tactical terminal procurement including revised user requirements (Support)	9.6	35.8
Revised allocation for initial spares (Support)	0.1	0.5
Total Changes	69.2	228.4
(3) MILCON		
No change.		
Total Changes	--	--

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
208.78	-12.66	-1.86	0.19	-8.40	11.56	--	10.21	-0.96	207.82

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) 5D-3 SPACECRAFT:	Initial Contract Price		
	Target	Ceiling	Qty
General Electric Company, Princeton, NJ F04701-86-C-0038, FPIF/AF Award: July 7, 1986 Definitized: July 7, 1986	$75.2	$82.4	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$75.4	$82.5	1	$90.6	$90.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-6.1	$-7.4
Cumulative Variances To Date (12/01/91)	$-11.9	$-2.2
Net Change	$-5.8	$5.2

Explanation of Change:

The increase to the current contract target price is due to a rounding error.

The estimated price at completion increased due to repeated rework and retest during manufacturing, late parts deliveries and additional support required by design changes. The estimated price on this effort is constrained by ceiling. Also included in the estimated price are $3.0M in award fees earned, $1.0M in potential future award fees, and $4.1M in potential on-orbit performance incentives. Neither award fees nor performance incentives were included in the estimates in previous reports.

Cost variance has worsened due to rate changes, rework efforts, repeated testing and manufacturing due to design flaws. Increased resources were used to recover schedule and deliver S-15 in early

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)
December. This cost variance should be tempered by the remaining Management Reserve which amounts to $3.8M as of the 1 Dec 91 report. No significant impact to the contract or program is anticipated.

Schedule variance improved as the significant effort on this contract was completed with the delivery of S-15. No significant impact to the contract or program is anticipated.

THIS CONTRACT IS OVER 90% COMPLETE AND WILL NO LONGER BE REPORTED IN THE SELECTED ACQUISITION REPORT.

(U) SSMI/S:	Initial Contract Price Target	Ceiling	Qty
Aerojet Electrosystems Co, Azusa, CA F04701-89-C-0036, FPIF/CP Award: March 17, 1989 Definitized: March 17, 1989	$62.1	$66.3	3

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$85.5	$91.7	5	$115.8	$115.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-8.4	$-4.2
Cumulative Variances To Date (11/30/91)	$-17.4	$-2.6
Net Change	$-9.0	$1.6

Explanation of Change:

The increase in the current contract price and ceiling is due to the exercise of the option for the fifth and final sensor.

The estimated price at completion includes both the fixed price production effort and the cost plus development effort on the contract. The estimated price for the fixed price portion is constrained by the ceiling which is the limit of the government's liability on the production effort. Also included in the estimated price is $0.2M in award fees earned, $3.0M in potential award fees, and $4.4M in potential on-orbit performance incentives. Neither award fees or performance incentives were included in the estimates in previous reports.

Increase in cost variance is due to an additional nine month slip in closing the Critical Design Review (CDR). The additional effort was driven by an inadequate understanding of constraints on weight, power, thermal control, and structural strength by the contractor. This lack of understanding resulted in unanticipated iterations of

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) design and design analysis to meet those requirements. Additionally, late discovery of the effect of the Doppler shift on the Upper Air Sounding function required modification of the design to accommodate its effect. Also contributing to the variance are additional cost associated with the signal processor drawings and rework of ground processing software due to changes in several surface imaging algorithms. Although there is no significant impact to the contract or program at this time, funding of the development overrun has seriously affected our funding flexibility.

Schedule variance has improved with the completion of CDR and mass model fabrication and test. No significant impact to the contract or program is anticipated at this time.

b.(U) Procurement --

(U) SSM/T:	Initial Contract Price Target	Ceiling	Qty
Aerojet Electrosystems Co, Azusa, CA F04701-83-C-0038, FPIF Award: April 15, 1983 Definitized: April 15, 1983	$9.5	$10.1	4

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$42.7	$45.3	6	$45.3	$45.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-5.5	$-0.9
Cumulative Variances To Date (11/30/91)	$-7.5	$-0.3
Net Change	$-2.0	$0.6

Explanation of Change:

There has been no change to current contract target or ceiling prices.

The increase in the estimated price at completion is due to delays in delivery of the final sensor unit and repeated test failures. The estimated price is constrained by the contract ceiling.

Cost variance increased due to repeated test failures which have driven the contract price to ceiling. No significant impact to the contract or program is anticipated.

Schedule variance improved with the completion of all significant effort on this contract. No significant impact to the contract or program is anticipated.

THIS CONTRACT IS OVER 90% COMPLETE AND WILL NO LONGER BE REPORTED IN

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)
THE SELECTED ACQUISITION REPORT.

(U) 5D-3 OLS:	Initial Contract Price Target	Ceiling	Qty
Westinghouse Elec Corp, Baltimore, MD F04701-88-C-0118, FPIF/AF Award: September 19, 1988 Definitized: September 19, 1988	$55.0	$61.1	2

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$107.4	$119.5	5	$118.5	$120.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$1.5	$-1.8
Cumulative Variances To Date (11/30/91)	$-4.2	$-3.1
Net Change	$-5.7	$-1.3

Explanation of Change:

The increase in the current target and ceiling prices is due to the contract modification for 10 KBPS uplink capability, digital tape recorders, and realtime data smooth capability.

The increase in the estimated price at completion results from the incorporation of the contract modifications and the schedule impact of late subcontractor deliveries. The estimate includes $1.4M in award fees earned, $1.5M in potential award fees, and $6.8M in potential on-orbit performance incentives. Neither award fees nor performance incentives were included in the estimates in previous reports.

Increase in cost variance is due to process transition to build specialty devices in house and increased inspection activities due to bulk delivery of piece parts for all flight units. The Bench Test Model development effort and acceleration of the operational amplifier production also contributed to the cost growth. No significant impact to the contract or program is anticipated.

Increase in schedule variance is due to late vendor deliveries. A minor schedule impact to deliveries of the first four flight units is anticipated. There is no impact to the program as the first unit, Operational Linescan System unit 17, is projected for delivery in Nov 92 and is not required for integration onto spacecraft S-16 until Aug 93.

15. (U) **Contract Information: Cont'd** (Then-Year Dollars in Millions)

(U) 5D-3 SPACECRAFT:	Initial Contract Price Target	Ceiling	Qty
General Electric Company, Princeton, NJ F04701-89-C-0029, FPIF/AF Award: June 30, 1989 Definitized: June 30, 1989	$228.2	$250.2	5

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$252.8	$272.0	5	$262.5	$277.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$5.0	$1.1
Cumulative Variances To Date (12/01/91)	$7.6	$-4.1
Net Change	$2.6	$-5.2

Explanation of Change:

The increase to the current contract target and ceiling prices is due to contract modifications for 10KBPS capability, realtime data smooth capability, and laser survivability.

The increase to the estimated price at completion is due to incorporation of the contract modifications and the inclusion of $1.2M in award fees earned, $8.4M in potential future award fees, and $15.4M in potential on-orbit performance incentives. Neither award fees nor incentives were included in the estimates in previous reports.

The improvement in cost variance is due to undercharging of direct labor due to delays in staffing and diversion of manpower to facilitate the delivery of S-15 and the launch of F-11. No impact to the program is anticipated.

The increase in schedule variance is due to delays in material deliveries and the impact on planned labor activities. No impact to the program is anticipated.

16. (U) **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 57.9% (11 yrs/19 yrs)

(2) Percent Program Cost Appropriated: 71.9% ($1495.0 / $2078.2)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY82-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2000)	Total
RDT&E	370.3	25.3	18.7	165.0	579.3
Procurement	979.6	114.1	47.6	351.9	1493.2
MILCON	5.7	-	-	-	5.7
O&M	-	-	-	-	-
Total	1355.6	139.4	66.3	516.9	2078.2

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1982				8.4	15.5	15.5	15.5	9.2
1983				8.7	16.8	16.8	16.1	4.9
1984				9.8	19.6	19.6	19.5	3.8
1985				18.4	37.9	37.9	36.2	3.4
1986				24.1	50.9	50.8	45.5	2.8
1987				26.9	58.8	58.7	50.2	2.7
1988				16.1	36.3	36.2	32.2	3.0
1989				19.3	45.3	45.1	42.6	4.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1990				18.1	44.0	43.6	26.2	4.0
1991				17.9	45.2	42.9	22.0	3.9
1992				9.7	25.3	8.5	0.1	3.1
1993				6.9	18.7			3.3
1994				8.4	23.4			3.3
1995				7.9	22.6			3.3
1996				7.7	22.9			3.2
1997				7.6	23.4			3.2
1998				7.9	24.9			3.2
1999				7.9	25.8			3.2
2000				6.5	22.0			3.2
Subtot	1			238.2	579.3	375.6	306.1	

Funding does not match the budget documentation because the SAR is limited to DMSP Blocks 5D-2 Improved and 5D-3.

Obligation and Expenditure information reflects official accounting records as of 31 Dec 91.

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force								
1982				7.0	14.4	14.4	14.6	9.6
1983	2	3.8	65.1	68.8	150.7	150.7	142.8	9.0
1984		3.7		12.6	28.7	28.7	28.3	8.0
1985	2	4.2	85.6	54.2	127.2	127.2	123.7	3.4
1986		4.0	17.1	16.1	39.5	39.5	32.9	2.8
1987		3.5		6.8	17.5	17.5	17.5	2.7
1988		2.7		25.8	68.5	68.5	43.4	3.0
1989	1	2.7	52.1	57.2	157.3	157.3	39.7	4.2
1990	1	5.2	46.4	41.4	117.4	114.1	34.6	4.0
1991	1	5.2	42.9	50.6	147.7	92.7	15.6	3.9
1992	2	5.0	83.5	35.2	106.1	65.2		3.1
1993		2.3		10.1	31.4			3.3
1994		2.2		9.4	30.2			3.3
1995		2.1		9.2	30.5			3.3
1996		1.9		9.1	31.0			3.2
1997		1.9		8.6	30.4			3.2
1998		2.0		9.7	35.4			3.2
1999		2.3		10.0	37.8			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force (Cont'd)								
2000		2.3		10.2	39.7			3.2
Subtot	9	57.0	392.7	452.0	1241.4	875.8	493.1	

FY 86 recurring amount is for primary and mission sensors for the development spacecraft (S-15).

Expenditures greater than obligated due to accounting and finance office posting errors.

Funding does not match the budget documentation because the SAR is limited to DMSP Blocks 5D-2 Improved and 5D-3.

Obligation and Expenditure information reflects official accounting records as of 31 Dec 91.

Appropriation: 3080 Other Procurement, Air Force

1983				3.7	7.5	7.5	7.1	4.9
1984				6.3	13.1	12.6	12.6	3.8
1985				13.3	28.7	25.7	26.4	3.4
1986				4.1	9.3	4.9	12.8	2.8
1987				3.0	6.9	5.2	6.0	2.7
1988				3.7	9.0	8.5	7.4	3.0
1989				6.5	16.3	15.0	14.6	4.2
1990				0.5	1.2	0.8	0.3	4.0

16c. (U) **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3080 Other Procurement, Air Force (Cont'd)								
1991				7.0	18.7	17.0	1.8	3.9
1992				2.9	8.0			3.1
1993				5.7	16.2			3.3
1994				6.0	17.6			3.3
1995				5.6	17.0			3.3
1996				4.9	15.3			3.2
1997				4.7	15.1			3.2
1998				5.0	16.7			3.2
1999				5.0	17.3			3.2
2000				5.1	17.9			3.2
Subtot				93.0	251.8	97.2	89.0	

Expenditures are greater than obligations due to accounting and finance office posting errors.

Funding does not match the budget documentation because the SAR is limited to DMSP Blocks 5D-2 Improved and 5D-3.

Obligation and Expenditure information reflects official accounting records as of 31 Dec 91. Only DMSP/AFSC obligations/expenditures are shown. Total Program dollars include SM-ALC/AFLC Programmed and Contractual funds in PE0305160F.

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY75 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3300 Military Construction, Air Force								
1985				2.7	5.7	5.7	5.7	3.4
Subtot				2.7	5.7	5.7	5.7	
Grand Total	10	57.0	392.7	785.9	2078.2	1354.3	893.9	

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- None.

The DMSP production rate is less than six units in any two fiscal years.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	785.9	N/A	0.0
(TY $)	N/A	N/A	2078.2	N/A	0.0
PAUC Cost (BY $)	N/A	N/A	78.590	N/A	N/A
(TY $)	N/A	N/A	207.820	N/A	N/A

17c. (U) Production Rate Data (Cont'd):

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	1/1
Procurement	4/4

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

Operations and support costs include all costs of operating, maintaining, and supporting the DMSP spacecraft from dedicated ground control centers at Fairchild AFB WA (Fairchild Satellite Operations Center) and Offutt AFB NE (Multi-Purpose Satellite Operations Center). Costs also include the costs for contractor support for sustaining engineering and the operations personnel at each of the operations centers. These costs do not include the unallocated costs associated with the shared use of remote tracking stations which are programmed and borne by the Air Force Satellite Control Network and the Consolidated Space Operations Center program elements.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs — (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 5D-2 Constellation	Avg Annual Cost Per (Antecedent)
Operations & Maintenance	11.2	N/A
Military Personnel	13.1	N/A
Other Procurement	2.4	N/A
Total	26.7	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	93.6	30.1	6.3	33.1	163.1
Total	93.6	30.1	6.3	33.1	163.1

The O&M Support Costs include funding for sustaining engineering and launch for satellites S-11 through S-20 beginning with the delivery of S-11 in FY 1989 and estimated through FY 2000. Beginning in FY 1993, higher headquarters approved the transfer of funding for sustaining engineering to the Missile Procurement appropriation. The O&M budget for FY 1993 through FY 2000 therefore includes only launch costs budgeted in the DMSP program element.

AF-9 DSP

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91-1012

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: DSP

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
Defense Support Program - Strategic Surveillance and Warning Satellite System (DSP)

2. (U) **DoD Component:** USAF

3. (U) **Responsible Office and Telephone Number:**
PROGRAM DIRECTOR DEFENSE SUPPORT — COL JOHN KIDD
SYSTEMS PROGRAM OFFICE — Assigned: August 1, 1989
SPACE SYSTEMS DIV. - LOS ANGELES AFB AV 833-1150 COMM (310) 363-1150
LOS ANGELES, CA 90009-2960

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
(b)(1) [redacted]

PROCUREMENT:
APPN 3020 ICN MS0647 (Air Force)
APPN 3080 ICN 833100 (Air Force)

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92-0354

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4. (U) Program Elements/Procurement Line Items (Cont'd):

MILCON:
(b)(1) [redacted]

5. (U) Related Programs:
Jam Resistant Secure Communications Terminals (JRSCT); MILSTAR; Defense Satellite Communication System (DSCS); Follow-on Early Warning System (FEWS); Survivable Communications Integration System (SCIS).

(b)(1) [redacted]

7. (U) Program Highlights:

a. (U) Significant Historical Developments --

(U) The Defense Support Program (DSP) was developed as an outgrowth of the ballistic missile infrared technology of Program 461. Full operational deployment of the DSP was completed during (b)(1) [redacted] DSP satellites contain infrared sensors, (b)(1) [redacted] (b)(1) [redacted] and radiation sensors. The system, as part of the Tactical Warning and Attack Assessment system, provides near real-time warning of ICBM's and SLBM's, nuclear detonation reporting, and nuclear test ban monitoring. The system's current deployment consists of (b)(1) [redacted] (b)(1) [redacted] (b)(1) [redacted] The three dedicated ground stations, Overseas Ground Station (OGS), Continental United States Ground Station (CGS), and European Ground Station (EGS), receive, process and transmit data. The European Ground Station has resulted from an "Upgraded Simplified Processing Station." Since its inception, DSP has detected over (b)(1) [redacted]

7a. (S) Program Highlights (Cont'd):

(b)(1) worldwide.

(U) DSP has initiated procurement of 22 satellites. The last five satellites (18-22) were approved by Congress to be procured using a Multi-Year Procurement (MYP) approach which saved the Government $455 million over an annual buy approach. To date, the program office has successfully launched 14 satellites. DSP has been responsible for constructing three fixed sites, a multi-purpose training facility, one transportable data processing facility, six mobile ground systems, and provided user displays and software.

(U) The sensor has undergone Sensor Evolutionary Development (SED) improvements which are intended to prolong the useful life of each satellite, to make the satellite more survivable in hostile environments, to increase the viewing area of each satellite, and to increase the accuracy of the data provided. The first satellite with SED enhancements was launched in December 1984 (Flight 12) and all subsequent DSP satellites have SED sensor improvements.

(b)(1)

(U) They have undergone the Peripheral Upgrade Program (PUP) and the Ground Stations' Upgrade for Satellite 14 (GS-14) to make them compatible with the second generation of satellites (Satellites 14-22). The OGS accepted the PUP equipment in April 1987 and the OGS in September 1987.

U) In 1986, Satellite 5R (Flight 13) was demated from the Titan 34D booster due to the booster investigations caused by the previous booster disasters. This was the first time any satellite had been demated from its booster.

7a. (b)(1) **Program Highlights (Cont'd):**

(U) Flight 14, the first DSP-1 satellite, was launched in June 1989.

(b)(1) [redacted]

(U) The Simplified Processing Station Replacement (SPSR) was completed. This facility is now designated the European Ground Station (EGS).

(U) The Laser Crosslink Subsystem (LCS) program was rebaselined due to difficulties in producibility and manufacturing. SAF/AQ approved the recovery plan in Oct 89. The first LCS will fly on Satellite 18, as opposed to Satellite 15.

(U) Flight 15 was successfully launched. Congress directed the procurement of Satellites 23 and 24 using a multiyear procurement strategy in FY92-94. The Laser Crosslink Subsystem (LCS) passed prototype qualification in September 1990 and three subsystems were completed.

b. (b)(1) Significant Developments Since Last Report --
(U) The program office is pursuing a multiyear procurement of Satellites 23-25 in FY93-97. Flight 16 was successfully launched on STS-44 from the shuttle Discovery. The first production Laser Crosslink Subsystem was delivered in December 1991.

(b)(1) [redacted]

(U) Upgraded Mobile Ground Terminals 1 and 2 were delivered and accepted by AFSPACECOM.

(b)(1) [redacted]

c. (U) Changes Since As Of Date --
None.

8. (U) Threshold Breaches:
There is currently one Acquisition Program Baseline (dated 31 Dec 88) threshold breach. The baseline procurement cost breach increased from $4095.2 to $4414.1 (7.8%). There are no Nunn-McCurdy unit cost

8. (U) Threshold Breaches (Cont'd):

breaches.

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
(b)(1)	[redacted]		

b. (U) Previous Change Explanations --

Multi-year procurement strategy approved by HQ Air Force for Satellites 18-22 replaced the Satellite 18-19 annual buy profile. The delay in the MYP award for Satellites 18-22 was due to a decision made by the program office and approved by Air Staff to offset cost growth in laser crosslink production. An additional delay in the Satellites 18-22 Delivery Start was the result of problems experienced in awarding the MYP contracts. The delay in Satellite 5R delivery from Jul 85 to Aug 85 was due to the deceleration of Satellite 5R, and further launch delay resulting from problems with the booster and accelerating the launches of Satellites 12 and 6R. The change in the IOC of the MGS was due to the inclusion of early link 1/2 receivers in two of the MGTs to provide a capability to

9b. (U) Schedule (Cont'd):
process mission data with Satellites 14 and on. The delay in the launch of Flight 14 was due to Titan IV/IUS lightning strike problems. Estimates for the launch of Flight 14 and the FOC of MGS Sat 14 Compatibility were revised to reflect actual deliveries and program slips. Some SAR milestone deleted since they no longer were applicable. FOC of MGS SAT 14 Capability, although the upgraded Mobile Ground Terminals (MGT-14) one and two were delivered on schedule, they failed IOT&E. They were returned to IBM for rework and then passed IOT&E. There is an approximate one year delay in the FOC of all six vehicles due to rework and repeating IOT&E.

c. (b)(1) Current Change Explanations --

- Change 1. (U) Rework of the upgrade Mobile Ground Terminals after their failed IOT&E, plus significant additional scope to the contract, has delayed the fielding of the final MGT-14 from December 1991 to September 1993. The first two of six MGT-14s passed IOT&E have been delivered and are fully operational.

(b)(1) [redacted]

d. (U) References --

(U) Development Estimate:
PMD # NO.R-S 4047 (24) Oct 18, 1983; SPECIFICATION NO. DSP 80-01, Revision A, May 1, 1984. FY85 RDT&E Descriptive Summaries, January 1984.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

10. (U) Performance Characteristics:

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1) [redacted]				

10a. (U) Performance Characteristics (Cont'd):

DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)			

10b. (b)(1) **Performance Characteristics (Cont'd):**

(b)(1) [redacted]

c. (U) Current Change Explanations --

None.

d. (U) References --

(U) Development Estimate:
PMD # NO.R-S 4047 (24) Oct 18, 1983; SPECIFICATION NO. DSP 80-01, Revision A, May 1, 1984. FY85 RDT&E Descriptive Summaries, January, 1984.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

11. (U) **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	1304.3	1618.3	1692.6
Procurement	3094.6	4095.2	4414.1
Flyaway	(2364.4)		(3492.1)
Total Flyaway	(2364.4)		(3492.1)
Other Weapon Systems	(730.2)		(13.7)
Total Other Wpn Sys	(730.2)		(13.7)
Peculiar Support	(0.0)		(852.5)
Initial Spares	(0.0)		(55.8)
Construction (MILCON)	25.7	25.5	25.5
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 78 Base-Year $	4424.6	5739.0	6132.2
Escalation	1123.0	2570.9	3418.8
Development (RDT&E)	(-30.4)	(263.6)	(364.4)
Procurement	(1151.6)	(2305.3)	(3052.4)
Construction (MILCON)	(1.8)	(2.0)	(2.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	5547.6	8309.9	9551.0
b. (U) Quantity --			
Development (RDT&E)	4	N/A	4
Procurement	15	22	21
Total	19	22	25

11c. (U) Total Program Cost and Quantity (Cont'd):

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
PMD # NO.R-S 4047 (24) Oct 18, 1983; SPECIFICATION NO. DSP 80-01, Revision A, May 1, 1984.
FY85 RDT&E Descriptive Summaries, January, 1984.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 31 December 1988.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	9551.0	9910.2	9551.0
(2) Quantity	25	26	25
(3) Unit Cost	382.04	381.16	382.04
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	122.3	122.3	354.3
Less CY Adv Proc	0.0	0.0	147.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	122.3	122.3	207.3
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1273.9	4246.2	27.5	5547.6
Previous Changes:				
Economic	-0.8	+1.6	-0.1	+0.7
Quantity	-	+2786.3	-	+2786.3
Schedule	+0.4	+156.2	-	+156.6
Engineering	-	-	-	-
Estimating	+727.6	+18.1	+0.1	+745.8
Other	-	-	-	-
Support	+289.4	+383.8	-	+673.2
Subtotal	+1016.6	+3346.0	-	+4362.6
Current Changes:				
Economic	-13.9	-83.7	-	-97.6
Quantity	-	-437.3	-	-437.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-219.6	+362.9	-	+143.3
Other	-	-	-	-
Support	-	+32.4	-	+32.4
Subtotal	-233.5	-125.7	-	-359.2
Total Changes	+783.1	+3220.3	-	+4003.4
Current Estimate	2057.0	7466.5	27.5	9551.0

13a. (U) **Cost Variance Analysis (Cont'd):**

a. (U) Summary -- (FY 1978 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1304.3	3094.6	25.7	4424.6
Previous Changes:				
Quantity	-	+1211.5	-	+1211.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+334.1	-52.6	-0.2	+281.3
Other	-	-	-	-
Support	+149.1	+177.9	-	+327.0
Subtotal	+483.2	+1336.8	-0.2	+1819.8
Current Changes:				
Quantity	-	-177.7	-	-177.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-94.9	+146.5	-	+51.6
Other	-	-	-	-
Support	-	+13.9	-	+13.9
Subtotal	-94.9	-17.3	-	-112.2
Total Changes	+388.3	+1319.5	-0.2	+1707.6
Current Estimate	1692.6	4414.1	25.5	6132.2

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices.

Schedule: Delay in integration effort due to launch standdown.

Estimating: Adjustment for current and prior inflation.
Changes associated with software upgrades to support Satellites 14-17.
Acquisition strategy change for Laser Crosslink Subsystem (LCS).
Cost changes associated with Satellite Readout Station Upgrade (SRSU), development delays in Mobile Ground Terminal (MGT).
Reprogramming of FY 90-92 funds due to delay of

13b. (U) Cost Variance Analysis (Cont'd):

System 1.

Support: Integration and other program level efforts to support the acquisition of an added satellite. Hardware and software upgrades for ground stations. Increased cost for Ground System Upgrade (GSU).

PROCUREMENT

Economic: Revised economic escalation indices.

Quantity: Acquisition of additional satellites in FY89, FY90, FY91, FY92, and FY93. Decrease of one satellite from 26 to 25.

Schedule: One year delay in procurement of Satellite 18.
Two year delay for Satellite 19.
Production delay for Satellites 23-26.
Slip buy of Satellites 23-25 from FY91 to FY92.

Estimating: Adjustment for current and prior inflation .
Revised procurement strategy (two in FY88 versus one each in years FY87 and FY88).

Support: Inclusion of previously deleted logistics items to support ground systems, support of additional satellite in FY 90, FY 91, FY 92, and FY 93. Ground Station hardware, acquisition. Addition of Satellite Readout Station Upgrade (SRSU) project, Gramm-Rudman-Hollings and Congressional reductions. Revised prior year actual costs. Decrease to reflect PB funding, Zero Base Transfer of FY 90 funds for GSU, reestimate of initial spares costs, contingent liabilities in FY 85, reduction of FY 86 funds for logistic support for GSU, additional ground support in FY 94. Negotiated value of Satellite Readout Station Upgrade (SRSU) lower than anticipated, FY93-94 delay of logistic support for SRSU, decreased technical support for ground systems, increase in FY85-86 funds for MGT-14 and Link 1/2 efforts.

MILCON

Economic: Revised economic escalation indices.

Estimating: Adjustment to current and prior year escalation indices.

13c. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Change Explanations —

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	-14.5
Adjustment for negative program change related escalation (Economic)	N/A	0.6
Adjustment for current and prior year escalation (Estimating)	2.0	3.3
Revised estimate due to cancellation of DSP-2 upgrade (Estimating)	-112.0	-254.6
Restoration of fixed and mobile ground efforts (Estimating)	15.1	31.7
Total Changes	-94.9	-233.5

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-89.0
Adjustment for program change related escalation (Economic)	N/A	5.3
Adjustment for current and prior year inflation offset		
(Estimating)	8.0	18.6
(Support)	1.5	3.2
Deletion of one satellite (Non-add)	-194.4	-489.0
(Quantity)	-177.7	-437.3
Allocation of cost increase since the baseline		
(Estimating)	-16.7	-51.7
Change in acquisition strategy associated with MYP vice annual long-lead funding (Estimating)	29.5	84.1
Refinement of program estimate to reflect change from DSP-2 to DSP-1 satellites and new spacecraft (Estimating)	127.8	316.1
Adjustment of FY87 funds to reflect actual costs (Estimating)	-2.1	-4.2
Increase in initial spares requirement (Support)	0.9	1.4
Logistic modifications to existing ground stations (Support)	13.9	33.0
Reduced Aerospace MTS support (Support)	-0.4	-0.8
Refinement of Peculiar Support Equipment estimate (Support)	-2.0	-4.4
Total Changes	-17.3	-125.7

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(3) MILCON No changes.		
Total Changes	--	--

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
291.979	-3.876	23.885	6.264	--	35.564	--	28.224	90.061	382.040

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) GSI 86-89:
IBM, BOULDER, CO
F04701-85-C-0178, CPIF
Award: October 1, 1985
Definitized: May 23, 1986

Initial Contract Price		
Target	Ceiling	Qty
$14.4	$15.8	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$152.3	N/A	0	$150.6	$150.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$6.0	$-0.3
Cumulative Variances To Date (09/20/91)	$5.1	$-0.2
Net Change	$-0.9	$0.1

Explanation of Change:

Cost and schedule variances are insignificant. Target price increased due to modifications to the contract concerning training and Satellite 16 Early On-orbit Testing. No impact to the program. This contract is primarily level of effort support. September 91 data was the last report submitted due to the contract being 99% complete. No impact to the program.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)
THIS CONTRACT IS OVER 90% COMPLETE AND WILL NO LONGER BE REPORTED IN THE SELECTED ACQUISITION REPORT.

(U) SYSTEM 1:	Initial Contract Price Target	Ceiling	Qty
IBM, Boulder, CO F04701-87-C-0011, CPAF Award: May 1, 1987 Definitized: July 10, 1987	$80.8	N/A	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$101.9	N/A	0	$147.0	$149.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-21.3	$-3.1
Cumulative Variances To Date (10/18/91)	$-6.2	$-3.3
Net Change	$15.1	$-0.2

Explanation of Change:

This contract implemented an over target baseline in June 1991. Cost variance was adjusted $26.1M and schedule variance was adjusted $2.1M. Since the implementation schedule variance has been driven by inefficiencies in the development environment, Types Dictionary Services Tool (TDS), and compiler problems. This has caused delays in Code and Unit Test phase and has caused dependencies to be unavailable to subcontractors thus causing schedule slips. Cost variance drivers include LPS subsystem experiencing difficulties due to Rational/ADA/SYS1 subsystem management requiring more configuration management time from programing than expected. TDS and incident reports expended more effort than anticipated to correct code anomalies. Operational Interface Code and Unit Test has encountered changing requirements and impacts due to complexity of code thus affecting cost. IBM has experienced an increase in their overhead burden and G&A rates. Increase in target price was due to the addition of the UNIX software conversion in January 1991. No impact to the program.

b.(U) Procurement --

(U) SATELLITES 14-17:	Initial Contract Price Target	Ceiling	Qty
TRW SPACE & DEFENSE, REDONDO BEACH, CA F04701-82-C-0035, FPI/FFP Award: March 11, 1982 Definitized: December 15, 1982	$47.9	N/A	4

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$633.0	$662.5	4	$662.5	$662.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-51.4	$-22.2
Cumulative Variances To Date (11/01/91)	$-52.9	$-3.6
Net Change	$-1.5	$18.6

Explanation of Change:

Schedule relief via contractural direction has been granted TRW which has slipped the required delivery dates for Laser Crosslink Subsystem (LCS) numbers 1-4. TRW has completed a rebaseline of the MDESC effort which resulted in a dramatic schedule recovery. Schedule variance since this action has increased due to Satellite 16 CAT II extensions, delays in Satellite 17 IST due to minor test problems and the reduction of crews from 4 to 3. Principle factors for cost variance changes are late part deliveries, engineering support rework and retest costs, greater digital engineering hours to resolve design and test equipment, and production problems on SHF units and design problems on EHF units. Change in Target and Ceiling Price due to contract modification for deobligation of Satellite 15 Laser Crosslink Subsystem. October data was the last report submitted due to the contract being 98% complete. No impact to the program.

THIS CONTRACT IS OVER 90% COMPLETE AND WILL NO LONGER BE REPORTED IN THE SELECTED ACQUISITION REPORT.

(U) MGT-14:
IBM, BOULDER, CO
F04701-81-C-0022, FPI/CPF
Award: October 1, 1985
Definitized: October 1, 1985

Initial Contract Price		
Target	Ceiling	Qty
$62.0	$66.9	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$214.3	$225.1	6	$263.7	$263.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-26.0	$-4.5
Cumulative Variances To Date (07/19/91)	$-34.7	$-2.1
Net Change	$-8.7	$2.4

Explanation of Change:

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) Major drivers to schedule variance are late deliveries of GFE (Link 1/2, SAT Availability, and Subarray Spares) and subcontractor problems with the Magnetic Tape Cartridge Unit and Software development problems. The software and systems engineering WBS elements have overrun and are the major cost variance drivers. Target price increased as a result of modification number P00223 dated 24 May 1991 which included negotiated amounts for TCP067. TCP067 was a claim against the government from the IBM Corporation for late GFE impacts during vehicle testing. IBM is currently in the process of implementing an over target baseline. The latest data received before this implementation process began was July 1991 and IBM was given relief of CPR reporting until finished. Complete OTB implementation is expected with the month end November data (under review now) which will be reported in the next SAR. No impact to the program.

(U) SATELLITES 18-22:	Initial Contract Price		
	Target	Ceiling	Qty
TRW SPACE & DEFENSE, REDONDO BEACH, CA			
F04701-86-C-0022, FPI	$743.5	$782.5	5
Award: July 30, 1987			
Definitized: July 30, 1987			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$759.6	$798.7	5	$770.4	$772.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-9.1	$-23.1
Cumulative Variances To Date (11/01/91)	$-13.7	$10.7
Net Change	$-4.6	$33.8

Explanation of Change:

Schedule variance improved due to the completion of McDonnell Douglas' restructure of the Laser Crosslink Subsystem (LCS) program. Major cost variance drivers include an increase in TRW's overhead burden and G&A rates as well as various technical difficulties including 20 watt power amplifier failure and Mission Data Message and Data Handling Unit redesign efforts. Contract target price increased due to an overhead and G&A rate increase on future effort per revised forward pricing rates. In previous SAR submissions contract ceiling price included only the FPI portion of the contract. This has been correted to the total contract value. No impact to the program.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) SENSORS 18-22:	Initial Contract Price		
	Target	Ceiling	Qty
AEROJET, AZUSA, CA F04701-86-C-0023, FPIF/AF Award: August 11, 1987 Definitized: August 11, 1987	$432.8	$454.9	5

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$491.8	$516.5	5	$496.9	$498.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-2.8	$-0.5
Cumulative Variances To Date (10/24/91)	$-3.9	$-2.2
Net Change	$-1.1	$-1.7

Explanation of Change:

Cost and schedule variances are insignificant. Increase in target price is due to the addition of parts obsolescence and data control system integration. No impact to the program.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status —

(1) Percent Program Completed: 83.9% (26 yrs/31 yrs)

(2) Percent Program Cost Appropriated: 73.1% ($6979.8 / $9551.0)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY67-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	1754.8	51.1	57.7	193.4	2057.0
Procurement	5024.1	122.3	354.3	1965.8	7466.5
MILCON	27.5	-	-	-	27.5
O&M	-	-	-	-	-
Total	6806.4	173.4	412.0	2159.2	9551.0

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1967				57.1	30.8	30.8	30.8	3.1
1968				93.4	52.3	52.3	52.3	3.6
1969				162.4	95.3	95.3	95.3	4.2
1970				118.9	73.5	73.5	73.5	5.4
1971				130.7	84.4	84.4	84.4	5.3
1972				47.5	31.9	31.9	31.9	3.6
1973				46.7	32.3	32.3	32.3	3.6
1974				77.6	60.1	60.1	60.1	8.3

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1975				40.7	34.4	34.4	34.4	10.8
1976				18.2	16.4	16.4	16.4	7.0
197T								
1977				30.4	29.4	29.4	29.4	7.5
1978				28.0	28.7	28.7	28.7	6.0
1979				27.2	30.6	30.6	30.6	8.4
1980				24.8	31.0	31.0	31.0	9.4
1981				63.2	87.6	87.6	87.6	11.9
1982				97.4	144.2	144.2	144.2	9.2
1983				76.9	119.2	119.2	119.2	4.9
1984				29.6	47.7	47.7	47.7	3.8
1985				38.0	63.3	63.3	63.3	3.4
1986				37.4	63.8	63.8	49.7	2.8
1987				65.5	115.4	111.4	100.5	2.7
1988				49.1	89.4	87.6	87.6	3.0
1989				52.6	99.8	93.6	90.0	4.2
1990				45.7	89.7	88.9	77.1	4.0
1991				99.8	203.6	69.2	12.8	3.9

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1992				24.3	51.1	14.4	0.1	3.1
1993				26.5	57.7			3.3
1994				35.9	80.5			3.3
1995				14.2	32.9			3.3
1996				17.1	40.9			3.2
1997				15.8	39.1			3.2
Subtot	4			1692.6	2057.0	1622.0	1510.9	
Appropriation: 3020 Missile Procurement, Air Force								
1969				31.4	17.8	17.8	17.8	3.5
1970				62.3	37.0	37.0	37.0	4.7
1971	3		282.6	165.3	102.8	102.8	102.8	5.7
1972	2		188.4	157.5	105.2	105.2	105.2	3.7
1973	3		282.6	231.4	167.1	167.1	167.1	4.7
1974				38.1	28.1	28.1	28.1	8.4
1975	1		94.2	91.7	80.8	80.8	80.8	16.3
1976				42.1	39.5	39.5	39.5	7.9
197T								

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3020 Missile Procurement, Air Force (Cont'd)								
1977				27.9	28.0	28.0	28.0	7.5
1978				88.9	94.1	94.1	94.1	6.0
1979				100.0	123.4	123.4	123.4	8.7
1980				73.9	103.9	103.9	103.9	9.7
1981				33.5	51.8	51.8	51.8	11.9
1982				146.2	241.4	241.4	241.4	9.6
1983	2		583.9	273.5	478.1	478.1	478.1	9.0
1984	2		583.9	239.5	436.6	436.6	436.6	8.0
1985				28.3	53.0	53.0	53.0	3.4
1986				56.8	111.4	111.4	111.4	2.8
1987				127.2	259.8	258.8	258.8	2.7
1988	1		130.8	166.5	353.4	353.3	338.4	3.0
1989	2		261.5	196.0	430.4	430.4	207.9	4.2
1990	1		130.8	151.6	343.5	308.4	140.7	4.0
1991	1		130.8	139.8	326.2	271.3	134.5	3.9
1992				26.7	64.3	23.0		3.1
1993				115.2	286.7			3.3
1994	1		274.2	171.3	440.0			3.3

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3020 Missile Procurement, Air Force (Cont'd)								
1995				162.3	430.2			3.3
1996	1		274.2	188.5	515.6			3.2
1997	1		274.2	158.7	448.1			3.2
Subtot	21		3492.1	3492.1	6198.2	3945.2	3380.3	
Appropriation: 3080 Other Procurement, Air Force								
1969				31.3	17.6	17.6	17.6	3.5
1970				144.5	85.4	85.4	85.4	4.7
1971				56.5	35.0	35.0	35.0	5.7
1972				65.2	42.0	42.0	42.0	3.7
1973				27.6	19.0	19.0	19.0	4.7
1974				2.2	1.7	1.7	1.7	8.4
1975				6.4	5.6	5.6	5.6	16.3
1976				13.7	12.8	12.8	12.8	7.9
197T								
1977				13.6	13.6	13.6	13.6	7.5
1978				0.3	0.3	0.3	0.3	6.0
1979				6.0	7.6	7.6	7.6	8.7

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3080 Other Procurement, Air Force (Cont'd)								
1980				19.0	26.6	26.6	26.6	9.7
1981				46.8	70.3	70.3	70.3	11.9
1982				66.5	103.4	103.4	103.4	9.2
1983				55.8	90.1	90.1	90.1	4.9
1984				21.7	36.1	36.1	36.1	3.8
1985				29.9	51.4	51.4	42.4	3.4
1986				71.9	128.9	128.9	96.6	2.8
1987				48.3	89.8	89.8	84.1	2.7
1988				13.8	26.6	26.6	10.5	3.0
1989				0.9	1.8	1.8	1.7	4.2
1990				34.4	71.0	61.3	37.7	4.0
1991				35.0	74.2	60.2	4.2	3.9
1992				26.5	58.0	2.5		3.1
1993				29.9	67.6			3.3
1994				21.1	49.3			3.3
1995				12.1	29.1			3.3
1996				10.0	24.9			3.2
1997				11.1	28.6			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3080 Other Procurement, Air Force (Cont'd)								
Subtot				922.0	1268.3	989.6	844.3	
Appropriation: 3300 Military Construction, Air Force								
1975				19.6	17.3	17.3	17.3	8.5
1976								
197T								
1977								
1978								
1979								
1980								
1981								
1982								
1983				1.1	1.9	1.9	1.9	4.9
1984								
1985				4.8	8.3	8.3	8.3	3.4
Subtot				25.5	27.5	27.5	27.5	
Grand Total	25		3492.1	6132.2	9551.0	6584.3	5763.0	

16c. (U) Program Funding Summary (Cont'd):
Obligation and Expenditure information reflects official accounting records as of 31 Dec 91.

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- None.

Since production is less than six or more in any two fiscal years, production information is not required.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	6132.2	N/A	
(TY $)	N/A	N/A	9551.0	N/A	
PAUC Cost (BY $)	N/A	N/A	245.288	N/A	N/A
(TY $)	N/A	N/A	382.040	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	4/4
Procurement	12/12

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules —

These Operations and Maintenance (O&M) funds implement PMD direction to support system sustaining engineering (orbital satellites, ground data systems, and operational system users), and to continue support of Ground Data Systems (GDS) sensors and survivability-enhanced Satellites 14-22. Support of operational orbital satellites includes anomaly detection and correction, analysis of on-orbit sensor performance, data compilation and analysis, analysis of special-interest, computer support functions, and launch support. These sustaining efforts reflect a relatively stable level-of-effort requirement through the Financial Plan years to support both advanced configuration of new operational satellites, and an aging orbital satellite configuration with increased anomaly resolution requirements, as well as an orderly transition of DSP Satellite Operations from Consolidated Space Test Center to Consolidated Space Operations Center.

b. (U) Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per DSP System	Avg Annual Cost Per No Antecedent
Other Direct Costs	29.2	N/A
Total	29.2	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M (Air Force)	38.7	6.8	4.7	---	50.2
Industrial Fund	---	---	---	---	---
Total	38.7	6.8	4.7	---	50.2

NOTE: Previous reports erroneously included only annual costs.

N-16 EA-6B

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: EA-6B PROWLER

AS OF DATE: December 31, 1991

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AS AMENDED
FOR OPEN PUBLICATION
MAR 20 1992
DIRECTOR FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
EA-6B/TACTICAL ELECTRONIC WARFARE (PROWLER)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
PROGRAM EXECUTIVE OFFICER
TACTICAL AIRCRAFT PROGRAMS
PMA234
WASHINGTON, DC 20361-1234
CAPT D. B. McKINNEY
Assigned: May 15, 1990
AV 222-8083 COMM 703-692-8083

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0204154N, 0604222N
PE 0604270N (Shared) ABN DEF ECM W0638

PROCUREMENT:
APPN 1506 ICN 0115 (Navy)
APPN 1506 ICN 0116 (Navy)

No Security Objection to Open Publication
(AS AMENDED)
92-D446
MAR 20 1992
Office of the Chief of
Naval Operations Dept. of the Navy

[redacted]
Classified by: OPNAVINST 5513.2-20
Declassify on: [redacted]
Downgrade Instructions:

OASD(PA) DFOISR 92-T-0600

(THIS PAGE IS [redacted])

[redacted]

5. (U) Related Programs:
A-6E INTRUDER, E-2/C, F-14 TOMCAT AND F-111

6. (U) Mission and Description:

The EA-6B's primary mission is the suppression and degradation of enemy electronic defense systems by use of tactical jamming or high speed anti-radiation (HARM) missiles. Other missions include passive early warning for fleet defense and battlefield electronic surveillance. It is equipped with computer controlled electronics surveillance receivers and up to ten high power jamming transmitters in various frequency bands depending on the particular mission. The EA-6B is powered by two J-52-P408 engines. The aircraft is 59 feet in length and has a wing span of 53 feet.

7. (U) Program Highlights:

(b)(1)

The schedule was adjusted to reduce program concurrency. The milestone IIA decision was scheduled for June 1992 consistent with the technical status of the program and the requirement to award the Advanced Acquisition Contract in FY 1992 for the three FY 1993 aircraft. The remaining portion of the program consists of only a remanufacture effort.

The total program acquisition unit cost breached 24% and the current procurement unit cost breached 240% due to the restructure of the EA-6B ADVCAP program. The restructure of the program included deferring the start of the remanufacture program by 2 years (from FY91 to FY93). Further, the restructured program resulted in the loss of the production option in the Receiver Processor Group (RPG) FSD contract, thereby greatly increasing the recurring cost of the RPG in the initial production lots. SECNAV letter of 22 March 1991 notified Congress of the unit cost breaches. Details of the unit cost breaches were provided in the March 1991 SAR.

A June 1991 SAR was submitted due to schedule milestone breaches and a Program Acquisition Unit Cost breach of 29% (5% more than the 24% breach reported in the March 1991 SAR). On 11 June 1991, USD(A) certified the EA-6B program to Congress based on a review of the program reflected in the FY 1992/1993 President's Budget.

7b. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report —
The last SAR was submitted June 1991. EA-6B Baseline Change Request and Devision Report (Change 5) was approved 18 Oct 1991. The date for commencing DT-IIF was adjusted from April 1991 to November 1991 to accommodate software changes required to improve signal classification algorithms in the Receiver Processor Group. The date for ADVCAP FOT&E was changed from January 1996 to December 1996 in order to recognize the overall schedule slip in the program resulting from delaying the first year of remanufacture from FY 1991 to FY 1993. Although SECNAV authority has been granted by Program Change Approval Document of Sep 89 to obligate long lead funding prior to MS IIA decision, the obligation of long lead funding for RPG will, nevertheless, be based on the results of the technical and operational assessment. This system will satisfy mission requirements.

c. (U) Changes Since As Of Date —
None.

8. (U) Threshold Breaches:
There is a Procurement breach of 6.5% to the Acquisition Program Baseline (APB) (Oct 1991) and no Unit Cost Breaches (Nunn McCurdy).

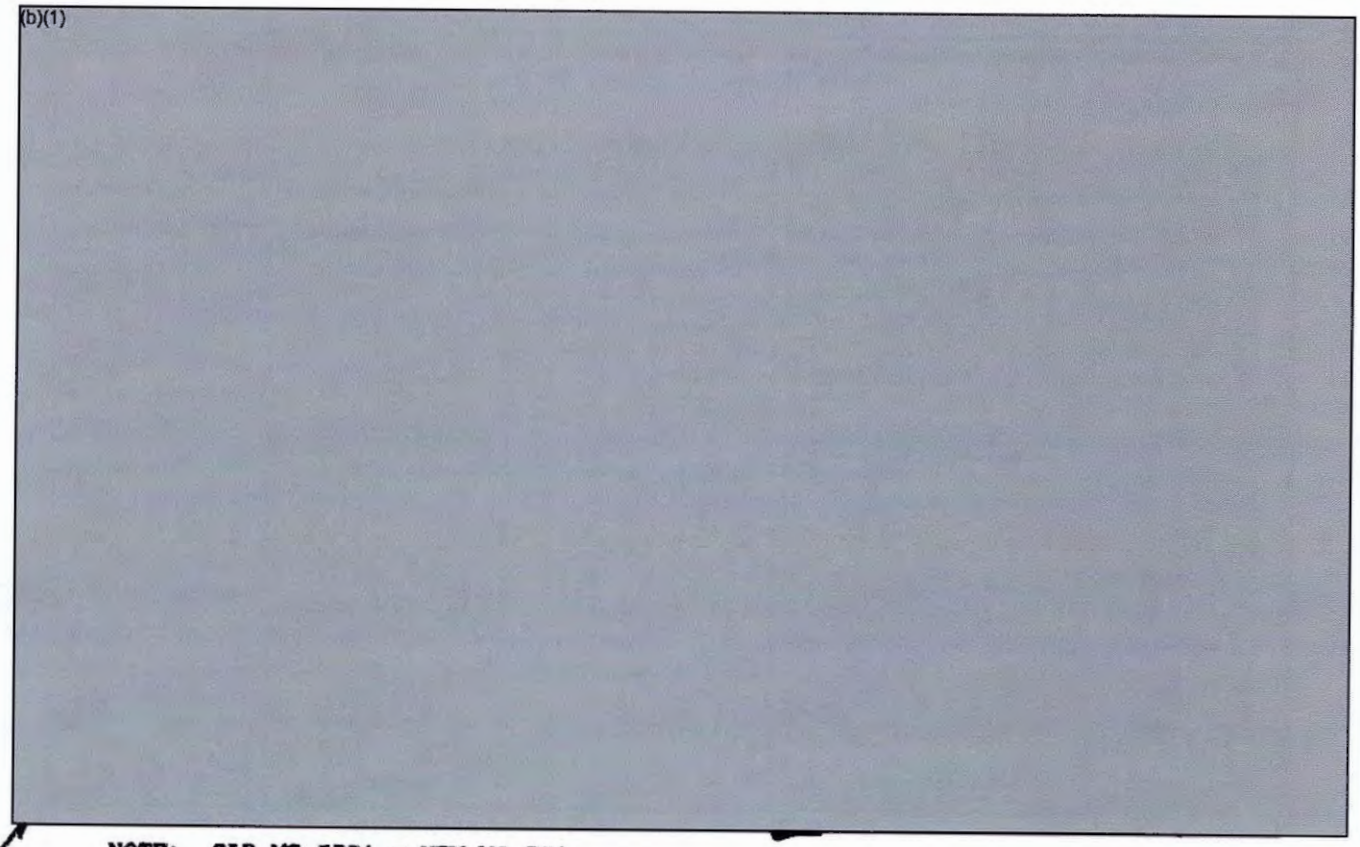
(b)(1)

(b)(1)

[redacted]

9a. (U) Schedule (Cont'd):

(b)(1)



NOTE: OLD MS IIIA = NEW MS IIA
OLD MS IIIB = NEW MS III

b. (U) Previous Change Explanations --

Production Estimate/Approval Program milestones were updated to reflect the approved NDCP for EW Counter Response dated 9 September 1985.
Estimates reflect milestone changes that were necessary due to dollar reductions in the program in FY 90 and FY 91. The changes reflect Advanced Capability (ADVCAP) going into production in FY 91 instead of FY 90 as originally scheduled.

Previous milestone estimates reflect changes caused by late delivery of Litton Amecom RPG engineering development model equipment in support of the Grumman ADVCAP FSD contract.
Changes due to one year slip in award of the Avionics Improvement Program contract and a one year gap in the EA-6B Remanufacture Program in FY 92.

9b. (U) Schedule (Cont'd):
The EA-6B remanufacture program was rephased in order to reduce concurrency with the development effort by deferring procurement of the three FY91 remanufactured A/C until FY93.
ADVCAP Tech/Op Assessment was rescheduled from April 1991 to November 1991 to recognize the current technical status of the Receiver Processor Group (RPG). ADVCAP FOT&E was rescheduled from January 1996 to December 1996 to coincide with full intermediate level support capability.

c. (U) Current Change Explanations --

CH-1 MS IIA (LRIP) changed since last SAR to reflect current estimate of Sep 92 due to revised DT-IIF/OT-IIA test schedule.

d. (U) References --

(U) Production Estimate:
EW Counter Response NDCP dated 9 Sep 1985.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 18 October 1991.

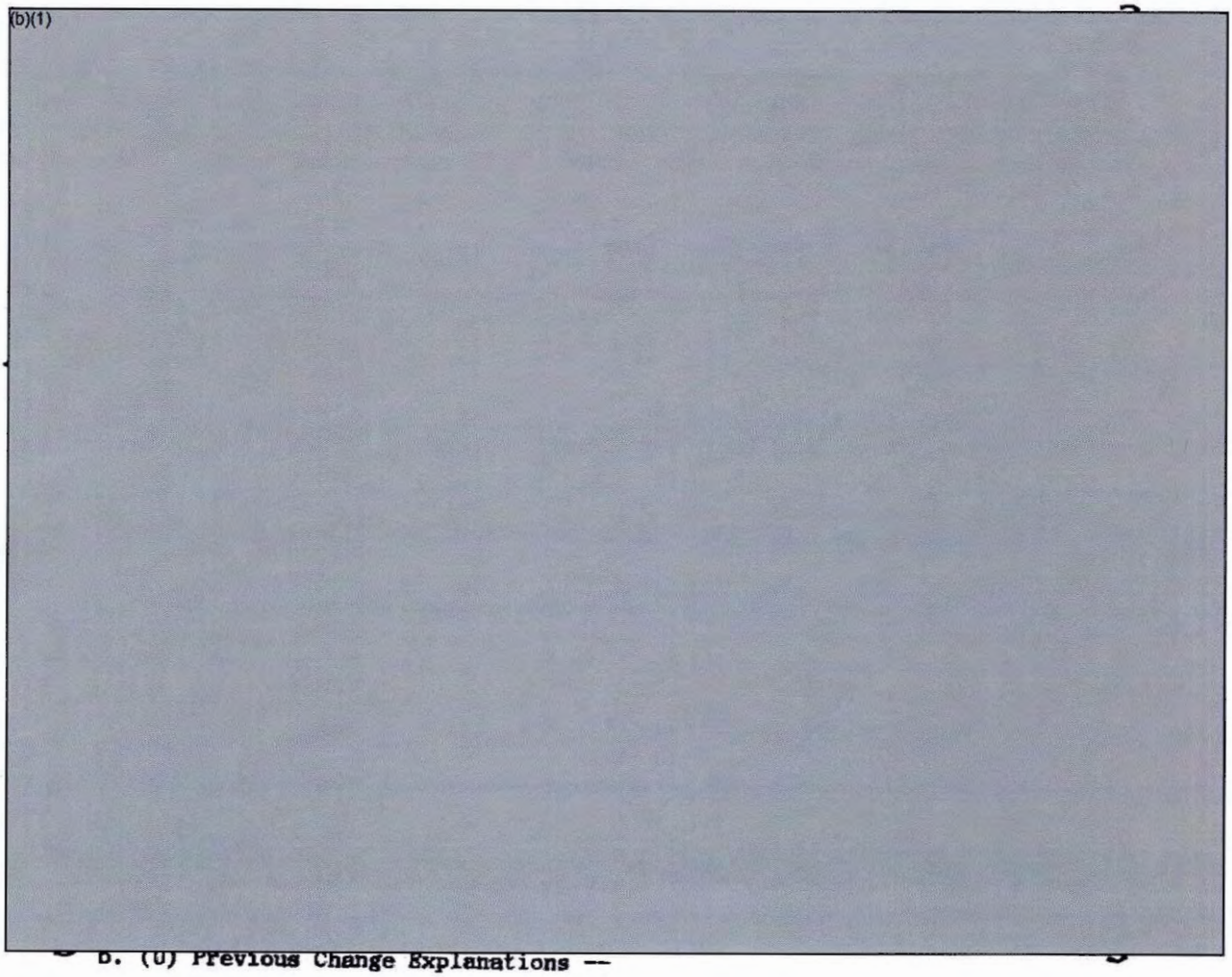
10. (U) Performance Characteristics:

a. (U) Performance --

	PdR	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) Performance Characteristics (Cont'd):

(b)(1)



b. (U) Previous Change Explanations --

The performance characteristics were updated to reflect the following: Band 2/3 transmitter (completing development in FY92) and Band 10 were added; and, the DF Accuracy for the Receiver Processor Group was changed to reflect increased accuracy. Maintenance man-hours per flight hours increased as a result of accelerated maintenance/inspections in anticipation of Desert Shield/Storm requirements. After the conclusion of Desert Storm, maintenance man-hours per flight hours returned to 51.

10c. (U) Performance Characteristics (Cont'd):

c. (U) Current Change Explanations —

None.

d. (U) References —

(U) Production Estimate:
EW Counter Response NDCP dated 9 Sep 1985.

(U) Approved Program:
NAR Approved Acquisition Program Baseline dated 18 October 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost —	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	210.6	349.4	348.9
Procurement	2029.0	6372.4	6790.9
Airframe	(639.9)		(1982.3)
Engine	(98.9)		(372.6)
Avionics	(490.9)		(2801.2)
Total Flyaway	(1229.7)		(5156.1)
Other Weapon Systems Cost	(678.6)		(1292.4)
Total Other Wpn Sys	(678.6)		(1292.4)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(120.7)		(342.4)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	2239.6	6721.8	7139.8
Escalation	508.2	2961.0	3064.8
Development (RDT&E)	(30.9)	(59.7)	(57.5)
Procurement	(477.3)	(2901.3)	(3007.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2747.8	9682.8	10204.6

b. (U) Quantity —			
Development (RDT&E)	0	N/A	0
Procurement	38	164	164
Total	38	164	164

c. (U) Foreign Military Sales — None.

11c. (U) Total Program Cost and Quantity (Cont'd):

c. (U) Foreign Military Sales — None.

d. (U) Nuclear Costs — None.

e. (U) References —

(U) Production Estimate:
EW Counter Response NDCP dated 9 Sep 1985.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 18 October 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(JUN 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	10204.6	10077.6	10204.6
(2) Quantity	164	164	164
(3) Unit Cost	62.223	61.449	62.223
b. (U) Current Procurement —	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	117.3	117.3	594.0
Less CY Adv Proc	17.0	17.0	47.3
Plus PY Adv Proc	0.0	0.0	17.0
Net Total	100.3	100.3	563.7
(2) Quantity	0	0	3
(3) Unit Cost	N/A	N/A	187.900

13. (U) Cost Variance Analysis:

a. (U) Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	241.5	2506.3	0.0	2747.8
Previous Changes:				
Economic	+53.7	+644.0	-	+697.7
Quantity	-	+4069.0	-	+4069.0
Schedule	+148.9	+334.8	-	+483.7
Engineering	-	+0.4	-	+0.4
Estimating	-35.0	+524.5	-	+489.5
Other	-	-	-	-
Support	-	+1589.5	-	+1589.5
Subtotal	+167.6	+7162.2	-	+7329.8
Current Changes:				
Economic	-2.0	-212.4	-	-214.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.7	+545.8	-	+545.1
Other	-	-	-	-
Support	-	-203.7	-	-203.7
Subtotal	-2.7	+129.7	-	+127.0
Total Changes	+164.9	+7291.9	-	+7456.8
Current Estimate	406.4	9798.2	-	10204.6

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary — (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	210.6	2029.0	0.0	2239.6
Previous Changes:				
Quantity	-	+2933.8	-	+2933.8
Schedule	+124.5	+123.5	-	+248.0
Engineering	-	+0.4	-	+0.4
Estimating	+14.3	+539.6	-	+553.9
Other	-	-	-	-
Support	-	+976.0	-	+976.0
Subtotal	+138.8	+4573.3	-	+4712.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.5	+329.2	-	+328.7
Other	-	-	-	-
Support	-	-140.6	-	-140.6
Subtotal	-0.5	+188.6	-	+188.1
Total Changes	+138.3	+4761.9	-	+4900.2
Current Estimate	348.9	6790.9	-	7139.8

b. (U) Previous Change Explanations —

RDT&E

Economic: Revised escalation indices.

Schedule: Increase due to introduction of ALQ-149/RPG into ADVCAP aircraft, integration of HARM into ICAP II and ADVCAP aircraft, and development of jammer modulation.

Estimating: Recategorization of Consolidated Electronic Warfare Funding and Below Threshold Reprogramming increase. Revised program estimate.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Increase of Sixty Nine (69) Aircraft to reflect

13b. (U) Cost Variance Analysis (Cont'd):

cost-to-complete program.
Costs associated with reduction of aircraft from 167 to 164.

Schedule: Total number of budgeted aircraft increased by 12 and added two additional fiscal years.
Procurement rate change.
Costs associated with reduction of aircraft from 167 to 164.

Engineering: Revised estimates.

Estimating: Revised Program Estimates.
Revised contractor business base, revised estimates for CFE/GFE and revised NRE estimates.
Costs associated with reduction of aircraft from 167 to 164.
Revised Grumman business base due to the cancellation of the F-14 program.

Support: Increased requirements to support four additional Fiscal Years (69 Aircraft). Revised support estimates.
Revised support requirements for remanufacture.
Revised Grumman business base due to the cancellation of the F-14 program.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Below Threshold Reprogramming decrease. (Estimating)	-0.5	-0.7
Revised escalation indices. (Economic)		-2.0
Total Changes	-0.5	-2.7
(2) PROCUREMENT		
Revised prog ests to incorporate add'l Grumman contractor data and pricing of prod engines vice engine kit upgrades. (Estimating)	329.2	545.8
Revised escalation indices. (Economic)		-212.4
Reduced support to comply with directed OSD/OMB PBD reductions. (Support)	-140.6	-203.7
Total Changes	188.6	129.7

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
72.31	2.95	-30.75	2.95	--	6.31	--	8.45	-10.09	62.22

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) RECEIVER PROCESSOR GROUP:
GRUMMAN AEROSPACE, BETHPAGE, LI,, NY
N00019-83-C-0148, FFP
Award: February 1, 1984
Definitized: July 1, 1986

Initial Contract Price		
Target	Ceiling	Qty
$255.0	N/A	6

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$255.0	N/A	6	$255.0	$266.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

CPR information is not required on this FFP contract.

b.(U) Procurement --

(U) AVIONICS IMPRV PROGRAM:
GRUMMAN AEROSPACE, BETHPAGE, NY
N00019-89-C-0121, FFP
Award: July 1, 1990
Definitized: July 31, 1990

Initial Contract Price		
Target	Ceiling	Qty
$248.1	N/A	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$248.1	N/A	1	$248.1	$248.1

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

PHASE III ADDED.

CPR information is not required on this FFP contract.

(U) VEHICLE ENHANCEMENT:
GRUMMAN AEROSPACE, BETHPAGE, NY
N00019-88-C-0227, FFP
Award: May 26, 1989
Definitized: May 26, 1989

Initial Contract Price		
Target	Ceiling	Qty
$34.7	N/A	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$80.3	N/A	1	$80.3	$80.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Planned contract modification added for static test of the EA-6B VEP.

CPR information is not required on this FFP contract.

(U) RPG NRE:
GRUMMAN AEROSPACE, BETHPAGE, NY
N00019-90-C-0105, FFP
Award: November 15, 1990
Definitized: November 15, 1990

Initial Contract Price		
Target	Ceiling	Qty
$57.6	N/A	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$57.6	N/A	1	$57.6	$57.6

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

CPR information is not required on this FFP contract.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status —

(1) Percent Program Completed: 50.0% (10 yrs/20 yrs)

(2) Percent Program Cost Appropriated: 36.0% ($3670.2 / $10204.6)

b. (U) Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2002)	Total
RDT&E	317.6	23.9	32.3	32.6	406.4
Procurement	3211.4	117.3	594.0	5875.5	9798.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3529.0	141.2	626.3	5908.1	10204.6

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary —

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1984				24.8	25.3	25.3	25.3	3.8
1985				34.1	35.8	35.8	35.8	3.4
1986				74.9	81.0	81.0	73.5	2.8
1987				54.2	60.3	60.3	53.0	2.7
1988				53.7	61.8	61.8	55.9	3.0
1989				14.4	17.2	17.2	15.2	4.2
1990				19.0	23.7	23.7	21.1	4.0
1991				9.7	12.5	12.1	7.2	3.9
1992				17.9	23.9	2.8		3.1
1993				23.5	32.3			3.3
1994				15.8	22.5			3.3
1995				6.0	8.8			3.3
1996				0.9	1.3			3.2
Subtot				348.9	406.4	320.0	287.0	
Appropriation: 1506 Aircraft Procurement, Navy								
1983				16.8	17.0	17.0	17.0	9.0

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
1984	8	2.5	222.2	453.2	475.7	475.7	475.7	8.0
1985	6	9.9	183.3	335.0	361.8	361.8	355.0	3.4
1986	12	26.8	277.0	375.9	418.4	418.4	407.1	2.8
1987	12	3.8	287.7	390.3	449.6	449.6	433.9	2.7
1988	12	5.1	282.3	375.9	451.8	451.8	432.0	3.0
1989	12	138.6	247.4	438.1	547.5	547.5	379.0	4.2
1990		48.9		104.7	135.6	134.4	66.9	4.0
1991	1	217.9	4.3	264.6	354.0	299.7	39.0	3.9
1992		11.7		84.9	117.3	18.6		3.1
1993	3	41.5	179.4	416.3	594.0			3.3
1994	9	3.5	324.6	425.9	627.4			3.3
1995	9	13.8	271.3	373.7	568.2			3.3
1996	12	22.5	351.2	470.5	738.4			3.2
1997	12	3.2	388.4	427.8	692.9			3.2
1998	12	58.5	318.6	476.8	796.8			3.2
1999	12	5.9	315.3	375.5	647.6			3.2
2000	12	5.6	312.3	366.9	653.0			3.2
2001	12	5.5	308.8	348.4	639.9			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
2002	8	5.4	251.4	269.7	511.3			3.2
Subtot	164	630.6	4525.5	6790.9	9798.2	3174.5	2605.6	
Grand Total	164	630.6	4525.5	7139.8	10204.6	3494.5	2892.6	

17. (U) Production Rate Data:

a. (U) Annual Production Rates —

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1984	N/A	8	8	8
1985	N/A	6	6	6
1986	N/A	6	12	12
1987	N/A	6	12	12
1988	N/A	8	12	12
1989	N/A	6	12	12
1990	N/A	0	0	0
1991	N/A	0	1	6
1992	N/A	0	0	9

17a. (U) Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1993	N/A	0	3	12
1994	N/A	0	9	18
1995	N/A	0	9	24
1996	N/A	0	12	24
1997	N/A	0	12	9
1998	N/A	0	12	0
1999	N/A	0	12	0
2000	N/A	0	12	0
2001	N/A	0	12	0
2002	N/A	0	8	0

Explanation of rate changes: FY83-FY89 are EA-6B production aircraft, FY91 is the Avionics Improvement Program prototype, and FY93 and beyond are remanufactured aircraft.

b. (U) Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2239.6	+4900.2	7139.8	+791.8	6348.0
(TY $)	2747.8	+7456.8	10204.6	+1622.0	8582.6
PAUC Cost (BY $)	58.937	-15.402	43.535	+4.828	38.707
(TY $)	72.311	-10.088	62.223	+9.890	52.333

17c. (U) Production Rate Data (Cont'd):

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdR)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	SEP 85	0	SEP 85	N/A	SEP 85
Duration (in MON)	66	155	221	59	162
End Date(MON YY)	MAR 91	155	FEB 04	N/A	MAR 99

d. (U) Deliveries (Plan/Actual) —

	To Date
RDT&E	0/0
Procurement	62/62

e. (U) Approved Design-to-Cost Objective — N/A.

N/A

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

DEC 1990 ESTIMATES

PERSONNEL - The makeup, in terms of grades and ratings/designators, of a 5 aircraft squadron is the same proportionally, to the manning of a 4 aircraft squadron. Four aircraft per squadron. Retirement account is 43.8% of the base pay.Four aircraft squadron manning, derived from the five aircraft Squadron Manpower Document (SQMD)/OP-123;28 officers and 186 enlisted, does not represent actual manning in the fleet. Actual manning levels compared to the SQMD are 92.9% for the officers and 81.2% for the enlisted. One Sea Operations Detachment (SEA-OP-DET) supports one EA-6B squadron. For costing purposes a Designated Striker is assumed to be an E-3 airman. For costing purposes a W-3's billet cost is assumed to be 1.05 times a E-9's cost.

PETROLEUM, OIL AND LUBRICANTS (POL) - None

TRAINING EXPENDABLES - None

MAINTENANCE CONSUMABLES - None

18a. (U) Operating and Support Costs (Cont'd):

AIRFRAME REWORK - A Standard Depot Level Maintenance (SDLM) would take place at an average of the cycle times as shown in the Weapons Systems Planning Document (WSPD). WSPD SDLM cycle times would be further adjusted to the Aircraft Service Period Adjustment (ASPA) program. The adjustments would reflect 70% of all aircraft having induction delayed one year, and then 30% of the 70% would be delayed for a second year. This would result in a projeced interval of 48.9 months [(.3*.7)(avg cycle + 24 months +(.7-(.3*.7))(average cycle + 12 months + (.3)(avg cycle)].

ENGINE REPAIR AND REWORK - None

COMPONENT REPAIR AND REWORK - The ratio of replenishment spares to the total component rework and replenishment spares, in Visibility and Management of Support Costs - Maintenance Subsystems (VAMOSC MS), is the same ratio as replenishment spares to Aviation Depot Level Repairables (AVDLR) in the OP-20 data.

REPLENISHMENT SPARES - The ratio of replenishment spares to the total component rework and replenishment spares, in VAMOSC MS, is the same ratio as replenishment spares to AVDLR's in the OP-20 data.

SUPPORT EQUIPMENT REPLENISHMENT - None

SOFTWARE MAINTENANCE - None

INDIRECT PERSONNEL SUPPORT - None

EA-6B (Antecedent) data not available at this time.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs — (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per EA-6B SQUADRON	Avg Annual Cost Per N/A
Personnel	9.6	N/A
O&S Consumables	5.5	N/A
Direct Depot Maintenance	7.8	N/A
Substaining Investment	1.7	N/A
Other Direct Cost	0.0	N/A
Indirect Cost	0.4	N/A
Total	25.0	N/A

c. (U) Contractor Support Costs — (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M,N	10.4	0.7	0.3	---	11.4
NIF	11.0	2.2	2.2	---	15.4
Depot Maintenance	79.7	---	---	---	79.7
Other	9.8	2.5	2.2	---	14.5
Total	110.9	5.4	4.7	---	121.0

N-15 E-6A

91-035

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: E-6A TACAMO

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
E-6A Airborne Strategic Communications

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**
PEO,AIR ASW,ASSAULT&SPECIAL MISSION PROGRAMS,PMA271 E-6A PROGRAM OFFICE
JP 1 ROOM 582
WASHINGTON, DC 20361-1271
CAPT Eddie Hampshire
Assigned: October 19, 1989
AV 222-8086 COMM (703)692-8086

AS AMENDED
FOR OPEN PUBLICATION
MAR 20 1992

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0101402N Project W1438
PROCUREMENT:
APPN 1506 ICN 0435 (Navy)
MILCON:
PE 0303196Y

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5. (U) Related Programs:
EC-130Q/TACAMO; High Power Transmit Set (HPTS); E-3A AWACS; TRIDENT Fleet; MILSTAR; WWABNCP; E-4B

6. (U) Mission and Description:
The E-6A is a manned strategic communications relay platform and is a critical node in the Minimum Essential Emergency Communications Network. The E-6A is the replacement for the EC-130/TACAMO Aircraft. Primary Mission is to monitor multiple networks, process Single Integrated Operational Plan Emergency Action Messages and provide survivable and enduring communications connectivity from the National Command Authority to the SSBNs during pre-, trans-, and post- attack phases of general nuclear exchange.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
In December 1981, a NADEC Decision Memorandum approved the ECX program. In January 1982, the Operational Requirement for TACAMO/ECX (OR W1438) was approved. On 11 February 1982, a Request for Quotation was released. A letter contract with Boeing Aerospace Company was signed on 29 April 1983 for the Full Scale Development effort and included options for fourteen (14) production aircraft. On 30 June 1983 ECX was formally designated as E-6A. FY 1986 President's Budget approved continuation of the development and procurement of the first two aircraft in FY-86. In July 1985 the contractor successfully completed its Critical Design Review. A Pre-CEB was completed in November 1985. The first EC-130 to be stripped of Mission Avionics was started in December 1985. The Class III mock-up was completed in December 1985. Production approval was received in February 1986, and the Full Scale Development/Pre-Production contract was definitized in June 1986. Tinker AFB has been designated as the single site MID-CONUS E-6A home base. Navy Decision Coordinating Paper (NDCP) was approved January 1986, and the Test and Evaluation Master Plan (TEMP) was approved in November 1986. Prototype aircraft rollout took place on 18 December 1986. A decision was made in December 1986 to increase the total number of aircraft to be procured from 15 to 16. In January 1987 contract award and production go ahead for 3 FY-87 aircraft (#'s 3, 4, 5) and FY-88 long lead for additional 3 aircraft (#'s 6, 7, 8) was approved. The ferry flight of the FSD aircraft to Boeing Field was accomplished in February 1987. In June 1987 the DT-IIIB flight test of FSD aircraft commenced. In July 1987 excessive wing tip/pod oscillation was discovered. The wing fix performed by Boeing incorporated inner wing stiffeners and also included replacing the outer wing with one that was structurally stronger. The Long Trailing Wire Antenna (LTWA) touched the horizontal stabilizer at high bank angles in August 1987. Assessment of additional test and evaluation and options to manage problem are in final stage. Congressional Appropriations Act released $11.8M in MILCON funds for initial

7a. (U) Program Highlights (Cont'd):

design/construction of facilities at Tinker AFB, contingent upon reapproval of Navy Life Cycle Cost Study citing Tinker AFB as best site for Main Operating Base (MOB) in December 1987. Study approved through VCNO as of 1 March 1988. In January 1988 the projected delivery of the FSD aircraft and the first production aircraft was changed to March 1989 due to ECPs for the KG-84 (Crypto equipment which replaced the KW-7) and the EVS (Enhanced VERDIN System). NAS Barbers Point designated as transition site for VQ-3 in April 1988. Likewise, NAS Patuxent River designated for VQ-4, and Tinker AFB designated MOB for both squadrons when facilities ready, in 1992. OT-IIIB completed in April 1988. The prototype E-6A arrived at NATC Patuxent River for TECHEVAL and EMI/EMC testing in May 1988. MILCON funding for FY-89, $38.2M, released for Tinker construction in October 1988. The prototype completed TECHEVAL Phase I testing in October 1988. Production #1 completed EMP testing at NATC Patuxent River in May 1988. On 16 February 1989, the E-6A prototype aircraft lost one-third of the vertical fin, one half of the rudder and ten feet of the right horizontal stabilizer. Groundbreaking ceremonies were held on 16 June 1989 for MOB at Tinker AFB. As of 31 December 1989 there had been a total of five aircraft deliveries. On 28 September 1989 the prototype E-6A again lost a portion of the vertical fin, rudder and right horiztonal stabilizer while undergoing one of a series of flutter tests conducted by Boeing to determine the cause of the similar incident that occurred in February 1989. The incidents have been successfully modeled to reflect actual flight test data. Ground static and dynamic testing of vertical fin and rudder complete. Boeing proposed final fix via ECP after successful completion of flight tests in Apr 1991. On 3 October 1989, Boeing machinists went on a 48 day strike which ended on 21 November 1989. Overall impact was a day-for-day slip in production, plus one additional week slip for production startup. As of 31 December 1990 there were a total of nine aircraft deliveries. The eighth production aircraft was delivered to VQ-3 on 31 Aug 90 which completed the transition to the E-6A in the Pacific fleet. Follow-on Operational Test and Evaluation (OT-III) report of the E-6A Airborne Command, Control and Communications Platform was received 24 Aug 90. Report assessed 24 critical operational issues - rated 6 satisfactory, 6 partially resolved and 12 unsatisfactory. Of the deficiencies, none were considered serious safety of flight issues or were deemed as having significant mission degradation. Based on fleet experience gained in successfully operating the E-6A over the course of 13 months and 9000 flight hours, the E-6A weapon system has proven to be operationally effective and suitable for the TACAMO mission. In survivability and mission effectiveness, the E-6A is capable of meeting all current or proposed tasking specified by JCS and USCINCPAC. NPDM conducted 25 Sep 90 resulted in decision to continue fleet introduction of E-6A and direction to update OR and

7a. (U) Program Highlights (Cont'd):

TEMP. In addition, OPNAV sponsor was tasked to define corrections required and to work with the Program Office to identify cost, funding and executable schedule. After eighteen months of negotiations with Boeing, an impasse was reached for the definitization of the FY86/87/88 production options. NAVAIR issued a Unilateral Price Determination (UPD) in July 1988. An appeal for the final price for the FY86/87/88 E-6A's was filed by Boeing with the Armed Services Board of Contract Appeals. Boeing claims cost $113M higher than the Navy determination. The FY89 option for seven aircraft was exercised in November 1988 with a Limitation of Government Liability (LGL) of $422M. FY89 production buy definitized with Boeing on 29 Oct 1990 for $507.5M. DD1415 reprogrammming request for delta between funded level and definitized price submitted by NAVAIR to NAVCOMPT on 26 Nov 1990.

b. (U) Significant Developments Since Last Report --
This is the E-6A's FINAL SAR as 94 percent of the aircraft will have been delivered by March 1992. This is in accordance with Title 10, United States Code, Section 2432, "Selected Acquisition Reports". The FY89 production buy was fully funded and definitized on 30 Jul 91. Vertical fin high speed flutter testing was successfully completed on 16 April 1991. Final verification of the wing loads fix was demonstrated by static wing test to ultimate load on 7 Jun 91. Acceleration limits have been increased to the full design envelope. DTIIID Phase II Testing was completed on 21 Jun 91. Revised Operational Requirement (OR) was approved by OPNAV on 2 Aug 91. Negotiations were finished on 12 Sep 91 for the Boeing claim against the FY86, 87 and 88 unilateral price determinations. Funded base adjustment of FY86/87/88 Boeing UPD claim in the amount of $68.9M with lapsed and expired funds on 5 Dec 91. DD1415 to fund the accrued interest from the UPD claim with FY 91 appropriations was forwarded to NAVCOMPT on 20 Dec 91. Prototype completed EMP production test satisfactorily in Sep 91. The fourteenth production aircraft was delivered on 20 Dec 91.

"The E-6A system will satisfy mission requirements."

c. (U) Changes Since As Of Date --
The prototype aircraft delivery slipped from February to March due to cracks discovered in the left wing fairing. Repair is a minor effort.

8. (U) Threshold Breaches:
There are currently no Acquisition Program Baseline (APB) (dated 21 Nov 91) breaches or Nunn McCurdy unit cost breaches.

9. (U) **Schedule**:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Justification For Major System New Starts (JMSNS) (Substantiation with POM)	JUL 81	JUL 81	JUL 81
Program Initiation (NADEC Decision Memo)	DEC 81	DEC 81	DEC 81
Operational Requirement	JAN 82	JAN 82	JAN 82
Request for Quotations (RFQ)	MAR 82	MAR 82	MAR 82
Award of Full Scale Development Contract	MAY 83	APR 83	APR 83
Preliminary Design Review (PDR)	OCT 83	NOV 83	NOV 83
DNSARC III	DEC 83	FEB 86	FEB 86
Release Long Lead Production Funds	DEC 83	JUN 84	JUN 84
Critical Design Review (CDR)	AUG 84	JUL 85	JUL 85
First Test Flight	AUG 86	JUN 87	JUN 87
Navy Technical Evaluation (NTE)	AUG 87	JUL 88	JUL 88
Deliver Prototype Aircraft	FEB 87	JAN 92	MAR 92(Ch-1)
Deliver First Production Aircraft	AUG 87	JUL 89	JUL 89
Initial Operational Capability	SEP 88	APR 90	APR 90

(b)(1) [redacted]

b. (U) Previous Change Explanations --

The following milestones were delayed due to program restructure to accommodate delay in receipt of FY-84 Advance Procurement Funds and deletion of FY-85 procurement funds: DNSARC III, Critical Design Review, First Test Flight, Delivery of the Prototype Aircraft, Delivery of the First Production Aircraft, IOC and FOC. DNSARC III scheduled for Apr 85 was cancelled. SECNAV memo of 3 Feb 86 approved E-6A production. IOC date reflected current 2-3-3-7 production aircraft buy schedule. FOC date accelerated due to accelerated aircraft delivery schedule because of contract savings and production efficiencies. Delivery of the FSD and first production aircraft was changed due to ECPs for the KG-84 (Crypto equipment which replaced the KW-7) and the EVS (Enhanced VERDIN system). Delay of first production aircraft due to wing load and DTWA clearance problems found in DTIIIB test; wing load fix was identified and will be incorporated by Boeing prior to delivery. FOC delayed to accommodate the JSTARS buy and to smooth transition for the east coast squadron. The two tail incidents caused the delivery of the prototype and FOC to slip. A strike by Boeing machinists was also a contributing factor to the FOC slip.

9c. (U) Schedule (Cont'd):

c. (U) Current Change Explanations --

(Ch-1) The prototype aircraft delivery was delayed due to unforeseen problems associated with simultaneous operations of communications equipment encountered during the final production acceptance testing. The cause was most likely due to the refurbishment activities required to bring the prototype aircraft up to production standards.

d. (U) References --

(U) Development Estimate:
Operational Requirement WI438 11 Jan 1982 Annex C to JSPD 84-91
[redacted] PE 0101402N

(U) Approved Program:
NAE approved Acquisition Program Baseline dated November 21, 1991.

10. (U) Performance Characteristics:

a. (U) Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Weight Empty (lbs)	165125	167800	/ 167800	167012	167012	
Maximum Gross Weight (lbs)	342000	342000	/ 342000	342000	342000	
Maintainability (manhours/flt hrs)	16.5	16.5	/ 16.5	1.8	16.5	
Reliability	1.5	N/A	/ N/A	DEL	DEL	
MFHBF (Critical)	73	73	/ 73	66.2	73	
MFHBF (Major)	12.5	12.5	/ 12.5	30.1	12.5	
Cruise Speed (mach no.)	.75	.75	/ .75	.66to.77	.75	
Endurance (hours)	14	14	/ 14	15	15	
Critical Field Length (ft)	7500	7500	/ 7500	7650	7500	
Range (unrefueled: nm)	6000	6000	/ 6000	6500	6500	
Extended Airborne Operations (hours)	72	72	/ 72	>24	72	
EMP Hardened (upset margin - db)	30	30	/ 30	32	32	(CH-1)
Orbit Verticality of Trailing Wire Antenna (%)	70	70	/ 70	70	70	

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Emergency Operations	CRITICAL ENGINE INOPERATIVE	CRITICAL ENGINE INOPERATIVE	/ CRITICAL ENGINE INOPERATIVE	CRITICAL ENGINE INOPERATIVE	CRITICAL ENGINE INOPERATIVE

b. (U) Previous Change Explanations --

Single reliability value no longer utilized. Aircraft reliability is now expressed in terms of MFHBF (Critical) and MFHBF (Major). The MFHBF (Critical/Major) is expressed as greater than or equal to. Critical Field Length, feet was misstated on Dec 1989 SAR.

Weight empty (lbs) increased due to additional material added to stiffen the wings and reinforce vertical fin to meet specification wing loading and tail flutter requirements.

Endurance and range estimates were enhanced and demonstrated due to a more thorough understanding of Naval Air Training and Operating Procedures Standardization (NATOPS) engine performance parameters.

c. (U) Current Change Explanations --

(Ch-1) Aircraft EMP hardening exceeded expectation. Demonstrated at 32 dbs above upset margin.

d. (U) References --

(U) Development Estimate:
Operational Requirement W1438 11 Jan 1982 Annex C to JSPD 84-91
[redacted] PE 0101402N

(U) Approved Program:
NAE approved Acquisition Program Baseline dated November 21, 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	292.6	325.5	328.3
Procurement	1292.1	1224.0	1237.2
Airframe	(653.7)		(993.3)
Engine	(168.7)		(0.0)
Avionics	(121.6)		(17.7)
Total Flyaway	(944.0)		(1011.0)
Other Weapons Systems Cost	(213.2)		(118.4)
Total Other Wpn Sys	(213.2)		(118.4)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(134.9)		(107.8)
Construction (MILCON)	0.0	53.1	56.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 82 Base-Year $	1584.7	1602.6	1621.5
Escalation	667.0	551.5	541.9
Development (RDT&E)	(61.6)	(51.6)	(52.5)
Procurement	(605.4)	(481.6)	(469.3)
Construction (MILCON)	(0.0)	(18.3)	(20.1)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2251.7	2154.1	2163.4
b. (U) Quantity --			
Development (RDT&E)	1	N/A	1
Procurement	14	15	15
Total	15	15	16

c. (U) Foreign Military Sales --
Not Applicable

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
Operational Requirement W1438 11 Jan 1982 Annex C to JSPD 84-91
(SECRET) PE 0101402N

(U) Approved Program:
NAE approved Acquisition Program Baseline dated November 21, 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2163.4	2072.3	2163.4
(2) Quantity	16	16	16
(3) Unit Cost	135.21	129.52	135.21
b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	3.4	3.4	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	3.4	3.4	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

The R&D unit will be fully configured and serve as an operational aircraft.

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	354.2	1897.5	0.0	2251.7
Previous Changes:				
Economic	-10.4	-209.8	-1.0	-221.2
Quantity	-	+61.2	-	+61.2
Schedule	-	-5.5	-	-5.5
Engineering	-2.9	+50.5	-	+47.6
Estimating	+36.5	+91.6	+72.4	+200.5
Other	-	-	-	-
Support	+2.9	-264.9	-	-262.0
Subtotal	+26.1	-276.9	+71.4	-179.4
Current Changes:				
Economic	+0.2	-3.2	-0.3	-3.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.3	+84.3	+5.0	+89.6
Other	-	-	-	-
Support	-	+4.8	-	+4.8
Subtotal	+0.5	+85.9	+4.7	+91.1
Total Changes	+26.6	-191.0	+76.1	-88.3
Current Estimate	380.8	1706.5	76.1	2163.4

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	292.6	1292.1	0.0	1584.7
Previous Changes:				
Quantity	-	+41.1	-	+41.1
Schedule	-	-5.3	-	-5.3
Engineering	-2.4	-7.1	-	-9.5
Estimating	+29.6	-23.2	+52.6	+59.0
Other	+8.2	-	-	+8.2
Support	-	-125.5	-	-125.5
Subtotal	+35.4	-120.0	+52.6	-32.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.3	+61.9	+3.4	+65.6
Other	-	-	-	-
Support	-	+3.2	-	+3.2
Subtotal	+0.3	+65.1	+3.4	+68.8
Total Changes	+35.7	-54.9	+56.0	+36.8
Current Estimate	328.3	1237.2	56.0	1621.5

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices
Engineering: Revised test program scope
Estimating: Communications suites integration and testing; refined estimates
Support: Increased field requirements

PROCUREMENT
Economic: Revised escalation indices
Quantity: Addition of 1 production aircraft in FY-86
Schedule: Delivery schedule extended by one year
Engineering: Revised mission avionics requirements
Estimating: Reduction caused by restructured program; revised

13b. (U) Cost Variance Analysis (Cont'd):

change order, availability of independent cost estimate; correction of prior report error; incorporation of EVS/EVP system in avionics suite, definitization of FY89 production contract option, correction to reconcile flyaway and support cost in prior year report

Support: Refinement of Support Equipment Requirements Document; refinement of support requirement Increased requirement for initial spares

MILCON
Economic: Revised escalation indices
Estimating: Reduced hangar facilities; refined estimates

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	0.2
Current & Prior escalation offset (Estimating)	-0.1	-0.2
Refined estimates for DTIII testing requirements (Estimating)	0.4	0.5
Total Changes	0.3	0.5
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-3.2
Current and prior year inflation offset (Estimating)	2.2	3.2
Settlement of adjudicated claims (Estimating)	51.8	68.9
Interest accrued on the claim settlement (Estimating)	6.1	9.6
Increased requirements for GFE repairs (Estimating)	1.8	2.6
Decreased initial spares requirement (Support)	-0.4	-0.5
Increased requirement for training equipment and publications (Support)	3.6	5.3
Total Changes	65.1	85.9

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(3) MILCON		
Revised escalation indices (Economic)	N/A	-0.3
Current and prior year inflation offset (Estimating)	0.2	0.3
Bachelor Enlisted Quarters (BEQ) at Tinker AFB (Estimating)	3.2	4.7
Total Changes	3.4	4.7

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
150.11	-14.03	-5.56	-0.34	2.98	18.13	--	-16.08	-14.90	135.21

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) FSD:	Initial Contract Price Target	Ceiling	Qty
Boeing, Seattle, WA N00019-83-C-0176, FFP Award: April 29, 1983 Definitized: June 1, 1986	$316.5	N/A	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$329.3	N/A	1	$354.1	$329.5

CPR information is not a requirement on this FFP contract.

b.(U) Procurement --

(U) PRODUCTION:	Initial Contract Price Target	Ceiling	Qty
Boeing, Seattle, WA N00019-83-C-0176, FFP Award: April 29, 1983 Definitized: July 30, 1991	$1478.9	N/A	15

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1572.2	N/A	15	$1625.2	$1572.2

CPR information is not a requirement on this FFP contract.

A negotiated settlement on the $112.9M Boeing claim against the FY86/87/88 unilateral price determinations was concluded on 12 Sep 91. The negotiated base adjustment was $68.9M plus interest. Received authorization to apply lapsed and expired funds against the base adjustment. This action was concluded 5 Dec 91. Direction was received to apply current year funds against the interest. A DD1415 Notification of Reprogramming Action was forwarded to NAVCOMPT on 20 Dec 91. Accrued interest was $9.2M as of 31 Dec 91 and it increases $2.1K per day until paid.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 100.0% (12 yrs/12 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($2163.4 / $2163.4)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY81-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	380.8	-	-	-	380.8
Procurement	1703.1	3.4	-	-	1706.5
MILCON	71.4	4.7	-	-	76.1
O&M	-	-	-	-	-
Total	2155.3	8.1	-	-	2163.4

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY82 Dollars Nonrec	Flyaway FY82 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1981				0.9	0.9	0.9	0.9	10.6
1982				1.0	1.0	1.0	1.0	7.6
1983				34.7	37.2	37.1	37.0	4.9
1984				63.1	70.0	69.9	55.2	3.8
1985				58.9	67.4	67.3	64.0	3.4
1986				76.6	90.2	89.7	68.5	2.8
1987				62.8	76.1	75.5	69.6	2.7
1988				27.4	34.3	34.3	28.3	3.0
1989				2.5	3.2	3.2	2.7	4.2
1990								4.0
1991				0.4	0.5	0.5	0.2	3.9
Subtot	1			328.3	380.8	379.4	327.4	
Appropriation: 1506 Aircraft Procurement, Navy								
1983		10.9		10.9	13.0	13.0		9.0
1984		6.8		86.3	106.6	106.6	97.1	8.0
1985								3.4

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars Nonrec	Flyaway FY82 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
1986	2	136.2	118.3	264.0	345.9	345.9	343.1	2.8
1987	3	13.6	170.7	299.0	405.5	405.5	400.0	2.7
1988	3	22.3	164.0	257.4	364.2	364.2	309.5	3.0
1989	7		362.1	307.5	452.4	452.4	322.3	4.2
1990				3.9	5.9	5.5	1.1	4.0
1991		6.1		6.1	9.6			3.9
1992				2.1	3.4			3.1
Subtot	15	195.9	815.1	1237.2	1706.5	1693.1	1473.1	

FY91 reflects $9.6M which is to cover interest accrued on the FY86, 87 and 88 claim settlements through anticipated payment (estimated June 1992). A DD1415 was forwarded to NAVCOMPT on 20 Dec 91 requesting these funds be reprogrammed from FY91.

Appropriation: 1205 Military Construction, Navy

1988				9.1	11.8	10.2	9.4	3.0
1989				28.2	38.1	37.6	24.6	4.2
1990				15.5	21.5	20.9	11.4	4.0
1991								
1992				3.2	4.7			

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars Nonrec	Flyaway FY82 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1205 Military Construction, Navy (Cont'd)								
Subtot				56.0	76.1	68.7	45.4	
Grand Total	16	195.9	815.1	1621.5	2163.4	2141.2	1845.9	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1985	2	0	0	0
1986	3	2	2	2
1987	3	3	3	3
1988	3	3	3	3
1989	3	7	7	7

Current Estimate and Maximum Economic Production Rates are the same because the E-6A was intertwined with Air Force and FMS E3s to achieve a total maximum economic production rate.

The E-6A aircraft was based on the Boeing commercial 707 aircraft which is now out of production.

17b. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	1432.6	+188.9	1621.5	+68.8	1552.7
(TY $)	1900.2	+263.2	2163.4	+91.1	2072.3
PAUC Cost (BY $)	95.507	5.837	101.344	+4.300	97.044
(TY $)	126.680	8.533	135.213	+5.694	129.519

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	FEB 86	0	FEB 86	N/A	FEB 86
Duration (in MON)	63	12	75	0	75
End Date(MON YY)	MAY 91	12	MAY 92	N/A	MAY 92

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	1/1
Procurement	15/14

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

Seven E-6A aircraft form a typical operating squadron. Flight hours per aircraft per month, steady state operations, is 188 hours. No modifications to the E-6A are included. Aircraft service life is 30 years; SDLM cycle set at 14,000 flight hours, requires two months and 12,000 manhours to perform. Maintenance concept is organizational to depot (O to D) with intermediate support to be developed at Tinker AFB. The personnel costs are the direct costs to support the primary personnel and to operate the aircraft; base operating support

18a. (U) Operating and Support Costs (Cont'd): personnel are included. Operating consumables include POL and support material. Depot maintenance costs include airframe (SDLM), engine rework, and component repair. For the E-6A, sustaining investment consists of replenishment spares, support equipment/spares, trainer maintenance, software support, follow-on flight and maintenance training, supply support management, contractor support, installation support personnel, and positioning of crews and maintenance detachment. The antecedant system is a squadron of seven EC-130 aircraft operating a nominal 142 flight hours per aircraft per month. The sustaining investment consists of replenishment spares only.

This estimate was prepared 31 December 1989.

b. (U) Costs -- (FY 1982 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per E-6A Squadron	Avg Annual Cost Per EC-130 Squadron
Personnel	18.4	26.6
Consumables	23.6	10.6
Depot Maintenance	8.4	4.8
Intermediate Maintenance	0.7	0.0
Sustaining Investment	6.3	0.5
Total	57.4	42.5

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&MN	53.4	25.8	0.3	---	79.5
NIF	0.1	0.1	0.1	---	0.3
Total	53.5	25.9	0.4	---	79.8

91-048

A-7 ATACMS

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: Army TACMS

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 23 1992
5
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) **Designation and Nomenclature (Popular Name):**
   Army Tactical Missile System (Army TACMS)

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**

HQDA	COL David F. Matthews
ATTN: SFAE-FS-AT	Assigned: April 13, 1990
RedstoneArsenal, AL 35898-5650	AV 746-1141 COMM (205) 876-1141

4. (U) **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 64324 Project D302
   PROCUREMENT:
   APPN 2032 ICN C98500 (Army)
   APPN 2032 ICN CA0261 (Army)
   MILCON:
   PE 024030

Change in Classification
23 MAR 1992
DOCKET, HQDA

~~Classified by: Army TACMS Security Classification Guide, 30 Nov 91~~
~~Declassify on: Originating Agency Determination Required (OADR)~~
~~Downgrade Instructions: Regraded Unclass when Separated from Class Encl/Pages~~

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92-T-0630

5. (U) **Related Programs:**
Army TACMS Smart Submunition Warhead (Block II); Multiple Launch Rocket System (MLRS)

6. (U) **Mission and Description:**
The Army Tactical Missile System (Army TACMS) is a ground-launched missile system consisting of a surface-to-surface guided missile with an anti-personnel/anti-materiel (APAM) warhead configuration. Army TACMS missiles are fired from the Multiple Launch Rocket System (MLRS) modified M270 launcher and are deployed within the ammunition loads of corps MLRS battalions and/or division artillery MLRS batteries. The Army TACMS includes GUIDED MISSILE AND LAUNCHING ASSEMBLY: M39; Missile/Launch Pod Assembly (M/LPA) Trainer; TRAINER SET, GUIDED MISSILE: M165; TRAINER TEST, DEVICE, GUIDED MISSILE: M70; Modified M270 Launcher; and the Army TACMS Missile Facilities.

7. (U) **Program Highlights:**
a. (U) Significant Historical Developments --
In 1981, the Army established a Special Task Force to initiate development of requirements for a Corps Support Weapon System (CSWS) to engage high priority targets at ranges beyond those of existing weapons. In Jun 82, DoD directed the merger of similar Army/Air Force programs into a joint development designated the Joint Tactical Missile System (JTACMS). In 1983, a TRADOC study resulted in an Army decision to utilize the MLRS launcher to fire the JTACMS. In 1984, a joint service decision was made to abandon efforts to develop a common missile, and DoD approved the Army's request to develop an Army peculiar weapon. During FY 85, the name was changed to Army TACMS and the Required Operational Capability (ROC) was approved in May 85. In Jun 85, the Assistant Secretary of the Army for Research, Development and Acquisition (ASA(RDA)) approved release of the request for proposal (RFP) for full-scale development (FSD). The Army Systems Acquisition Review Council (ASARC) approval of the program was received in Dec 85. The Defense Systems Acquisition Review Council (DSARC) approval was received in Feb 86. To initiate FSD, a competitive contract was awarded for the M39s and a sole source contract was awarded for integration in Mar 86. In Jan 89, ASARC IIIA authorized award of a low-rate initial production (LRIP) option which was accomplished 1 Feb 89. Engineering Design Test-Contractor (EDT-C) flights were completed in Feb 89. Development Test (DT) flights were completed in Dec 89. In Dec 89, a "Rump" ASARC IIIB was conducted which granted approval for a second year of LRIP. Army TACMS reported a Nunn-McCurdy Breach on 31 Mar 90. The Initial Operational Test and Evaluation Program (IOTE) was successfuly completed in Jun 90. Army TACMS LRIP-I and LRIP-II were accelerated during Sep 90 requiring early delivery of 20 missiles in support of Operation Desert Shield. On 2 Nov 90, Army TACMS was granted approval to proceed to Milestone IIIB, full-rate production (FRP), by the Defense Acquisition Board (DAB). On 15 Nov 90, the Army TACMS Missile

7a. (U) **Program Highlights (Cont'd)**:

Facility at Weilerbach Ammunition Storage Area, Germany, was certified as the organic depot for Army TACMS. The first electronic safe and arm fuze (ESAF)/off-the-side missile flight was successfully conducted at White Sands Missile Range (WSMR) on 11 Jan 91. LRIP-II was accelerated a second time in Jan 91 in support of Operation Desert Storm. FRP-I was accelerated on 13 Mar 91 to fill a production gap between LRIP-II and FRP-I and to prevent further delay in fielding to Europe and Korea.

b. (U) Significant Developments Since Last Report --
A letter contract for 55 additional FRP missiles was signed 1 May 91. Delivery will be in Aug-Sep 92 which will prevent a production gap between FRP-I and FRP-II. The Commander-In-Chief, U.S. Army Europe (USAREUR), approved the conditional release of Army TACMS to USAREUR. The first FRP missile was delivered 31 May 91. All ESAF missile flight tests were successfully completed as of 6 Jun 91. A total of 18 missiles have been successfully handed off to USAREUR as of 25 Jul 91; this completes initial fielding to USAREUR. The Army TACMS Test and Evaluation Master Plan (TEMP) was approved by the Deputy Under Secretary of the Army for Operations (USA(OR)) on 5 Aug 91. In support of lightweight launcher concept development efforts, an Army TACMs firing was conducted 4 Sep 91 using a test bed vehicle. The firing resulted in an in-flight failure due to failure of the rocket motor throat insert. Failure analysis indicated the throat failure was due to the use of material with insufficient mechanical strength. All future motors will utilize throat insert material which has demonstrated adequate mechanical strength. A retrofit program is planned for those assets currently containing the suspect throat inserts. A total of 22 missiles has been successfully handed off to the 8th U.S. Army-Korea (EUSA) as of 18 Sep 91; this completes initial fielding to EUSA. All four of the "Explicit Guidance" missile flight tests were successfully conducted at WSMR. The first follow-on production test (FPT) program flight test was conducted 11 Dec 91 at WSMR and resulted in an in-flight failure. The flight hardware has been recovered and failure analysis is currently in process.
Army TACMS is expected to satisfy the mission requirements.

c. (U) Changes Since As Of Date --
On 16 Jan 92, the Army TACMS Project Manager was named the Army's Project Manager of the Year at the PEO/PM Conference in Orlando, FL.

8. (U) **Threshold Breaches**:
There is a performance breach to the Approved Acquisition Program Baseline (APB) dated 6 Sep 91. The breach is applicable to the missile reliability. Reliability is evaluated using the moving 25 round average methodology. Using this small sample size will cause

8. (U) Threshold Breaches (Cont'd):

significant fluctuations in the reliability. This is expected and acceptable as long as the overall trend is above the requirement. Reliability dropped due to two recent flight failures. Failure analysis is complete on one missile and is ongoing for the other with corrective actions being implemented as failure analysis indicates. Also two flights are scheduled for 24 Mar 92 and 14 Apr 92 and with success will increase reliability above the requirement. There are no Nunn-McCurdy Unit Cost Breaches.

9. (U) Schedule:

a. (U) Milestones --	Production Estimate	Approved Program	Current Estimate
Assault Breaker Tech Demonstration			
Start	APR 78	APR 78	APR 78
Complete	DEC 82	DEC 82	DEC 82
Special Task Force Initiated	MAR 81	N/A	MAR 81
Mission Element Need Statement Approval	APR 81	N/A	APR 81
Joint (Army/AF) Program Directed	JUN 82	JUN 82	JUN 82
ROC Approved	MAY 85	MAY 85	MAY 85
Request For Proposal (RFP) Released	JUN 85	N/A	JUN 85
Milestone II (ASARC)	DEC 85	N/A	DEC 85
Milestone II (DSARC)	FEB 86	FEB 86	FEB 86
FSD Contract Award	MAR 86	MAR 86	MAR 86
Long Lead Time Items Contract Option Award	MAY 88	MAY 88	MAY 88
EDT-C			
Start	MAR 86	MAR 86	MAR 86
Complete	FEB 89	FEB 89	FEB 89
DA Program Review (ASARC IIIA)	FEB 89	FEB 89	FEB 89
LRIP Contract Option Award	FEB 89	FEB 89	FEB 89
DT II Flight Test			
Start	MAR 89	MAR 89	MAR 89
Complete	DEC 89	DEC 89	DEC 89
OT Readiness Review	MAR 90	OCT 90	MAR 90
First LRIP Delivery	MAR 90	MAR 90	MAR 90
IOTE Flight/Ground Test			
Start	MAR 90	MAR 90	MAR 90
Complete	JUN 90	JUN 90	JUN 90
Confirmatory Test Complete (if required)	JUL 90	JUL 90	JUN 90
First Unit Equipped	AUG 90	AUG 90	AUG 90
Milestone III (DAB)	OCT 90	OCT 90	NOV 90

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
Initial Operational Capability (IOC)	OCT 90	OCT 90	AUG 90
Prod Verification Test (if required)			
Start	NOV 90	NOV 90	NOV 90
Complete	MAY 91	JAN 91	JAN 91
Full-Rate Production Contract Award	NOV 90	NOV 90	NOV 90
First Full Rate Production Delivery	OCT 91	OCT 91	MAY 91 (Ch-1)
Multiyear Production Contract Award	N/A	NOV 91	N/A (Ch-2)
First Multiyear Production Delivery	N/A	OCT 92	N/A (Ch-2)
Full-Rate Production-II Contract Award	N/A	N/A	DEC 91 (Ch-3)
First Full-Rate Production-II Delivery	N/A	N/A	OCT 92 (Ch-3)

ACRONYMS:

EDT-C - Engineering Development Test-Contractor
MILS - Miliradian (6400 MILS = 360 degree of a circle)
ROC - Required Operational Capability
M/LPA - Missile/Launch Pod Assembly
MTBOMF - Mean Time Between Operational Mission Failure

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

(Ch-1) Actual Completion Date.
(Ch 2) The Multiyear Procurement Program was not approved by the Army Acquisition Executive due to inadequate cost savings when compared to annual contracts.
(Ch-3) Milestones added as the Multiyear Procurement Program was not approved.

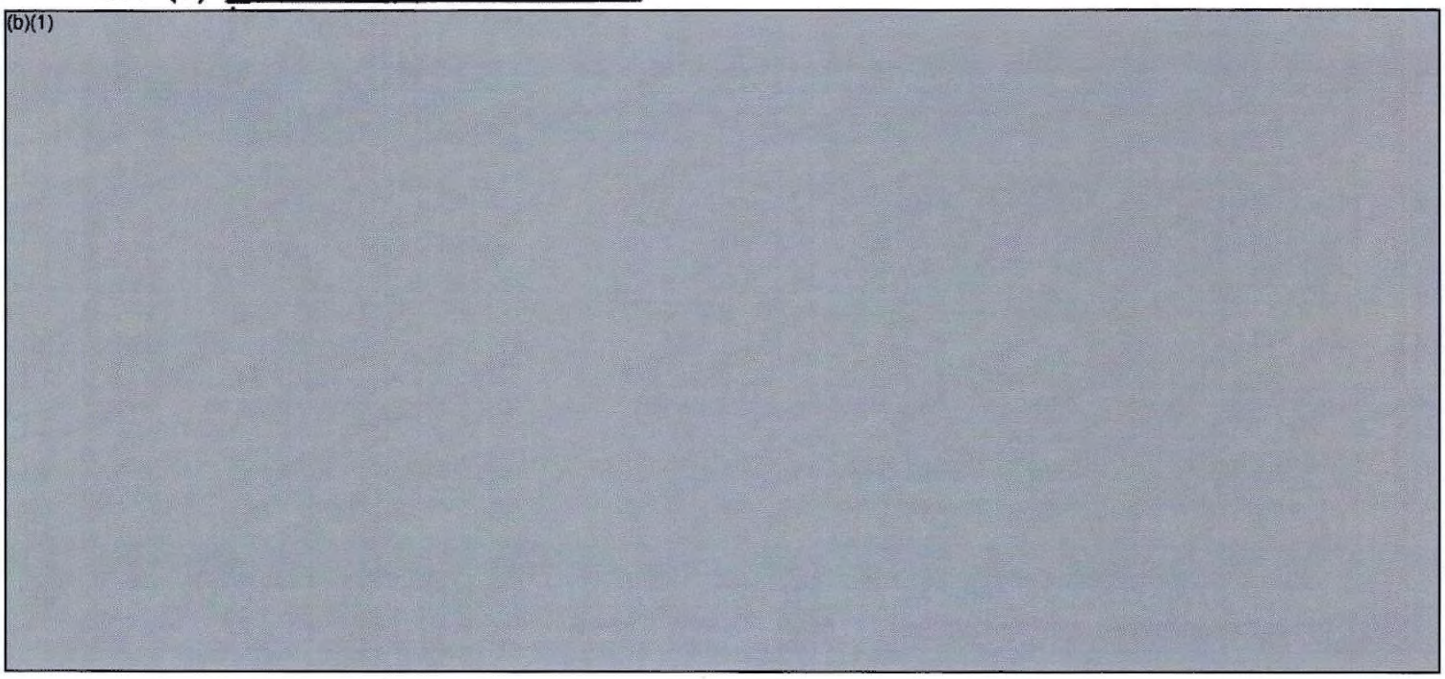
d. (U) References --

(U) Production Estimate:
DCP, dated 15 Sep 90, subject: "Army Tactical Missile System Block I," based on Milestone III (DAB) decision.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 6 September 1991.

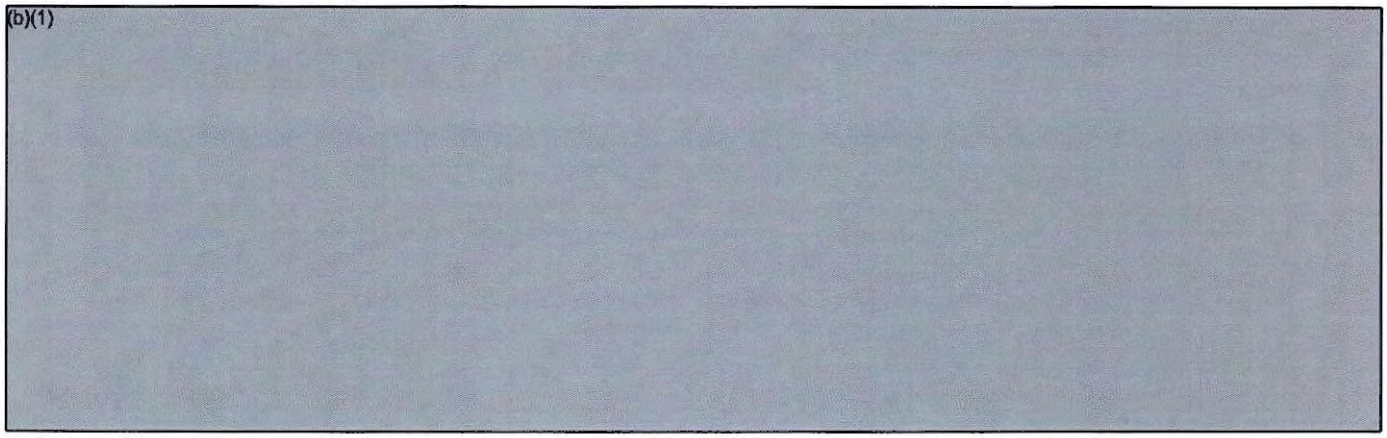
10. (U) Performance Characteristics:

(b)(1)



b. (U) Previous Change Explanations -- None.

(b)(1)



(U) Production Estimate:
DCP, dated 15 Sep 90, subject: "Army Tactical Missile System Block I," based on Milestone III (DAB) decision.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 6 September 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	650.6	649.6	647.6
Procurement	846.4	893.4	888.1
Flyaway	(821.2)		(861.7)
Total Flyaway	(821.2)		(861.7)
Other Weapon Systems	(22.9)		(24.1)
Total Other Wpn Sys	(22.9)		(24.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(2.3)		(2.3)
Construction (MILCON)	9.6	10.3	9.7
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 91 Base-Year $	1506.6	1553.3	1545.4
Escalation	1.6	44.4	-5.5
Development (RDT&E)	(-89.3)	(-88.1)	(-86.4)
Procurement	(90.0)	(131.3)	(80.1)
Construction (MILCON)	(0.9)	(1.2)	(0.8)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1508.2	1597.7	1539.9
b. (U) Quantity --			
Development (RDT&E)	15	N/A	15
Procurement	1542	1000	1573
Total	1557	1000	1588

Excludes 35 RDT&E prototypes that are not considered fully configured end items.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Production Estimate:
DCP, dated 15 Sep 90, subject: "Army Tactical Missile System (Block I)," based on Milestone III (DAB) decision.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 6 September 1991.

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1539.9	1508.2	1539.9
(2) Quantity	1588	1557	1588
(3) Unit Cost	0.970	0.969	0.970
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	170.9	170.9	188.3
Less CY Adv Proc	24.0	24.0	25.0
Plus PY Adv Proc	15.5	15.5	24.0
Net Total	162.4	162.4	187.3
(2) Quantity	300	300	340
(3) Unit Cost	0.541	0.541	0.551

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	561.3	936.4	10.5	1508.2
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	+2.8	-12.3	-	-9.5
Quantity	-	+15.3	-	+15.3
Schedule	-	-4.3	-	-4.3
Engineering	-	-	-	-
Estimating	-2.9	+31.6	-	+28.7
Other	-	-	-	-
Support	-	+1.5	-	+1.5
Subtotal	-0.1	+31.8	-	+31.7
Total Changes	-0.1	+31.8	-	+31.7
Current Estimate	561.2	968.2	10.5	1539.9

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	650.6	846.4	9.6	1506.6
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	+13.1	-	+13.1
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-3.0	+27.4	+0.1	+24.5
Other	-	-	-	-
Support	-	+1.2	-	+1.2
Subtotal	-3.0	+41.7	+0.1	+38.8
Total Changes	-3.0	+41.7	+0.1	+38.8
Current Estimate	647.6	888.1	9.7	1545.4

b. (U) Previous Change Explanations --

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)		2.8
Prior and current year inflation offset. (Estimating)	-3.0	-2.9
Total Changes	-3.0	-0.1

13c. (U) **Cost Variance Analysis (Cont'd):**

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices. (Economic)	--	-12.3
Increase of 31 missiles to the procurement schedule. (Quantity)	13.1	15.3
Effect of increasing 1991 buy and the decrease of buys in 1993 and 1994. (Schedule)	--	-4.3
Currrent and prior year inflation offset. (Estimating)	4.9	5.2
Program estimate revisions mandated by reduced funding. (Estimating)	22.5	26.4
Revised estimate of fielding costs. (Support)	1.2	1.5
Total Changes	41.7	31.8
(3) MILCON		
Revised escalation indices. (Economic)	--	-0.1
Prior and current year inflation indices. (Estimating)	0.1	0.1
Total Changes	0.1	--

14. (U) **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Prod Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.159	-0.049	-0.096	0.026	0.143	-1.234	--	0.020	-1.190	0.969

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions) (Cont'd)

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.969	-0.006	-0.009	-0.003	--	0.018	--	0.001	0.001	0.970

PAUC data includes 15 fully configured RDT&E missiles.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) FSD LCH & GSE INTEG:	Initial Contract Price		
	Target	Ceiling	Qty
LTV Aero & Defense Co, Dallas, TX DAAH01-86-C-A037, FPI Award: March 27, 1986 Definitized: March 27, 1986	$83.0	$94.4	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$102.3	$115.6	0	$115.6	$115.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-17.9	$-2.7
Cumulative Variances To Date (11/24/91)	$-20.8	$-0.9
Net Change	$-2.9	$1.8

Explanation of Change:

The ceiling price decreased by .7M as a result of a contract "reopener" clause.

Explanation of Change: The majority of the schedule and cost growth is in the software areas of the FCS and FDDM. Late definition of the FCS requirements and late availability of the FDDM software have impacted the testing, fabrication, and integration process.

15. (U) **Contract Information**: Cont'd (Then-Year Dollars in Millions)

b.(U) Procurement --

(U) FRP I:

LTV Aero & Defense Co, Dallas, TX
DAAH01-86-C-A036, FFP
Award: November 5, 1990
Definitized: May 5, 1991

Initial Contract Price		
Target	Ceiling	Qty
$132.3	N/A	318

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$172.4	N/A	373	$172.4	$172.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

The current contract price includes an additional 55 missiles. Supplemental budget guidance was received for replenishment of assets expended during Operation Desert Storm and to prevent a production gap between FRP-I and FRP-II.

Cost Performance Report (CPR) data is not required for this FFP contract.

(U) FRP II:

LTV Aero & Defense Co, Dallas, TX
DAAH01-92-C-0038, FFP
Award: December 6, 1991
Definitized: December 6, 1991

Initial Contract Price		
Target	Ceiling	Qty
$114.0	N/A	300

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$114.0	N/A	300	$114.0	$114.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Program Manager's Estimated Price at Completion doesn't include 13.0M for long lead time items awarded under contract DAAH01-86-C-A036.

15. (U) **Contract Information**: Cont'd (Then-Year Dollars in Millions)
CPR data is not required for this FFP contract.

LRIP-I and LRIP-II contracts are 100 percent complete and will no longer be reported.

16. (U) **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 72.2% (13 yrs/18 yrs)

(2) Percent Program Cost Appropriated: 75.3% ($1158.8 / $1539.9)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY80-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	561.2	-	-	-	561.2
Procurement	416.2	170.9	188.3	192.8	968.2
MILCON	5.0	5.5	-	-	10.5
O&M	-	-	-	-	-
Total	982.4	176.4	188.3	192.8	1539.9

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1980				14.8	9.4	9.4	9.4	10.6
1981				20.0	14.0	14.0	14.0	10.6

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1982				15.8	11.8	11.8	11.8	7.6
1983				7.7	6.0	5.7	5.7	4.9
1984				62.2	50.2	34.0	34.0	3.8
1985				91.8	76.4	51.3	51.3	3.4
1986				124.2	106.6	106.6	106.6	2.8
1987				86.9	76.5	76.5	76.5	2.7
1988				109.6	100.1	100.1	100.1	3.0
1989				77.7	73.8	73.8	69.0	4.2
1990				36.9	36.4	36.4	30.3	4.0
Subtot	15			647.6	561.2	519.6	508.7	
Appropriation: 2032 Missile Procurement, Army								
1988				3.7	3.5	3.5	3.5	3.0
1989	66		62.4	72.8	72.5	70.2	70.2	4.2
1990	104		94.7	100.8	103.3	102.7	88.7	4.0
1991	373		223.4	223.4	236.9	213.1	81.5	3.9
1992	300		155.7	156.0	170.9	126.5		3.1
1993	340		165.3	166.5	188.3			3.3

16c. (U) **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2032 Missile Procurement, Army (Cont'd)								
1994	390		160.2	161.5	188.6			3.3
1995				1.4	1.7			3.3
1996				1.2	1.5			3.2
1997				0.8	1.0			3.2
Subtot	1573		861.7	888.1	968.2	516.0	243.9	
Appropriation: 2050 Military Construction, Army								
1991				4.7	5.0			3.9
1992				5.0	5.5			3.1
Subtot				9.7	10.5			
Grand Total	1588		861.7	1545.4	1539.9	1035.6	752.6	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1989	66	66	66	66
1990	276	104	104	276
1991	452	318	373	456
1992	440	300	300	456
1993	470	351	340	319
1994	483	403	390	N/A

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	1506.6	+38.8	1545.4	+99.8	1445.6
(TY $)	1508.2	+31.7	1539.9	+124.7	1415.2
PAUC Cost (BY $)	0.968	0.005	0.973	0.063	0.910
(TY $)	0.969	0.001	0.970	0.079	0.891

17c. (U) **Production Rate Data (Cont'd):**

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	FEB 89	0	FEB 89	N/A	FEB 89
Duration (in MON)	79	0	79	19	60
End Date(MON YY)	SEP 95	0	SEP 95	N/A	FEB 94

Maximum Economic Rate Acquisition costs In TY $ is less than the Current Estimate.

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	50/50
Procurement	271/274

There are 15 fully configured RDT&E units.

e. (U) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 1573 - @ Peak Rate: 38.0/mo			
FY 91 Base-Year $	0.462	0.547	0.574
Then Year $	0.539	0.598	0.628
@ Qty 170 (1st three years) - @ Peak Rate: 38.0/mo			
FY 91 Base-Year $	0.587	0.924	0.970
Then Year $	0.673	0.935	0.982

18. (U) **Operating and Support Costs:**

a. (U) Assumptions and Ground Rules --

Army TACMS will be fired from the modified MLRS M270 launcher within the MLRS organizational units. Army TACMS Operating and Support (O&S) costs are included in the O&S section of the MLRS SAR and are from the Jul 91 Army TACMS Baseline Cost Estimate. Manning/crew support will be provided by MLRS organizational unit. Army TACMS is a certified round. Maintenance determined on the basis of periodic surveillance tests taken from Jul 91 Baseline Cost Estimate.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	1.8	---	---	---	1.8
Industrial Fund	---	---	---	---	---
Total	1.8	---	---	---	1.8

O&S costs, section b., sustainment costs for the missile are .005. There are no costs reflected for fielding.

N-46 V-22

91-089

*** UNCLASSIFIED ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: V-22 (OSPREY)

AS OF DATE: December 31, 1991

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MAR 24 1992
9
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name):
V-22 Joint Services Advanced Vertical Lift Aircraft (Osprey)

2. DoD Component: Navy

Joint Participants:
USMC,USN,USAF

3. Responsible Office and Telephone Number:

NAVAL AIR SYSTEMS COMMAND	COL James H. Schaefer, USMC
PMA-275	Assigned: January 19, 1990
WASHINGTON, DC 20361-1275	AV 222-7414 COMM (703) 692-7414

4. Program Elements/Procurement Line Items:

RDT&E:
PE 0603203N
PE 0603256 (Shared) Navy proj-W1557
Project 642973
PE 0604262N
PE 1110011F (Shared) Proj. 643752
, 0604222A
PE B6404D (Shared) Proj. 643752

PROCUREMENT:
APPN 1506 ICN 016300 (Navy)

Publication
92-C-0499
1992

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4. Program Elements/Procurement Line Items (Cont'd):

MILCON:
PE M62470

5. Related Programs: None.

6. Mission and Description:
The V-22 Osprey is a Department of the Navy program for the purpose of developing, testing, evaluating, procuring and fielding a tilt rotor, vertical takeoff and landing aircraft for Joint Service application. The V-22 program is designed to provide an aircraft to meet the amphibious/vertical assault needs of the Marine Corps, the strike rescue needs of the Navy, and the special operations needs of the Air Force. The V-22 will replace the CH-46 and CH53A/D in the Marine Corps, and the HH-3A in the Navy, and will supplement H-53, H-60 and C-130 in the Air Force. The V-22 will be capable of flying over 2000 nautical miles without refueling, giving the services the advantage of a VSTOL aircraft that could rapidly self-deploy to any location in the world.

7. Program Highlights:
a. Significant Historical Developments --
Preliminary Design was initiated in April 1983 with Bell-Boeing. Allison Gas Turbine Division of General Motors Corp was selected for engine design. The V-22 program went through Milestone II (DSARC II) in April 1986 and was approved for entry into Full Scale Development on 1 May 1986, at which time the FSD contract with Bell-Boeing was signed. Rollout of aircraft #1 occurred 23 May 1988. First flight of aircraft #1 occurred 19 March 1989. The Secretary of Defense removed funding for the V-22 program in April 1989. Congressional action funded the program in FY 90 and FY 91. DT IIA and B were completed.

b. Significant Developments Since Last Report --
An incident with Aircraft #5 occurred on 11 June 1991 resulting in a total loss of the aircraft but with minor injuries to the crew. All four development prototypes have resumed flight test and have completed 651.7 flight test hours to date in 549 flights. Total program has increased +$790.0M in RDT&E due to Congressional actions in FY92 but has been placed on OSD deferral pending SECDEF decision on how to implement Congressional requirements. Air Force funding also increased $15.0M in FY 92 due to Congressional action. APN funds have decreased a total of $257.6M due to various Navy reprogrammings of $92.6M and due to a Congressional reprogramming of $165.0M to the RDT&E appropriation.

The V-22 cannot meet its mission requirement due to added weight. Weight reduction plans are in place.

7c. Program Highlights (Cont'd):

c. Changes Since As Of Date --
A program review DAB occured on the V-22 program 17 January 1992.

8. Threshold Breaches:
There is currently an RDT&E Cost breach to the APB dated 30 Dec 90. There are no Nunn McCurdy unit cost breaches that are applicable to this program.

9. Schedule:

a. Milestones --

	Development Estimate	Approved Program	Current Estimate	
Milestone 0 (DEPSECDEF MEMO)	DEC 81	DEC 81	DEC 81	
Milestone I (DSARC I)	DEC 82	DEC 82	DEC 82	
Preliminary Design Contract Award	APR 83	APR 83	APR 83	
Milestone II (DSCARC II)	APR 86	APR 86	APR 86	
FSD Contract Award	MAY 86	MAY 86	MAY 86	
Production Contract Award (Long Lead AAC)	JAN 89	JAN 89	MAR 89	
Operational Testing IIA	AUG 89	AUG 89	N/A	(Ch-1)
Milestone IIIA (USMC Pil Prod)	DEC 89	DEC 89	N/A	
Operational Testing IIB	AUG 90	AUG 90	N/A	
Milestone IIIB (All Serv Ltd Prod)	DEC 90	DEC 90	N/A	
Operational Testing IIIC (OPEVAL)	AUG 91	AUG 91	N/A	
Operational Testing IID (AF OPEVAL)	AUG 91	AUG 91	N/A	
First Fleet Deliveries	DEC 91	DEC 91	N/A	
Milestone IIIC (USN/MC/A Full Production)	DEC 91	DEC 91	N/A	
USMC IOC (5 Acft Trng Det)	SEP 92	MAY 92	N/A	
USAF IOC (6 Acft Mission Capable)	SEP 94	SEP 94	N/A	
USA IOC (First Operational Company Equipped)	SEP 95	SEP 95	N/A	

b. Previous Change Explanations --

Contract award date reflects contractual agreement. Impact of production termination, 19 Apr 89. Army references no longer applicable. OTIIA added back into the schedule.

c. Current Change Explanations --

CH-1 OPERATIONAL TESTING IIA - OTIIA has been changed back to a status of Not Applicable because a defined schedule has not been determined due to uncertainty in the program.

9d. Schedule (Cont'd):

d. References --

Development Estimate:
FY 1988/89 President's Budget.

Approved Program:
DAE Approved Acquisition Program Baseline dated 30 December 1990.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Folded					
Length (ft)	62.24	62.24	/ 62.24		N/A
Width (ft)	18.42	18.42	/ 18.42		N/A
Height (ft)	17.98	17.98	/ 17.98		N/A
Unfolded					
Length (ft)	57.33	57.33	/ 57.33		N/A
Width (ft)	83.83	83.83	/ 83.83		N/A
Height (ft)	21.73	21.73	/ 21.73		N/A
Empty Weight (lbs)	31786	31786	/ 31786		N/A
Readiness, Msn Capability Rate (% MC)	70	70	/ 70		N/A
Mission Complete Probability, Rate (MFHBMA Design Controllable) (%)	98	98	/ 98		N/A
Direct Maintenance Manhours per Flight Hour, Design Controllable:					
Org Level, Unscheduled (corrective)	7.0	7.0	/ 7.0		N/A
Org Level, Scheduled (preventive)	2.5	2.5	/ 2.5		N/A
World-wide Self-Deployment (nm) (minimum distance)	2100	2100	/ 2100		N/A
Continuous Cruise Speed (kts)	250	250	/ 250		N/A
Dash Speed (kts)	275	275	/ 275		N/A
Instantaneous G-Loading					

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Plus	4.0	4.0 / 4.0		N/A
Minus	-1.0	1.0 / 1.0		N/A
Troop Capacity	24	24 / 24		N/A
External Cargo (lbs)	10000	10000 / 10000		N/A

Acronym

MFHBMA - Mean Flight Hours Between Maintenance Actions

b. Previous Change Explanations --

Impact of production program termination.

c. Current Change Explanations --

NONE

d. References --

Development Estimate:
FY 1988/89 President's Budget.

Approved Program:
DAE Approved Acquisition Program Baseline dated 30 December 1990.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	2443.7	1973.3	3007.3
Procurement	20493.1	0.0	203.5
Flyaway	(15517.1)		(203.5)
Total Flyaway	(15517.1)		(203.5)
Other Weapon Systems Cost	(3299.6)		(0.0)
Total Other Wpn Sys	(3299.6)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(1676.4)		(0.0)
Construction (MILCON)	136.2	0.0	6.2
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 86 Base-Year $	23073.0	1973.3	3217.0

11a. Total Program Cost and Quantity (Cont'd):

	Development Estimate	Approved Program	Current Estimate
Escalation	6589.3	93.2	370.1
Development (RDT&E)	(181.5)	(93.2)	(333.1)
Procurement	(6371.1)	(0.0)	(35.8)
Construction (MILCON)	(36.7)	(0.0)	(1.2)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	29662.3	2066.5	3587.1
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	913	0	0
Total	913	0	0

There are six RDT&E aircraft that are not considered fully configured. Three additional production representative aircraft were identified in the FY 92 Congressional language. FY 93 and beyond dollars need to be identified in the FY 93 budget before these three aircraft can be procured.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Development Estimate:
FY 1988/89 President's Budget.

Approved Program:
DAE Approved Acquisition Program Baseline dated 30 December 1990.

12. Program Acquisition/Current Procurement Unit Cost Summary:

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3587.1	3042.4	3587.1
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2625.2	26864.2	172.9	29662.3
Previous Changes:				
Economic	-3.7	+0.9	-	-2.8
Quantity	-77.0	-20095.5	-	-20172.5
Schedule	+0.6	-	+7.8	+8.4
Engineering	-	-	-	-
Estimating	-9.0	+164.2	-173.3	-18.1
Other	-	-	-	-
Support	-	-6434.9	-	-6434.9
Subtotal	-89.1	-26365.3	-165.5	-26619.9
Current Changes:				
Economic	-2.9	-2.3	-0.1	-5.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+807.2	-257.3	+0.1	+550.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+804.3	-259.6	-	+544.7
Total Changes	+715.2	-26624.9	-165.5	-26075.2
Current Estimate	3340.4	239.3	7.4	3587.1

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1986 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2443.7	20493.1	136.2	23073.0
Previous Changes:				
Quantity	-72.9	-15237.6	-	-15310.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-8.1	+132.2	-130.1	-6.0
Other	-	-	-	-
Support	-	-4976.0	-	-4976.0
Subtotal	-81.0	-20081.4	-130.1	-20292.5
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+644.6	-208.2	+0.1	+436.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+644.6	-208.2	+0.1	+436.5
Total Changes	+563.6	-20289.6	-130.0	-19856.0
Current Estimate	3007.3	203.5	6.2	3217.0

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation rates offset by impact of program funding termination.

Quantity: Impact of program funding termination. FY 91 Congressional appropriation.

Schedule: Air Force simulator modification rescheduled one year.

Engineering: Air Force deletion of IDADS and addition of EW analysis offset by impact of program funding termination.

Estimating: Reprogrammings, budget adjustments, reprice of Air Force ECP offset by program funding termination. SBIR assessment. Contract price escalation clause

13b. Cost Variance Analysis (Cont'd):

adjustment and correction of error. Air Force transfer within program element.

PROCUREMENT

Economic: Revised escalation rates offset by impact of program funding termination.

Quantity: Army withdrawal, Air Force reduction in quantity offset by impact of program funding termination.

Schedule: Navy and Air Force rephase buy schedule offset by impact of program funding termination.

Estimating: Reprice to reflect lower quantities, GFE to CFE changes, and tooling refinements offset by impact of program funding termination. Congressional appropriation of advanced procurement.

Support: Army withdrawal and impact of program funding termination.

MILCON

Economic: Revised escalation rates offset by impact of program funding termination.

Schedule: Air Force rephase of facilities offset by impact of program funding termination.

Estimating: Estimating refinements and impact of program funding termination.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 escalation rate (Economic)	--	-2.9
FY 91 Small Business Innovative Research Assessment (Navy) (Estimating)	-1.9	-2.4
Congressional reprogramming from FY 91 APN to FY 92 R&D (Navy) (Estimating)	131.7	165.0
FY 92 Congressional Appropriation (Navy) (Estimating)	498.8	625.0
FY 92 Congressional Appropriation (Air Force) (Estimating)	12.0	15.0
Current and prior inflation offset (Estimating)	2.4	2.9
FY86/87 accounting adjustments to reflect actuals. (Estimating)	1.6	1.7
Total Changes	644.6	804.3

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised Jan 92 escalation rates (Economic)		-4.1
Economic adjustment for negative program change (Economic)		1.8
FY 91 funding reprogrammed to EA6 program (Navy) (Estimating)	-20.0	-23.5
FY 91 funding reprogrammed to the F/18 program (Navy) (Estimating)	-3.2	-3.8
FY 91 funding reprogrammed to the AV-8B program (Navy) (Estimating)	-0.3	-0.3
FY 91 funding reprogrammed to other APN sources (Navy) (Estimating)	-4.3	-5.0
$62.0M FY 91 funding placed on OSD deferral and expired (Navy) (Estimating)	-52.8	-62.0
Congressional reprogramming from FY 91 APN to FY 92 RDT&E appropriation (Navy) (Estimating)	-131.1	-165.0
Current and prior inflation offset (Estimating)	3.5	2.3
Total Changes	-208.2	-259.6
(3) MILCON		
Revised Jan 92 escalation rates (Economic)	--	-0.1
Current and prior inflation offset (Estimating)	0.1	0.1
Total Changes	0.1	--

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
40.180	-4.900	-6.700	0.800	--	--	--	2.900	-7.900	32.280

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions) (Cont'd)

b. Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
32.489	--	--	--	--	--	--	--	--	N/A

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

AIRFRAME FSD:

BELL-BOEING, Fort Worth, TX
N00019-85-C-0145, FPI
Award: May 1, 1986
Definitized: May 1, 1986

Initial Contract Price		
Target	Ceiling	Qty
$1714.0	$1810.0	6

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1728.5	$1825.3	6	$2086.0	$2137.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-50.0	$-49.5
Cumulative Variances To Date (09/30/91)	$-108.3	$-59.8
Net Change	$-58.3	$-10.3

Explanation of Change:

Cost variance due primarily to unplanned application of recurring manpower in contractor flight testing; rework, redesign and replacement effort; and unanticipated aircraft modification periods. In addition, retroactive rate adjustments and material cost overruns have contributed to cost growth. Schedule variance is influenced by the unplanned aircraft modification periods as well as by the late delivery of subcontractor equipment.

Contract rebaselining accomplished as of 31 Jan 90. CPR now shows an over-target baseline of $1941.0M (was 1547.6) however, contract ceiling price remains the same. Contractor anticipates overrunning ceiling price by $261.7M.

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

ENGINE FSD:
General Motors Corp., Indianapolis, IN
N00019-85-C-0034, FFP
Award: May 1, 1986
Definitized: May 1, 1986

Initial Contract Price		
Target	Ceiling	Qty
$76.4	N/A	21

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$141.7	N/A	21	$141.7	$141.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

CPR information is not required for this FFP contract.

Technology Effort:
Bell-Boeing, Fort Worth, TX
N00019-91-C-0172, Letter
Award: June 10, 1991
Definitized: N/A

Initial Contract Price		
Target	Ceiling	Qty
$75.5	$0.0	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$75.5	$0.0	0	$67.4	$67.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (09/30/91)	$-0.1	$-0.9
Net Change	$-0.1	$-0.9

Explanation of Change:

Shown for the first time.

V-22 (OSPREY), December 31, 1991

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 100.0% (11 yrs/11 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($3587.1 / $3587.1)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY82-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	2535.4	805.0	-	-	3340.4
Procurement	239.3	-	-	-	239.3
MILCON	7.4	-	-	-	7.4
O&M	-	-	-	-	-
Total	2782.1	805.0	-	-	3587.1

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY86 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1982				1.5	1.3	1.3	1.1	7.6
1983				37.3	34.5	34.5	34.5	4.9
1984				88.9	85.2	85.2	84.9	3.8
1985				174.4	172.4	172.4	168.3	3.4
1986				515.3	524.0	524.0	514.1	2.8

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1987				402.8	421.7	421.7	403.4	2.7
1988				427.8	462.8	462.1	397.2	3.0
1989				267.1	301.1	301.0	248.0	4.2
1990				216.4	253.7	251.7	107.0	4.0
1991				193.2	234.6	145.4	18.1	3.9
1992				630.4	790.0			3.1
Subtot				2955.1	3281.3	2399.3	1976.6	
NOTE: FY 1983 $'s reflect $29.9M of Army funds (PE 060422A)								
Appropriation: 1506 Aircraft Procurement, Navy								
1989				203.5	239.3	239.3	33.0	4.2
Subtot				203.5	239.3	239.3	33.0	
Appropriation: 1205 Military Construction, Navy								
1990				6.2	7.4			4.0
Subtot				6.2	7.4			
Navy				3164.8	3528.0	2638.6	2009.6	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 3600 Research, Development, Test + Eval, AF								
1985				0.6	0.6	0.6	0.6	3.4
1986				2.2	2.2	2.2	2.2	2.8
1987				2.8	2.9	2.9	2.9	2.7
1988				23.7	25.6	25.6	25.6	3.0
1989				4.3	4.8	4.8	2.3	4.2
1990								
1991				6.6	8.0			3.9
1992				12.0	15.0			3.1
Subtot				52.2	59.1	36.1	33.6	
USAF				52.2	59.1	36.1	33.6	
Grand Total				3217.0	3587.1	2674.7	2043.2	

17. **Production Rate Data:**

a. Annual Production Rates -- None.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	3217.0	N/A	
(TY $)	N/A	N/A	3587.1	N/A	
PAUC Cost (BY $)	N/A	N/A	N/A	N/A	N/A
(TY $)	N/A	N/A	N/A	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	6/4
Procurement	0/0

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules -- None

b. Costs -- None.

c. Contractor Support Costs -- None.

N-25 LCAC

91-141

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LCAC

AS OF DATE: December 31, 1991

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1. Designation and Nomenclature (Popular Name):
LCAC/Landing Craft, Air Cushion

2. DoD Component: Navy

Joint Participants:
N/A

3. Responsible Office and Telephone Number:
AMPHIBIOUS WARFARE AND STRATEGIC SEALIFT PROGRAM OFFICE (PMS377)
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, DC 20362-5101

MR. E.E. SHOULTS
Assigned: April 29, 1985
AV 332-8511/COMM (703) 602-8511

4. Program Elements/Procurement Line Items:

RDT&E:
PE 0604567N (Shared) Project 1803, S0857
PROCUREMENT:
APPN 1611 ICN 5105 (Navy)
MILCON:
PE 0204796N (Shared), 0805796N (Shared)

5. Related Programs:
AALC; LHD; LSD 41; LSD 41 (CV)

CLEARED
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92-0645

6. Mission and Description:
The LCAC program has been established to transport weapon systems, equipment, cargo, and personnel of the assault elements of the Marine air/ground task force from ship to shore and across the beach. The LCAC is a fully amphibious air cushion vehicle capable of operating from existing and future amphibious well deck ships. Having an on-cushion length of 88ft and beam of 47ft, the LCAC can carry a 60 ton payload (75 ton overload capacity) and provides drive through capability by means of ramps forward and aft.

7. Program Highlights:
a. Significant Historical Developments —
In 1970, contracts were awarded for the design and construction of prototype Amphibious Assault Landing Craft (AALC). Results from the test program led to the follow-on LCAC production program. Bell Aerospace, Textron was competitively awarded contracts for production of six craft (three authorized in FY82 and three in FY83).
The first LCAC successfully completed Acceptance Trials on 7 December 1984 at the Naval Coastal Systems Center (NAVCOASTSYSCEN) in Panama City, Florida. During the initial phase of operational testing (OT-IIIA) early in 1985 the LCAC met all mission specifications; however, discrepancies affecting craft reliability were identified. Correction of these discrepancies were shown effective during Operational Testing (OT-IIIB) in April 1987. Approval for Full Production was granted by ASN in June 1987.

A second source, Lockheed Shipbuilding Company, was selected to produce two FY85 craft in Sep 1985. Subsequently Avondale Gulfport Marine (AGM) obtained the contract from Lockheed.

A Mine Countermeasure, Air Cushion (MCAC) DEMVAL was completed in June 1988 demonstrating that LCAC is an effective MCM Platform using equipment of existing Fleet designs.

Successful Shock Test Trials were completed on board LSD 44 on 15 December 1989.

A successful lashing test in March 1990 demonstrated that an M1A1 Main Battle Tank (MBT) can be carried by an LCAC in accordance with the Top Level Requirement (TLR).

As of 31 Dec 90, production contracts had been awarded for a total of 60 craft (45 TMS, 15 AGM) and 29 craft had been delivered (21 TMS, 8 AGM).

b. Significant Developments Since Last Report —
The FY91 production contract for 12 craft was awarded to TMS with an option for 12 craft in FY92.

7b. Program Highlights (Cont'd):

AGM delivered 1 craft (LCAC 023) in 1991. TMS delivered 9 craft (LCAC 031, 032, 033, 037, 038, 039, 040, 041, and 042) in 1991.

OT-IVB, intended to demonstrate LCAC capabilities in cold weather and to resolve certain vulnerability issues, is now scheduled for March 1992 (plans previously reported as delayed due to Operation Desert Storm).

The LCAC Program has been shown to satisfy the mission requirement.

c. Changes Since As Of Date — None.

8. Threshold Breaches:
There are currently no Acquisition Program Baseline (APB) (dated 20 April 90) breaches or unit cost breaches.

9. Schedule:

a. Milestones —

	Production Estimate	Approved Program	Current Estimate
Milestone II SAIP	FEB 80	FEB 80	FEB 80
MENS Approved	OCT 80	OCT 80	OCT 80
Detail Design/Long-Lead Material Contract	JUN 81	JUN 81	JUN 81
Milestone IIIA Approval of Lead Production	DEC 81	DEC 81	DEC 81
Contract Award	FEB 82	FEB 82	FEB 82
First Craft Delivery	DEC 84	DEC 84	DEC 84
Milestone IIIB Approval for Full Production	JUL 85	JUN 87	JUN 87
Material Support Date	APR 88	NOV 91	NOV 91
Naval Support Date	JAN 90	NOV 91	NOV 91
Initial Operational Capability	JUL 86	DEC 86	DEC 86

IOC - Reflects date the lead craft were ready for operational deployment

b. Previous Change Explanations —

The Milestone IIIB Approval for Full Production occurred later than the Production Estimate due to operational testing issues. As a result of Ships Parts Control Center not being ready to support the LCAC Program with stocked parts, MSD was rescheduled to Nov 91. NSD was rescheduled to Nov 91 based on slippage of the Full Mission Trainer. Correction of operating problems surfaced during operational testing on LCAC 1, which resulted in IOC slippage of 5

9b. Schedule (Cont'd):
months.

c. Current Change Explanations — None.

d. References —

Production Estimate:
SECNAV Memo dated December 21, 1981, Subject: "LCAC Milestone IIIA DNSARC Decision Memorandum "; Approved LCAC NDCP dated May 25, 1983.

Approved Program:
NAE approved Acquisition Program Baseline dated 20 April 1990.

10. Performance Characteristics:

a. Performance —	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Operating Crew	5	5	/ 5	5	5
Troop Capacity (Internal)	24	24	/ 24	24	24
Cargo Deck Area (ft2)	1,800	1809	/ 1809	1,809	1,809
Length-On Cushion (ft)	88'	87'11"	/ 87'11"	87'11''	87'11''
Beam-On Cushion (ft)	47'	47'	/ 47'	47'	47'
Speed (kts)	35	40+	/ 40+	40+	40+
Design Payload (lbs)	120,000	120,000	/ 120,000	120,000	120,000
System Reliability (%)	90	96	/ 96	96	96
Maintainability MMH/OH Total (CM&PM)	34	34	/ 34	29.6	34
Unrefueled Range	195	100	/ 100	195+	195+

Demonstrated performance for the cargo deck area exceeds the production estimate.

Trials have shown that the craft exceeds minimum speed requirements.

The approved Top Level Requirement (TLR), dated 22 April 1980, Threshold for System Reliability % is 90. Improved reliability based on demonstrated performance.

b. Previous Change Explanations — None.

c. Current Change Explanations — None.

10d. Performance Characteristics (Cont'd):

d. References —

Production Estimate:
SECNAV Memo dated December 21, 1981, Subject: "LCAC Milestone IIIA DNSARC Decision Memorandum "; Approved LCAC NDCP dated May 25, 1983.

Approved Program:
NAE approved Acquisition Program Baseline dated 20 April 1990.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost —	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	21.2	33.5	31.3
Procurement	1023.6	2128.6	1724.7
Sailaway	(1006.9)		(1721.0)
Total Sailaway	(1006.9)		(1721.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(3.3)		(3.7)
Initial Spares	(13.4)		(0.0)
Construction (MILCON)	58.5	87.0	91.2
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 82 Base-Year $	1103.3	2249.1	1847.2
Escalation	507.4	623.1	425.2
Development (RDT&E)	(0.2)	(0.0)	(-0.6)
Procurement	(489.3)	(596.2)	(396.2)
Construction (MILCON)	(17.9)	(26.9)	(29.6)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1610.7	2872.2	2272.4
b. Quantity —			
Development (RDT&E)		N/A	0
Procurement	60	105	84
Total	60	105	84

c. Foreign Military Sales —
None.

d. Nuclear Costs —
None.

11e. Total Program Cost and Quantity (Cont'd):

e. References --

Production Estimate:
SECNAV Memo dated December 21, 1981, Subject: "LCAC Milestone IIIA DNSARC Decision Memorandum "; Approved LCAC NDCP dated May 25, 1983.

Approved Program:
NAE approved Acquisition Program Baseline dated 20 April 1990.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2272.4	2287.3	2272.4
(2) Quantity	84	84	84
(3) Unit Cost	27.052	27.230	27.052
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	270.4	270.4	0.0
Less CY Adv Proc	5.6	5.6	4.6
Plus PY Adv Proc	23.2	23.2	4.6
Net Total	288.0	288.0	0.0
(2) Quantity	12	12	0
(3) Unit Cost	24.000	24.000	N/A

Note: Post Delivery Costs ($5.6M in Current Procurement) are reflected in the CY Advance Procurement line.

Post Delivery Costs ($4.6M in FY 93) are reflected in the Budget Year CY Advance Procurement and PY Advance Procurement lines.

13. Cost Variance Analysis:

a. Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	21.4	1512.9	76.4	1610.7
Previous Changes:				
Economic	-2.8	-387.9	-2.8	-393.5
Quantity	-	+686.8	-	+686.8
Schedule	-	+28.5	-	+28.5
Engineering	-	+2.8	-	+2.8
Estimating	+12.1	+221.9	+47.2	+281.2
Other	-	-	-	-
Support	-	+70.8	-	+70.8
Subtotal	+9.3	+622.9	+44.4	+676.6
Current Changes:				
Economic	-0.1	-48.3	-1.8	-50.2
Quantity	-	+31.5	-	+31.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.1	+88.9	+1.8	+90.8
Other	-	-	-	-
Support	-	-87.0	-	-87.0
Subtotal	-	-14.9	-	-14.9
Total Changes	+9.3	+608.0	+44.4	+661.7
Current Estimate	30.7	2120.9	120.8	2272.4

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	21.2	1023.6	58.5	1103.3
Previous Changes:				
Quantity	-	+440.2	-	+440.2
Schedule	-	-1.2	-	-1.2
Engineering	-	+2.2	-	+2.2
Estimating	+10.1	+174.2	+31.6	+215.9
Other	-	-	-	-
Support	-	+60.9	-	+60.9
Subtotal	+10.1	+676.3	+31.6	+718.0
Current Changes:				
Quantity	-	+24.2	-	+24.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+74.5	+1.1	+75.6
Other	-	-	-	-
Support	-	-73.9	-	-73.9
Subtotal	-	+24.8	+1.1	+25.9
Total Changes	+10.1	+701.1	+32.7	+743.9
Current Estimate	31.3	1724.7	91.2	1847.2

b. Previous Change Explanations --

RDT&E
Economic: Revised economic escalation rates.
Estimating: Increase based on qualification of second source for LCAC construction; reduction based on returned cost for completed design and reduced R&D effort.

PROCUREMENT
Economic: Revised economic escalation rates.
Quantity: Increase based on addition of 24 craft (net change) and associated advance procurement.
Schedule: Increase based on rescheduling of 28 craft and associated advance procurement.
Engineering: Increase for arctic-configured LCAC.

13b. Cost Variance Analysis (Cont'd):

Estimating: Increase based on: revised program estimates for re-estimation of contractor provisioning material; second source planning; contract cost growth; rephasing of program estimates; returned cost on completed craft; and increased cost associated with program closeout. Reduction based on: multi-year procurement savings; reduction of CFE spares; and CAAS reduction for Civil Service Conversion.

Support: Increase based on actual execution and initial ACU 4 COSAL buy and Post Delivery associated with additional 24 craft. Reduction based on revised program estimates and returned costs on completed craft.

MILCON

Economic: Revised economic escalation rates.

Estimating: Increase based on addition of MILCON Projects to support additional craft and rephasing of MILCON Projects; reduction based on revised program estimates, and returned costs on completed projects.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised economic escalation indices (Economic)	N/A	-48.3
Current & Prior Inflation Offset (Estimating)	36.7	49.0
Returned cost on delivered craft (Estimating)	-2.8	-3.5
Reduction in estimates (Estimating)	-8.7	-11.3
Revised post delivery estimates (Estimating)	-0.4	-0.8
Mis-categorization of outfitting and post delivery as Support vice sailaway in prior SARs. (Support)	-73.9	-87.0
Correction of prior SAR outfitting and post delivery changes from Support to Quantity. (Quantity)	24.2	31.5
Correction of prior SAR outfitting and post delivery changes from Support to Estimating. (Estimating)	49.7	55.5
Total Changes	24.8	-14.9

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) MILCON		
Revised economic escalation indices (Economic)	—	-1.8
Current & Prior Inflation Offset (Estimating)	0.8	1.3
Increased cost estimates (Estimating)	0.3	0.5
Total Changes	1.1	—

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
26.845	-5.282	0.881	0.339	0.033	4.429	—	-0.193	0.207	27.052

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement —

LCAC 37-48 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
TEXTRON MARINE SYSTEMS, NEW ORLEANS, LA N00024-89-C-2028, FPI Award: December 13, 1988 Definitized: December 13, 1988	$132.4	$144.6	12

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$132.9	$145.1	12	$131.8	$134.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-1.1	$-4.3
Cumulative Variances To Date (12/29/91)	$0.2	$-2.4
Net Change	$1.3	$1.9

Explanation of Change:

Cost Variance: The majority of favorable net change of $1.3M is due to construction labor efficiencies and related overhead. Favorable change offset by increased cost in raw material and additional

15. Contract Information: Cont'd (Then-Year Dollars in Millions) quantities of material for electrical redesign.

Schedule Variance: The majority of favorable net change of $1.9M is due to material and labor recoveries slightly offset by delays in vendor billings.

The PM's Estimated Price at Completion takes the variances into consideration.

LCAC 34-36 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
AVONDALE GULFPORT MARINE, GULFPORT, MS N00024-89-C-2110, FPI Award: December 13, 1988 Definitized: December 13, 1988	$42.6	$44.8	3

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$42.6	$44.7	3	$39.6	$40.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$1.5	$-3.1
Cumulative Variances To Date (12/29/91)	$4.0	$-1.5
Net Change	$2.5	$1.6

Explanation of Change:

Cost Variance: The majority of favorable net change of $2.5M is due to support labor being less than planned, favorable labor rates, overhead expenditures being less than planned, and low value material earnings. The favorable change has been slightly offset by unfavorable material growth.

Schedule Variance: The majority of favorable net change of $1.6M is due to a material rebaselining from an accelerated schedule to the contract schedule.

The PM's Estimated Price at Completion takes these variances into consideration.

LCAC 52-60 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
TEXTRON MARINE SYSTEMS, NEW ORLEANS, LA N00024-89-C-2028, FPI Award: December 22, 1989 Definitized: December 22, 1989	$104.2	$112.8	9

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$104.5	$113.0	9	$103.4	$101.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-0.3	$0.0
Cumulative Variances To Date (12/31/91)	$-1.7	$3.0
Net Change	$-1.4	$3.0

Explanation of Change:

Cost Variance: The majority of unfavorable net change of $1.4M is associated with material earnings for discrete material taken before delivery, material growth, and delayed earnings for bill of material items.

Schedule Variance: The majority of favorable net change of $3.0M is associated with early receipt of lot and discrete material.

The PM's Estimated Price at Completion takes these variances into consideration.

LCAC 49-51 CONSTRUCTION:	Initial Contract Price		
	Target	Ceiling	Qty
AVONDALE GULFPORT MARINE, GULFPORT, MS N00024-89-C-2110, FPI Award: December 22, 1989 Definitized: December 22, 1989	$39.1	$41.1	3

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$39.2	$41.1	3	$36.8	$39.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.2	$-1.2
Cumulative Variances To Date (12/31/91)	$3.0	$0.2
Net Change	$2.8	$1.4

Explanation of Change:

Cost Variance: The majority of favorable net change of $2.8M is due to overhead expenditures being less than planned and favorable production labor rates.

Schedule Variance: The majority of favorable net change of $1.4M is due to a material rebaselining from an accelerated schedule to the contract schedule and early receipt of material.

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

The PM's Estimated Price at Completion takes these variances into consideration.

LCAC 61-72 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
TEXTRON MARINE SYSTEMS, NEW ORLEANS, LA N00024-91-C-2201, FFP Award: April 24, 1991 Definitized: April 24, 1991	$122.1	N/A	12

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$122.1	N/A	12	$122.1	$122.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/29/91)	$-0.3	$0.6
Net Change	$-0.3	$0.6

Explanation of Change:

Cost Variance: The cumulative unfavorable variance of $0.3M is due to material earnings for discrete material taken before delivery.

Schedule Variance: The cumulative favorable variance of $0.6M is due to early receipt of lot material.

The PM's Estimated Price at Completion takes these variances into consideration.

The Program Manager's (PMs) Estimated Price at Completion reflects the current Firm Fixed Price (FFP) value of $122.1M . The PMs LRE is $132.2M which results in a $8.0M contractor loss.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status —

(1) Percent Program Completed: 84.2% (16 yrs/19 yrs)

(2) Percent Program Cost Appropriated: 98.8% ($2245.9 / $2272.4)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY77-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-95)	Total
RDT&E	30.7	-	-	-	30.7
Procurement	1837.2	270.4	4.6	8.7	2120.9
MILCON	79.3	28.3	-	13.2	120.8
O&M	-	-	-	-	-
Total	1947.2	298.7	4.6	21.9	2272.4

c. Annual Summary —

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1977				0.3	0.2	0.2	0.2	2.6
1978				2.1	1.5	1.5	1.5	6.8
1979				1.9	1.5	1.5	1.5	8.4
1980				9.2	8.2	8.2	8.2	10.6
1981				4.8	4.7	4.7	4.7	10.6
1982				5.2	5.3	5.3	5.3	7.6
1983				1.0	1.1	1.1	1.1	4.9
1984				0.8	0.9	0.9	0.9	3.8

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1985				0.5	0.6	0.6	0.6	3.4
1986				2.6	3.1	3.1	2.5	2.8
1987				2.1	2.6	2.6	2.4	2.7
1988				0.8	1.0	0.9	0.6	3.0
Subtot				31.3	30.7	30.6	29.5	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1981				50.6	53.5	53.5	53.1	9.6
1982	3	55.0	121.0	106.1	115.6	115.4	114.0	7.5
1983	3		79.0	63.0	69.7	69.3	67.6	3.8
1984	6		157.9	149.8	168.7	168.0	165.2	3.6
1985	9		202.2	229.5	263.1	255.2	245.2	2.1
1986	12		232.0	224.1	262.4	262.3	248.6	1.1
1987				21.2	25.3	24.7	24.6	1.5
1988				31.0	38.1	36.8	36.0	2.3
1989	15		257.6	240.1	304.1	294.5	225.6	2.8
1990	12		206.1	206.6	269.3	249.5	83.2	1.3
1991	12		198.8	198.9	267.4	228.2	9.1	1.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1992	12		211.4	194.8	270.4			3.1
1993				3.2	4.6			3.3
1994				3.4	5.1			3.3
1995				2.4	3.6			3.3
Subtot	84	55.0	1666.0	1724.7	2120.9	1757.4	1272.2	
Appropriation: 1205 Military Construction, Navy								
1984				18.2	20.8	19.5	19.5	3.8
1985				16.5	19.4	18.1	18.1	3.4
1986				13.5	16.4	16.4	16.4	2.8
1987								2.7
1988								3.0
1989								4.2
1990								4.0
1991				15.8	22.7	8.9	1.5	3.9
1992				19.1	28.3			3.1
1993								3.3
1994								3.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1205 Military Construction, Navy (Cont'd)								
1995				8.1	13.2			3.3
Subtot				91.2	120.8	62.9	55.5	
Grand Total	84	55.0	1666.0	1847.2	2272.4	1850.9	1357.2	

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1982	0	3	3	3
1983	0	3	3	3
1984	0	6	6	6
1985	0	12	9	9
1986	0	12	12	12
1987	0	12	0	15
1988	0	12	0	12
1989	0	0	15	12
1990	0	0	12	12

17a. Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1991	0	0	12	0
1992	0	0	12	0
1993	0	0	0	0
1994	0	0	0	0

b. Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	1103.3	+743.9	1847.2	+198.9	1648.3
(TY $)	1610.7	+661.7	2272.4	+326.7	1945.7
PAUC Cost (BY $)	18.388	3.602	21.990	+2.368	19.623
(TY $)	26.845	0.207	27.052	+3.889	23.163

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	FEB 82	0	FEB 82	N/A	FEB 82
Duration (in MON)	110	50	160	24	136
End Date(MON YY)	APR 91	50	JUN 95	N/A	JUN 93

d. Deliveries (Plan/Actual) —

	To Date
RDT&E	0/0
Procurement	40/39

17d. Production Rate Data (Cont'd):
The government did not accept 1 AGM craft (LCAC 034) in October 1991 (contract delivery date) due to an unsatisfactory Logistics Readiness Review (LRR) and due to insufficient progress on Technical Manuals. The estimated completion date of the LRR and Technical Manuals is March 1992.

e. Approved Design-to-Cost Objective --

	(Average Unit Flyaway Cost) Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 84 - @ Peak Rate: 0.5/mo			
FY 82 Base-Year $	16.400	20.490	20.200
Then Year $	24.300	25.210	25.900
@ Qty 12 (1st three years) - @ Peak Rate: 0.5/mo			
FY 82 Base-Year $	23.800	34.410	28.800
Then Year $	29.900	38.360	31.700

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

LCAC Class Operating & Support (O&S) cost estimates are based on historical return costs from craft currently in the fleet and on projections based on the LCAC program Operational Support Costs and Requirements (OSCAR) data model as of December 1991. The O&S costs are presented per craft operation hour for underway and maintenance cost categories and per craft for crew personnel and indirect costs related to the infrastructure in place to support the LCACs. Direct Personnel costs are the annual cost for the five person crew manning an LCAC. Direct Operations consist of the cost of fuel, oil and lubricants to operate the craft. Direct Maintenance consists of interim maintenance support and the replacement of spares and consumable materials and equipment resulting from operations. Indirect costs include all direct and indirect training costs related to the LCAC and consumables and other technical and support services necessary to support the LCAC infrastructure. Personnel retirement costs are not included.

18b. Operating and Support Costs (Cont'd):

b. Costs — (FY 1982 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Craft - Pers / Ind Op Hour - Op / Maint	Avg Annual Cost Per N/A
Direct Personnel	0.1	N/A
Direct Operations	0.0	N/A
Direct Maintenance	0.0	N/A
Indirect Costs	0.1	N/A
Total	0.2	N/A

c. Contractor Support Costs — (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M,N	5.6	1.6	2.2	9.5	18.9
Industrial Fund	—	—	—	—	—
Total	5.6	1.6	2.2	9.5	18.9

The LCAC Direct Operations and Direct Maintenance estimated costs per operational hour are $0.3K and $2.0K respectively in FY 1982 base year dollars.

N=26 LHD 1

91-142

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LHD - 1

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
LHD 1 Amphibious Assault Ship

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
AMPHIBIOUS WARFARE AND STRATEGIC SEALIFT PROGRAM OFFICE (PMS377)
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, DC 20362-5101
MR. E.E. SHOULTS
Assigned: April 29, 1985
AV 332-8511 COMM (703) 602-8511

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0603564N (Shared) Project 0408
PE 0604567N (Shared) Project 01803, S0857
PROCUREMENT:
APPN 1611 ICN 3035 (Navy)

AS AMENDED
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

Classified by: OPNAVINST S5513.3B - 08
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(AS AMENDED)
MAR 23 1992
Office of the Chief of
Naval Operations Dept. of the Navy

92-T-0647

5. (U) Related Programs:
Landing Craft, Air Cushion (LCAC)

6. (U) Mission and Description:
The ships primary amphibious mission is to embark, deploy and land elements of a Marine landing force in an assault by helicopters, landing craft, amphibious vehicles, and by combinations of these methods. LHD 1 Class has a secondary/convertible mission for sea control and power projection. The LHD is a modification of the LHA Class design, with significant upgrades in combat systems, medical spaces, chemical biological radiological defense, aviation ordnance handling, and landing craft handling capabilities. The LHD amphibious lift capacity will partially offset the loss in lift capacity resulting from block retirements of aging amphibious ships in the 1990's.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
The LHD Program began in FY 1981 as part of an overall program to address impending block obsolescence of the Navy's amphibious lift capability. In June 1981, SECNAV proposed that the LHD have a convertible sea control mission; and, in November, directed that the Program be a modified LHA design.

A sole-source detail design and construction contract was awarded to Ingalls Shipbuilding Incorporated (ISI) in February 1984 for LHD 1. Construction began in September 1984. The ship was delivered in May 1989. Final Contract trials were completed in December 1989. A three-shot shock trial was conducted in March 1990. Post Shakedown Availability was completed in October 1990.

A competitive contract for LHD 2 (ESSEX), with options for LHD 3 (KEARSARGE) and 4 (BOXER), was awarded to ISI in September 1986. Construction on LHD 2 began in July 1988. The option for LHD 3 was exercised in November 1987 and construction began in March 1989. The option for LHD 4 was exercised in October 1988 and construction began in July 1990. LHD 5 planning began in April 1988 with CNO's direction to proceed with feasibility studies, which were completed in December 1988. Contract Design was completed in August 1990.

b. (U) Significant Developments Since Last Report --
LHD 2 was launched on 4 June 1991 and christened on 16 March 1991. Keel laying ceremony for LHD 4 was held 8 April 1991. A competitive contract for the LHD 5 was awarded to ISI on 20 December 1991. An Acquisition Program Baseline request change was approved 22 March 1991 to revise the Naval Support Date from May 90 to March 93.

The LHD 1 Program has been shown to satisfy the mission requirement.

7c. (U) Program Highlights (Cont'd):

c. (U) Changes Since As Of Date —
None.

8. (U) Threshold Breaches:
There are currently no Acquisition Program Baseline (APB) (dated 22 March 1991) breaches or unit cost breaches.

9. (U) Schedule:

a. (U) Milestones —

	Development Estimate	Approved Program	Current Estimate
Milestone I	OCT 81	OCT 81	OCT 81
Milestone II SAIP	JUL 82	JUL 82	JUL 82
Start Contract Design	AUG 82	AUG 82	AUG 82
Milestone IIIA Production-Decision	JUN 83	JUN 83	JUN 83
Award Lead Ship Contract	DEC 83	FEB 84	FEB 84
Milestone IIIB Production-Decision	JUL 85	AUG 85	AUG 85
Approve Full-Production (AFP)	AUG 85	AUG 85	AUG 85
Launch First Ship	AUG 87	AUG 87	AUG 87
Acceptance Trials (Lead Ship)	FEB 89	FEB 89	MAR 89
Lead Ship Delivery	MAR 89	MAR 89	MAY 89
Material Support Date	MAR 89	MAR 89	JUL 89
Naval Support Date	MAY 90	MAR 93	MAR 93
IOC	MAY 90	MAY 90	NOV 90

IOC - Reflects date the lead ship is ready for operational deployment.

b. (U) Previous Change Explanations —

Actual contract award was Feb 1984. Initial Builders Trials (BT) were not fully successful causing a six week delay in delivery. Due to late receipt of Provisioning Technical Documentation, the Material Support Date was rescheduled to Jul 89 and Naval Support Date was rescheduled to Oct 90. NSD was also extended to Mar 93 based on lack of support for 11 Shipbuilder Furnished Systems. IOC was rescheduled to Oct 90 due to the delivery slippage and the need for a longer Post Shakedown Availability (PSA). Subsequently, IOC was changed from Oct 90 to Nov 90 as a result of concurrent unplanned Carrier availabilities which delayed the start of PSA.

c. (U) Current Change Explanations — None.

9d. (U) Schedule (Cont'd):

d. (U) References —

(U) Development Estimate:
SECNAV Memo dated 2 December 1982, subject "LHD 1 Class Amphibious Assault Ship SAIP"; LHD 1 Class NDCP dated 15 August 1985.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 22 March 1991.

10. (U) Performance Characteristics:

a. (U) Performance —

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Troops	1873	1873	/ 1873	1894	1894
Vehicle Square (ft^2)	22900	22900	/ 22900	22900	22900
Cargo Cube (ft^3)	109000	109000	/ 109000	109000	109000
LCAC	3	3	/ 3	3	3
Length (ft)	840	844	/ 844	844	844
Beam (ft)	106	106	/ 106	106	106
Draft (full load) (ft)	26'	26'8"	/ 26'8"	26'8"	26'8"
Displacement (full load)	39400	40533	/ 40533	40533	40533
Offload Capability (tons/hr)	300	300	/ 300	300	300
Propulsion	Steam	Steam	/ Steam	Steam	Steam
Shaft Horsepower	70000	70000	/ 70000	70000	70000
No. of Screws	2	2	/ 2	2	2
Medical Facilities (operating rooms)	6	6	/ 6	6	6
Speed (knots)	22	22	/ 22	22	22

(b)(1)

b. (U) Previous Change Explanations —

The 1873 troop estimate was based on actual in place berthing accommodations on LHD 1. The 26/39,400 draft and displacement estimates were figures provided during the design development phase. The 26'8" and 40,533 reflects the full load weight estimate at the completion of the Contract Design.

10c. (U) Performance Characteristics (Cont'd):

c. (U) Current Change Explanations —

NONE

d. (U) References —

(U) Development Estimate:
SECNAV Memo dated 2 December 1982, subject "LHD 1 Class Amphibious Assault Ship SAIP"; LHD 1 Class NDCP dated 15 August 1985.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 22 March 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost —	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	39.9	48.9	42.8
Procurement	2891.9	4756.8	4973.7
Sailaway	(2872.5)		(4951.5)
Total Sailaway	(2872.5)		(4951.5)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(10.1)		(11.5)
Initial Spares	(9.3)		(10.7)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 82 Base-Year $	2931.8	4805.7	5016.5
Escalation	1519.2	1269.0	1389.0
Development (RDT&E)	(3.7)	(6.0)	(5.5)
Procurement	(1515.5)	(1263.0)	(1383.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	4451.0	6074.7	6405.5

b. (U) Quantity —			
Development (RDT&E)	0	N/A	0
Procurement	3	6	6
Total	3	6	6

c. (U) Foreign Military Sales — None.

d. (U) Nuclear Costs — None.

11e. (U) Total Program Cost and Quantity (Cont'd):

e. (U) References --

(U) Development Estimate:
SECNAV Memo dated 2 December 1982, subject "LHD 1 Class Amphibious Assault Ship SAIP"; LHD 1 Class NDCP dated 15 August 1985.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 22 March 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6405.5	5038.2	6405.5
(2) Quantity	6	5	6
(3) Unit Cost	1067.58	1007.64	1067.58
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	18.7	18.7	36.0
Less CY Adv Proc	18.7	18.7	36.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Note: Outfitting and Post Delivery Costs of $18.7M are reflected in the Current Estimate CY Advance Procurement line in FY 1992. The Budget Year UCR Baseline for FY 1993 includes $36.0M of outfitting and post delivery in the CY Advance Procurement line.

13. (U) Cost Variance Analysis:

a. (U) Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	43.6	4407.4	0.0	4451.0
Previous Changes:				
Economic	-0.1	-1407.0	-	-1407.1
Quantity	-	+3006.3	-	+3006.3
Schedule	+4.5	+40.5	-	+45.0
Engineering	-	-5.9	-	-5.9
Estimating	+0.3	-1128.4	-	-1128.1
Other	-	-	-	-
Support	-	+77.0	-	+77.0
Subtotal	+4.7	+582.5	-	+587.2
Current Changes:				
Economic	-0.2	-91.7	-	-91.9
Quantity	-	+1086.3	-	+1086.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.2	+449.7	-	+449.9
Other	-	-	-	-
Support	-	-77.0	-	-77.0
Subtotal	-	+1367.3	-	+1367.3
Total Changes	+4.7	+1949.8	-	+1954.5
Current Estimate	48.3	6357.2	-	6405.5

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	39.9	2891.9	0.0	2931.8
Previous Changes:				
Quantity	-	+1870.3	-	+1870.3
Schedule	+3.4	+52.1	-	+55.5
Engineering	-	-5.6	-	-5.6
Estimating	-0.6	-830.1	-	-830.7
Other	-	-	-	-
Support	-	+44.3	-	+44.3
Subtotal	+2.8	+1131.0	-	+1133.8
Current Changes:				
Quantity	-	+687.9	-	+687.9
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.1	+304.4	-	+304.5
Other	-	-	-	-
Support	-	-41.5	-	-41.5
Subtotal	+0.1	+950.8	-	+950.9
Total Changes	+2.9	+2081.8	-	+2084.7
Current Estimate	42.8	4973.7	-	5016.5

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised economic escalation rates.
Schedule: Increase based on Rephasing of R&D to accommodate rescheduling of FY92 ship to FY91.
Estimating: Decrease based on returned cost for LHD 2, 3, and 4. Increases based on repricing of program requirements for LHD 4, 5, and 6; and increase to complete contract design on LHD 5.

PROCUREMENT
Economic: Revised economic escalation rates.
Quantity: Increase based on Addition of LHD 4 and 5 including associated advance procurement.

13b. (U) Cost Variance Analysis (Cont'd):

Schedule: Increase based on mis-categorization of acquisition strategy change from Schedule to Estimating. Decrease based on rescheduling of LHD 5 ship and associated Advance Procurement.

Engineering: Decrease based on deletion of expanded Collective Protection System for LHD 5. Increase based on configuration for combat and ship system improvement.

Estimating: Reductions based on very favorable competitive Basic award (LHD 2, 3 and 4); returned cost for completed program; reduction for acquisition strategy change from annual to Multi-year procurement for LHD 5, 6, and 7; CAAS reduction for Civil Service Conversion; reduction for GFE repricing; and mis-categorization of acquisition strategy change from Schedule. Increases based on revised Program estimates for multiyear procurement (LHD 2, 3, and 4).

Support: Increase in Outfitting and Post Delivery associated with LHD 2, 3 and 4; increased post delivery to cover trial card deficiencies on LHD 1; reductions reflecting deletion of FY93 ship and returned cost for outfitting on LHD 1.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation rates (Economic)	N/A	-0.2
Current & Prior Year Inflation Offset (Estimating)	0.1	0.2
Total Changes	0.1	--

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised economic escalation rates (Economic)	N/A	-91.7
Addition of FY96 ship (Quantity)	660.0	1039.8
Estimating change associated with additional ship (Estimating)	108.0	176.4
Revised cost estimate based on LHD 5 bid price (Estimating)	122.4	164.5
Current & Prior Year Inflation Offset (Estimating)	75.2	97.0
Revised cost estimates (Estimating)	-7.2	-10.0
Outfitting & post delivery revised estimates (Estimating)	-7.6	-8.7
Mis-categorization of outfitting and post delivery as Support vice sailaway in prior SARs. (Support)	-41.5	-77.0
Correction of prior SAR outfitting and post delivery changes from Support to Quantity. (Quantity)	27.9	46.5
Correction of prior SAR outfitting and post delivery changes from Support to Estimating (Estimating)	13.6	30.5
Total Changes	950.8	1367.3

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1483.7	-249.8	-59.7	7.5	-1.0	-113.0	--	--	-416.0	1067.6

*** [redacted] ***

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) Procurement --

(U) LHD 2 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
INGALLS SHIPBUILDING INC., PASCAGOULA, MS N00024-86-C-2005, FPI Award: September 10, 1986 Definitized: September 10, 1986	$401.3	$453.3	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$483.3	$546.8	1	$540.7	$540.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-11.3	$-5.2
Cumulative Variances To Date (12/29/91)	$-33.7	$-10.7
Net Change	$-22.4	$-5.5

Explanation of Change:

Cost Variance: The majority of unfavorable change is reported by the Contractor to be a net labor, overhead, and material growth offset by G&A and cost of money savings.

Schedule Variance: The majority of unfavorable change is reported by the Contractor to be identified with labor, material and burden performance. The Program Manager predicts a 2 month slip in the current schedule.

The PM's Estimated Price at Completion takes these variances into consideration.

The Program Manager's Estimated Price at Completion is equal to the Ceiling Price for the construction effort but slightly under target price for the long lead time material effort. The PM's LRE exceeds ceiling by $55.2M. The projected contractor loss is reduced to $48.3M when the potential ILS Award Fee and Cost of Money are considered.

(U) LHD 3 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
INGALLS SHIPBUILDING INC., PASCAGOULA, MS N00024-86-C-2005, FPI Award: November 20, 1987 Definitized: November 20, 1987	$380.4	$409.2	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$406.8	$438.2	1	$438.2	$438.2

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-9.2	$-13.4
Cumulative Variances To Date (12/29/91)	$-4.8	$-12.8
Net Change	$4.4	$0.6

Explanation of Change:

Cost Variance: The majority of favorable change is reported by the Contractor to be labor and overhead performance to date.

Schedule Variance: The favorable change is considered insignificant.

The PM's Estimated Price at Completion takes these variances into consideration.

The Program Manager's Estimated Price at Completion is equal to the Ceiling Price. The PM's LRE exceeds ceiling by $76.8M. The projected contractor loss is reduced to $72.4M when the potential ILS Award Fee and Cost Of Money are considered.

(U) LHD 4 CONSTRUCTION:
INGALLS SHIPBUILDING, INC, PASCAGOULA, MS
N00024-86-C-2005, FPI
Award: October 3, 1988
Definitized: October 3, 1988

Initial Contract Price		
Target	Ceiling	Qty
$366.9	$391.4	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$391.9	$418.9	1	$418.9	$418.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-13.2	$1.8
Cumulative Variances To Date (12/29/91)	$-16.9	$-21.4
Net Change	$-3.7	$-23.2

Explanation of Change:

Cost Variance: The majority of unfavorable change is reported by the Contractor to be identified with material growth

Schedule Variance: The majority of unfavorable change is reported by the Contractor to be identified with both labor and material performance being behind schedule. The Program Manager predicts a 6 month slip in the current schedule.

The PM's Estimated Price at Completion takes these variances into

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)
consideration.

The Program Manager's Estimated Price at Completion is equal to the Ceiling Price. The PM's LRE exceeds ceiling by $94.4M. The projected contractor loss is reduced to $90.6M when the potential ILS Award Fee and Cost of Money are considered.

(U) LHD 5 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
INGALLS SHIPBUILDING, INC, PASCAGOULA, MS N00024-92-C-2204, FPI Award: December 20, 1991 Definitized: December 20, 1991	$707.0	$808.0	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$707.0	$808.0	1	$707.0	$725.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/29/91)	N/A	N/A
Net Change	$0.0	$0.0

Explanation of Change:

Variance information is not available since this is a new award and Cost Performance Reports are not due yet.

The Program Manager's Estimated Price at Completion is based on a project overrun of $37.0M which results in a contractor profit of $67.0.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status —

(1) Percent Program Completed: 57.1% (12 yrs/21 yrs)

(2) Percent Program Cost Appropriated: 79.2% ($5072.5 / $6405.5)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY81-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2001)	Total
RDT&E	48.3	-	-	-	48.3
Procurement	5005.5	18.7	36.0	1297.0	6357.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	5053.8	18.7	36.0	1297.0	6405.5

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1981				0.9	0.9	0.9	0.9	10.6
1982				11.1	11.4	11.3	11.2	7.6
1983				17.9	19.2	19.2	18.8	4.9
1984				0.8	0.9	0.9	0.9	3.8
1985				1.7	2.0	2.0	1.9	3.4
1986				0.3	0.4	0.4	0.4	2.8
1987				0.5	0.6	0.6	0.6	2.7
1988				0.6	0.8	0.8	0.8	3.0

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1989				2.8	3.7	3.7	3.5	4.2
1990				5.5	7.4	6.7	5.8	4.0
1991				0.7	1.0	1.0	0.8	3.9
Subtot				42.8	48.3	47.5	45.6	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1982				41.3	45.0	45.0	45.0	7.5
1983				48.6	53.7	53.7	53.0	3.8
1984	1	150.0	1115.2	1161.4	1307.8	1304.8	1279.1	3.6
1985				34.2	39.2	39.2	30.2	2.1
1986	1		760.8	702.0	822.0	775.4	676.2	1.1
1987				30.3	36.2	36.0	30.4	1.5
1988	1		637.1	614.7	756.6	650.7	486.6	2.3
1989	1		630.0	604.6	765.8	614.4	331.1	2.8
1990				33.4	43.6	46.4	13.7	1.3
1991	1		890.4	844.7	1135.6	713.9	8.7	1.3
1992				13.5	18.7	0.3		3.1
1993				25.1	36.0			3.3

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1994				11.6	17.2			3.3
1995				17.1	26.1			3.3
1996	1		768.0	749.0	1180.0			3.2
1997				14.6	23.8			3.2
1998				0.5	0.8			3.2
1999				4.0	7.0			3.2
2000				10.0	17.9			3.2
2001				13.1	24.2			3.2
Subtot	6	150.0	4801.5	4973.7	6357.2	4279.8	2954.0	
Grand Total	6	150.0	4801.5	5016.5	6405.5	4327.3	2999.6	

17. (U) Production Rate Data:

a. (U) Annual Production Rates — None.

b. (U) Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	5016.5	N/A	
(TY $)	N/A	N/A	6405.5	N/A	
PAUC Cost (BY $)	N/A	N/A	836.083	N/A	N/A
(TY $)	N/A	N/A	1067.583	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) —

	To Date
RDT&E	0/0
Procurement	1/1

e. (U) Approved Design-to-Cost Objective — N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules —

LHD 1 Class O&S cost estimates were developed September 1991 based on historical return costs from LHA 1 Class ships and are approximations using a mathematical model. The LHD 1 Class O&S cost estimates are given as an average annual O&S cost for each ship of the class. The estimates are in FY82 constant dollars, the year of the first construction contract for an LHD 1 Class ship. Direct personnel

18a. (U) Operating and Support Costs (Cont'd):
costs are the annual cost for enlisted and officers based on LHD 1 manning levels. Direct operations include the cost of fuel, repair parts, supplies, training expended stores and purchased services. Direct maintenance is intermediate and depot maintenance costs. Indirect costs include training, publications, ammo handling, engineering and technical services. Personnel retirement costs are now included in Indirect costs.

b. (U) Costs — (FY 1982 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per LHD 1	Avg Annual Cost Per LHA 1
Direct Personnel	17.6	14.1
Direct Operations	9.6	10.3
Direct Maintenance	21.3	16.8
Indirect Costs	7.1	0.8
Total	55.6	42.0

c. (U) Contractor Support Costs — None.

AF-19 PEACEKEEPER

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91-017

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: PCKR IN MM SILO

AS OF DATE: December 31, 1991

INDEX

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 3 1992
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
LGM-118A/Land Based ICBM (Peacekeeper)

2. (U) DoD Component: USAF

3. (U) Responsible Office and Telephone Number:
BMO/MV
BALLISTIC MISSILE ORGANIZATION
NORTON AFB
SAN BERNARDINO, CA 92409-6468
COL J. WAYNE SHATTUCK
Assigned: June 1, 1989
AV 876-6421 COMM 714/382-6421

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0604312F (Shared) Project
PROCUREMENT:
APPN 3020 ICN MMXOLG (Air Force)
APPN 3020 ICN MMXYO (Air Force)
MILCON:
PE 0101215F

SAF/PAS
92-225 -T

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~~Declassify on: OADR~~
~~Downgrade~~ Instructions: Not Subject to ~~Automatic Downgrade~~

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5. (U) **Related Programs:**
Small ICBM, Peacekeeper Rail Garrison

6. (U) **Mission and Description:**
The mission of the Peacekeeper weapon system is to enhance the deterrent posture of US strategic forces. Should deterrence fail, Peacekeeper must be able to effectively attack the full spectrum of designated targets with nuclear weapons. The system must provide a prompt retaliatory capability. The Peacekeeper missile has three solid propellant stages and a liquid fueled post-boost vehicle capable of delivering 10 multiple independently targetable reentry vehicles. This system replaces 50 Minuteman III missiles, but does not replace the Minuteman system.

7. (U) **Program Highlights:**
a. (U) Significant Historical Developments --
DSARC I, held in 1976, selected Trench & Horizontal Multiple Protective Shelters for further validation. In 1978, at DSARC II the Air Force recommended use of multiple vertical protective structures as the basing mode.

In 1981, the horizontal multiple protective shelter basing mode was terminated and the President directed production of 100 M-X missiles. The President also directed interim deployment of 40 missiles in existing Minuteman and Titan silos while long-term basing options of deep basing, defended fixed basing, defended deceptive basing, and continuous patrol aircraft were studied. In late 1982, the President directed Closely Spaced Basing at F.E. Warren AFB, Wyoming. At this point, the M-X was given the name "Peacekeeper." In April 1983, the President recommended deployment of 100 Peacekeeper missiles in 100 Minuteman silos at F.E. Warren AFB. Direction was received in July 1985 to deploy not more than 50 missiles in Minuteman silos at F.E. Warren AFB. IOC was achieved in December 1986. Program needs have been successfully met and FOC was achieved in December 1988, within cost and schedule.

The R&D flight test program was completed in March 1989 with 18 successful flight tests. The system displayed accuracies better than the requirement at maturity. The SAC Operational Test and Evaluation (OT&E) program began in June 1989.

b. (U) Significant Developments Since Last Report --
The fifth launch in the OT&E program (GT-05) that took place in March 91 exhibited the best accuracy to date. The sixth launch took place on 11 June 91. It was the first launch to carry a Global Positioning System (GPS) package. The Peacekeeper test program was enhanced by the Simulated Electronic Launch Peacekeeper (SELP) capability delivered to SAC in March 91. SELP provides the capability to demonstrate critical hardware functions that cannot be tested during

7b. (U) Program Highlights (Cont'd):

normal operations without expending Peacekeeper Aerospace Vehicle Equipment (AVE) systems. Guidance system reliability has improved significantly as a result of changes to the IMU and SFIR. Mean time between recycles increased to 8130 hours, exceeding the mature subsystem goal of 6210 hours.

This system will satisfy mission requirements.

c. (U) Changes Since As Of Date --
On 28 Jan 92, the President directed the halt of new Peacekeeper production. This decision reduces the acquisition program to 102 missiles: 50 deployed, 37 for operational test and evaluation, and 15 for aging and surveillance. Contracts for FY91 procurement of solid motors will not be awarded. Baseline remains 114, awaiting Congressional recision of FY91 procurement.

8. (U) Threshold Breaches:
No Acquisition Program Baseline (APB) or Nunn-McCurdy threshholds have been breached (ref: APB dated 3 February 1991).

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Milestone I	MAR 76	MAR 76	MAR 76
Milestone II	DEC 78	DEC 78	DEC 78
Systems Design Review	FEB 80	FEB 80	FEB 80
Preliminary Design Review	AUG 80	AUG 80	AUG 80
Stage Destruct Test Complete	JUL 82	JUL 82	JUL 82
Ordnance Induced Shock Tests Complete	DEC 82	DEC 82	DEC 82
First Flight	JAN 83	JUN 83	JUN 83
Structure Load Tests Complete	JUN 83	JUN 83	JUN 83
First Production Contract Award	JAN 84	JAN 84	JAN 84
Propulsion Flight Proof Tests Complete	APR 84	JUL 84	JUL 84
First Assets Delivered (was IOC)	DEC 86	DEC 86	DEC 86
Full Operational Capability (FOC)	N/A	DEC 88	DEC 88

b. (U) Previous Change Explanations --

First flight delayed due to development problems and congressional restrictions which ran concurrently from January to June 1983. Propulsion Flight Proof Tests were completed late due to a redesign of the Stage IV propellant tank which required an additional flight proof test in July 1984.

9c. (U) Schedule (Cont'd):

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
SDDM, dated February 14, 1980.

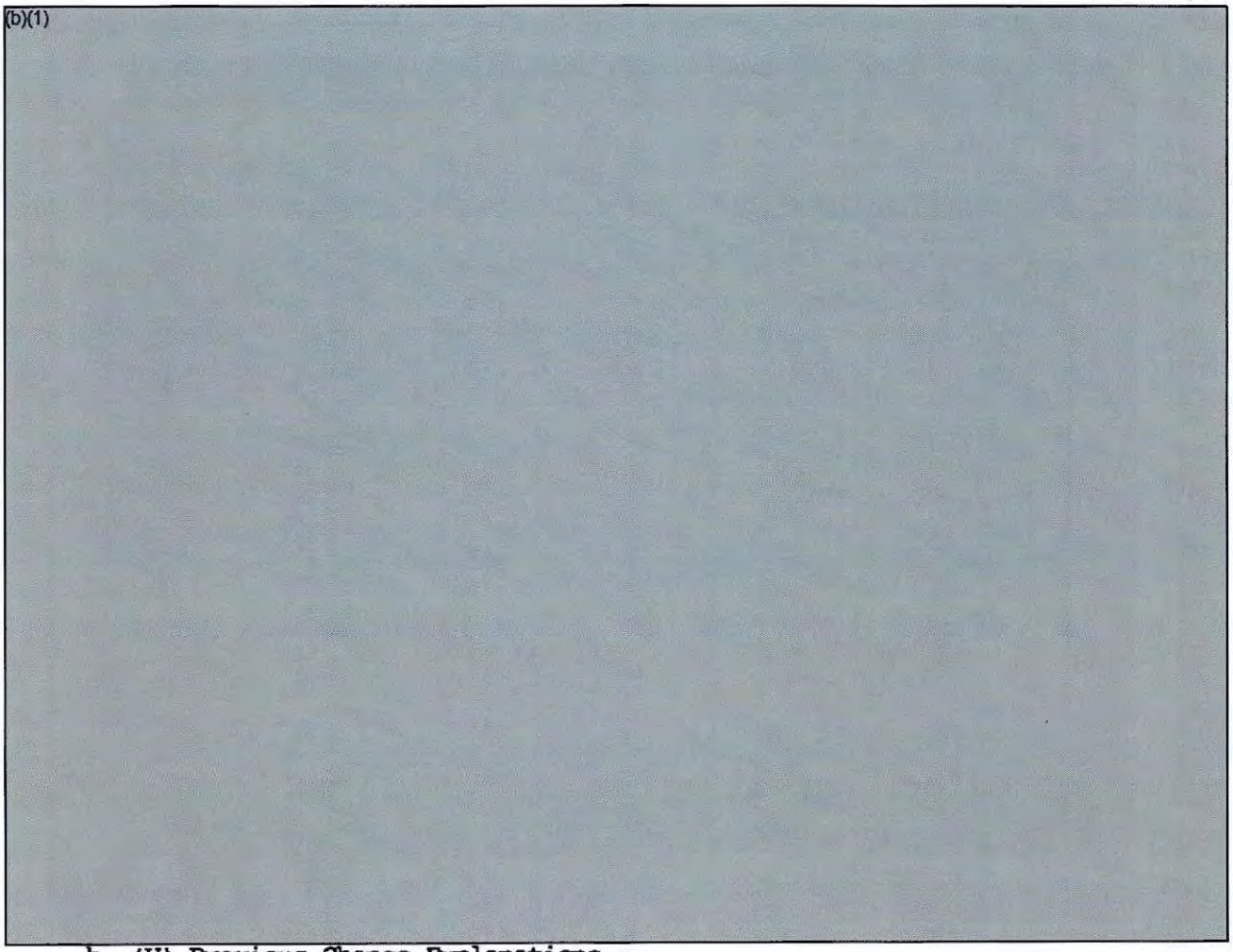
(U) Approved Program:
AFAE Approved Acquisition Program Baseline dated 3 February 1991.

10. (U) Performance Characteristics:

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

(b)(1)



b. (U) Previous Change Explanations --

The previous Current Estimate MEF was a result of previous changes in Targeting Efficiency and Countdown/Flight Reliability. The increase in Countdown and Flight Reliability had resulted from test results and analysis of additional flight test data.

c. (U) Current Change Explanations --

(Ch-1) Countdown and flight reliability, and in turn, MEF, have decreased due to performance of one type of nosetip. This nosetip type is being replaced by a better performing one. The current reliability is based on the current mix of nosetip types in the operational force. Reliability will improve as the mix continues to shift toward exclusive use of the better nosetips.

(Ch-2) The computed accuracy current estimate has improved due to additional test data points reducing the uncertainty of errors in the

10c. (U) Performance Characteristics (Cont'd):
accuracy estimate.

d. (U) References --

(U) Development Estimate:
SDDM, dated February 14, 1980.

(U) Approved Program:
AFAE Approved Acquisition Program Baseline dated 3 February 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	6018.2	5745.4	5722.3
Procurement	10292.0	7066.1	7037.3
Total Flyaway	(6645.9)		(4641.4)
Total Flyaway	(6645.9)		(4641.4)
Total Other Weapon Systems	(2546.2)		(952.6)
Total Other Wpn Sys	(2546.2)		(952.6)
Peculiar Support	(795.7)		(1136.5)
Initial Spares	(304.2)		(306.8)
Construction (MILCON)	324.7	192.2	191.6
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 82 Base-Year $	16634.9	13003.7	12951.2
Escalation	5045.3	3216.3	3233.2
Development (RDT&E)	(878.9)	(686.2)	(681.3)
Procurement	(4086.2)	(2494.1)	(2516.3)
Construction (MILCON)	(80.2)	(36.0)	(35.6)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	21680.2	16220.0	16184.4

These total costs correspond to the $17.4B estimate (FY 82 dollars), $23.5B TY, for the Peacekeeper program based on the Report by the President's Commission on Strategic Forces, April 1983, and the President's letter, 19 April 1983, transmitting the Strategic Forces Technical Assessment Review (31 March 1983), to the Congress. It does not include $3199.5 in FY 82 and prior missile costs (development of flight test missiles and all equipment leading to first flight) or $1399.2 in FY 83 and prior spent on earlier basing modes (Multiple Protective Shelters, horizontal shelter system, interim deployment in 40 Minuteman silos, and Closely Spaced Basing)(then-year dollars in millions). Rail Garrison costs are included in the Rail Garrison Basing mode SAR.

Construction figure does not include $86.1M in FY82 and prior year

11a. (U) Total Program Cost and Quantity (Cont'd):
funds (then-year dollars) associated with earlier basing modes.

The 114 production missiles equates to 50 deployed missiles, 49 operational test and evaluation missiles, and 15 aging and surveillance missiles. If this system is projected to remain in the inventory beyond its 15 year service life, this number may need to be increased to provide sufficient assets for system effectiveness and reliability testing.

b. (U) Quantity --

Development (RDT&E)	0	N/A	0
Procurement	223	114	114
Total	223	114	114

The PIMS Program has 20 R&D units which were not considered fully configured end items ~~for the purposes of this table.~~

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
SDDM, dated February 14, 1980.

(U) Approved Program:
AFAE Approved Acquisition Program Baseline dated 3 February 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	16184.4	16231.4	16184.4
(2) Quantity	114	114	114
(3) Unit Cost	141.97	142.38	141.97

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	194.5	194.5	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus FY Adv Proc	0.0	0.0	0.0
Net Total	194.5	194.5	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

The total quantity of 114 missiles supports the service life of 15 years. The total quantity consists of 50 deployed missiles, 49 operational test and evaluation missiles, and 15 aging and surveillance missiles.

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	6897.1	14378.2	404.9	21680.2
Previous Changes:				
Economic	-147.8	-420.8	-6.5	-575.1
Quantity	-	-5815.6	-	-5815.6
Schedule	-	+1059.9	-	+1059.9
Engineering	-	-517.8	-97.1	-614.9
Estimating	-335.9	+2844.5	-14.7	+2493.9
Other	-	-	-	-
Support	-0.8	-1936.8	-59.4	-1997.0
Subtotal	-484.5	-4786.6	-177.7	-5448.8
Current Changes:				
Economic	-1.0	-26.1	-0.1	-27.2
Quantity	-	-443.0	-	-443.0
Schedule	-	+101.7	-	+101.7
Engineering	-	-63.8	-	-63.8
Estimating	-8.0	+233.9	+0.1	+226.0
Other	-	-	-	-
Support	-	+159.3	-	+159.3
Subtotal	-9.0	-38.0	-	-47.0
Total Changes	-493.5	-4824.6	-177.7	-5495.8
Current Estimate	6403.6	9553.6	227.2	16184.4

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	6018.2	10292.0	324.7	16634.9
Previous Changes:				
Quantity	-	-3286.6	-	-3286.6
Schedule	-	+17.6	-	+17.6
Engineering	-	-318.4	-72.5	-390.9
Estimating	-290.0	+1688.4	-11.4	+1387.0
Other	-	-	-	-
Support	-1.3	-1348.9	-49.2	-1399.4
Subtotal	-291.3	-3247.9	-133.1	-3672.3
Current Changes:				
Quantity	-	-247.3	-	-247.3
Schedule	-	+2.9	-	+2.9
Engineering	-	-46.6	-	-46.6
Estimating	-4.6	+185.5	-	+180.9
Other	-	-	-	-
Support	-	+98.7	-	+98.7
Subtotal	-4.6	-6.8	-	-11.4
Total Changes	-295.9	-3254.7	-133.1	-3683.7
Current Estimate	5722.3	7037.3	191.6	12951.2

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices.

Estimating: Adjustment for current and prior year inflation.
Adjustment to Budget Authority FY87 increased risk to the program.
Adjustment for overinflated funding profile.
Adjustment for combined command withdrawal/withhold.

Support: Reduce development test data analysis to live within fiscal constraints. Reinstate essential development test data analysis previously reduced by fiscal constraints.

13b. (U) **Cost Variance Analysis (Cont'd):**

PROCUREMENT

Economic:	Revised economic escalation indices.
Quantity:	Increased missile buy quantity by 12 to support Rail Garrison Basing. Reduction of 62 missiles. Further reduction of 59 additional missiles.
Schedule:	Adjustment for reduced annual purchases from 21 to 12 missiles.
Engineering:	Removal of hardware to support 2nd 50 UE missiles. Increase of 3 reentry systems for rebasing. Funds from AFLC to accomplish Sustaining Engineering. Deletion of 3 reentry systems.
Estimating:	Adjustment for reduced annual purchases from 21 to 12 missiles, current and prior year inflation, and a reduction in program funding. Adjustment for overinflated funding profile. Reduction for Military Personnel. Reduction for Government Furnished Material. IMU negotiation savings. Command withdrawal and reprogramming. Adjustment for current and prior year escalation.
Support:	Adjustment for reduced annual purchases from 21 to 12 missiles, current and prior year inflation, and an adjustment to the purchasing of initial spares (PBD 170). Removal of support for last 62 missiles. Removal of spares and support equipment for deployment of second 50 UE missiles. Addition of START program support. Deletion of support to 59 reduced missiles.

MILCON

Economic:	Revised economic escalation indices.
Estimating:	Adjustment for current and prior year inflation and refinement of estimate for storage facilities based on schedule change (May 88 Financial Review).
Support:	Removal of planning and design funds included in 30 June 89 SAR. This change was direced by higher headquarters since these funds were not considered program unique.

13c. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices (Economic)		-1.7
Economic adjustment/allocation due to reduced program requirement (Economic)		0.7
Current and prior year inflation offset (Estimating)	1.4	1.6
Combined Command withhold/withdrawal as a result of reduced requirements. (Estimating)	-6.0	-8.9
Adjustment/allocation resulting from reduced program requirement (Estimating)		-0.7
Total Changes	-4.6	-9.0

PCKR IN MM SILO, December 31, 1991

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised economic escalation indices (Economic)		-27.3
Adjustment/allocation due to reduced program requirements (Economic)		1.2
Correction to Dec 90 SAR as a result of a negative program change (Quantity)	-247.3	-443.0
Correction to Dec 90 SAR as a result of a negative program change (Schedule)	2.9	101.7
Correction to Dec 90 SAR as a result of a negative program change (Engineering)	-46.6	-63.8
Current and prior year inflation offset (Estimating)	17.0	26.1
Removal of funds associated with START (Estimating)	-12.2	-19.5
Correction to Dec 90 SAR as a result of a negative program change (Estimating)	291.0	405.1
Reduced requirements/negotiation savings (Estimating)	-110.3	-177.8
Increased support as a result of contract closeouts (Support)	98.7	159.3
Total Changes	-6.8	-38.0
(3) MILCON		
Revised economic escalation indices (Economic)		-0.1
Current and prior year inflation offset (Estimating)		0.1
Total Changes	--	--

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
97.22	-5.28	38.06	10.19	-5.95	23.86	—	-16.12	44.76	141.97

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) Procurement --

(U) REENTRY SYS FY88/89/90:	Initial Contract Price		
	Target	Ceiling	Qty
TEXTRON DEFENSE SYSTEMS, WILMINGTON, MA			
F04704-88-C-0053, FPI/CPF	$75.3	$79.6	12
Award: January 27, 1989			
Definitized: January 27, 1989			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$152.5	$154.4	44	$152.5	$150.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (10/27/91)	$5.5	$-3.1
Net Change	$5.5	$-3.1

Explanation of Change:

This Textron contract replaces the Martin Marietta 064 contract which was reported as 90% complete in the last SAR.

The ceiling price only applies to the FPI portion of the contract. The target price pertains to both the FPI and CPF portions.

The decrease in unfavorable schedule variance is due to receipt of some delinquent subcontractor material.

The increase in favorable cost variance is a result of a reduction in the supporting project management.

The difference between the Contractor and the Program Manager Estimated Price At Completion is attributed to independent forecasting methodologies used to price the work remaining. Both estimates are within approved funding.

15. (U) **Contract Information: Cont'd** (Then-Year Dollars in Millions)

The current cost and schedule variances are not forecasted to impact the contract performance at completion.

(U) MGCS, 88/89/90:	Initial Contract Price		
	Target	Ceiling	Qty
ROCKWELL INTERNATIONAL, ANAHEIM, CA F04704-88-C-0096, FPI/CPF Award: April 14, 1989 Definitized: April 14, 1989	$196.9	$207.7	44

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$376.6	$312.1	56	$376.6	$375.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$4.2	$0.6
Cumulative Variances To Date (11/01/91)	$10.3	$1.3
Net Change	$6.1	$0.7

Explanation of Change:

The ceiling price only applies to the FPI portion of the contract. The target price pertains to both the FPI and CPF portions.

The positive net change in the cost and schedule variances are due to manufacturing efficiencies and favorable indirects. These favorable variances are expected to erode in the next year as the contractor reduces the production rate from 2 per month to 1 per month.

The increase in the Current Contract Target Price is due to the addition of the Peacekeeper Support Program III, a cost plus sustaining engineering program which supports the production contract.

The increase in the Current Contract Ceiling Price is due to the addition of Engineering Change Proposals to the production contract. The driver is the addition of the -91 Operational Ground Program/Operational Flight Program (OGP/OFP) update.

The difference between the Contractor and the Program Manager Estimated Price At Completion is attributed to independent forecasting methodologies used to price the work remaining. Both estimates are within approved funding.

The current cost and schedule variances are not forecasted to impact the contract performance at completion.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) PBV, FY 88/89/90:	Initial Contract Price Target	Ceiling	Qty
ROCKWELL INTERNATIONAL, CANOGA PARK, CA F04704-89-C-0009, FPI/CPF Award: May 1, 1989 Definitized: May 1, 1989	$107.1	$110.6	32

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$155.2	$157.9	45	$155.2	$156.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$1.8	$1.6
Cumulative Variances To Date (11/01/91)	$1.5	$1.6
Net Change	$-0.3	$0.0

Explanation of Change:

The ceiling price only applies to the FPI portion of the contract. The target price pertains to both the FPI and CPF portions.

The decrease in the target and ceiling prices are due to cancellation of hardware refurbishments which would have been needed for second source testing. Additionally, Test and Evaluation requirements were eliminated for cable sets and thrust vector actuators.

The decrease in favorable cost variance is due to an increase in labor rates.

The difference between the Contractor and the Program Manager Estimated Price At Completion is attributed to independent forecasting methodologies used to price the work remaining. Both estimates are within approved funding.

The current cost and schedule variances are not forecasted to impact the contract performance at completion.

(U) STAGE III, FY 88/89/90:	Initial Contract Price Target	Ceiling	Qty
HERCULES, MAGNA, UT F04704-88-C-0035, FPIF Award: May 1, 1989 Definitized: May 1, 1989	$151.9	$165.2	32

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$208.1	$225.6	45	$208.1	$196.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$6.3	$-3.8
Cumulative Variances To Date (10/31/91)	$8.4	$-4.2
Net Change	$2.1	$-0.4

Explanation of Change:

The increase in favorable cost variance is due to aggressive overhead management. The increase in unfavorable schedule variance is due to rewelding of noncompliant gas generators.

The increase in target and ceiling prices are due to qualification of North American Rayon materials and the re-qualification of Ammonium Perchlorate (propellant) materials.

The difference between the Contractor and the Program Manager Estimated Price At Completion is attributed to independent forecasting methodologies used to price the work remaining. Both estimates are within approved funding.

The current cost and schedule variances are not forecasted to impact the contract performance at completion.

(U) STAGE II, FY 88/89/90:	Initial Contract Price		
	Target	Ceiling	Qty
AEROJET, SACRAMENTO, CA F04704-88-C-0025, FPI/CPF Award: August 1, 1989 Definitized: August 1, 1989	$190.9	$191.7	37

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$274.5	$300.6	45	$274.5	$275.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.9	$-2.1
Cumulative Variances To Date (10/18/91)	$-2.5	$-4.8
Net Change	$-3.4	$-2.7

Explanation of Change:

The ceiling price only applies to the FPI portion of the contract. The target price pertains to both the FPI and CPF portions.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

The increase in target and ceiling prices are due to qualification of North American Rayon materials and the re-qualification of Ammonium Perchlorate (propellant) materials.

The increase in unfavorable cost variance is attributable to unfavorable indirect rates. The increase in unfavorable schedule variance is due to nozzle/flexseal process problems and late vendor deliveries.

The difference between the Contractor and the Program Manager Estimated Price At Completion is attributed to independent forecasting methodologies used to price the work remaining. Both estimates are within approved funding.

The current cost and schedule variances are not forecasted to impact the contract performance at completion.

(U) STAGE I, FY 88/89/90:	Initial Contract Price		
	Target	Ceiling	Qty
THIOKOL CORPORATION, BRIGHAM CITY, UT			
F04704-88-C-0015, FPI/CPF	$225.9	$242.4	32
Award: August 1, 1989			
Definitized: August 1, 1989			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$326.0	$352.4	45	$326.0	$334.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$3.8	$-6.6
Cumulative Variances To Date (10/27/91)	$-4.3	$-1.0
Net Change	$-8.1	$5.6

Explanation of Change:

The ceiling price only applies to the FPI portion of the contract. The target price pertains to both the FPI and CPF portions.

The significant increase in target and ceiling prices are due to the exacting requirements of the Strategic Arms Reduction Treaty (START) in addition to purchases of Ammonium Perchlorate (propellant) as schedule protection.

The unfavorable change in cost variance is due to unfavorable rate changes, second source qualifications, and production anomaly investigations. The decrease in unfavorable schedule variance is due to improved vendor material delivery performance and subcontract

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)
production rates.

The difference between the Contractor and the Program Manager Estimated Price At Completion is attributed to independent forecasting methodologies used to price the work remaining. Both estimates are below ceiling price.

The current cost and schedule variances are not forecasted to impact the contract performance at completion.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 83.3% (10 yrs/12 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($16182.4 / $16184.4)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94)	Total
RDT&E	6398.7	2.9	1.0	1.0	6403.6
Procurement	9359.1	194.5	-	-	9553.6
MILCON	227.2	-	-	-	227.2
O&M	-	-	-	-	-
Total	15985.0	197.4	1.0	1.0	16184.4

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1983				1789.1	1912.6	1911.3	1910.9	4.9
1984				1766.5	1962.6	1928.5	1925.2	3.8
1985				1324.4	1520.4	1499.5	1474.4	3.4
1986				568.7	668.8	663.1	639.2	2.8
1987				207.3	252.3	244.2	198.6	2.7
1988				27.6	34.7	34.0	32.2	3.0
1989				22.6	29.6	29.1	21.7	4.2
1990				7.5	10.2	10.2	9.6	4.0
1991				5.3	7.5	5.3	2.8	3.9
1992				2.0	2.9	0.3	0.1	3.1
1993				0.7	1.0			3.3
1994				0.6	1.0			3.3
Subtot				5722.3	6403.6	6325.5	6214.7	

Obligations and expenditures reflect program office records as of 31 January 1992.

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force								
1984	21	222.5	987.5	1718.6	2143.1	2045.1	2010.1	8.0
1985	21	7.8	748.8	1871.5	2399.3	2240.2	2056.3	3.4
1986	12		565.8	754.5	1012.5	904.9	873.4	2.8
1987	12		528.5	760.5	1061.6	984.2	916.3	2.7
1988	12		538.8	597.7	867.2	857.2	794.5	3.0
1989	12		462.9	504.3	757.5	737.9	481.6	4.2
1990	12		368.8	390.4	604.7	548.0	90.3	4.0
1991	12		210.0	321.8	513.2	154.5	73.4	3.9
1992				118.0	194.5	61.0	6.3	3.1
Subtot	114	230.3	4411.1	7037.3	9553.6	8533.0	7302.2	

Obligations and expenditures reflect program office records as of 31 January 1992.

Appropriation: 3300 Military Construction, Air Force								
1983				15.0	16.7	12.1	12.0	4.9
1984				27.1	31.2	26.1	26.0	3.8
1985				81.4	95.7	60.6	56.8	3.4
1986				43.9	53.1	32.3	30.3	2.8

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3300 Military Construction, Air Force (Cont'd)								
1987				20.7	25.9	22.3	22.3	2.7
1988				3.5	4.6	4.5	2.5	3.0
Subtot				191.6	227.2	157.9	149.9	
Grand Total	114	230.3	4411.1	12951.2	16184.4	15016.4	13666.8	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1984	19	14	21	48
1985	28	24	21	48
1986	30	17	12	48
1987	48	14	12	0
1988	48	34	12	0
1989	48	48	12	0
1990	0	48	12	0
1991	0	48	12	0

17b. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	16160.2	-3209.0	12951.2	+2052.6	10898.6
(TY $)	20907.4	-4723.0	16184.4	+3538.4	12646.0
PAUC Cost (BY $)	N/A	N/A	113.607	+18.005	95.602
(TY $)	N/A	N/A	141.968	+31.039	110.930

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JAN 84	0	JAN 84	N/A	JAN 84
Duration (in MON)	112	13	125	97	28
End Date(MON YY)	MAY 93	13	JUN 94	N/A	MAY 86

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	20/20
Procurement	77/77

Start date refers to first contract award date. End date refers to last missile delivery.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

1. Program is 114 missiles (50 deployed, 15 A&S, 49 FOT&E).

2. The O&S period commences with Oct 91 and continues through Sep 99.

18a. (U) Operating and Support Costs (Cont'd):

3. Military Construction costs are not included.

4. All O&S costs are in BY82$M (Inflation indices AFR 173-13, Jan 92).

5. Estimate includes three (3) FOT&E test firings per year.

6. Depot Support data derived from Ogden Air Logistics Center (OO-ALC/LMIL).

7. The dollar figures reflected in section 18b. are based on the steady state cost per squadron. No entries are shown under the second column since Peacekeeper weapon system replaces 50 Minuteman III missiles, but does not replace the Minuteman system.

The concept of operation is a 50 Peacekeeper ICBM squadron on 24-hour alert. The personnel costs are the direct costs to support the primary personnel to operate, maintain, service, and secure the ICBM. The O&S consummables costs include POL and maintenance material costs. The depot maintenance cost is a summary cost which includes support costs. The sustaining investment consists primarily of replenishment spares, class IV modification kits and replacement for support equipment. The other direct costs category includes costs for sustaining engineering, operational firings and depot non-maintenance activities. The indirect costs are for base operating support (BOS), personnel permanent change of station, and acquisition and training of primary and support program personnel.

NOTE: Data extracted from O&S estimate done for Strategic Systems Committee, August 1991, adjusted to include replenishment spares (+$20.6M sustaining investment) and updated BOS (+$0.8M indirect).

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs — (FY 1982 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Squadron	Avg Annual Cost Per
Personnel	25.2	N/A
O&S Consummables	0.3	N/A
Direct Depot Maintenance	15.7	N/A
Sustaining Investment	23.9	N/A
Other Direct Costs	45.0	N/A
Indirect	5.9	N/A
Total	116.0	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	55.7	24.1	19.5	---	99.3
Industrial Fund	5.8	1.5	8.0	---	15.3
Total	61.5	25.6	27.5	---	114.6

N-11 CV HELO (SH-60F)

11-1225

~~*** CONFIDENTIAL ***~~

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: SH-60F (CV HELO)

AS OF DATE: December 31, 1991

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AS AMENDED
FOR OPEN PUBLICATION
MAR 20 1992 2
DIRECTORATE FOR RESTRICTED INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
   Aircraft Carrier Inner Zone Anti-Submarine Warfare Helicopter (SH-60F)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
   Air ASW, Assault and Special Mission Programs (PMA-266)
   Jefferson Plaza 1, Rm 720
   WASHINGTON, DC 20361-1266

   CAPT B. D. STRONG
   Assigned: August 8, 1988
   AV 286-1534 COMM 703-746-1534

4. (U) Program Elements/Procurement Line Items:

   RDT&E:
   PE 0604228N Project W1629
   PE 0604229N Project W1810
   PROCUREMENT:
   APPN 1506 ICN 0183 (Navy)

No Security Objection to Open Publication
(AS AMENDED)
92-1045
MAR 20 1992
Office of the Chief of
Naval Operations Dept. of the Navy

OASD(PA) DFOISR 92-T-0607

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4. (U) Program Elements/Procurement Line Items (Cont'd):

MILCON:
PE 0204696N (Shared)

5. (U) Related Programs:
Army: UH-60A BLACK HAWK, EH-60A Quickfix.

Air Force: HH-60D NIGHT HAWK, MH-60G Pave Hawk, MH-60K Special Operations Helicopter.

Navy: SH-60B SEAHAWK, SH-60F Trainer, HH-60H Helicopter Combat Support Aircraft, Airborne Low Frequency Sonar (ALFS).

Coast Guard: HH-60J Medium Range Recovery Helicopter.

6. (U) Mission and Description:
The CV Inner Zone Anti-Submarine Warfare (ASW) Helicopter provides Aircraft Carrier Battle Groups (CVBG) with quick reaction Inner Zone ASW protection. The SH-60F will replace the existing SH-3H ASW helicopters which are becoming insufficient in number and capability to counter the submarine threat to the CVBG. Primary mission is Inner Zone ASW. Other missions which the SH-60F will perform are Anti-Air Warfare (chaff); Command, Control and Communications; Fleet Support Operations (including plane guard, MEDEVAC, and Search and Rescue); logistic support and surveillance. The SH-60F is equipped with the improved AQS-13F dipping sonar. All mission requirements are satisfied.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
From full and open competition held in FY 1984, Sikorsky Aircraft Division of United Technologies was selected as the prime contractor for the CV Inner Zone ASW Helo. A letter contract for development and options for five lots of production aircraft was signed on February 28, 1985. The firm fixed price contract for the development portion was definitized August 1986. The U.S. Navy accepted delivery of the first SH-60F aircraft in June 1987. Sikorsky demonstrated the entire avionics system and the AQS-13F integration in June 1987 (DT-IID). In October 1987, Naval Air Test Center (NATC) conducted ground and flight tests at NATC to evaluate the ability to meet technical thresholds and on the USS Theodore Roosevelt (CVN-70) to demonstrate CV compatibility (DT-IIE/Phase 1). NATC and Commander, Operational Test and Evaluation Force (COMOPTEVFOR) performed ground and flight test in November 1987. VX-1, the Navy's operational testing squadron, and NATC tested operational effectiveness and operational suitability of the SH-60F Weapons System on two fully integrated aircraft at Atlantic Underwater Test and Evaluation Center (AUTEC) (DT-IIE/Phase 2 and OT-IIB combined). Technical Evaluation

7a. (U) Program Highlights (Cont'd):

(TECHEVAL) was completed in November 1987. In January 1988 OPEVAL (OT-IIC) was completed by COMOPTEVFOR aboard the USS Dwight D. Eisenhower (CVN-69). The Acquisition Decision Memorandum (ADM) granting full production was signed April 28, 1988. The Lot III option (18 aircraft) was definitized in September 1988. In October 1988, NATC completed DT-IIE/F which evaluated contractor corrective actions of aircraft and avionics deficiencies noted during prior DT/OT periods. Follow-On Test & Evaluation (FOT&E), OT-IIIA, was completed in March 1989. Initial Operating Capability was attained in September 1989. DT-IIG commenced in September 1989 to verify corrections to deficiencies from previous DT/OT periods and was successfully completed in March 1990. OT-IIIB was completed in June 1990. Favorable test results led to an ADM, dated 15 October 1990, that approved continued full rate production for the program. HS-10 accepted the operational flight trainer in July 1990 and the composite maintenance trainer in October 1990. HS-2 completed transition and pre-deployment training while HS-6 and HS-4 commenced transition training.

b. (U) Significant Developments Since Last Report --
As of 31 December 1991, 46 aircraft have been delivered.

HS-2 deployed aboard USS NIMITZ, the first SH-60F deployment, from March to August 1991, HS-6 deployed aboard USS LINCOLN from June to November 1991 and HS-4 deployed aboard USS KITTY HAWK from October to December 1991. Both HS-2 and HS-6 employed the "6+2" concept, deploying with 6 SH-60F aircraft plus 2 HH-60H aircraft. HS-3, the first east coast squadron, completed training and reached IOC 27 August 1991 at NAS Jacksonville, FL.

DT-III (BIS Trials) were conducted from November 1990 to April 1991 to verify correction of deficiencies and to evaluate capabilities. Test results showed major improvements in avionics tactical mission software, sonar and sonar cable hover, tactical data transfer and communications and the aircraft demonstrated excellent ASW mission capability.

The SH-60F is expected to meet all mission requirements.

c. (U) Changes Since As Of Date --
None.

8. (U) Threshold Breaches:
There are currently no breaches to the 21 February 1992 APB and no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Production Estimate	Approved Program	Current Estimate
JMSNS	AUG 82	N/A	AUG 82
SECDEF Approved FY 84 New Start	AUG 82	N/A	AUG 82
Milestone I (DSARC)	JUN 83	N/A	JUN 83
SDDM Milestone I Approval	MAY 84	N/A	MAY 84
RFP Release	JUN 84	N/A	JUN 84
Proposals Received	AUG 84	N/A	AUG 84
Milestone II (DSARC)	JAN 85	N/A	JAN 85
SDDM Milestone II Approval	FEB 85	N/A	FEB 85
Contract Award for SH-60F	FEB 85	N/A	FEB 85
Award Lot I/II Long Lead Contract	JAN 86	N/A	JAN 86
Award Lot III Long Lead Contract	JAN 87	N/A	MAR 87
Operational Evaluation			
Start	NOV 87	NOV 87	NOV 87
End	DEC 87	JAN 88	JAN 88
Milestone III (DAB)	MAR 88	MAR 88	MAR 88
Initial Operating Capability (IOC)	SEP 89	SEP 89	SEP 89

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Production Estimate:
DCP, "CV Inner Zone ASW Helicopter (SH-60F)", Rev 1, dated March 1, 1988.

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 21 Feb 92.

10. (U) Performance Characteristics:

a. (U) Performance --

	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

10a. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)	[redacted]			

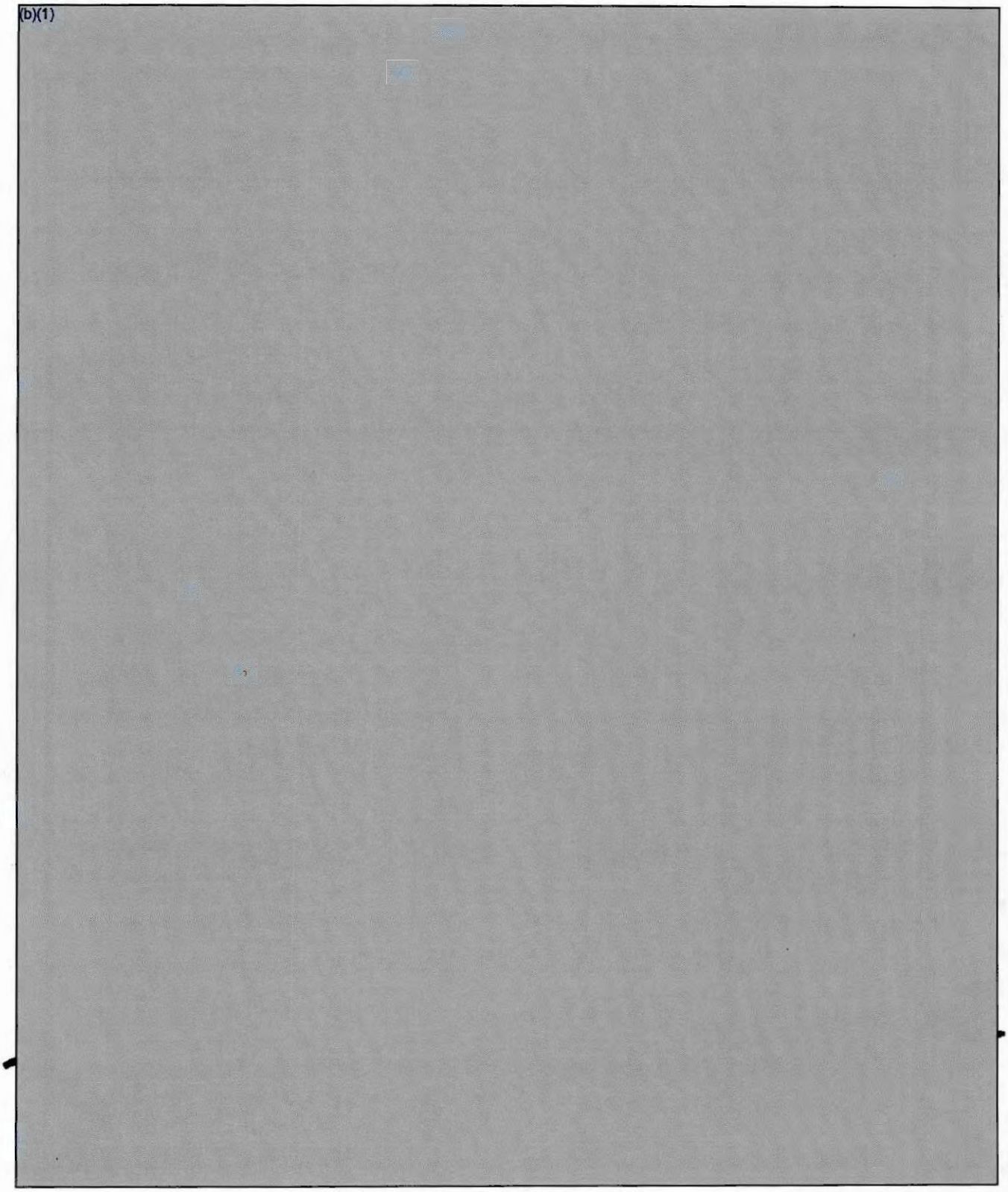
10a. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

(b)(1)



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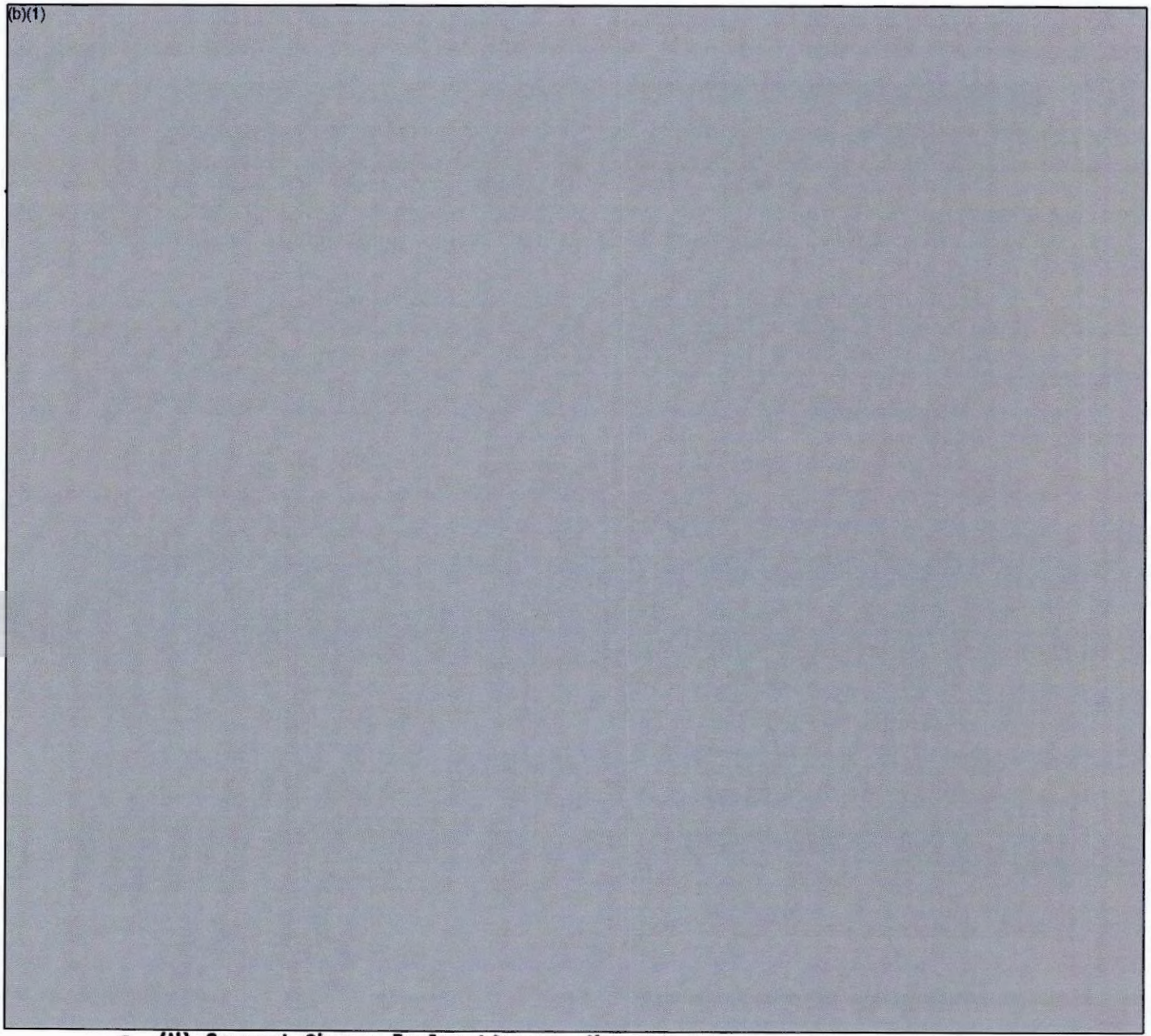


c. (U) Current Change Explanations -- None.

d. (U) References --

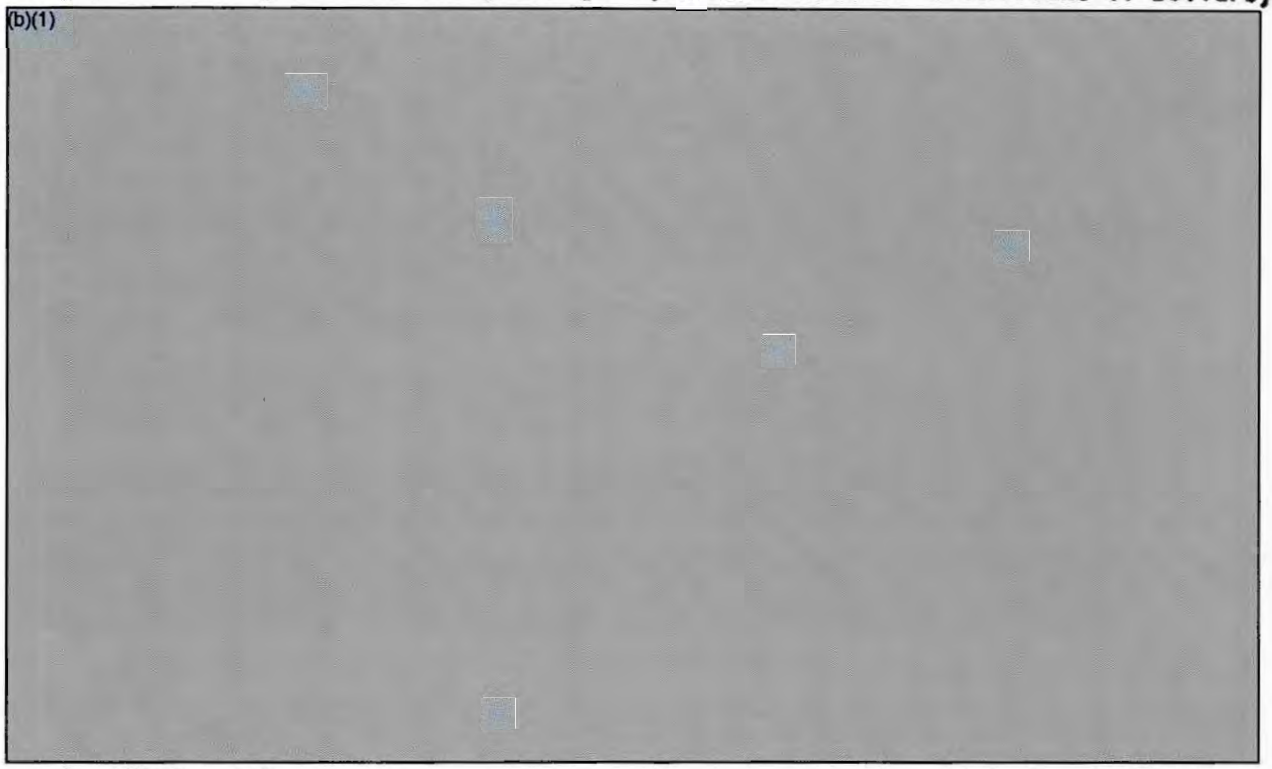
(U) Production Estimate:
DCP, "CV Inner Zone ASW Helicopter (SH-60F)", Rev 1, dated March 1, 1988.

10d. (U) Performance Characteristics (Cont'd):

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 21 Feb 92.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

(b)(1)



b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	175	175	175
Total	175	175	175

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Production Estimate:
DCP, "CV Inner Zone ASW Helicopter (SH-60F)", Rev 1, dated March 1, 1988.

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 21 Feb 92.

SH-60F (CV HELO), December 31, 1991

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	4020.1	4303.4	4020.1
(2) Quantity	175	175	175
(3) Unit Cost	22.972	24.591	22.972
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	266.0	266.0	276.1
Less CY Adv Proc	48.2	48.2	40.2
Plus PY Adv Proc	53.1	53.1	69.5
Net Total	270.9	270.9	305.4
(2) Quantity	12	12	12
(3) Unit Cost	22.575	22.575	25.450

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	55.3	3090.8	27.7	3173.8
Previous Changes:				
Economic	+0.6	+207.2	-	+207.8
Quantity	-	-	-	-
Schedule	-	+106.0	-	+106.0
Engineering	+86.1	+71.0	-	+157.1
Estimating	-1.8	+469.9	+2.6	+470.7
Other	-	-	-	-
Support	-	+188.0	-	+188.0
Subtotal	+84.9	+1042.1	+2.6	+1129.6
Current Changes:				
Economic	-1.1	-103.7	-	-104.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+64.0	-	+64.0
Estimating	+63.6	-326.4	-	-262.8
Other	-	-	-	-
Support	-	+20.3	-	+20.3
Subtotal	+62.5	-345.8	-	-283.3
Total Changes	+147.4	+696.3	+2.6	+846.3
Current Estimate	202.7	3787.1	30.3	4020.1

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	59.5	2606.4	25.9	2691.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	+15.0	-	+15.0
Engineering	+71.7	+56.1	-	+127.8
Estimating	-1.8	+350.2	+1.5	+349.9
Other	-	-	-	-
Support	-	+104.4	-	+104.4
Subtotal	+69.9	+525.7	+1.5	+597.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+41.3	-	+41.3
Estimating	+49.3	-234.5	+0.1	-185.1
Other	-	-	-	-
Support	-	+12.4	-	+12.4
Subtotal	+49.3	-180.8	+0.1	-131.4
Total Changes	+119.2	+344.9	+1.6	+465.7
Current Estimate	178.7	2951.3	27.5	3157.5

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Engineering: Development and integration of the Airborne Low Frequency Sonar (ALFS).
Estimating: Revised cost estimates for aircraft testing; revised cost estimates for development of ALFS.

PROCUREMENT
Economic: Revised escalation indices.
Schedule: Revised procurement schedule.
Engineering: Incorporation of HEELS, GPS, Sonobuoy Launcher and FIR; incorporation of Standard Attitude Heading & Reference System (SAHRS), E-1 Harness, Solid Shaft

13b. (U) Cost Variance Analysis (Cont'd):
and Battery Disconnect; and additional engineering costs associated with ALFS..

Estimating: Increase in flyaway costs in FY-88 thru FY-90 without increase in total contract NTE; increase in negotiated overhead rates of major contractor; loss of cost savings due to loss of business base of contractor programs; extended delivery period for FY93 buy; refinement of cost estimates/learning curves based on actuals and contract definitizations.

Support: Decrease in support areas in FY-88 thru FY-90 contract NTEs; increased costs due to delay in procurement of support items and increased funding for existing spares requirements; addition of support costs for ALFS.

MILCON

Estimating: Engine Maintenance Facility (P-138) not funded; addition of two previously unfunded projects, Engine Maintenance Facility (P-158) and Aircraft Hangar Improvements (P-602).

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-1.1
Revised estimates due to UYS-2 cost growth, cost realism, and additional risk reduction measures. (Estimating)	49.3	63.6
Total Changes	49.3	62.5

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices. (Economic)	N/A	-103.7
Incorporation of Sonar Improvement and Night Vision Goggles ECP's. (Engineering)	20.1	30.2
Engineering costs associated with integration of ALFS into SH-60F. (Engineering)	21.2	33.8
Revised estimates based on actuals, costs savings resulting due multi-model and Blackhawk restoration. (Estimating)	-234.5	-326.4
Additional support funds provided to modify SH-60F trainers for HH-60H use. (Support)	12.4	20.3
Total Changes	-180.8	-345.8
(3) MILCON		
Increase due to revised outyear indices. (Estimating)	0.1	
Total Changes	0.1	--

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Prod Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
17.578	-0.170	--	--	--	-0.518	--	1.246	0.558	18.136

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions) (Cont'd)

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
18.136	0.589	--	0.606	1.263	1.188	--	1.190	4.836	22.972

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) Procurement --

(U) CV HELO (SH-60F):	Initial Contract Price		
	Target	Ceiling	Qty
UNITED TECHNOLOGIES CORP., STRATFORD, CT N00019-85-C-0148, FFP Award: February 28, 1985 Definitized: August 9, 1989	$296.0	N/A	18

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$288.3	N/A	18	$288.3	$288.3

CPR information is not a requirement on this FFP contract.

(U) CV HELO (SH-60F):	Initial Contract Price		
	Target	Ceiling	Qty
UNITED TECHNOLOGIES CORP., STRATFORD, CT N00019-85-C-0148, FFP Award: February 28, 1985 Definitized: April 30, 1991	$199.8	N/A	18

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$199.8	N/A	18	$199.8	$199.8

CPR information is not a requirement on this FFP contract.

(U) CV HELO (SH-60F) LOT VI:	Initial Contract Price		
	Target	Ceiling	Qty
UNITED TECHNOLGIES CORP., STRATFORD, CT N00019-89-C-0153, FFP Award: June 29, 1990 Definitized: January 24, 1992	$161.3	N/A	12

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$161.3	N/A	12	$161.3	$161.3

CPR information is not a requirement on this FFP contract.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 47.4% (9 yrs/19 yrs)

(2) Percent Program Cost Appropriated: 41.6% ($1672.3 / $4020.1)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY84-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2002)	Total
RDT&E	77.8	19.7	40.7	64.5	202.7
Procurement	1282.8	266.0	276.1	1962.2	3787.1
MILCON	26.0	-	-	4.3	30.3
O&M	-	-	-	-	-
Total	1386.6	285.7	316.8	2031.0	4020.1

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1984				20.2	18.3	18.3	15.7	3.8
1985				20.3	19.0	19.0	18.1	3.4
1986				12.1	11.6	11.6	10.6	2.8

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1987				6.9	6.8	6.8	5.9	2.7
1988								3.0
1989								4.2
1990				9.1	10.1	10.1	8.8	4.0
1991				10.5	12.0	9.5	6.0	3.9
1992				16.6	19.7	4.5		3.1
1993				33.3	40.7			3.3
1994				22.1	27.9			3.3
1995				14.8	19.3			3.3
1996				12.8	17.3			3.2
Subtot				178.7	202.7	79.8	65.1	
Appropriation: 1506 Aircraft Procurement, Navy								
1986			30.8	30.8	30.5	30.5	30.0	2.8
1987	7	18.6	104.5	159.1	163.0	163.0	151.5	2.7
1988	18	4.2	212.4	310.8	332.2	332.2	323.3	3.0
1989	18	1.9	206.3	330.8	367.7	367.7	333.1	4.2
1990			50.9	94.1	108.4	108.0	46.2	4.0
1991	18	1.5	181.7	236.2	281.0	259.5	49.0	3.9
1992	12		137.4	216.5	266.0	12.6		3.1
1993	12		123.6	217.6	276.1			3.3
1994	12	1.1	139.0	167.5	219.4			3.3
1995	12		164.1	204.8	277.0			3.3
1996	12	14.9	125.2	190.7	266.1			3.2
1997	12		149.5	214.3	308.7			3.2
1998	12		134.4	188.0	279.5			3.2
1999	12		156.3	185.0	283.7			3.2
2000	18		142.4	166.5	263.6			3.2
2001				19.3	31.6			3.2
2002				19.3	32.6			3.2
Subtot	175	42.2	2058.5	2951.3	3787.1	1273.5	933.1	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY88 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obli-gated	Ex-pended	Escl Rate (%)
Appropriation: 1205 Military Construction, Navy								
1988				16.2	17.2	17.2	16.5	3.0
1989				8.0	8.8	8.8	7.8	4.2
1990								4.0
1991								3.9
1992								3.1
1993								3.3
1994				1.3	1.7			3.3
1995				2.0	2.6			3.3
Subtot				27.5	30.3	26.0	24.3	
Grand Total	175	42.2	2058.5	3157.5	4020.1	1379.3	1022.5	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1987	7	7	7	60
1988	18	18	18	60
1989	18	18	18	55
1990	18	18	0	0
1991	12	12	18	0
1992	12	12	12	0
1993	12	12	12	0
1994	12	12	12	0
1995	11	11	12	0
1996	24	24	12	0
1997	24	24	12	0
1998	7	7	12	0
1999	0	0	12	0
2000	0	0	18	0

Annual Production Rates - The maximum economic production rate of 60 aircraft per year is the total of SH-60B, SH-60F, HH-60H, HH-60J, S-70C(M) (Taiwan) and S-70B-2 (Australia) that can be produced with existing tooling and facilities.

17b. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2691.8	+465.7	3157.5	+492.6	2664.9
(TY $)	3173.8	+846.3	4020.1	+988.3	3031.8
PAUC Cost (BY $)	15.382	2.661	18.043	+2.815	15.228
(TY $)	18.136	4.836	22.972	+5.647	17.325

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JUL 87	0	JUL 87	N/A	JUL 87
Duration (in MON)	149	34	183	144	39
End Date(MON YY)	DEC 99	34	OCT 02	N/A	OCT 90

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	45/46

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

Assumptions:

	SH-60F	SH-3H
Flight hours per aircraft per month	46.9	40.0
Number of aircraft per squadron	6 *	6
Consumption rate, gals per hour	146.0	148.4
POL cost, JP-5, per barrel, FY 88$	27.72	27.72

* Current planning is to deploy 2 HH-60H aircraft with a 6 aircraft

18a. (U) Operating and Support Costs (Cont'd):
SH-60F squadron. Costs for all eight aircraft are included in this estimate.

The maintenance concept for both the SH-60F and the antecedent system is for organic support at all three levels of maintenance. Estimates for the SH-60F avionics assume a 50% increase in the reliability of the AQS-13F over the AQS-13E onboard the SH-3H.

Personnel costs are for all people assigned to the squadron required to operate and maintain the aircraft according to the Preliminary Squadron Manning Document of September 1987 and are prepared using the Billet Cost Model. This cost also includes the cost of administrative and staff personnel required for the operational control of the squadron. The O&S consumable cost is for fuel, training expendables and other consumables used in the direct support of the weapons system. Direct depot maintenance contains the cost of Scheduled Depot Level Maintenance (SDLM), engine repair/rework and components repair. The sustaining investment cost is for replenishment spares, support equipment maintenance, simulator maintenance, trainer maintenance and software support. Indirect costs are for base operating and health support personnel and the materials required by these two groups.

Assumptions and ground rules for the SH-60F and the SH-3H are the same unless otherwise annotated.

b. (U) Costs -- (FY 1988 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SH-60F Squadron	Avg Annual Cost Per SH-3H Squadron
Personnel	9.2	7.7
O&S Consumables	2.1	1.5
Direct Depot Maintenance	2.9	2.1
Sustaining Investment	1.2	0.5
Indirect Costs	0.5	0.4
Total	15.9	12.2

18c. (U) Operating and Support Costs (Cont'd):

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
NIF	0.2	0.4	0.4	---	1.0
OM,N	3.9	4.1	4.3	---	12.3
Total	4.1	4.5	4.7	---	13.3

Source:
SH-60F & SH-3H: Naval Air Systems Command Cost Analysis Division Operating and Support Cost Estimates for SH-60F dated January 21, 1988; updated January 26, 1990 and again 8 February 1991 to reflect new escalation indices.

The SH-3H is the antecedent system of the SH-60F.

A-31 SINCGARS

94076

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*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: SINCGARS

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
Single Channel Ground and Airborne Radio System (SINCGARS)

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
US ARMY COMMUNICATIONS-ELECTRONICS C COL,SC ROBERT W. CAMPBELL
ATTN: SFAE-CM-GAR Assigned: December 21, 1990
FORT MONMOUTH, NJ 07703-5000 AV 995-3063 COMM (201) 544-3063

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 63746 (Shared) Project D555 (Shared)
PE 64805 Project D282

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DEPARTMENT OF DEFENSE

No Security Objection to Public Release
19 MAR 1992

92-0589

*** [redacted] ***

4. **Program Elements/Procurement Line Items (Cont'd):**

PROCUREMENT:
APPN 2031 ICN AA0974 (Army) (Shared)
APPN 2031 ICN AZ3500 (Army)
APPN 2035 ICN B00500 (Army)
APPN 2035 ICN B00508 (Army)
APPN 2035 ICN B45500 (Army) (Shared)
APPN 2035 ICN BA9520 (Army) (Shared)
APPN 2035 ICN BW0006 (Army)
APPN 2035 ICN T99500 (Army) (Shared)
APPN 2035 ICN Z16800 (Army)
APPN 2035 ICN BA9102 (Army) (Shared)
APPN 2035 ICN J30500 (Army)

5. **Related Programs:**
None

6. **Mission and Description:**
SINCGARS is a new family of VHF-FM combat net radios which provides the primary means of command and control for Infantry, Armor and Artillery Units. The SINCGARS system is designed on a modular basis to achieve maximum commonality among the various ground and airborne system configurations. A common receiver-transmitter (RT) is used in the manpack and all vehicular configurations. The SINCGARS family of radios has the capability to transmit and receive voice, tactical data and record traffic messages and is consistent with NATO interoperability requirements. The system will operate on any of the 2320 channels between 30-88 Megahertz and is designed to survive in a nuclear environment. Communication Security (COMSEC) for the basic radio is provided by use of the VINSON device. An Integrated COMSEC (ICOM) version of the SINCGARS is currently in production. The SINCGARS system will be operable in a hostile environment through use of electronic counter-counter measures (ECCM). SINCGARS will replace the currently standard manpack and vehicular radios, the AN/PRC-77 and the AN/VRC-12 family, respectively. An airborne version of the SINCGARS radio is in production and will replace the currently standard aircraft radios, the AN/ARC-114 and AN/ARC-131.

7. **Program Highlights:**
a. Significant Historical Developments --
DA approved the SINCGARS ROC in Dec 74. In Jun 77, the VCSA direction resulted in a decision to proceed from Advanced Development (AD) directly into production. The SINCGARS ground radio production hardware was type [redacted] standard at ASARC III in Sep 83. A single year production contract was awarded in Dec 83, Option 1 in Nov 84, Option 2 in May 85, Option 3 in Jun 89, and Option 4 in Dec 90 to ITT Aerospace/Communication Div (formerly Aerospace/Optical Div) Ft. Wayne, IN. The initial SINCGARS airborne production

7a. Program Highlights (Cont'd):

contract (single year plus three options) was awarded to ITT in May 85, Option 1 in April 88, Option 2 in April 89, and Option 3 in Jan 91. The alternative source strategy was approved and documented in a February 87 Secretary of Defense Decision Memorandum (SDDM) to independently select and manage a second source which would be form, fit, function equivalent to ITT A/OC Integrated COMSEC (ICOM) SINCGARS at the Line Replaceable Unit (LRU) level. Award of the second source ground production contract was made to General Dynamics (GD) in Jul 88 with Option 1 awarded in Mar 91. Deliveries of ICOM radios were capped by the Defense Acquistion Executive (DAE) memo of Jun 89 until completion of ITT IOT&E. ITT ground and airborne contracts were modified in Mar 90 to reflect the low rate delivery schedules. The tests resulted in DOTE certification that the ITT ground and airborne radios were operationally effective and suitable. A Milestone IIIB DAB held in Dec 90 approved full-rate production for the ITT ground and airborne radios and continuation of low-rate production for GD radios. The Milestone IIIB DAB also approved a revised total program quantity of 150,000 radios. A program decision was made to postpone the GD IOT&E to permit hardware retrofit to improve reliability.

b. Significant Developments Since Last Report --
Production Reliability Acceptance Testing (PRAT) began on the General Dynamics radio. First Article Testing (FAT) is in process. A GD Production Readiness Review (PRR) was completed by the Army and Defense Product Engineering Services Offices with no high risk areas identified.

The SINCGARS system is expected to satisfy mission requirements.

c. Changes Since As Of Date --
The first Production Reliability Acceptance Test of the General Dynamics SINCGARS has been completed, and the radio did not demonstrate the required MTBF. The IOT&E recently begun at Fort Hood has been suspended because early results indicated that the radio would not meet reliability requirements. The Army and General Dynamics are working to identify and to implement corrective actions.

8. Threshold Breaches:
There are no DAE Approved Acquisition Program Baseline (dated 17 January 1992) breaches. There are no current Nunn-McCurdy unit cost breaches.

9. **Schedule:**

a. Milestones --	Production Estimate	Approved Program	Current Estimate
Milestone 0 (ROC Approval)	DEC 74	N/A	DEC 74
ASARC I	OCT 75	N/A	OCT 75
Milestone I (DSARC I)	FEB 76	N/A	FEB 76
Award AD Contracts	APR 78	N/A	APR 78
Milestone IIIA	SEP 83	SEP 83	SEP 83
Complete DT/OT -- I/II	DEC 83	N/A	DEC 83
Complete Limited DT/OT	DEC 82	N/A	DEC 82
Complete Maturity DT/OT	DEC 83	N/A	DEC 83
Initial Ground (ITT) Production Contract Award	DEC 83	DEC 83	DEC 83
Initial Airborne Production Contract Award	N/A	MAY 85	MAY 85
JRMB - Level Program Review	N/A	DEC 86	DEC 86
Ground (ITT) FAT			
Start	N/A	N/S	AUG 85
Complete	JUN 85	JAN 88	JAN 88
Ground (ITT) Production Delivery Begins	AUG 85	JAN 88	JAN 88
Airborne Option I Award	N/A	APR 88	APR 88
Ground (ITT) Option I Delivery Begins	N/A	MAY 88	MAY 88
Initial Ground (GD) Award	N/A	JUL 88	JUL 88
Airborne FAT			
Start	N/A	N/S	
Complete	N/A	SEP 88	SEP 88
Airborne Production Delivery Begins	N/A	NOV 88	NOV 88
ICOM EUT&E	N/A	NOV 88	NOV 88
Milestone IIIB -- ITT Full Rate Production (Non-ICOM)	N/A	MAR 89	MAR 89
Airborne Option 2 Award	N/A	APR 89	APR 89
Ground (ITT) Option 3 Award	N/A	JUN 89	JUN 89
Ground (ITT) Option 2 Delivery Begins	N/A	JUN 89	JUN 89
Airborne Option 1 Delivery Begins	N/A	AUG 89	AUG 89
Airborne Option 2 Delivery Begins	N/A	APR 90	APR 90
ICOM IOT&E (ITT)	N/A	JUN 90	JUN 90
Ground (ITT) Option 3 Delivery Begins	N/A	JUL 90	JUL 90
Milestone IIIB -- ITT Full Rate (ICOM) and GD Low Rate Option I	N/A	DEC 90	DEC 90
Ground (GD) Option 1 Award	N/A	DEC 90	MAR 91
Airborne Option 3 Award	N/A	DEC 90	JAN 91
Ground (ITT) Option 4 Award	N/A	DEC 90	DEC 90
IOC (1st Div Equipped)	OCT 87	DEC 90	DEC 90
ICOM FOT&E (GD)	N/A	JAN 92	JAN 92

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
Ground (GD) FAT			
Start	N/A		AUG 91
Complete	N/A	DEC 91	MAR 92(Ch-1)
Ground (GD) Production Delivery Begins	N/A	FEB 92	MAY 92(Ch-1)
Milestone IIIB GD Full Rate Production	N/A	JUN 92	JUN 92
Ground (GD) Option 2 Award	N/A	JUN 92	JUN 92
Airborne Option 3 Delivery Begins	N/A	JAN 92	JAN 92
Ground (ITT) Option 4 Delivery Begins	N/A	JAN 92	JAN 92
Ground (GD) Option 1 Delivery Begins	N/A	AUG 92	AUG 92
Ground (GD) Option 2 Delivery Begins	N/A	JUL 93	JUL 93

Footnote:
1. All contract schedule dates in the General Dynamics contract are specified as "Days after event __" based on approval of First Article Test Report 135 days after start of First Article Test.

ACRONYMS:
ICOM - Integrated Communications Security
ECCM - Electronic Counter Counter Measures
DRA - Data Rate Adapter
ITT - International Telephone and Telegraph
JRMB - Joint Requirements Management Board
FAT - First Article Tests
GD - General Dynamics
FOE - Follow-On Evaluation
EUT&E- Early User Test and Evaluation
IOT&E- Initial Operational Test and Evaluation
IOC - Initial Operational Capability
FOT&E- Follow-On Operational Test and Evaluation

b. Previous Change Explanations --

Late start of ITT First Article Test (FAT) plus problems encountered during the first phase of testing indicated that previous estimates of FAT completion and start of Production Delivery would not be met. FAT completion, First Production Deliveries, Third Option award and IOC were revised in accordance with the schedule presented at the Dec 86 Joint Requirements and Management Board (JRMB) (program review). As a result of the contract rebaselining modification signed in Nov 87, hardware delivery schedules were revised causing the IOC to be rescheduled from Dec 89 to Dec 90. ITT ICOM IOT&E was rescheduled as a result of the Jun 89 memo which capped deliveries of ICOM RT's at 730 per month until completion of additional operational testing. A

9b. Schedule (Cont'd):
Milestone IIIC (Follow-on Competition) review was changed to a Milestone IIIB (GD Full-rate) review. Ground radio (GD) option award and delivery milestones were rescheduled to reflect the then current Army plan rather that option expiration dates. A required Follow-on Experiment (FOEX) on the ITT radio completed in Oct 90 required additional time for reporting and certification causing the rescheduling of the Milestone IIIB (ITT) Full-rate (ICOM) from Sep 90 to Dec 90. Development of a new COMSEC chip for the GD radio and delays in the completion of contractor testing in preparation for First Article Test resulted in the rescheduling of all subsequent GD schedule milestones. Changes in the GD milestones were also attributable to the decision to defer the planned Option 1 award from Dec 90 to Mar 91 to allow the government time to investigate alleged contract administration issues which had been raised by the contractor. ITT Airborne Option 3 award was delayed from Nov 90 to Jan 91 due to the requirement for extended negotiations as the result of the government's decision to reduce the scope of work. Reliability problems resulted in a program decision to postpone start of GD's IOT&E from May 91 to Jan 92 and required rescheduling of the following milestones: Ground (GD) FAT (Start-Complete) from Oct 91 to Dec 91, Ground (GD) Production Delivery Begins from Nov 91 to Feb 92, Milestone IIIB GD Full Rate Production from Dec 91 to Jun 92, Ground (GD) Option 2 award from Dec 91 to Jun 92, Ground (GD) Option 1 Delivery Begins from May 92 to Aug 92, and Ground (GD) Option 2 Delivery Begins from Apr 93 to Jul 93.

c. Current Change Explanations --

(Ch-1) Ground (GD) FAT Start-Complete has been extended from Dec 91 to Mar 92 to permit completion of lengthy environmental and EMI tests that were delayed due to a shortage in availability of test hardware. Since the initial production delivery start date is keyed to completion of FAT, Ground (GD) Production Delivery Begins has been rescheduled from Feb 92 to May 92.

d. References --

Production Estimate:
Draft Decision Coordinating Paper (DCP) #156, dated September 1983 for the Single Channel Ground and Airborne Radio System.

Approved Program:
DAE approved Acquisition Program Baseline dated January 17, 1992.

10. Performance Characteristics:

a. Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Frequency Band (MHz)	30 - 87.975	30 - 87.975	/ 30 - 87.975	30-87.975	30-87.975
Number of Channels	2320	2320	/ 2320	2320	2320
Channel Spacing (KHz)	25	25	/ 25	25	25
Weight (Manpack + ICOM (lbs))	22.5	22.5	/ 22.5	19.5	22.5
Power Requirements (Vdc)	28	28	/ 28	28	28
Communications Range: (KM)					
(Voice & Analog Data)					
Manpack (above 40 MHz)	8	8	/ 8	8	8
Vehicular	35	35	/ 35	35	35
Airborne (@ 1000 ft)	TBD	35	/ 35	60	35
(Data @ 16 kbps @ 10^ -3 Ber)					
Manpack (above 40 MHz)	4.5	4	/ 4	4	4
Vehicular	17.5	17	/ 17	27	17
Mean Time Between Failure Operational Environment (MTBFOE) (Hrs)					
Ground					
Non-ICOM (less ECCM, DRA)	N/A	1250	/ 1250	7588	1250
ICOM	N/A	1250	/ 1250	8069	1250
Airborne	750	750	/ 750	7345	750
ECCM (Hrs)	3500	N/A	/ N/A	8056	3500
Mean Time To Repair (MTTR)(Min)					
Organizational Level	15	15	/ 15	4.2	15
Direct Support (DS)					
Non-ICOM	N/A	60	/ 60	52.2	45/60
ICOM	N/A	45	/ 45	30	45
General Support (GS) (Hrs)	2	N/A	/ N/A	1.78	2

PERFORMANCE CHARACTERISTICS AS DISPLAYED ARE SUBJECT TO THE FOLLOWING CONDITIONS:

10a. **Performance Characteristics (Cont'd):**

a. Data for specified performance characteristics demonstrated performance on production models is available from First Article Test and Follow-on Evaluations.

b. Performance characteristic parameters are point values not ranges.

c. Measurement conditions for Communications Range, rolling plains, antenna not buried in foliage, average ground, 25% circuit reliability, environmental noise of 17db @ 50 MHz.

d. Since Manpack and Vehicular have the same value for MTBF, they have been combined and designated as Ground.

e. The SINCGARS reliability requirement as approved in 1974 has no MTBF requirement or DCP threshold. This means that only radio hardware failures are counted, but under field test rather than in a lab. Demonstrated performance results are expressed on a point estimate basis on the AN/VRC-90 or 1477A airborne R/T system basis.

f. Direct support Mean Time to Repair (MTTR) is not a cumulative requirement and does not include Organizational Level MTTR.

SOURCE OF DEMONSTRATED PERFORMANCE BY PERFORMANCE CHARACTERISTIC:

1. Frequency Band (30-87.975), ITT production units were used.

2. Number of Channels (2320), Same as above.

3. Channel Spacing (25), Same as above.

4. Weight (19.5), Reflects weight of current production RT-1523/u radio with battery box and battery installed.

5. Power Requirements (28), ITT production units were used.

6. Communications Range Manpack (8), Demonstrated in the Operational Assessment by Army Development and Employment Agency (ADEA) at Ft. Lewis, WA, Sep 87.

7. Communications Range Vehicular (35), Follow-on Operational Test and Evaluation, Ground non-ICOM, May-Jun 88, Ft. Sill, OK.

8. Communications Range Airborne (60), Early User Test and Evaluation, Airborne non-ICOM, May-Jun 88, Ft. Sill, OK.

9. Data Manpack (4), Demonstrated in the Operational Assessment by Army Development and Employment Agency (ADEA) Ft. Lewis, WA, Sep 87.

10. Data Vehicular (27) Same as above.

10a. Performance Characteristics (Cont'd):

11. MTBF non-ICOM (7588), IOT&E, Ft. Hood, TX, May-Jun 90.

12. MTBF ICOM (8069), Same as above.

13. MTBF Airborne (7345), Demonstrated during reliability testing at Ft. Rucker, AL, Aug 90-Mar 91.

14. MTBF ECCM (8056), IOT&E, Ft. Hood, TX, May-Jun 90.

15. MTTR Organizational Level (4.2), Demonstrated in the Maintainability Demonstration (M-Demo) at Ft. Hood, TX, Nov 90.

16. MTTR Direct Support non-ICOM (52.2), Same as above.

17. MTTR Direct Support ICOM (30), Same as above.

b. Previous Change Explanations --

None.

c. Current Change Explanations --

None.

d. References --

Production Estimate:
Draft Decision Coordinating Paper (DCP) #156, dated September 1983 for the Single Channel Ground and Airborne Radio System.

Approved Program:
DAE approved Acquisition Program Baseline dated January 17, 1992.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	154.4	190.3	187.2
Procurement	4013.3	2063.3	2093.4
Major System Equipment	(3151.8)		(1798.1)
Ancillary Equipment	(431.8)		(151.7)
Total Flyaway	(3583.6)		(1949.8)
Total Other Weapon Systems	(25.9)		(105.2)
Total Other Wpn Sys	(25.9)		(105.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(403.8)		(38.4)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	4167.7	2253.6	2280.6
Escalation	1444.0	826.5	841.2
Development (RDT&E)	(-19.0)	(-6.8)	(-7.9)
Procurement	(1463.0)	(833.3)	(849.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	5611.7	3080.1	3121.8

b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	292853	150000	150000
Total	292853	150000	150000

Excludes 62 R&D units from the Production Estimate (PdE) and 123 units from the Current Estimate (CE) that are not considered fully-configured end items.

Other Service Requirements:

	Qty	BY84 $(M)	TY $(M)
USAF	2,756	18.7	27.9
USMC	31,783	221.7	329.4
USN	5,349	34.0	50.1
USAR*	2,376	20.8	28.4
USARNG**	884	6.6	9.2

* Special requirement for US Army Reserves, USAR funded.
** Special requirement for US Army National Guard, USARNG funded.

c. Foreign Military Sales --
N/A

11d. **Total Program Cost and Quantity (Cont'd):**

d. Nuclear Costs -- None.

e. References --

Production Estimate:
Draft Decision Coordinating Paper (DCP) #156, dated September 1983 for the Single Channel Ground and Airborne Radio System.

Approved Program:
DAE approved Acquisition Program Baseline dated January 17, 1992.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3121.8	3213.3	3121.8
(2) Quantity	150000	150000	150000
(3) Unit Cost	0.021	0.021	0.021
b. Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	287.6	287.6	223.3
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	287.6	287.6	223.3
(2) Quantity	19885	19885	12329
(3) Unit Cost	0.014	0.014	0.018

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	135.4	5476.3	0.0	5611.7
Previous Changes:				
Economic	-0.1	+204.5	-	+204.4
Quantity	+11.6	-2669.4	-	-2657.8
Schedule	+2.2	+705.0	-	+707.2
Engineering	+16.3	-	-	+16.3
Estimating	+11.8	-329.3	-	-317.5
Other	-	-	-	-
Support	-	-383.6	-	-383.6
Subtotal	+41.8	-2472.8	-	-2431.0
Current Changes:				
Economic	-	-53.6	-	-53.6
Quantity	-	-	-	-
Schedule	-	+13.1	-	+13.1
Engineering	-	-	-	-
Estimating	+2.1	-26.1	-	-24.0
Other	-	-	-	-
Support	-	+5.6	-	+5.6
Subtotal	+2.1	-61.0	-	-58.9
Total Changes	+43.9	-2533.8	-	-2489.9
Current Estimate	179.3	2942.5	-	3121.8

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	154.4	4013.3	0.0	4167.7
Previous Changes:				
Quantity	+9.7	-1567.0	-	-1557.3
Schedule	-	+43.9	-	+43.9
Engineering	+13.8	-	-	+13.8
Estimating	+7.5	-95.2	-	-87.7
Other	-	-	-	-
Support	-	-288.0	-	-288.0
Subtotal	+31.0	-1906.3	-	-1875.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.8	-15.5	-	-13.7
Other	-	-	-	-
Support	-	+1.9	-	+1.9
Subtotal	+1.8	-13.6	-	-11.8
Total Changes	+32.8	-1919.9	-	-1887.1
Current Estimate	187.2	2093.4	-	2280.6

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation indicies.

Quantity: Addition of 45 prototypes for Integrated COMSEC (ICOM).

Schedule: Effort rescheduled to later years due to funding shortfall.

Engineering: Redesign radio and COMSEC device for Integrated COMSEC. Increased scope of work for P3I effort.

Estimating: Reduction in FY 86 and FY 87 Program Budget Guidance for engineering development effort. Revised estimate for ICOM effort and Installation Kit (IK) development. Adjustment of prior year amounts to actuals. Increased effort for IK and

13b. Cost Variance Analysis (Cont'd):

Second Source Test Program Set (TPS) development. Additional effort for product improvement studies and SINCGARS Remote Control Unit (SRCU) development. Revised estimate for P3I cost studies. Removal of out year funding designated for SINCGARS follow-on system. Elimination of anticipated product improvement cost reduction tasks.

PROCUREMENT

Economic: Revised escalation indicies.

Quantity: Reduced requirement for airborne radios. Additional radios required due to redefinition of force structure. Reduced ground and airborne radio requirements resulting from Quick Silver.

Schedule: Stretch-out in procurement adjusted to available funding and problems encountered in FAT. Reduced costs in then-year dollars resulting from shortened schedule due to increased annual quantities. ICOM deliveries capped pending completion of additional operational testing. Additional costs to revise and extend contract delivery schedules and to reschedule balance of program. Reduction due to elimination of six years of procurement schedule.

Estimating: Revised estimates for warranty, COMSEC module, installation kits, Battlefield Electronic Communications Systems (BECS), KGV-10, and revised cost-quantity relationship. Additional requirement for KGV-10's and BECS Electronic Notebook, OE-254 antennas, and tooling based on increased annual quantities. Revised estimate for airborne radio ICOM production. Revised average unit cost of Army ground radios based on including other service quantities in learning curve calculations. Reduced estimate for warranty based on WARM model and AMC warranty guidance. Reduced hardware cost resulting from applying learning curve through end of production instead of stopping learning after a specified quantity. Adjustment in FY 88-89 budget resulting in change to FY98. Revised estimate for ground radio production based on prices in second source contract. Reduced requirement for SINCGARS Remote Control Unit (SRCU). Reduced requirement for the Battlefield Electronics Communications Electronics Operating Instructions (CEOI) System due to revised distribution plan. Revised estimate for ground radio based on revised procurement mix of ITT and GD radios. Estimating changes

13b. Cost Variance Analysis (Cont'd):

applicable to ground and airborne radio quantity elimination. Increased estimate for BECS Basic Generator Unit (BGU) based on change in anticipated Non-Developmental Item (NDI) hardware. Additional requirement for installation kits for POMCUS. Increased estimate for General Dynamics ground radio based on extrapolation of contract cost data. Increased estimate for Remote Control Unit based on contractor proposal data. Increased estimate for airborne radio maintenance group, OA-9264 based on actual data. Revised estimate resulting from the elimination of BECS Electronic Notebook and Basic Generator Unit Interface efforts. Adjustment to prior year (FY83-90) procurement program to actual dollars.

Support: Reduced requirement for radio spares, reclassification of initial spares from procurement to Army Stock Fund, elimination of spares requirement for KGV-10 and reduced estimate for data. Reduced estimate for initial spares based on requirement identified by SESAME model and reduced hardware cost. Revised estimate for initial spares based on increased cost for spares components. Reduced quantity for initial spares due to reduced end-item requirement. Increased estimate for ground radio initial spares based on revised methodology (cost per operating hour). Addition of costs for Total Package Fielding (TPF) and New Equipment Training (NET) now reportable in SAR. Addition of costs for Project Management Office salaries, Contractor Field Service Representatives, and Information Management.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised inflation indices. (Economic)		-0.2
Current & Prior inflation offset. (Estimating)	0.1	0.2
Adjusted to prior year actuals (Estimating)	1.7	2.1
Total Changes	1.8	2.1

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indicies (Economic)	--	-53.6
Current & Prior year inflation offset (Estimating)	7.1	9.9
Revised estimate due to extending procurement program one year (Schedule)	--	13.1
Redistribution of FY92 Army quantity from Source 1 to Source 2 (Estimating)	-24.3	-35.6
Budgetary adjustments - Primary hardware (Estimating)	1.7	-0.4
Budgetary adjustments - ISRP and other weapons system (Support)	1.9	5.6
Total Changes	-13.6	-61.0

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.019	0.001	0.001	0.005	--	-0.002	--	-0.003	0.002	0.021

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

SINCGARS GROUND PROD:	Initial Contract Price Target	Ceiling	Qty
ITT CORPORATION, FORT WAYNE, IN DAAB07-84-C-K503, FFP Award: December 2, 1983 Definitized: N/A	$53.8	N/A	650

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$769.3	N/A	44100	$807.9	$787.4

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variance reporting not required for this FFP contract.

Contract DAAB07-91-C-G001 was awarded December 1990 as an administrative continuation of contract DAAB07-84-C-K503. This display combines DAAB07-84-C-K503 and DAAB07-91-C-G001 data.

	Initial Contract Price		
SINCGARS A/B PROD:	Target	Ceiling	Qty
ITT CORPORATION, FORT WAYNE, IN DAAB07-85-C-K561, FFP Award: May 31, 1985 Definitized: N/A	$19.5	N/A	150

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$117.9	N/A	3870	$126.3	$119.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variance reporting not required for this FFP contract.

	Initial Contract Price		
SINCGARS SECOND SOURCE:	Target	Ceiling	Qty
GENERAL DYNAMICS, SAN DIEGO, CA DAAB07-88-C-T026, FPAF Award: July 15, 1988 Definitized: N/A	$21.9	N/A	400

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$49.9	N/A	2125	$125.1	$53.4

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and schedule variance reporting not required for this FPAF contract.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 68.0% (17 yrs/25 yrs)

(2) Percent Program Cost Appropriated: 45.6% ($1422.7 / $3121.8)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY76-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2000)	Total
RDT&E	179.3	-	-	-	179.3
Procurement	955.8	287.6	223.3	1475.8	2942.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1135.1	287.6	223.3	1475.8	3121.8

16c. **Program Funding Summary (Cont'd):**

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1976				0.7	0.4	0.4	0.4	6.6
197T				0.3	0.2	0.2	0.2	2.9
1977				3.2	2.0	2.0	2.0	2.6
1978				9.3	6.2	6.2	6.2	6.8
1979				16.8	12.4	12.4	12.4	8.4
1980				24.8	20.0	20.0	20.0	10.6
1981				27.5	24.4	24.4	24.4	10.6
1982				14.0	13.2	13.2	13.2	7.6
1983				12.0	11.8	11.8	11.8	4.9
1984				10.1	10.3	10.3	10.3	3.8
1985				9.9	10.4	10.4	10.4	3.4
1986				11.0	12.0	12.0	12.0	2.8
1987				13.3	14.8	14.8	14.8	2.7
1988				14.3	16.5	16.5	16.5	3.0
1989				7.6	9.2	9.2	9.2	4.2
1990				10.3	12.8	12.6	11.0	4.0
1991				2.1	2.7	2.7	1.0	3.9

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
Subtot				187.2	179.3	179.1	175.8	

Appropriation includes Army requirements only and does not include funding from other sources.

Appropriation: 2031 Aircraft Procurement, Army

1985	150	4.3	10.6	17.4	19.0	19.0	17.6	3.4
Subtot	150	4.3	10.6	17.4	19.0	19.0	17.6	

OPA inflation indices were used since the Airborne radios are Communications-Electronics equipment. All requirements for the Airborne radio will be funded in the OPA appropriation beginning in FY88.

Appropriation: 2035 Other Procurement, Army

1983	175	1.2	17.4	19.6	20.3	20.3	20.3	4.9
1984	1325	3.2	56.5	63.0	66.9	66.9	66.9	3.8
1985	10268	0.2	131.3	132.9	145.5	145.5	145.3	3.4
1986	400	0.9	71.8	75.7	85.6	85.6	75.1	2.8
1987			4.5	11.1	13.0	13.0	13.0	2.7
1988	720		23.5	26.3	32.2	32.2	30.5	3.0

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2035 Other Procurement, Army (Cont'd)								
1989	13599	3.1	172.5	177.9	225.6	233.0	229.3	4.2
1990	2925	3.5	59.7	65.0	84.8	78.2	48.0	4.0
1991	15328	0.9	193.4	195.0	262.9	266.3	20.0	3.9
1992	19885	2.9	195.3	206.6	287.6			3.1
1993	12329	1.0	145.7	155.3	223.3			3.3
1994	20563	0.1	230.7	247.4	367.2			3.3
1995	22239	0.1	240.1	261.5	400.5			3.3
1996	21553	0.1	224.2	252.9	399.8			3.2
1997	6334	0.1	86.8	106.8	174.2			3.2
1998	2207		47.7	60.8	102.4			3.2
1999			16.5	17.4	30.2			3.2
2000				0.8	1.5			3.2
Subtot	149850	17.3	1917.6	2076.0	2923.5	941.0	648.4	
Grand Total	150000	21.6	1928.2	2280.6	3121.8	1139.1	841.8	

NOTE: FY 89 Other Procurement, Army (OPA) quantity is understated by 1200 units and FY 90 OPA is overstated by 1200 units. Funding for these years is correct as shown. Airborne radio, option 2 for 1200 units was awarded in April 1989 with FY 89 funding.

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1983	0	175	175	175
1984	0	1325	1325	1325
1985	0	8595	10418	10750
1986	0	23650	400	400
1987	0	23193	0	0
1988	0	34800	720	720
1989	0	35400	13599	16000
1990	0	35400	2925	2925
1991	0	35400	15328	17800
1992	0	37080	19885	28775
1993	0	33000	12329	35230
1994	0	24835	20563	34304
1995	0	0	22239	2900
1996	0	0	21553	0
1997	0	0	6334	0
1998	0	0	2207	0

NOTE: Attainment of maximum economic production rate may be limited by other service customers. In maximum economic estimate, the airborne radio completes procurement in FY93 (2230) and the ground radio completes procurement in FY95 (2900). Funded delivery periods other than 12 months are as follows:

17d. **Production Rate Data (Cont'd):**

FY	Quantity	Delivery Period (Months)
83 (ground)	175	2
84 (ground)	1,325	6
85 (ground)	10,268	16
85 (airborne)	150	3
86 (ground)	400	8
88 (airborne)	720	10
89 (ground)	13,599	18
90 (airborne)	1,200	20
90 (ground)	1,725	11
98 (ground)	2,207	2

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	4167.7	-1887.1	2280.6	0.0	2280.6
(TY $)	5611.7	-2489.9	3121.8	+725.8	2396.0
PAUC Cost (BY $)	0.014	0.001	0.015	0.000	0.015
(TY $)	0.019	0.002	0.021	0.005	0.016

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	DEC 83	0	DEC 83	N/A	DEC 83
Duration (in MON)	150	35	185	36	149
End Date(MON YY)	JUN 96	35	MAY 99	N/A	MAY 96

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	29420/30291

17e. Production Rate Data (Cont'd):

e. Approved Design-to-Cost Objective -- N/A.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

SINCGARS is the VHF-FM radio communication system which provides the primary means of command and control for infantry, artillery and armor units. Since SINCGARS will be fielded to every type of unit in the Army, there is no "typical" division set; however; 4,500 receiver-transmitters (RTs) are used as an average division quantity. Eighty-one per cent of the total buy will be fielded; costs shown are based on fielded divisions. SINCGARS does not require a dedicated operator except for an average of 1200 retransmission operators needed for specific missions. Operating tempo (peacetime) varies depending on the theater in which the radio is deployed and ranges from 177 hours per year for Reserve Units to 1638 hours per year in Europe. No depot overhaul is scheduled. Operating and Maintenance (O&M) (consumable) repair parts includes batteries. Maintenance includes depot maintenance, civilian field maintenance labor, and interim contractor support. Other Operating and Support (O&S) costs include training, transportation, System/Project Management and other sustaining support costs. The operating life of SINCGARS is 20 years. No operating and support cost data is currently available for the antecedent system, AN/PRC-77 and AN/VRC-12 family of radios.

SINCGARS Baseline Cost Estimate dated July 23, 1990.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Division (4500 RTs)	Avg Annual Cost Per (Antecedent)
O&M Repair Parts	5.1	N/A
Procurement Funded Mat'l	0.7	N/A
Maintenance	0.3	N/A
Military Personnel	1.3	N/A
Oth Operating & Support	0.6	N/A
Total	8.0	N/A

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	2.7	---	---	---	2.7
Total	2.7	---	---	---	2.7

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11-081

N-37 STD MSL 2

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: STD MSL (SM-2) II

AS OF DATE: December 31, 1991

INDEX

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AS AMENDED
AS CLEARED
FOR OPEN PUBLICATION
MAR 24 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
STANDARD MISSILE 2 MEDIUM RANGE/EXTENDED RANGE

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:
COMMANDER
NAVAL SEA SYSTEMS COMMAND
(PMS 422)
WASHINGTON, DC 20362-5101

CAPT W.C. STARK
Assigned: July 15, 1989
AV 332-0662 COMM (703)602-0662

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0603318N Project S01632
PE 0604366N Project S00439
PE 0603321N Project S1671
PE 0604365N
PROCUREMENT:
APPN 1507 ICN 0204229N (Navy)

No Security Objection to Publication
MAR 23 1992
Office of the Chief of Naval Operations Dept. of the Navy

Classified by: OPNAVINST S-5513.3B
Declassify on: OADR
Downgrade Instructions: NOT SUBJECT TO AUTOMATIC DOWNGRADE

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OASD(PA) DFOISR 92-T-0656

4. (U) Program Elements/Procurement Line Items (Cont'd):

MILCON:
PE 0702096N

5. (U) Related Programs:
(U) FFG-7 Frigate, CG 47 AEGIS Cruiser, and DDG 51 AEGIS Destroyer Ship Classes, and TERRIER CG/NTU, TARTAR CGN/NTU, and Vertical Launch System.

(b)(1)

(U) Block II SM-2 is a variation of Block I SM-2. Block II Medium Range (MR) and Extended Range (ER) Missiles incorporate increased kinematics, new conventional warhead, improved fuzing, and improved guidance to provide enhanced capability against high flying, steep diving anti-ship missiles (ASM's). Due to the addition of a MK-104 Dual Thrust Rocket Motor, Block II MR missile range is double that of Block I MR missiles and approximates range of Block II ER missiles. The SM-2 Block II MR is deployed on TARTAR New Threat Upgrade ships and AEGIS CG-47/51 Cruisers and AEGIS DDG-51 Destroyers. The SM-2 Block II ER is deployed on all 31 TERRIER Guided Missile Cruisers and Destroyers.

(b)(1)

(b)(1)



7. (U) Program Highlights:

a. (U) Significant Historical Developments --

(U) The STANDARD Missile-2 Block I (RIM-67), Extended Range Development program was initiated in August 1976. The Block II is an improved missile with capability to counter high speed, higher altitude anti-ship missiles in an advanced ECM environment. Based upon TECHEVAL and OPEVAL results the CNO recommended approval of limited production in May 1983. The Block II improvements are required to meet the Advanced Anti-Ship Missile (ASM) threats of the mid 1980s.

The STANDARD Missile-2, Medium Range, Block II (RIM/66H) is a derivative of the STANDARD Missile-2, Block II Extended Range that incorporated a new rocket motor and a modified airframe for compatibility with the vertical launcher system. Initial pilot production of 30 medium range rounds was approved for FY 83 in order to provide missiles for CSSQT and FOT&E testing in the CG 47 AEGIS Cruisers, the first medium range Block II ship. The Block II improvements are required to meet the Advanced Anti-Ship Missile (ASM) threats of the mid 1980s.

The Milestone IIIC ARB was conducted 20 February 1985. On 8 June 1985, SECNAV approved limited production (Lot #3) for a FY 85 buy of 255 ER missiles and 529 MR missiles.

The Milestone IIID Decision Memorandum was signed on 15 May 1986. SECNAV approved limited production for a FY 86 buy of 470 ER missiles and 846 MR missiles.

The Milestone IIIE ARB was conducted October 1986 and the Navy Program Decision Meeting was held on 26 November 1986. As a result, the Approval for Full Production Decision Memorandum was signed 17 December 1986. Follower producer source selection of the GC&A was awarded to Raytheon Company on 6 June 1986. Second sources were selected for all STANDARD Missile components and all contracts were competitively bid in FY 88 except the MK 30 Sustainer which will remain single source due to small procurement quantities. Second sources selected for qualification were Raytheon (Guidance, Control,

7a. (U) Program Highlights (Cont'd):

and Airframe); ATI (MK 115 Warhead Case); Bendix (Target Detecting Device); ARC (MK 104 Dual Thrust Rocket Motor); and Hercules (MK 70 Booster).

Approval for production of the Block III was received 12 May 1988 by the Navy Acquisition Review Board.

The Missile Homing Improvement Program (MHIP) was approved for Rapid Development Capability in January 1989.

Block III achieved IOC in August 1990.
Block IIIA Critical Design Review (CDR) process completed in March 1990.
Initiated assembly of ordnance sections and integration into FTRs to support DT/OPEVAL Testing of the Block IIIA.
Block IIIB completed ADM/EDM Release Review (AERR).
Five successful static firings of the Block IV Booster were completed in October/November 1990.
Began full scale Block IV round integration effort.

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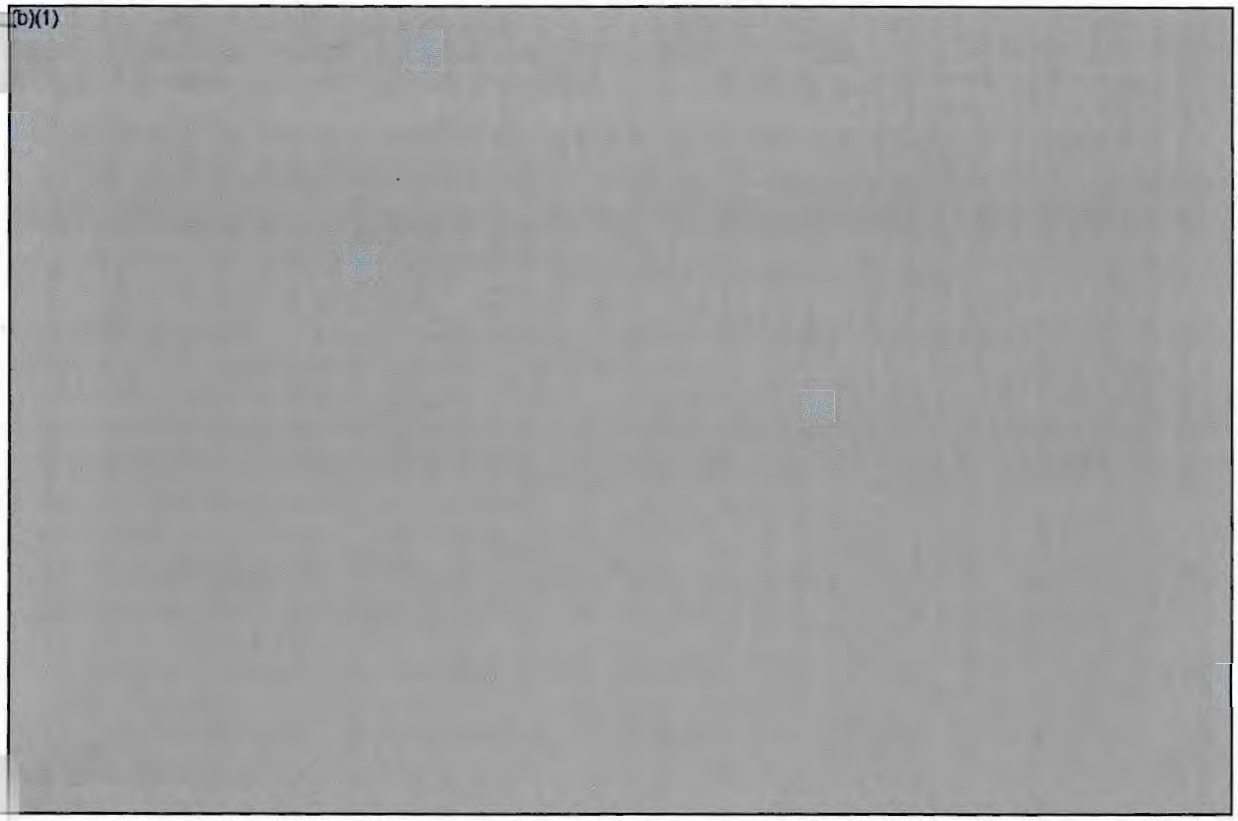

8. (U) Threshold Breaches:
There is one performance breach and a procurement cost breach to the Acquisition Program Baseline (dtd 13 Jan 92); there are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Production Estimate	Approved Program	Current Estimate
BLOCK II MR			
First Flt Test (development test)	FEB 83	FEB 83	FEB 83
Pilot Production Approved	JUN 83	JUN 83	JUN 83
Lot 1 Approval for Limited Prod	FEB 84	FEB 84	FEB 84
DT/OT and OPEVAL	SEP 84	SEP 84	SEP 84
Lot 2 Approval for Limited Prod	JUN 85	JUN 85	JUN 85
FOT&E USS VINCENNES CG-49	NOV 85	NOV 85	MAY 86
Lot 3 ALP	APR 86	APR 86	MAY 86
Milestone IIIE(AFP)	DEC 84	DEC 86	DEC 86
BLOCK II ER			
OPEVAL Complete	MAR 83	MAR 83	MAR 83
Pilot Production Approved	APR 82	APR 82	APR 82
Lot 1 Approval for Limited Production	JUN 83	JUN 83	JUN 83
Lot 2 Approval for Limited Production	FEB 84	FEB 84	FEB 84
Lot 3 Approval for Limited Production	MAR 85	MAR 85	MAR 85
FOT&E USS MAHAN DDG 42	MAR 85	MAR 85	MAR 85
Lot 4 Approval for Limited Production	APR 86	APR 86	MAY 86
Milestone IIIE (AFP)	DEC 84	DEC 84	DEC 86

(b)(1)

[redacted]

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --

	Production Estimate	Approved Program	Current Estimate
(b)(1)	[redacted]		

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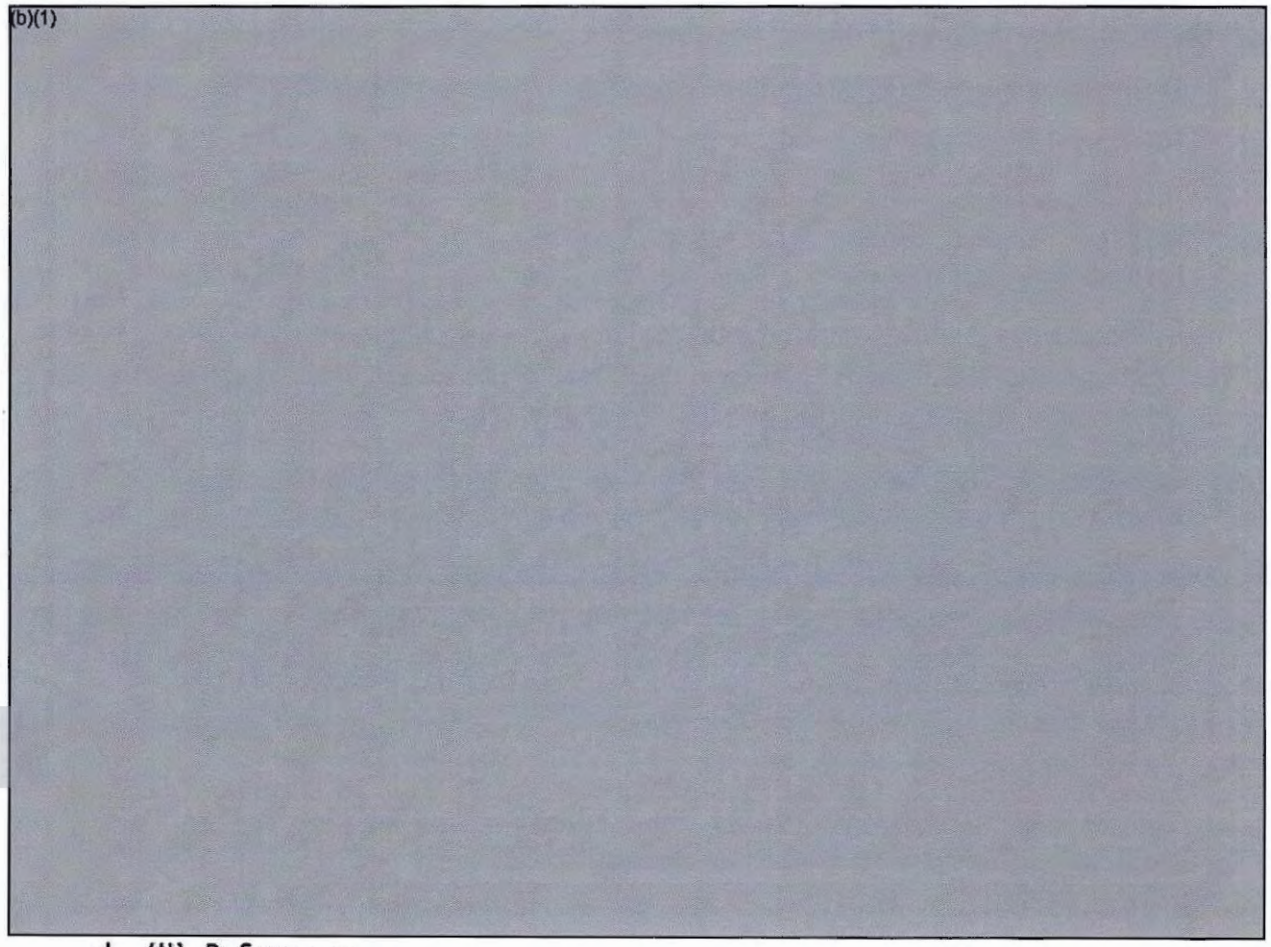

d. (U) References --

(U) Production Estimate:
-SM-2 BLOCK II MILESTONE IIIE NPDM OF 17 DECEMBER 1986. BLOCK III MILESTONE IIIB NAVY ARB OF 12 MAY 1988.

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 13 January 1992.

10. (U) Performance Characteristics:

a. (U) Performance --

	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

10a. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) Performance Characteristics (Cont'd):

	PdF	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

b. (C) Previous Change Explanations --

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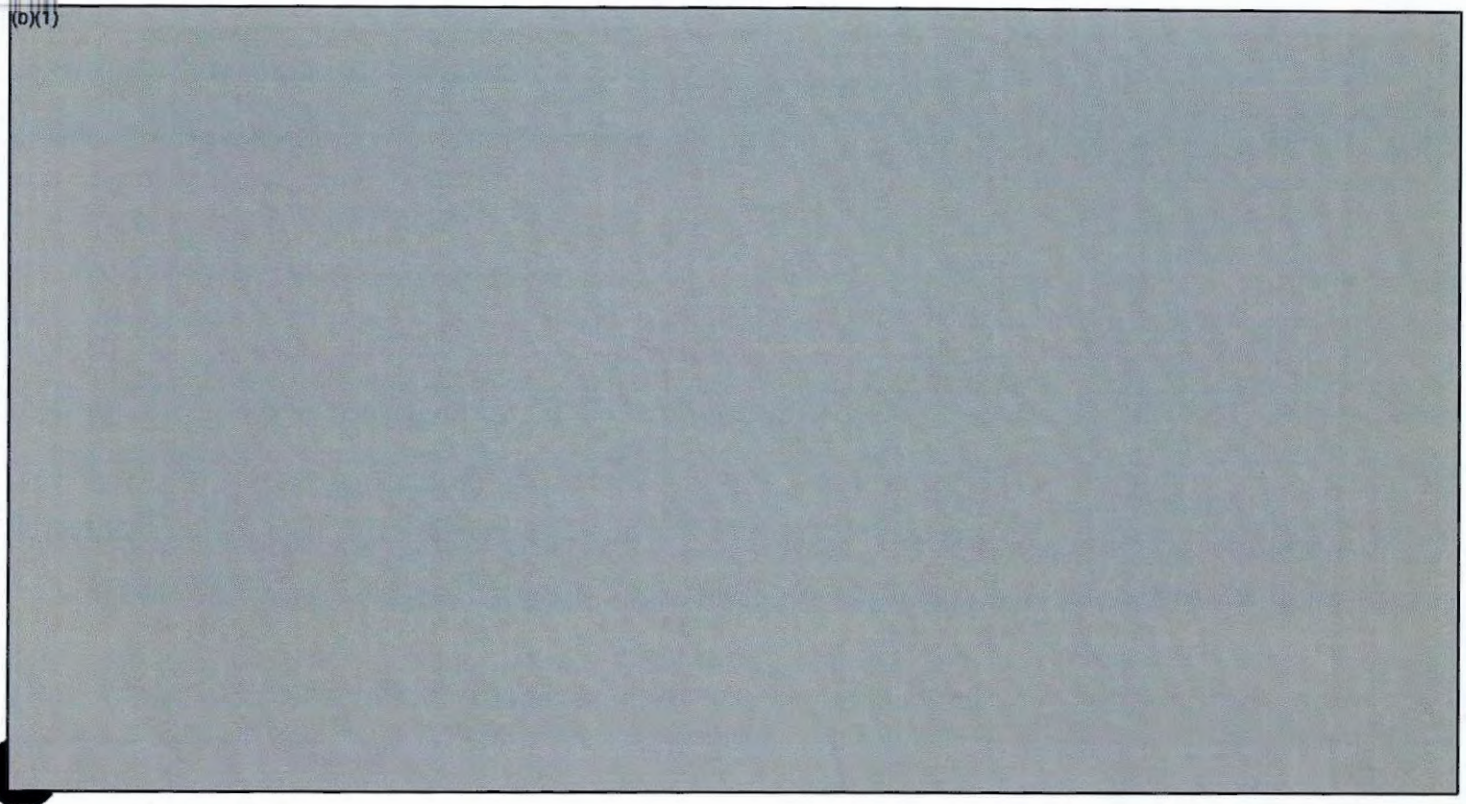
(b)(1)



d. (U) References --

(U) Production Estimate:
-SM-2 BLOCK II MILESTONE IIIE NPDM OF 17 DECEMBER 1986. BLOCK III MILESTONE IIIB NAVY ARB OF 12 MAY 1988.

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 13 January 1992.

II. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	648.4	1084.7	1108.0
Procurement	5923.2	7423.7	7910.6
ALL-UP-ROUND	(4510.5)		(5717.3)
PROC SUPPORT	(500.0)		(1079.6)
Total Flyaway	(5010.5)		(6796.9)
NONREC PROD SUPPORT	(388.9)		(537.7)
FLEET SUPPORT	(330.9)		(385.8)
Total Other Wpn Sys	(719.8)		(923.5)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(192.9)		(190.2)
Construction (MILCON)	0.0	34.0	34.2
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	6571.6	8542.4	9052.8
Escalation	1481.2	2182.8	2668.0
Development (RDT&E)	(53.2)	(157.8)	(161.2)
Procurement	(1428.0)	(2016.2)	(2498.2)
Construction (MILCON)	(0.0)	(8.8)	(8.6)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	8052.8	10725.2	11720.8
b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	10778	14677	14677
Total	10778	14677	14677

EXCLUDES 88 RDT&E UNITS THAT ARE NOT CONSIDERED FULLY CONFIGURED.

c. (U) Foreign Military Sales --
COMMITMENTS TO DATE ARE: 41 SM-2 BLOCK III MISSILES FOR JAPAN AT A COST OF $28.7M IN FY92 AND 50 AT A COST OF $38.3M IN FY93. TAIWAN HAS ALSO COMMITTED FOR 100 SM-2 BLOCK III MISSILES AT A COST OF $50.1M IN FY93.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Production Estimate:
-SM-2 BLOCK II MILESTONE IIIE NPDM OF 17 DECEMBER 1986. BLOCK III MILESTONE IIIB NAVY ARB OF 12 MAY 1988.

(U) Approved Program:
NAE approved Acquisition program Baseline dated 13 January 1992.

11e. (U) Total Program Cost and Quantity (Cont'd):

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TYS)	11720.8	10725.2	11720.8
(2) Quantity	14677	14677	14677
(3) Unit Cost	0.799	0.731	0.799
b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	340.4	340.4	262.6
Less CY Adv Proc	74.0	74.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	266.4	266.4	262.6
(2) Quantity	330	330	330
(3) Unit Cost	0.807	0.807	0.796

LESS CALENDAR YEAR ADVANCE PROCUREMENT LINE SHOWS $74.0M OF BLOCK IV LONG LEAD MATERIAL REQUIREMENTS. ALTHOUGH NOT TECHNICALLY AN ADVANCE PROCUREMENT, THE $74.0M IS ENTERED HERE FOR DISPLAY PURPOSES IN ORDER TO MORE ACCURATELY REFLECT THE CURRENT PROCUREMENT UNIT COST.

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	701.6	7351.2	0.0	8052.8
Previous Changes:				
Economic	-25.1	-520.5	+1.6	-544.0
Quantity	-	+2398.5	-	+2398.5
Schedule	-	+1158.1	-	+1158.1
Engineering	+365.1	+199.1	-	+564.2
Estimating	+200.9	-1414.1	+41.2	-1172.0
Other	-	-	-	-
Support	-	+267.6	-	+267.6
Subtotal	+540.9	+2088.7	+42.8	+2672.4
Current Changes:				
Economic	-5.8	-117.8	-0.2	-123.8
Quantity	-	-	-	-
Schedule	-	-238.3	-	-238.3
Engineering	-	-	-	-
Estimating	+32.5	+1199.3	+0.2	+1232.0
Other	-	-	-	-
Support	-	+125.7	-	+125.7
Subtotal	+26.7	+968.9	-	+995.6
Total Changes	+567.6	+3057.6	+42.8	+3668.0
Current Estimate	1269.2	10408.8	42.8	11720.8

4305.1
8052.8
12357.9

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	648.4	5923.2	0.0	6571.6
Previous Changes:				
Quantity	-	+1848.7	-	+1848.7
Schedule	-	+415.6	-	+415.6
Engineering	+311.4	+158.0	-	+469.4
Estimating	+124.9	-1067.2	+34.0	-908.3
Other	-	-	-	-
Support	-	+145.5	-	+145.5
Subtotal	+436.3	+1500.6	+34.0	+1970.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-330.6	-	-330.6
Engineering	-	-	-	-
Estimating	+23.3	+761.8	+0.2	+785.3
Other	-	-	-	-
Support	-	+55.6	-	+55.6
Subtotal	+23.3	+486.8	+0.2	+510.3
Total Changes	+459.6	+1987.4	+34.2	+2481.2
Current Estimate	1108.0	7910.6	34.2	9052.8

b. (U) Previous Change Explanations --

RDT&E

Economic: REVISED ESCALATION INDICES.

Engineering: INCREASE REFLECTS PROGRAM RESTRUCTURING CAUSED BY DECISION TO PURSUE AEGIS MISSILES AND ADDITION OF MISSILE HOMING IMPROVEMENT PROGRAM.

Estimating: INCREASE IN FY 87-90 FUNDS TO CONTINUE AND EXTEND (FOR 2 YEARS) THE BLK IIIA/IV DEVELOPMENT PROGRAM. ADJUSTMENT FOR CURRENT AND PRIOR YEAR INFLATION. REPROGRAMMING (GRH/SBIR) IN FY 90. REVISED FY 91-94 REQUIREMENTS. NEW REQUIREMENTS ADDED THROUGH FY97 TO MEET NEW THREAT SCENARIOS.

13b. (U) Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic: REVISED ESCALATION INDICES.

Quantity: ADDITION OF A PROGRAM YEAR AS A CONTINUING PROGRAM.

Schedule: DECREASE DUE TO A SHIFT OF 160 MISSILES IN FY 92 TO FY 88. INCREASE DUE TO SHIFT OF 310 FY 89-91 MISSILES TO FY 92-94 TO PROCURE MORE ADVANCED MISSILES. FUNDING ADDED BY CONGRESS TO PROCURE 350 ADDITIONAL MISSILES IN FY 90. DECREASE IN FY 92-93 CONTROLS FOR REALLOCATION OF MISSILE QUANTITIES. INCREASE DUE TO PROGRAM STRETCH OUT AND REDUCTION IN ANNUAL BUY QUANTITIES.

Engineering: INTRODUCTION OF EARLY PHASES OF LOW ALTITUDE IMPROVEMENTS AND IMPROVEMENTS TO THE TDD, WARHEAD AND ROCKET MOTOR.

Estimating: DECREASE DUE TO GRH CUTS, NIF AND DPSD REDUCTIONS, REDUCED HARDWARE COSTS DUE TO COMPETITION FOR ALL MAJOR COMPONENTS IN FY 88 AND OUTYEARS. INCREASE DUE TO CHANGE IN MISSILE MIX. ADJUSTMENT FOR CURRENT AND PRIOR YEAR INFLATION. SAVINGS FROM PLANNED CHANGE IN ACQUISITION STRATEGY TO SINGLE SOURCE COMPETITIVE PROCUREMENT. MISCELLANEOUS REPROGRAMMING DUE TO PRODUCTION EFFICIENCIES AND DUE TO REDUCTIONS FROM DMR, CALS, CAAS, AND NIF RATES. INCREASE IN G,C&A PROCUREMENT CONTRACT OVER ESTIMATED AMOUNT. ADJUSTMENT TO RECONCILE DIFFERENCES IN PREVIOUS SUPPORT CHANGES. INCREASED FUNDING FOR INFLATION IMPACT.

Support: DECREASE DUE TO ANNUALIZATION AND REALIGNMENT OF SUPPORT COSTS AND SAVINGS ON INITIAL SPARES COMPONENTS PROCUREMENT DUE TO COMPETITION. INCREASE DUE TO ADDITIONAL PROGRAM YEARS AND TO SUPPORT NEW MISSILE CONFIGURATIONS. INCREASE IN TEST EQUIPMENT COST TO SUPPORT COMPLEX NEW MISSILES. ADJUSTMENT TO RECONCILE DIFFERENCES IN PREVIOUS SUPPORT CHANGES.

MILCON

Economic: INCREASE DUE TO REVISED ESCALATION INDICES.

Estimating: FUNDS ADDED FOR CONSTRUCTION OF ENCAN/DECAN FACILITIES, ADDITIONAL MAGAZINES AND IMPROVED FACILITIES AT NAVAL WEAPON STATIONS. INCREASE DUE TO REVISED REQUIREMENTS AT NWS SEAL BEACH AND CONCORD. DECREASE DUE TO ADJUSTMENT FOR CURRENT AND PRIOR YEAR INFLATION. DECREASE DUE TO REVISED REQUIREMENTS IN FY92/93.

13c. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
REVISED ESCALATION INDICES (Economic)		-5.8
ADJUSTMENT FOR CURRENT AND PRIOR ESCALATION (Estimating)	1.6	2.1
INCREASE DUE TO REVISED REQMTS FY93-97 (Estimating)	21.7	30.4
Total Changes	23.3	26.7

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
REVISED ESCALATION INDICES (Economic)		-117.8
ADJUSTMENT FOR CURRENT & PRIOR ESCALATION (Estimating)	17.3	23.1
ADJUSTMENT TO RECONCILE EFFECT OF INFLATION ON PREVIOUS SCHEDULE CHANGE (Schedule)	-335.8	-439.7
(Estimating)	335.8	439.7
ADJUSTMENT TO RECONCILE DIFFERENCES IN PREVIOUS SUPPORT CHANGES (Support)	-20.7	-1.2
(Estimating)	20.7	1.2
DECREASE DUE TO SM-2 BLOCK IV DEFERRAL (Schedule)	-292.8	-391.1
DECREASE IN PRODUCTION SUPPORT FUNDING DUE TO BLOCK IV DEFERRAL (Schedule)	-14.0	-20.0
DECREASE DUE TO NSWC AND NAVAIRWARCEN BC&R II ADJUSTMENT (Estimating)	-8.8	-13.8
INCREASE DUE TO DBOF-NIF CUSTOMER AND BC&R II DMRD 922 NIF CREDIT (Estimating)	6.0	8.8
DECREASE DUE TO CAAS AND SCA ADJUSTMENTS (Estimating)	-19.3	-26.7
DECREASE DUE TO CONTRACT MANAGEMENT PROGRAM ADJUSTMENT (Estimating)	-21.5	-32.5
DECREASE DUE TO INFLATION ASSUMPTIONS (FY 1993-97) (Estimating)	-36.7	-56.3
INCREASE DUE TO REVISED BLOCK IV UNIT COST ESTIMATE (Estimating)	480.0	870.4
INCREASE IN INITIAL SPARES AND OTHER SUPPORT REQUIREMENTS (Support)	76.3	126.9
INCREASE DUE TO PROGRAM STRETCH-OUT AS A RESULT OF REDUCED MISSILE QUANTITIES IN THE FYDP (Schedule)	312.0	612.5
REDUCTION OF FY89 FUNDING TO REFLECT ACTUALS (Estimating)	-11.7	-14.6
Total Changes	486.8	968.9
(3) MILCON		
REVISE ESCALATION INDICES (Economic)		-0.2
ADJUSTMENT FOR CURRENT & PRIOR YEARS INFLATION OFFSET (Estimating)	0.2	0.2
Total Changes	0.2	--

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.747	-0.045	-0.035	0.063	0.038	0.004	--	0.027	0.052	0.799

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) SM-2 BLK IV DEVELOPMENT:
RAYTHEON, BEDFORD, MA
N00024-87-C-5321, FFP/PI
Award: July 30, 1987
Definitized: July 30, 1987

Initial Contract Price		
Target	Ceiling	Qty
$231.0	N/A	0

Current Contract Price		
Target	Ceiling	Qty
$231.0	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
$231.0	$271.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

INITIAL CONTRACT TARGET PRICE WAS CHANGED FROM $222.1M TO $231.0M TO REFLECT CONTRACT PRICE INSTEAD OF COST AS PREVIOUSLY REPORTED.

Cost/Schedule Variance: CPR data not required on FFP contracts.

NOTE: This is an incrementally funded contract.

(U) SM-2 BLK IIIB AUR:
IRISS RAYTHEON CO, BEDFORD, MA
N00024-90-C-5307, CPAF
Award: December 15, 1989
Definitized: September 5, 1991

Initial Contract Price		
Target	Ceiling	Qty
$138.7	N/A	0

STD MSL (SM-2) II, December 31, 1991

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$138.7	N/A	0	$139.4	$150.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (11/24/91)	$-2.1	$-1.9
Net Change	$-2.1	$-1.9

Explanation of Change: None.

b.(U) Procurement --

(U) SM-2 FY88 AUR PROD:
GENERAL DYNAMICS, POMONA, CA
N00024-88-C-5300, FFP/PI
Award: January 15, 1988
Definitized: January 15, 1988

Initial Contract Price		
Target	Ceiling	Qty
$169.9	N/A	801

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$169.9	N/A	801	$169.9	$187.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

INITIAL CONTRACT TARGET PRICE WAS CHANGED FROM $165.0M TO $169.9M TO REFLECT CONTRACT PRICE INSTEAD OF COST AS PREVIOUSLY REPORTED.

-Cost /Schedule Variance: CPR data not required on FFP contracts.

(U) SM-2 FY89 AUR PROD:
RAYTHEON COMPANY, BRISTOL, TN
N00024-89-C-5301, FFP/PI
Award: March 24, 1989
Definitized: March 24, 1989

Initial Contract Price		
Target	Ceiling	Qty
$176.1	N/A	786

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$176.1	N/A	786	$176.1	$176.1

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

INITIAL CONTRACT TARGET PRICE WAS CHANGED FROM $171.3M TO $176.1M TO REFLECT INITIAL CONTRACT PRICE INSTEAD OF COST AS PREVIOUSLY REPORTED.

- Cost Schedule Variance: CPR data not required on FFP contracts.

(U) SM-2 FY89 AUR PROD:
GENERAL DYNAMICS, POMONA, CA
N00024-89-C-5300, FFP/PI
Award: July 27, 1989
Definitized: July 27, 1989

Initial Contract Price		
Target	Ceiling	Qty
$145.9	N/A	524

Current Contract Price		
Target	Ceiling	Qty
$152.3	N/A	524

Estimated Price At Completion	
Contractor	Program Manager
$152.3	$152.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

INITIAL CONTRACT TARGET PRICE WAS CHANGED FROM $142.4M TO $145.9M TO REFLECT INITIAL CONTRACT PRICE INSTEAD OF CONTRACT COST AS PREVIOUSLY REPORTED.

Cost/Schedule Variance: CPR data not required on FFP contracts.

(U) SM-2 FY88 AUR PROD:
RAYTHEON, BRISTOL, TN
N00024-88-C-5301, FFP/PI
Award: January 15, 1988
Definitized: January 15, 1988

Initial Contract Price		
Target	Ceiling	Qty
$131.8	N/A	509

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$135.5	N/A	509	$135.5	$158.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

Cost/Schedule Variance: CPR data not required on FFP contracts.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 58.6% (17 yrs/29 yrs)

(2) Percent Program Cost Appropriated: 57.1% ($6693.9 / $11720.8)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY76-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2004)	Total
RDT&E	1004.3	71.0	53.0	140.9	1269.2
Procurement	5235.4	340.4	262.6	4570.4	10408.8
MILCON	42.8	-	-	-	42.8
O&M	-	-	-	-	-
Total	6282.5	411.4	315.6	4711.3	11720.8

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1982				324.1	305.0	305.0	305.0	7.6
1983				23.6	23.2	23.2	23.2	4.9
1984				17.0	17.3	17.3	17.3	3.8
1985				27.8	29.2	29.2	29.2	3.4
1986				56.8	61.4	61.3	60.2	2.8
1987				66.0	73.5	72.7	69.7	2.7
1988				85.0	97.8	97.7	95.5	3.0
1989				130.5	156.4	156.4	152.0	4.2
1990				119.9	149.4	149.4	131.6	4.0
1991				70.6	91.1	90.1	73.9	4.4
1992				53.3	71.0	45.4	9.3	4.1
1993				38.5	53.0			3.7
1994				33.9	48.2			3.6
1995				19.0	27.9			3.5
1996				17.8	26.9			3.4
1997				24.2	37.9			3.4
Subtot				1108.0	1269.2	1047.7	966.9	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1507 Weapons Procurement, Navy								
1976	22		53.8	92.4	48.4	48.4	48.4	6.6
197T								3.6
1977	36		60.4	73.9	42.9	42.8	41.4	3.8
1978	40		61.3	74.2	48.2	48.1	48.1	6.8
1979	40		51.8	65.4	46.8	47.3	47.3	8.7
1980	85		63.0	81.9	64.6	64.7	64.7	11.8
1981	345		156.2	198.2	174.3	174.2	174.2	11.6
1982	495		229.7	286.8	273.9	275.3	267.1	14.3
1983	500		292.6	398.1	402.0	404.6	391.7	9.0
1984	490		312.8	385.5	405.1	406.7	380.2	8.0
1985	730		394.5	443.5	479.7	474.2	453.5	3.4
1986	1271		581.3	652.0	729.6	743.0	723.3	2.8
1987	1194		504.2	583.3	676.2	674.5	647.0	2.7
1988	1310		435.6	476.1	573.5	568.7	527.4	3.0
1989	1310		425.9	465.2	582.0	581.9	499.1	4.2
1990	710		267.8	304.3	394.6	384.4	164.7	4.0
1991	405		182.8	219.2	293.6	219.3	62.1	3.9
1992	330		208.2	246.1	340.4	128.1	3.5	3.1

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1507 Weapons Procurement, Navy (Cont'd)								
1993	330		157.3	183.8	262.6			3.3
1994	630		309.0	356.9	526.4			3.3
1995	480		220.0	262.5	399.6			3.3
1996	480		219.7	258.1	405.4			3.2
1997	480		233.5	273.9	444.0			3.2
1998	480		192.9	216.3	361.9			3.2
1999	480		199.2	222.3	383.9			3.2
2000	480		239.1	262.0	466.9			3.2
2001	480		232.1	254.8	468.5			3.2
2002	480		227.0	249.3	473.2			3.2
2003	480		222.9	245.1	480.0			3.2
2004	84		62.3	79.5	160.6			3.2
Subtot	14677		6796.9	7910.6	10408.8	5286.2	4543.7	
Appropriation: 1205 Military Construction, Navy								
1989				23.6	29.3	30.6	30.6	4.2
1990				10.6	13.5	9.2	4.1	4.0
1991								3.9

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1205 Military Construction, Navy (Cont'd)								
1992								3.1
1993								3.3
Subtot				34.2	42.8	39.8	34.7	
Grand Total	14677		6796.9	9052.8	11720.8	6373.7	5545.3	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1976	0	0	22	0
197T	0	0	0	0
1977	0	0	36	0
1978	0	0	40	0
1979	0	0	40	0
1980	0	0	85	0
1981	0	0	345	0
1982	1063	1063	495	1080

17a. (U) Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1983	500	500	500	1080
1984	490	490	490	1080
1985	730	730	730	1080
1986	1330	1330	1271	1440
1987	2160	2160	1194	1800
1988	1990	1990	1310	2160
1989	2515	2515	1310	2160
1990	0	0	710	2160
1991	0	0	405	637
1992	0	0	330	0
1993	0	0	330	0
1994	0	0	630	0
1995	0	0	480	0
1996	0	0	480	0
1997	0	0	480	0
1998	0	0	480	0
1999	0	0	480	0
2000	0	0	480	0
2001	0	0	480	0
2002	0	0	480	0

17a. (U) Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
2003	0	0	480	0
2004	0	0	84	0

- CURRENT ESTIMATE - QUANTITY SHOWN IS PROJECTED PROCUREMENT QUANTITIES FOR THE FY PERIODS.

- MAXIMUM ECONOMIC - FY 86 WAS THE FIRST YEAR OF SECOND SOURCE G,C&A PROCUREMENT. MAXIMUM ECONOMIC INDICATES SECOND SOURCE PRODUCING 30 MISSILES PER MONTH IN FY 88 INCREASING TO 60 PER MONTH IN FY 89 AND 90 PER MONTH IN FY 90 WITH BOTH CONTRACTORS AT AN AVERAGE MAXIMUM ECONOMIC RATE OF 90 PER MONTH THRU MID JANUARY 1993.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	6571.5	+2481.3	9052.8	+2084.6	6968.2
(TY $)	8052.8	+3668.0	11720.8	+3988.0	7732.8
PAUC Cost (BY $)	N/A	N/A	0.617	+0.142	0.475
(TY $)	N/A	N/A	0.799	+0.272	0.527

17c. (U) Production Rate Data (Cont'd):

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JUL 82	0	JUL 82	N/A	JUL 82
Duration (in MON)	108	180	288	162	126
End Date(MON YY)	JUL 91	180	JUL 06	N/A	JAN 93

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	88/88
Procurement	7450/6214

e. (U) Approved Design-to-Cost Objective -- N/A.

APPROVED DESIGN TO COST GOAL - NO DESIGN-TO-COST GOALS APPLY TO THE SM-2 PROGRAM, AS THIS PROGRAM WAS INITIATED IN 1966, PRIOR TO DESIGN-TO-COST IMPLEMENTATION.

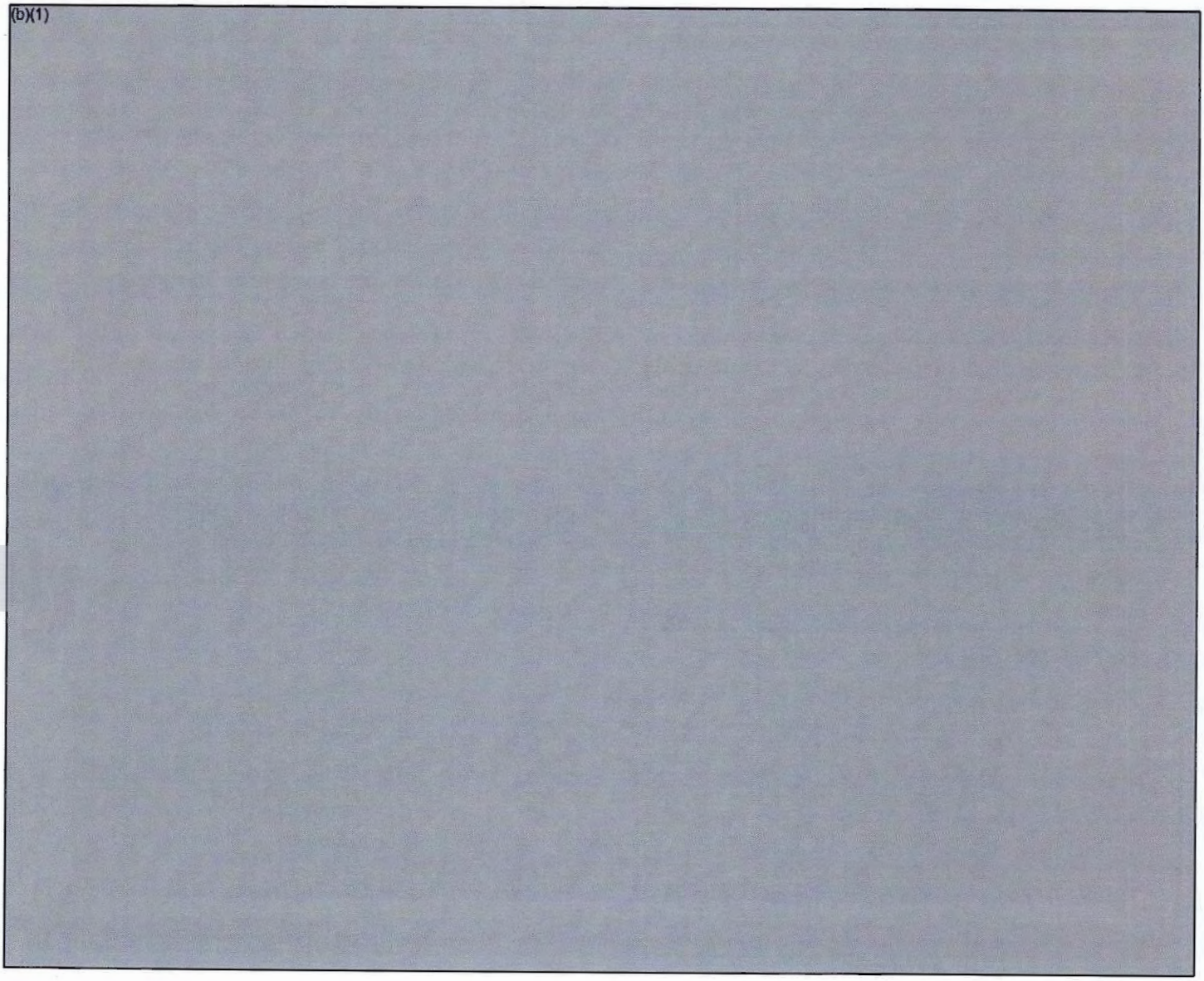
18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

SINCE THE SM-2 IS A WOODEN ROUND, PERSONNEL COST ARE UNNECESSARY FOR MISSILE OPERATION. THE O&S CONSUMABLES INCLUDE RANGE AND TARGET COST AS WELL AS POST FLIGHT ANALYSIS. THE DIRECT MAINTENANCE CONSISTS OF INTERMEDIATE AND DEPOT MAINTENANCE. THE SUSTAINING INVESTMENT CATEGORY INCLUDES REPLENISHMENT SPARES AND SUPPORT EQUIPMENT, EQUIPMENT MODIFICATION, RECEIPT, SEGREGATION STORAGE AND ISSUE (RSSI). DIRECT SUPPORT CONSISTS OF TRANSPORTATION AND TECHNICAL SUPPORT. THERE IS NO ANTECEDENT SYSTEM.

18b. (U) Operating and Support Costs (Cont'd):

(b)(1)



N-3 AN/BSY-1 91-1135

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AN/BSY-1

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
AN/BSY-1 Submarine Combat Weapons System

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**

DEPARTMENT OF THE NAVY
PEO SCWS (PMO 417)
NATIONAL CENTER #2 11W08
WASHINGTON, DC 20362-5103

CAPT ROBERT L. LOWELL JR., USN
Assigned: August 10, 1990
AV 332-0032 COMM (703) 602-0032

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604524 Project S1347
PE 0604503 (Shared) Project S0219 (Shared)
PE 0603524 (Shared) Project S1346
PE 0603504 (Shared) Project S0223
PE 0204281 (Shared) Project S0239

No Security Objection to Open Publication
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MAR 24 1992
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Naval Operations Dept. of the Navy

~~Classified by: OPNAVINST S5513.2E~~
~~Declassify on: OADR~~
~~Downgrade Instructions: OADR~~

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DEPARTMENT OF DEFENSE

[redacted]

4. (U) Program Elements/Procurement Line Items (Cont'd):

PROCUREMENT:
APPN 1810 ICN 221700N (Navy) (Shared)
APPN 1810 ICN 204261 (Navy) (Shared)

5. (U) Related Programs: None.

6. (U) Mission and Description:

AN/BSY-1 is the combat system for the improved SSN 688 (688I) class submarines, FY83-90 new construction (SSN 751-773). AN/BSY-1 replaces the AN/BQQ-5 sonar and CCS MK1 combat systems, as well as a number of peripheral acoustic standalone components. AN/BSY-1 provides capabilities for maneuvering, target motion analysis, combat system service, combat system management, onboard training, weapons, countermeasures and mines, piloting and navigation. It provides increased acoustic performance and weapons control over previous SSN 688 class systems.

To support the SSN 688I class mission, the following functional capabilities are provided/supported by the AN/BSY-1 system: (1) detection of multiple contacts, including early warning threat determination through processing and analysis of sensor data; (2) classification of sensor data for the purpose of identifying contacts; (3) localization (tracking) of contacts to determine position and motion through analysis of sensor data; (4) preset, launch, and control of weapons and countermeasures; (5) command and control for correlation of sensor data and audio circuits; (6) communication with submerged, surface, airborne, and land forces via voice and data links; and (7) navigation in open ocean and restricted waters.

7. (U) Program Highlights:

a. (U) Significant Historical Developments --

The AN/BSY-1 Program was initiated in response to the Mission Element Needs Statement (MENS) and was designated as a Major System Acquisition Category (ACAT I) Program by SECDEF on 28 NOV 1980. The acquisition strategy was approved by Defense Systems Acquisition Review Council (DSARC) Milestone I/IIA by SECDEF on 5 OCT 1983. The program underwent a major restructuring in SEP 1985, resulting in two separate combat systems, AN/BSY-1 and AN/BSY-2. The restructured program was approved by Secretary of Defense Decision Memorandum (SDDM) of 16 May 1986. A Conventional Systems Committee review was held on 28 NOV 1989. An Acquisition Decision Memorandum (ADM) was signed on 22 DEC 1989 by the Defense Acquisition Executive (DAE), approving procurement of the last shipset in FY90 and the Software Maintenance Facility (SMF) in FY91. All 23 shipsets, all trainers,

7a. (U) Program Highlights (Cont'd):

and the SMF have been approved for production. Full scale development is complete.

b. (U) Significant Developments Since Last Report --

AN/BSY-1 is a successful, mature program with no significant programmatic decisions remaining.

o Performance Characteristics: TECH/OPEVAL has completed, demonstrating successful system performance. COMOPTEVFOR evaluated AN/BSY-1 "Operationally Effective and Operationally Suitable...recommended for fleet introduction." Correction/recommendations identified by the fleet, test teams, and COMOPTEVFOR during nearly two years of testing and operation in the fleet have been resolved.
- Post-TECHEVAL Update (ECI-008) has been developed, tested and installed in 3 systems with the remaining systems scheduled.
- Post-OPEVAL Update (ECI-009), an acoustic software-only update, is in development with scheduled fleet delivery in JUN 92.

o Test and Evaluation: All TEMP testing has completed. TECH/OPEVAL threshold breaches are minor and have been addressed in a Program Baseline Change Request. The proposed changes include two system effectiveness and three system suitability criteria. COMOPTEVFOR recommendation to:
- Improve Acoustic subsystem Reliability and Maintainability (Reconfiguration Management complexity, "voluminous" system notes, PM/FL) is corrected by ECI-008 and -009.
- Conduct FOT&E for advanced under ice navigation is planned with SSN 688I participation in ICEX 1-93.

o Logistics Requirements and Readiness Objectives and Funding:
-The AN/BSY-1 support infrastructure is in place or on schedule.
- All trainers have been delivered to the Navy - six of seven are in operation. The first of two AN/BSY-1 Team Trainers was delivered to SUBSCOL NLON on schedule for RFT 30 NOV 1991. Initial feedback from school staff and AN/BSY-1 crews using the facility was very positive. Second Team Trainer on schedule for RFT NOV 92.
- Two of three Module Screen and Repair Activities (MSRAs) are in operation. The third is on schedule for DEC 92.
- Initial facilitization of an Organic Repair Depot is in progress. Phased transition of depot-level repair capability from the original equipment manufacturers is on schedule to complete by SEP 95.
- Initial Operational Capability (IOC) Logistics Review Group Audit recommended AN/BSY-1 be certified for IOC.
- IOC was demonstrated in JUL 91 with deployment of USS PASADENA

7b. (U) Program Highlights (Cont'd):

(SSN 752).

o Cost, Schedule, Contracts and Production: Contracts for all 25 systems (23 shipsets, 1 Maintenance Trainer, 1 Software Maintenance Facility) have been awarded. 18 systems have been accepted by the Navy. The remaining 7 are on schedule to meet Builders' Delivery Dates at Newport News and Electric Boat shipyards.
- All FPI development contracts are greater than 90% complete, below ceiling and no longer reported in the SAR.

o No major AN/BSY-1 system upgrade decision is proposed. Only one significant enhancement has been directed (modification of AN/BSY-1 to launch TOMAHAWK TLAM D and Block III), and that is on track...accomplished by modifying the proven CCS MK 4.2 software program algorithms to operate in AN/BSY-1.

o In view of the maturity of the program, including successful completion of TECH/OPEVAL, all production contracts being awarded, IOC demonstrated, no remaining milestone decision points, and "non-acquistion" nature of the remaining issues to be resolved, a second quarter FY92 "TECH/OPEVAL Data Review" chaired by PEO SCWS will assess readiness to transition the AN/BSY-1 Program from ACAT IC status to PEO SCWS oversight.

o This system will satisfy mission requirements.

c. (U) Changes Since As Of Date --
AN/BSY-1 Baseline Change approved by ASN(RD&A) 24 JAN 1992.

8. (U) Threshold Breaches:
Minor performance threshold breaches were noted during TECH/OPEVAL. A Program Deviation Report and Baseline Change Request have been forwarded to ASN (RD&A) for approval. Further explanation in paragraph 10c.

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Program Initiated (MENS Approved)	NOV 80	NOV 80	NOV 80
Milestone I (DSARC) Approve Design Definition SUBACS A & Concept Development SUBACS B	SEP 83	SEP 83	SEP 83

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Milestone II (DSARC) Approve FSD SUBACS Basic	SEP 83	SEP 83	SEP 83
Award FSD Contract SUBACS Basic	OCT 83	DEC 83	DEC 83
Milestone II (DSARC) Approve Concept Definition FY88 CS	SEP 85	SEP 85	SEP 85
DoD AN/BSY-1 Program Review	N/A	MAR 86	MAR 86
DoD AN/BSY-1 Program Review	OCT 86	MAY 88	OCT 87
DoD AN/BSY-1 Program Review	OCT 87	MAY 89	NOV 88
SSN 751 Delivery	JUN 88	JUN 88	JUN 88
DoD AN/BSY-1 Program Review	N/A	NOV 89	NOV 89
Start TECH/OPEVAL AN/BSY-1	JAN 89	APR 90	APR 90
Review of TECH/OPEVAL Results	OCT 89	NOV 91	FEB 92(Ch-1)
IOC	MAR 90	JUL 91	JUL 91(Ch-2)

b. (U) Previous Change Explanations --

Changes reflect shipyard and program schedule slips for AN/BSY-1(V).

c. (U) Current Change Explanations --

Change 1: Extended due to delayed issue of OPEVAL report (16 OCT 91).

Change 2: IOC demonstrated 15 JUL 91 with deployment of AN/BSY-1 in USS PASADENA (SSN-752).

d. (U) References --

(U) Development Estimate:
DCP, dated 15 November 1985.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 31 January 1992.

10. (U) Performance Characteristics:

a. (U) Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Detection Figures of Merit (FOM) Passive Broad Band (PBB) (dB)				

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) **Performance Characteristics (Cont'd):**

DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)			

[redacted]

AN/BSY-1, December 31, 1991

10a. (U) **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
[redacted]				

(b)(1)

[redacted]

10a. (U) Performance Characteristics (Cont'd):

DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)			

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

10a. (U) **Performance Characteristics (Cont'd)**:

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10b. (U) Performance Characteristics (Cont'd):

b. (U) Previous Change Explanations --

Reflect earlier changes in the AN/BSY-1(V) TEMP.

c. (U) Current Change Explanations --

CH-1 Measured during AN/BSY-1(V) TECH/OPEVAL - within TEMP thresholds.

CH-2 FOM considered satisfactory, since result is within measurement error tolerance.

CH-3 Required ambient noise condition for accurate IKA FOM measurement unachievable. Performance evaluation procedures changed to be consistent with those used by submarines prior to deploying for Arctic operations. Threshold change approved based on this revised procedure.

CH-4 There are essentially no changes in FLIT/MATE capabilities included in AN/BSY-1(V) over those present in all (prior) CCS Mk 1 variants. Differences are driven by target geometries, test ship maneuvers, operation responses, and environmental conditions. Standard test methodology and execution are virtually impossible to achieve. It is expected that a crew's nominal time to achieve a solution will decrease with increased experience. AN/BSY-1(V) system FLIT/MATE TMA performance evaluated as satisfactory.

CH-5 Threshold subject to a number of in-situ variables which impact results. Performance to be subjectively evaluated based on in-situ conditions. Threshold change to "unthresholded" approved.

CH-6 Incorporation of Post-TECHEVAL Update in the system has improved performance. Achievement of threshold has been demonstrated during laboratory testing of the change.

CH-7 Inclusion of 150 microprocessors make previous threshold inappropriate. Significant improvement noted in laboratory testing of Post-TECHEVAL Update. Threshold change to 6 hours approved.

CH-8 Discrepancy due to (a) recorded repair times were inflated by inclusion of logistics delay time, (b) intermittent faults increased localization times, (c) recorded repair times were rounded up to the nearest hour. Improvements incorporated in both Post-TECHEVAL and Post-OPEVAL Updates. Satisfactory performance (21 minutes) demonstrated under controlled laboratory conditions (Maintenance Demonstration in Developmental Testing).

10c. (U) Performance Characteristics (Cont'd):

CH-9 False Alarms/# of detections not an accurate indicator of function quality. Same false alarm may reappear each time as the PM cycles through testing the system. Threshold change to "98% of PMs free of false alarms" approved.

CH-10 Preventive maintenance for AN/BSY-1(V) Combat Control subsystem exceeded threshold by .7 hr/week. This does not adversely impact the crew or ship's ability to perform her mission. Threshold change to 5 hours/week approved.

d. (U) References --

(U) Development Estimate:
DCP, dated 15 November 1985

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 31 January 1992.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	2027.5	1125.7	1125.7
Procurement	944.9	2407.4	268.6
Total Sailaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(944.9)		(268.6)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	2972.4	3533.1	1394.3
Escalation	855.2	551.9	176.3
Development (RDT&E)	(319.4)	(80.7)	(80.7)
Procurement	(535.8)	(471.2)	(95.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	3827.6	4085.0	1570.6
b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	0	24	0
Total	0	24	0

Production systems ("Approved Program Procurement") for new construction ships are procured under SCN appropriations and reported in the SSN 688 SAR under the cognizance of NAVSEA (PMS393). Only

11b. (U) Total Program Cost and Quantity (Cont'd):
procurement of Organic Depot, MSRA TPS, System Improvements, Trainers and End of Life Buys ("Current Estimate Procurement") are reported in the AN/BSY-1 SAR submitted by the PEO-SCWS.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --

None

e. (U) References --

(U) Development Estimate:
DCP, dated 15 November 1985

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 31 January 1992.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1570.6	1571.1	1570.6
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	45.7	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	45.7	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Production systems for new construction ships are procured under SCN appropriations and reported in the SSN 688 SAR under the cognizance of NAVSEA (PMS393). Only procurement of Organic Depot, MSRA TPSs, System Improvements, Trainers, and End of Life Buys are reported in the AN/BSY-1 SAR submitted by the PEO-SCWS.

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2346.9	1480.7	0.0	3827.6
Previous Changes:				
Economic	-51.7	-23.3	-	-75.0
Quantity	-62.1	-	-	-62.1
Schedule	+15.5	-	-	+15.5
Engineering	+34.0	-	-	+34.0
Estimating	-26.6	-	-	-26.6
Other	-1050.9	-	-	-1050.9
Support	-	-1091.4	-	-1091.4
Subtotal	-1141.8	-1114.7	-	-2256.5
Current Changes:				
Economic	-0.1	-5.7	-	-5.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.4	-	-	+1.4
Other	-	-	-	-
Support	-	+3.9	-	+3.9
Subtotal	+1.3	-1.8	-	-0.5
Total Changes	-1140.5	-1116.5	-	-2257.0
Current Estimate	1206.4	364.2	-	1570.6

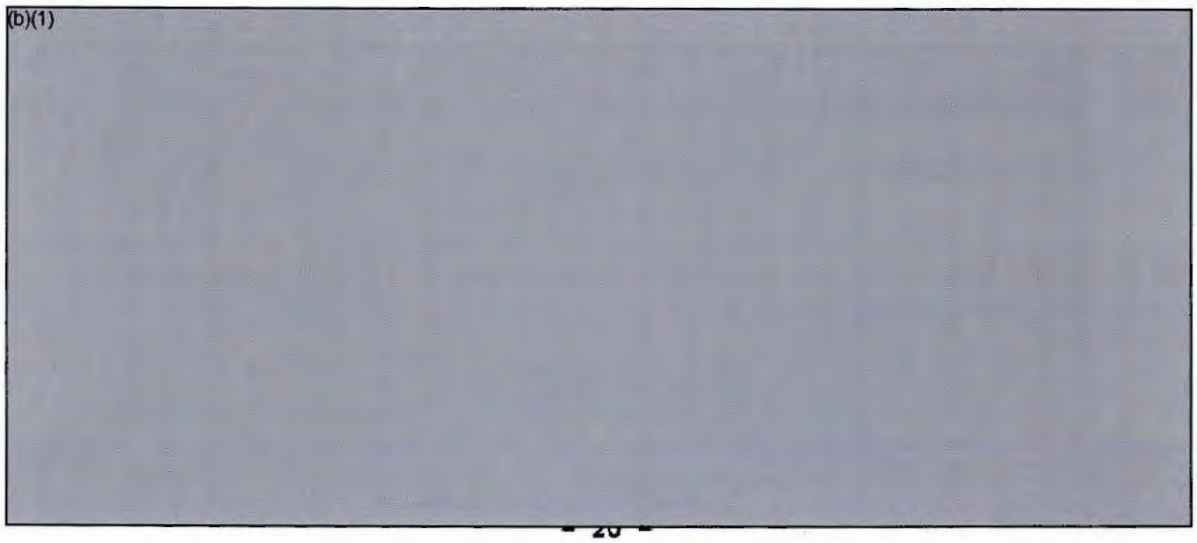
[redacted]

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2027.5	944.9	0.0	2972.4
Previous Changes:				
Quantity	-57.0	-	-	-57.0
Schedule	+13.2	-	-	+13.2
Engineering	+29.6	-	-	+29.6
Estimating	-22.1	-	-	-22.1
Other	-866.5	-	-	-866.5
Support	-	-679.1	-	-679.1
Subtotal	-902.8	-679.1	-	-1581.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.0	-	-	+1.0
Other	-	-	-	-
Support	-	+2.8	-	+2.8
Subtotal	+1.0	+2.8	-	+3.8
Total Changes	-901.8	-676.3	-	-1578.1
Current Estimate	1125.7	268.6	-	1394.3

(b)(1)



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(b)(1)



PROCUREMENT

Economic:	Revised Escalation Indices
Quantity:	Addition of MSRA, Team Trainers and associated spares to support an increased number of operational systems; Recategorization to previous SARs.
Schedule:	Change of backfit equipment and earlier deliveries to meet accelerated shipbuilding schedule; Recategorization to previous SARs.
Engineering:	Configuration changes to enhance capability and recategorization to previous SARs.
Estimating:	Increase in product improvement and overhaul material needs; loss of Software Maintenance Facility due to budget cuts; decrease in number of spares for Maintenance Assisted Modules (MAMS) and Installation and Checkout(I&C); restoration of Software Maintenance Facility(SMF); loss of 2 Team Trainers; additional funding for Wide Aperture Array (WAA) backfits; decrease in product improvement needs; increase in Module Screening and Repair Activity(MSRA) requirements; transfer of funding for Wide Aperture Array(WAA) backfit to AN/BSY-2 program; increase in Organic Depot and MSRA requirements.
Other:	Separation of the AN/BSY-1 and AN/BSY-2; Recategorization to previous SARs.
Support:	Re-categorization to previous SARS. Redefinition of support requirements for trainers and spares; Adjustment to MSRA/TPSs, Organic Depot, SMF/GFE, TT/BOT Upgrade, Spares and System Improvements.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)		-0.1
Team Trainer Development Adjustment (Estimating)	1.0	1.4
Total Changes	1.0	1.3

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)		-5.7
Adjustment to MSRA/TPSs, Organic Depot, SMP, TT/BOT Upgrade, Spares, and System Improvements. (Support)	2.8	3.9
Total Changes	2.8	-1.8

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Not Applicable.

15. (U) Contract Information: None.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 66.7% (10 yrs/15 yrs)

(2) Percent Program Cost Appropriated: 92.1% ($1446.5 / $1570.6)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	1206.4	-	-	-	1206.4
Procurement	194.4	45.7	32.7	91.4	364.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1400.8	45.7	32.7	91.4	1570.6

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1983				241.5	237.5	200.4	199.1	4.9
1984				126.8	129.2	129.2	128.6	3.8
1985				174.3	183.1	183.1	182.1	3.4
1986				184.5	199.4	199.4	189.4	2.8
1987				188.6	209.9	209.9	196.7	2.7
1988				115.6	133.0	133.0	121.9	3.0
1989				72.9	87.3	87.3	66.8	4.2
1990				19.9	24.9	24.9	21.6	4.0
1991				1.6	2.1	2.1	1.8	3.9
Subtot				1125.7	1206.4	1169.3	1108.0	
Appropriation: 1810 Other Procurement, Navy								
1986				0.5	0.6	0.6	0.6	2.8
1987				41.4	48.1	48.1	38.7	2.7
1988				38.4	46.7	46.7	42.8	3.0
1989				1.0	1.2	1.2	1.2	4.2
1990				6.4	8.4	8.4	8.4	4.0

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1810 Other Procurement, Navy (Cont'd)								
1991				66.2	89.4	89.2	24.4	3.9
1992				32.8	45.7	35.8	0.3	3.1
1993				22.7	32.7			3.3
1994				16.8	25.0			3.3
1995				18.4	28.3			3.3
1996				22.3	35.3			3.2
1997				1.7	2.8			3.2
Subtot				268.6	364.2	230.0	116.4	
Grand Total				1394.3	1570.6	1399.3	1224.4	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1983	0	0	0	0

None required since production is less than six (6) per year.

b. (U) Cost Variance -- None.

c. (U) Schedule Variance -- None.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) **Operating and Support Costs:**

a. (U) Assumptions and Ground Rules -- None

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&MN	19.2	11.9	13.2	31.1	75.4
Total	19.2	11.9	13.2	31.1	75.4

A-34 TOW 2

91-1123

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: TOW 2

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
TOW 2

CLEARED
FOR OPEN PUBLICATION
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (DASD - A)
DEPARTMENT OF DEFENSE

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
Program Executive Officer, Fire Supp COL JACK D. CONWAY
ATTN: SFAE-FS-TO Assigned: January 15, 1991
RSA, AL 35898-5701 AV 746-7194 COMM 205-876-7194

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 23802 Project D336, D051

Declassification as marked
23 MAR 1992
SECURITY REVIEW, OCSINT, HQDA

Classified by: Multiple Sources
Declassify on: OADR
Downgrade instructions: REGRADED UNCLASS WHEN SEPARATED FROM CLASS ENCL/PAGES

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92-T-0660

4. (U) Program Elements/Procurement Line Items (Cont'd):

PROCUREMENT:
APPN 2032 ICN C59300 (Army)
APPN 2032 ICN C59800 (Army)
APPN 2032 ICN C61700 (Army)
APPN 2032 ICN CA0253 (Army)
APPN 2032 ICN CA0258 (Army)
APPN 2035 ICN BL5295 (Army)
APPN 2035 ICN K42500 (Army)

5. (U) Related Programs:
None.

6. (U) Mission and Description:

The TOW 2 weapon system is an upgrade of the basic TOW system necessitated by existing and postulated future threats. The basic TOW (tube-launched, optically tracked, wire-guided) system is a vehicle-mounted or crew-portable, heavy anti-tank, assault weapon system designed to attack and defeat armored vehicles and other targets such as field fortifications. Concurrent with lethality improvements, the TOW 2 system hardens against obscurants and electro-optical countermeasures which enables the system to be effectively employed in all weather conditions to engage tanks, other armored vehicles, bunkers, crew-served weapons and has a limited self defense capability against helicopters. The launcher consists of a launch tube, traversing unit, optical sight, night sight, missile guidance set, battery assembly, tripod, overpack shroud and carrying strap. The missile is encased in a disposable launch container. The TOW system has been incorporated into the improved TOW vehicle (ITV), the high mobility multipurpose wheeled vehicle (HMMWV), the M151 jeep, the armored personnel carrier, and the U.S. Marine Corps (USMC) light armored vehicle (LAV). The TOW subsystems on the Bradley Fighting Vehicle Systems are separately funded by that project manager and managed by the TOW PM by agreement. The TOW subsystem on the COBRA aircraft is funded by the COBRA Project Manager and managed by the U.S. Army Missile Command (MICOM) Weapon System Management Directorate by agreement. The missiles and Research, Development, Test & Evaluation (RDT&E) programs related to missile improvements for all platforms are funded in the TOW line and managed by the TOW PM.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --

The TOW 2 missile contract was developed under a product improvement program initiated in 1979. TOW 2A is an enhancement to the TOW 2 missile initiated in December 1984 to counter the reactive

7a. (U) Program Highlights (Cont'd):

applique armor threat. The effort added a tip charge to the probe, a redesigned safe and arming device and an electronic timing device to provide delay between the tip and main charge functions. Additional ballast was added to the aft end of the missile to accommodate the extra weight resulting from the probe improvements. Acquisition of TOW 2A was accomplished as an Engineering Change Proposal to the missile production line beginning with the FY 86 buy. The TOW 2B fly-over shoot-down missile version development contract was awarded 24 September 1987. Production of TOW 2B was cut into the TOW 2A contract by an Engineering Change Proposal on 21 December 1990 (2406 missiles). Funding cuts in the FY 91 RDT&E and FY92-94 modification program required deletion of the Alternate TOW 2B effort.

b. (U) Significant Developments Since Last Report --

A FY 91 supplemental budget was added to the budget to replace assets used during Operation Desert Storm. These supplemental funds will be used to buy 4500 missiles (2000 TOW 2As/2500 TOW 2Bs).

The TOW Sight Improvement Program (TSIP) Army Systems Acquisition Review Council (ASARC) was held on 18 July 1991 and did not result in a decision to begin full scale development, but was elevated to a higher level. A decision briefing with the Secretary of the Army and the Chief of Staff of the Army was held 5 August 1991. TSIP was terminated by Secretary of the Army on 17 October 1991.

TOW 2B production configuration verification test (PCVT) required by the In-process Review of November 1990 was completed in August 1991. Results of the PCVT scoring conference held on 23 August were 12 successes, five failures and four no tests. Of the five failures, only one was TOW 2B unique with all others directly linked to the delivery system.

As a result of the PCVT and some Production Acceptance Testing (PAT) failures, Government (U.S. Army Missile Command Research, Development & Engineering Center and TOW Project Office personnel) and contractor red teams as well as independent technical consultants were tasked to explore missile problems which led to the Acquisition Program Baseline (APB) breach of the TOW 2B IOC threshold. The teams are inveetigating possible production transition and technical design problems. Telemetry instrumentation equipment slug test flights are currently being conducted at Hughes Aircraft Company and Redstone Arsenal, AL. Inconclusive results are available at this time to submit an APB change establishing a new TOW 2B IOC.

The Project Office is currently developing an affordable alternative to the TOW Sight Improvement Program to meet some of the existing sight deficiencies. This alternate program, in coordination with the Infantry School, will be reviewed by the Army Staff during January 1992 and a In-Process Review with the Army Acquisition Executive (AAE) is planned for 22 January 1992.

7b. (U) Program Highlights (Cont'd):

This system will satisfy mission requirements.

c. (U) Changes Since As Of Date --

In a letter from the AAE dated January 29, 1992, the Improved Target Acquisition System (ITAS) was approved to compete for priority in the FY94-99 POM. ITAS, an Army Category III (ACAT III) program, will fix critical target acquisition and survivability deficiencies which currently exist. The ITAS will provide a capability enhancement to TOW which will meet the Heavy Anti-Armor Weapon (HAW), QMR dated November 1989. Reliability of the TOW 2B production missile during production configuration verification tests (PCVT) and the first two Production Acceptance Test lots were cited as substandard. The reliability defect is a production transition problem. Government and contractor teams were established to find and correct the problem. An APB change containing the new IOC will be submitted following assessment of the program and corrective action plan.

8. (U) Threshold Breaches:
There is a schedule breach to the approved Acquisition Program Baseline (APB), dated February 26, 1990 for TOW 2B IOC. A TOW Weapon System Program Deviation Report was submitted through PEO, Fire Support to the AAE on 23 OCT 91. There are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --	Production Estimate	Approved Program	Current Estimate
TOW 2			
Program Go Ahead	SEP 78	N/A	SEP 78
R&D Contract Award	AUG 79	AUG 79	AUG 81
DT/OT Test			
Start	N/A	MAY 81	MAY 81
Complete	N/A	JUL 81	JUL 81
DA IPR (Production Approval)	SEP 81	SEP 81	SEP 81
Initial Production Contract Award	DEC 81	DEC 81	DEC 81
Production Contract Deliveries Begin (missile)	N/A	JAN 83	JAN 83
Initial Operational Capability (IOC)	SEP 83	SEP 83	SEP 83
Production Contract Deliveries Complete	N/A	APR 87	APR 87

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
TOW 2A			
Engineering Development Begin	N/A	JAN 84	JAN 84
Qualification Test Begin	N/A	APR 86	APR 86
Qualification Test Complete	N/A	JUL 86	JUL 86
Initial Production Contract Award	N/A	AUG 86	AUG 86
Warhead Cut-In	N/A	MAY 87	MAY 87
Production Contract Deliveries Begin - FY86 Buy	N/A	JUN 87	AUG 87
FY 87 Production Contract Award	N/A	AUG 87	AUG 87
IOC	N/A	SEP 87	SEP 87
Second Source Educational Buy Contract Award	N/A	AUG 89	JUL 89
Production Contract Deliveries Complete-FY90 (1 month delivery)	N/A	MAR 92	N/A (Ch-1)
Prime Source/2nd Source Split Buy Contract Award	N/A	DEC 91	N/A (Ch-1)
TOW 2B			
R&D Contract Award	N/A	SEP 87	SEP 87
DT/OT Test Complete	N/A	APR 90	OCT 90
DA IPR (Production Approval)	N/A	JUN 90	NOV 90

(b)(1)

[redacted]

b. (U) Previous Change Explanations --

Previous changes which have affected schedule milestones include new milestones resulting from APB dated February 26, 1990, and cancellation of TOW 2 Retrofit Phase II. In addition, the TOW 2B DT/OT schedule slip from April 1990 to October 1990 has affected schedule milestones.

c. (U) Current Change Explanations --

(CH-1) Second Source effort terminated by direction of Office of the Secretary of Defense.

9c. (U) **Schedule (Cont'd):**

(CH-2) Management review panel directed confirmation testing of corrective actions before approving resumption of TOW 2B production.

(CH-3) TSIP ASARC V slipped from Apr 91 to Jul 91 awaiting a decision.

(Ch-4) TOW Sight Improvement Program (TSIP) terminated by direction of the Secretary of the Army.

d. (U) References --

(U) Production Estimate:
IPR approved by HQDA message, DAMA-WSM-S, dated 9 Oct 1981.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated February 26, 1990.

10. (U) **Performance Characteristics:**

a. (U) Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Weight (lbs)						
TOW 2						
Missile Weight Only	N/A	48	/ 48	48	48	
Msl Weight (Tactical missile in container) (lbs)	63.4	63.4	/ 63.4	63.4	63.4	
Launcher Weight (including night vision sight & batteries) (lbs)	216	216	/ 216	216	216	
System Ready to Fire (lbs)	276	279.4	/ 279.4	279.4	279.4	
TOW 2A						
Missile Weight Only (lbs)	N/A	49.8	/ 49.8	47.0	47.0	(CH-1)
Msl Weight (Tactical missile in container) (lbs)	N/A	64.5	/ 64.5	61.7	61.7	(CH-1)

10a. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Launcher Weight (including night vision sight & batteries) (lbs)	N/A	216	/ 216	216	216	
System Ready to Fire (lbs)	N/A	280.5	/ 280.5	277.7	277.7	(CH-1)
TOW 2B						
Missile Weight Only (lbs)	N/A	49.8	/ 51.0	49.4	49.4	(CH-1)
Msl Weight (Tactical missile in container) (lbs)	N/A	64.5	/ 65.7	64.1	64.1	(CH-1)
Launcher Weight (including night vision sight & batteries) (lbs)	N/A	216	/ 216	216	216	
System Ready to Fire (lbs)	N/A	280.5	/ 281.7	280.1	280.1	(CH-1)
Range (meters)						
TOW 2/TOW 2A						
Minimum (M)	65M	65	/ 65	65	65	
Maximum (M)	3750M	3750	/ 3750	3750	3750	
TOW 2B						
Minimum (M) 1/	N/A	65	/ 400	200	200	
Maximum (M)	N/A	3750	/ 3750	3750	3750	
System Reliability %						
TOW 2/TOW 2A missile with launcher	91.6	95	/ 91.6	91.6	95	(CH-2)
TOW 2B missile with launcher	N/A	95	/ 91.6	82.9	91.6	(CH-2)
Probability of Kill (PK)						
Benign						

(b)(1) [redacted]

TOW 2, December 31, 1991

10a. (U) Performance Characteristics (Cont'd):

PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)			

b. (U) Previous Change Explanations --

Previous changes include improvements to the warhead approved through PIPs which increased missile weight. Also, TOW 2A, TOW 2B, and Alternate TOW 2B performance characteristics added based on APB dated February 26, 1990.

(b)(1)

(b)(1)



d. (U) References --

(U) Production Estimate:
IPR approved by HQDA message, DAMA-WSM-S, dated 9 Oct 1981.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated February 26, 1990.

11. (U) **Total Program Cost and Quantity:** **(Current Estimate in Millions of Dollars)**

a. (U) Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	107.0	357.9	239.5
Procurement	2195.1	2626.1	2464.7
Heat Missile	(1299.3)		(1615.8)
Launcher	(7.0)		(0.0)
AN/TAS4/4A Night Sight	(363.2)		(237.1)
Ground Spt Retrofit	(325.8)		(421.6)
Night Sight Retrofit	(26.1)		(23.0)
Total Flyaway	(2021.4)		(2297.5)
Other Weapon Systems	(103.3)		(80.0)
Total Other Wpn Sys	(103.3)		(80.0)
Peculiar Support	(48.9)		(31.7)
Initial Spares	(21.5)		(55.5)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	2302.1	2984.0	2704.2
Escalation	321.7	518.3	445.4
Development (RDT&E)	(-15.7)	(60.4)	(16.8)
Procurement	(337.4)	(457.9)	(428.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2623.8	3502.3	3149.6

11b. (U) Total Program Cost and Quantity (Cont'd):

b. (U) Quantity --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	113	N/A	213
Procurement	141224	174532	153869
Total	141337	174532	154082

(b)(1)

[redacted]

d. (U) Nuclear Costs --

None.

11e. (U) Total Program Cost and Quantity (Cont'd):

e. (U) References --

(U) Production Estimate:
IPR approved by HQDA message, DAMA-WSM-S, dated 9 Oct 1981.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated February 26, 1990.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3149.6	3388.4	3149.6
(2) Quantity	154082	150625	154082
(3) Unit Cost	0.020	0.022	0.020
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	218.6	218.6	188.1
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	218.6	218.6	188.1
(2) Quantity	10000	10000	9440
(3) Unit Cost	0.022	0.022	0.020

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	91.3	2532.5	0.0	2623.8
Previous Changes:				
Economic	+1.6	-46.5	-	-44.9
Quantity	-	+338.6	-	+338.6
Schedule	-	+102.4	-	+102.4
Engineering	+314.1	+208.3	-	+522.4
Estimating	-	-215.7	-	-215.7
Other	-	-	-	-
Support	-	+61.8	-	+61.8
Subtotal	+315.7	+448.9	-	+764.6
Current Changes:				
Economic	-2.0	-8.3	-	-10.3
Quantity	-	+27.3	-	+27.3
Schedule	-	+27.0	-	+27.0
Engineering	-151.6	-143.0	-	-294.6
Estimating	+2.9	+81.2	-	+84.1
Other	-	-	-	-
Support	-	-72.3	-	-72.3
Subtotal	-150.7	-88.1	-	-238.8
Total Changes	+165.0	+360.8	-	+525.8
Current Estimate	256.3	2893.3	-	3149.6

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	107.0	2195.1	0.0	2302.1
Previous Changes:				
Quantity	-	+234.8	-	+234.8
Schedule	-	+33.8	-	+33.8
Engineering	+239.7	+163.0	-	+402.7
Estimating	-	-157.3	-	-157.3
Other	-	-	-	-
Support	-	+31.9	-	+31.9
Subtotal	+239.7	+306.2	-	+545.9
Current Changes:				
Quantity	-	+18.5	-	+18.5
Schedule	-	+6.7	-	+6.7
Engineering	-109.2	-69.3	-	-178.5
Estimating	+2.0	+45.9	-	+47.9
Other	-	-	-	-
Support	-	-38.4	-	-38.4
Subtotal	-107.2	-36.6	-	-143.8
Total Changes	+132.5	+269.6	-	+402.1
Current Estimate	239.5	2464.7	-	2704.2

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Engineering: Enhancement to the TOW 2 Warhead (TOW 2B) and the TOW Sight Improvement Program (TSIP). Termination of the Alternate TOW 2B Program.

PROCUREMENT
Economic: Revised escalation indices.
Quantity: Reduction in quantity of TOW 2 Missiles.
Schedule: Stretch-out of missile procurements.
Engineering: Funding of approved PIP's, enhancement to TOW 2 Warhead. Termination of the Alternate TOW 2B Program.

13b. (U) Cost Variance Analysis (Cont'd):

Estimating: Changes to reflect current data.
Support: Decrease in Support Equipment requirements.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	-3.0
Economic adjustment for negative program change (Economic)	N/A	1.0
Current and Prior Inflation Offset (Estimating)	1.0	1.4
Termination of TOW Sight Improvement Program (TSIP) (Engineering)	-112.9	-156.6
Alternate TOW 2 Warhead Study (Engineering)	3.7	5.0
Changes due to cost estimating update to reflect most recent data (Estimating)	1.0	1.5
Total Changes	-107.2	-150.7

13c. (U) **Cost Variance Analysis (Cont'd):**

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-16.8
Economic adjustment for negative program change (Economic)	N/A	8.5
Current & Prior Inflation Offset (Estimating)	1.4	3.7
Total variance associated with quantity increase of 4500 missiles.	57.3	84.7
Quantity variance (Quantity)	18.5	27.3
Schedule allocation associated with quantity change (Schedule)	6.7	18.9
Engineering allocation associated with quantity change (Engineering)	32.1	38.5
Reschedule of missile purchases in FY 1989-91 (Schedule)	--	8.1
Termination of TOW Sight Improvement Program (TSIP) (Engineering)	-101.4	-181.5
Changes due to cost estimating update to reflect most recent data (Estimating)	12.4	15.4
Decrease in initial spares (Support)	-4.4	-7.6
Decrease in other support (Support)	-1.9	-2.6
Correction to prior variances to reconcile flyaway and support costs (Support)	-32.1	-62.1
Correction to prior variances to reconcile flyaway and support costs (Estimating)	32.1	62.1
Total Changes	-36.6	-88.1

14. (U) **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.019	--	--	0.001	0.001	-0.001	--	--	0.001	0.020

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) Procurement --

(U) TOW MISSILE:	Initial Contract Price Target	Ceiling	Qty
Hughes Aircraft Co., Tucson, AZ DAAH01-90-C-0171, FFP Award: N/A Definitized: February 1, 1990	$394.7	N/A	19797

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$394.7	N/A	19797	$394.7	$394.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract performace reporting is not required for this FFP contract.

(U) TOW 2 Subsystems:	Initial Contract Price Target	Ceiling	Qty
Hughes Electro Optical Op, Manhattan Beach, CA DAAH01-90-C-0369, FFP Award: N/A Definitized: September 28, 1990	$111.7	N/A	1200

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$111.7	N/A	1200	$111.7	$111.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract performance reporting is not required for this FFP contract.

16. (U) **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 75.0% (15 yrs/20 yrs)

(2) Percent Program Cost Appropriated: 86.7% ($2730.6 / $3149.6)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY78-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	222.8	33.5	-	-	256.3
Procurement	2255.7	218.6	188.1	230.9	2893.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	2478.5	252.1	188.1	230.9	3149.6

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1978				8.0	5.3	5.3	5.3	11.1
1979				13.9	10.3	10.3	10.3	12.6
1980				31.9	25.7	25.7	25.7	11.4
1981				25.3	22.5	22.5	22.5	7.6
1982				6.5	6.1	6.1	6.1	7.6

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1983				2.2	2.2	2.2	2.2	4.9
1984				4.7	4.8	4.8	4.8	3.8
1985				11.3	11.9	11.9	11.9	3.4
1986				9.7	10.5	10.5	10.5	2.8
1987				5.7	6.3	6.3	6.3	2.7
1988				17.6	20.4	20.3	20.3	3.0
1989				20.5	24.7	24.6	24.6	4.2
1990				43.2	53.9	49.8	27.4	4.0
1991				14.0	18.2	0.8	0.3	3.9
1992				25.0	33.5			3.1
Subtot	213			239.5	256.3	201.1	178.2	
Appropriation: 2032 Missile Procurement, Army								
1981	3875		131.0	135.8	117.9	117.9	117.9	11.9
1982	10008		196.2	215.2	206.4	206.4	206.4	14.3
1983	12000		183.2	187.8	193.8	193.8	193.8	9.0
1984	18000		196.3	219.0	231.8	221.0	221.0	8.0
1985	12000		184.3	204.0	224.1	220.0	219.3	3.4

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2032 Missile Procurement, Army (Cont'd)								
1986	12000		135.9	170.1	191.4	182.0	179.1	2.8
1987	9350		109.0	120.6	141.0	135.9	122.9	2.7
1988	12000	10.2	133.5	150.8	182.6	177.7	167.2	3.0
1989	13115	8.8	114.1	151.4	190.8	179.7	147.4	4.2
1990	7297		102.7	105.0	136.3	116.4	62.7	4.0
1991	14784		221.5	222.2	298.3	242.8	121.6	3.9
1992	10000		155.0	157.7	218.6	6.7		3.1
1993	9440		130.2	131.4	188.1			3.3
1994	10000		135.0	138.3	204.5			3.3
1995			4.0	5.6	8.6			3.3
1996			3.9	5.6	8.8			3.2
1997			4.0	5.5	9.0			3.2
Subtot	153869	19.0	2139.8	2326.0	2752.0	2000.3	1759.3	

In 1989, the previous quantity of 12000 missiles was increased to 13115 missiles to account for a foreign military sales (FMS) payback that increased TOW's authority.
In 1991, the Army will procure the maximum number of supportable systems consistent with the dollars appropriated for missile procurement.

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2035 Other Procurement, Army								
1981			29.0	29.0	27.8	27.8	27.8	11.9
1982			32.2	32.2	32.3	32.3	32.3	14.3
1983			43.7	43.7	45.3	45.3	45.3	9.0
1984			33.8	33.8	35.9	35.9	35.9	8.0
Subtot			138.7	138.7	141.3	141.3	141.3	
Grand Total	154082	19.0	2278.5	2704.2	3149.6	2342.7	2078.8	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1981	0	3875	3875	30000
1982	0	10008	10008	30000
1983	0	12000	12000	30000
1984	0	18000	18000	30000
1985	0	18000	12000	30000
1986	0	18000	12000	3869
1987	0	15500	9350	0
1988	0	21029	12000	0
1989	0	24812	13115	0
1990	0	0	7297	0
1991	0	0	14784	0
1992	0	0	10000	0
1993	0	0	9440	0
1994	0	0	10000	0

17b. (U) **Production Rate Data (Cont'd):**

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2302.1	+402.1	2704.2	+141.8	2562.4
(TY $)	2623.8	+525.8	3149.6	+558.8	2590.8
PAUC Cost (BY $)	0.016	0.002	0.018	0.001	0.017
(TY $)	0.019	0.001	0.020	0.004	0.017

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	DEC 81	0	DEC 81	N/A	DEC 81
Duration (in MON)	107	51	158	95	63
End Date(MON YY)	NOV 90	51	FEB 95	N/A	MAR 87

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	213/213
Procurement	110246/105340

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) **Operating and Support Costs:**

a. (U) Assumptions and Ground Rules --

O&S costs were obtained from a Baseline Cost Estimate (BCE) dated September 1991. Costs were presented in FY92 Constant dollars. Costs were calculated OSD inflation guidelines dated 23 January 1991. The MICOM approved PICES Cost Model was used to develop the operations/sustainment cost estimates. O&S costs reflect full sustainment from 1981 - 2015 to include sustainment of existing and emerging TOW configurations. There is no antecedent program for TOW 2.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per TOW System Support	Avg Annual Cost Per Antecedent
Personnel less PCS	339.6	N/A
O & S Consummables	34.6	N/A
Direct Depot Maintenance	4.0	N/A
Substaining Investment	18.4	N/A
Other Direct Costs	16.4	N/A
Indirect Costs	6.4	N/A
Total	419.4	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	4.7	3.7	3.7	---	12.1
Industrial Fund	---	---	---	---	---
Total	4.7	3.7	3.7	---	12.1

N-40 T45TS

91-082

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: T45TS

AS OF DATE: December 31, 1991

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MAR 24 1992 9

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name):
   GOSHAWK

2. DoD Component: Navy

3. Responsible Office and Telephone Number:
   PEO (A) PMA 273 CAPT RICHARD E. KOEHLER
   WASHINGTON, DC 20361-1273 Assigned: June 15, 1989
   AV 222-3375 COMM 703-692-3375

4. Program Elements/Procurement Line Items:

   RDT&E:
   PE 0603208N Project H1142
   PROCUREMENT:
   APPN 1506 ICN 0017/0018 (Navy)
   MILCON:
   PE PROJ 236

No Security Objection to Open Publication
95-C-0496
MAR 24 1992
Chief, Aircraft Division
Naval Air Systems Dept. of the Navy

5. Related Programs:
   PE 0603216N Navy Aircrew Common Ejection Seat (NACES)
   PE 0604203N Standard Attitude and Heading Reference System (SAHRS)

6. Mission and Description:
The T45TS is an integrated system designed to provide undergraduate jet pilot training for prospective Navy/Marine Corps pilots and

*** [redacted] ***

6. Mission and Description (Cont'd):

selected international students to meet aircrew requirements in the 1990's and beyond.

The T45TS consists of aircraft, simulators, academics, a training integration system (TIS) and contractor logisitics support. It is a derivative of the British Aerospace Hawk that has been adapted to provide the capability for carrier catapult take offs and arrested landings. The simulator suite includes both Instrument Flight Trainers (IFT) (device 2F137) and Operational Flight Trainers (OFT) (device 2F138). Academics include textbook materials, classroom aids and a computer-assisted instruction (CAI) (device 4E10) system. The TIS (device 4E9) utilizes existing hardware and software to provide scheduling and tracking of training events in order to achieve required training efficiency. Contractor logistics support has been structured to provide for future competition of maintenance support services to ensure that the system will be supported in the most cost effective manner. The T45TS will replace existing T-2C intermediate and TA-4J advanced jet trainer aircraft, simulators, and associated equipment.

7. Program Highlights:

a. Significant Historical Developments --

Development of the T45TS was initiated in 1975 to replace both the T-2B/C and TA-4J aircraft during the early 1990's due to age and attrition. A Mission Element Need Statement (MENS) was approved in 1979. In August 1980, contracts were awarded for the development/definition of two alternatives - a new design aircraft and an existing or derivative aircraft. In March 1981, a Request for Proposal (RFP) for Pre-Full Scale Development (Pre-FSD) was released and in November 1981, the Navy announced Douglas Aircraft Company (DAC) as the winner of the competition to develop a training system based on a derivitive of the British Aerospace HAWK aircraft. The Pre-FSD contract was awarded to DAC in September 1982 and the aircraft was designated the T-45A.

Following the DSARC Milestone I/II Review, a Secretary of Defense Decision Memorandum (SDDM) was issued in October 1984 authorizing the program to enter Full Scale Engineering Development (FSED). A contract was signed on October 2, 1984 to initiate a firm-fixed price, incrementally funded development of the system at a total cost of approximately $511.9 million (TY$) over a six year period.

The Deputy Secretary of Defense gave his authorization in an Acquisition Decision Memorandum (ADM) signed November 24, 1987 to procure the FY 1988 production program of twelve T-45A aircraft, two flight simulators, a TIS, an academic subsystem and the required integrated logisitics support for FY 1988 and released the FY 1989

7a. Program Highlights (Cont'd):

long lead funding. The firm-fixed price contract option was definitized in December 1987 at $420.8 million (TY$).

First flight of prototype aircraft Y-1 occurred in April 1988 and first flight of Y-2 occurred in November 1988. In November 1988 DT/OT IIA was conducted and several aircraft performance deficiencies were documented. The prototype OFT was formally accepted on 20 December 1988.

In 1989 the contractor worked to resolve the aircraft performance deficiencies from DT/OT IIA. The OFT OT-IIA (Phase I) report was received in March 1989 and stated the OFT "has potential to be operationally effective and operationally suitable".

September 1989 testing identified the need for wing design changes to solve deficiencies related with aircraft stall. An aggressive engineering effort to solve the stall deficiency resulted in a November 1989 decision to redesign the wing with a full span slat.

Previous budget decisions restructured the program by deleting 24 aircraft in FY 1990, 36 aircraft in FY 1991 and 24 aircraft in FY 1992 and adding them to the end of the program. This production stretch reduced the procurement quantities to the minimum sustaining production rate, accomodating the time necessary to fabricate and test all DT/OT IIA deficiency corrections. A Defense Acquisition Board (DAB) review in December 1989 culminated with the issuing of an ADM which approved program baseline changes and authorized continuation of pilot rate production.

In January 1990 McDonnell Douglas Corporation (MDC) formally announced their decision to move the T45TS program from their Douglas Aircraft Company component in Long Beach, CA to McDonnell Aircraft Company in St. Louis, MO. In conjunction with this announcement, the decision was made to deliver all production aircraft (after the first two aircraft in the FY 1988 lot) in the final configuration, with all DT/OT IIA corrections installed. This decision eliminated the retrofit plan for the first 18 aircraft. This revised delivery schedule impacted the IOC milestone which is defined as delivery of the first twelve aircraft and associated ground training system elements. As a result, IOC slipped from the baseline goal of June 1991 (the threshold was September 1992) to November 1992. This slip represents a baseline deviation of 17 months from the threshold.

The move of the program from Long Beach, CA to St. Louis MO was completed during the second half of 1990. The impact of the move and the time required to design and produce the aircraft corrections lead to the decision to deliver the first two aircraft in late 1990 to be

7a. Program Highlights (Cont'd):

used in the flight test program and system integration testing. The balance of the FY 88 aircraft (10) will deliver in FY 92. Also in late 1990 the FY 88 production simulators, academics hardware and courseware, and training support center entered government acceptance testing.

In August 1990, McDonnell Douglas Corporation filed a claim against the Navy related to the FSD and the pilot production (FY 88) contracts. The claim centered on the design and production of the wing slats and engine change.

The T45TS program was again restructured in the FY 92/93 budget. The procurement quantities in FY 91 through FY 94 were reduced in order to minimize development/production concurrency. The reduced aircraft quantities were rescheduled for FY 98 and FY 99.

The aircraft were modified to incorporate the configuration changes required to correct the DT/OT IIA deficiencies. The three most significant aircraft improvements were an engine model upgrade, fuel control modifications, and moveable wing leading edge devices (slats). DT/OT IIB was conducted in December 1990 to evaluate all of the corrections. The DT report stated that "Within the scope of these tests, the T-45A exhibits satisfactory potential...".

b. Significant Developments Since Last Report --

The OT IIB report was received in March 1991 and also found that the aircraft exhibited satisfactory potential for its mission. The report recommended proceeding with limited production.

MS IIIA DAB review on 26 June 1991 resulted in approval to release balance of advance procurement funding for the FY 92 LRIP aircraft (qty 12) but deferred final LRIP approval pending submission by Navy of a fully funded program and a revised program baseline. The DAB approved Navy plans to change the following technical thresholds in the program baseline document: Flight Design Weight, Specific Range, Bolter Ground Roll Distance. Further threshold revisions to the following schedule activities were also approved: MS IIIB, TECHEVAL and OPEVAL. The Navy has forwarded a fully funded budget and an updated baseline document (reflecting final budget amounts) is in OSD for final approval.

The fully funded program reflects an annual Pilot Training Rate reduced from 600 to 450 at two strike training sites (NAS Kingsville, TX and NAS Meridian, MS). NAS Chase Field, TX was closed due to force structure changes consistent with military base closure authorizations. Additionally, an aircraft cockpit upgrade to a

7b. Program Highlights (Cont'd):

digital electronic configuration (called Cockpit 21) has been approved and is included in the fully funded program.

DT/OT IIC for the aircraft satisfactorily completed in August 1991. DT IID, which included a successful initial sea trials period, was completed in December 1991. The T-45A flew over 30 catapults and arrested landings from the USS Kennedy.

The academics element of the T45TS has been installed and accepted at NAS Kingsville, TX. COMOPTEVFOR completed operational testing (OT IIC Phase 3) in September 1991 and designated the T45TS Academics "potentially suitable and effective". The Training Support Center (TSC) was accepted in June by the Navy and is supporting the T45TS academics in the areas of curriculum updates and modifications.

Two IFT and four OFT simulators were accepted by the Navy and are in place at NAS Kingsville, TX. The simulators are being used to train the initial cadre of instructors for the T45TS.

The production Training Integration System (TIS) installation at NAS Kingsville, TX was completed in August 1991 with final Navy acceptance completed in November. The system is on line and being used to support the initial cadre instructor training. COMOPTEVFOR operational testing (OT IIC Phase 2) is scheduled for early 1992.

This system will satisfy mission requirements.

c. Changes Since As Of Date --
The Acquisition Program Baseline document is in OSD for final approval.

The FY 89/90/91 production contract was definitized on 7 February 1992. The contract price is $610.5M and includes new slatted wings, an upgraded engine and tooling investment payments through FY 91.

8. Threshold Breaches:
There are currently no breaches to the March 1991 Acquisition Program Baseline. There are no Nunn-McCurdy unit cost breaches.

9. Schedule:

9a. Schedule (Cont'd):

a. Milestones --	Planning Estimate	Approved Program	Current Estimate
Program Initiated	JUL 75	JUL 75	JUL 75
Requirements Validation Study	MAR 78	MAR 78	MAR 78
MENS Approved	JUN 79	JUN 79	JUN 79
RFQ For Concept Definition	DEC 79	DEC 79	DEC 79
Project Charter Approved	AUG 80	AUG 80	AUG 80
ASE Studies Completed	MAR 81	MAR 81	MAR 81
Sustain Engr Contract Award	NOV 81	NOV 81	NOV 81
DEM/VAL Contract Award (Pre FSED)	SEP 82	SEP 82	SEP 82
Program Redirect (All Carrier Qual)	N/A	NOV 83	NOV 83
Advance Development Contract Award	N/A	JUL 84	JUL 84
Milestone I/II (DSARC)	N/A	SEP 84	SEP 84
FSED Letter Contract	SEP 84	SEP 84	SEP 84
Milestone IIIA Approval Pilot Prod (APP)	N/A	SEP 87	SEP 87
T45A First Flight	JAN 88	MAR 88	APR 88
Pilot Lot II FY 89	N/A	DEC 89	DEC 89
Milestone IIIA (ALRIP) FY92	N/A	NOV 91	FEB 92(Ch-I)
Milestone IIIB (ALRIP) FY93	N/A	NOV 92	JUN 93(Ch-1)
Complete Navy Tech Eval (NTE)	JAN 90	MAR 92	AUG 92(Ch-1)
Complete OPEVAL	JUN 90	JUL 92	NOV 92(Ch-1)
Initial Operational Capability	MAY 91	NOV 92	NOV 92

b. Previous Change Explanations --

DSARC I/II was completed in September 1984 and IOC redefined as delivery of the 12th aircraft projected for October 1990. Similarly, MS IIID (AFP) was projected for October 1990 based on the development schedule. Subsequent definitization of the FSED contract established the delivery date of the 12th production aircraft as September 1990. The 31 December 1986 SAR showed four production milestones: MS IIIA-Pilot Production (9/87), MS IIIB-Limited Production (9/88), MS IIIC-Limited Production (9/89), and MS-IIID Full Production (10/90). For the 31 December 1987 SAR the pilot production milestone was approved by OSD review of a Navy Program Decision (NPDM) rather than a formal DAB major milestone. MS IIIA, as part of that decision was redefined as Approval for Limited Production (ALP) (9/88). MS IIIB and IIIC were deleted. MS III was redefined as Approval for Full Production. First flight of Y-1 prototype was contractually required on 31 March 1988. It was delayed two weeks due to contractor's late delivery. For the June 1989 SAR MS IIIA was retitled Approval for Continued Pilot Production and Approval for Low Rate Initial Production (FY 91) was retitled MS IIIA. These milestones along with TECHEVAL, OPEVAL, IOC and AFP were slipped due to late delivery of the flight test

9b. Schedule (Cont'd):
articles, delayed flight test schedule and to allow for correction of the DT/OT IIA deficiencies. DAB approval for Continued Pilot Production (Pilot Lot II) was December 1989. For the December 1989 SAR MS IIIA (FY 92) was added and MS IIIA (FY 91), TECHEVAL, OPEVAL, and AFP decisions were slipped due to program restrucuture and to incorporate time required to design, test, and produce the slatted wing configuration. For the June 1990 SAR MS IIIA (FY 91) was rescheduled to April 1991 to allow sufficient time to complete DT/OT IIB and to evaluate the test results. IOC was changed to reflect the move of the program and the time required to produce the slatted wing. For the Dec 1990 SAR MS IIIA (FY 1991) was deleted due to congressional deletion of aircraft from FY 1991.

c. Current Change Explanations --

Change I represents current estimates that are within the revised baseline threshold dates reflected in the Acquisition Program Baseline currently in OSD for final approval.

d. References --

Planning Estimate:
Draft SCP of January, 1984.

Approved Program:
DAE Approved Acquisition Program Baseline dated March 8, 1991.

10. Performance Characteristics:

a. Performance --

	PE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Aircraft						
Wing Span (ft)	30.81	30.81	/ 30.81	N/A	30.81	
Length (ft)	39.26	39.26	/ 39.26	N/A	39.26	
Height (ft)	13.42	13.42	/ 13.92	N/A	13.92	
Flight Design Weight (lbs)	12420	12758	/ 13470	13256	14000	(CH-1)
Specific Range @ 30,000 ft (takeoff less 40% useable fuel) (nm/lb)	N/A	.39	/ .34	N/A	.32	(CH-1)
Endurance @ 5000 ft (takeoff less 80% useable fuel) (lb/hr)	N/A	964	/ 1090	N/A	1160	(CH-1)

10a. Performance Characteristics (Cont'd):

	PE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate	
Waveoff (altitude loss ft)	N/A	50 / 70	50	50	
Bolter (ground roll distance ft @ 15 kts WOD)	N/A	325 / 353	270-315	325	(CH-1)
Lateral Directional Stability (sideslip excursion approach configuration)(deg)	N/A	4 / 6	4	4	
Roll Off at Stall (approach configuration) (deg)	N/A	<30 / 30	20	<30	(CH-2)
"G" Excursion Speed Brake Extension (Gs)	N/A	.25 / .40	.40	.40	
Longitudinal Stability (stick free damping ratio 10,000 ft & .86 IMN)	N/A	.45 / .25	.40	.40	
Simulator					
Total Time Lag Error (ms)	N/A	124 / 155	155	155	
Digital Computational System					
Main Memory with spare (MB)	N/A	4.0/2.75 / 4.0/2.0	4.0/2.0	4.0/2.0	
Processing Capacity (ms)	N/A	16.05 / 16.67	16.67	16.67	(CH-2)
Visual System Luminance (ft-l)	N/A	2.0 / 1.5	2.16	2.16	
Academics					
Memory/Spare (K/MB)	N/A	640/80 / 640/40	640 / 80	640 / 80	
Terminal Response Time (sec avg)	N/A	<3 / 3	<3	<3	
Training Integration System					
Memory (RAM)(MB)	N/A	256 / 192	256	256	
I/Os per second	N/A	210 / 75	75	75	

10a. Performance Characteristics (Cont'd):

	PE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Terminal Response Time (sec avg)	N/A	<3	/ 3	<3	<3	
Aircraft						
Speed						
Max Level Flt (Mach)	.80	.85	/ .84	.84	.84	
Approach (kts)	155-125	125	/ 125	125	125	
Sustain G's @ 15,000 ft	3.0	3.4	/ 3.2	3.4	3.2	
Mean Flight Hours Between Failure (MFHBF)	3.2	3.2	/ 2.0	2.7	3.2	(CH-2)
Direct Maintenance Man Hours/Flight Hour (DMMH/FH)	10.0	10.0	/ 10.0	4.9	10.0	(CH-2)
Availability (%)	85	85	/ 75	94	85	
Simulator Availability (%)						
Instrument Flight Trainer (IFT)	96	95	/ 80	90	95	
Operational Flight Trainer (OFT)	95	95	/ 80	90	95	
Academics						
Computer Aided Instruction (CAI) System Availability (% Sched)	98	95	/ 85	100	95	
Training Integration System (TIS)						
Availability (% Sched)	N/A	95	/ 85	100	95	
Pilot Training Rate	600	N/A	/ N/A			
Utilization Rate (Hr/Yr)*	720	N/A	/ N/A		N/A	
Max Range	1000	N/A	/ N/A		N/A	
Wing Area	179.64	N/A	/ N/A		N/A	

Performance values were demonstrated during Navy developmental test phases. Finalized data for demonstrated performance characteristics will be available for MS IIIB decision.

ACRONYMS:

10a. Performance Characteristics (Cont'd):
MB - Megabytes
MS - Milliseconds
WOD - Wind Over Deck
IMH - Indicated Mach Number

b. Previous Change Explanations --

The TIS availability estimate was reduced from 99% to 95% because of cost effectiveness considerations. The CAI availability estimate is an actual contract specification value. Definitized FSED contract changed flight design weight from 12,699 to 12,758 pounds. Program Manager's estimate of weight increased due to design changes to correct deficiencies discovered during DT/OT IIA.

c. Current Change Explanations --

Change 1 - Current estimates for Flight Design Weight, Specific Range, Endurance, and Bolter Ground Roll Distance are updated to reflect changes resulting from major configuration improvements including the upgraded engine and fuel control modifications and the redesigned wing to include a moveable leading edge slat. An updated Acquisition Program Baseline is currently in OSD for final approval.

Change 2 - Updated to reflect more current information. These characteristics are still within the thresholds of the approved baseline.

d. References --

Planning Estimate:
Draft SCP of January, 1984.

Approved Program:
DAE Approved Acquisition Program Baseline dated March 8, 1991.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Planning Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	1150.3	548.5	605.9
Procurement	2604.3	3959.9	3867.4
Airframs/CFE	(1259.1)		(2343.8)
Engine/Accessories	(363.6)		(0.0)
Electronics CFE/GFE	(136.6)		(222.7)
Change Allowance/ECO	(42.9)		(55.9)
Other GFE	(17.7)		(124.4)
Nonrecurring	(35.4)		(147.6)
Adv Prod Adjustment	(N/S)		(10.8)
Total Flyaway	(1855.3)		(2905.2)
Other Wpn Sys Cost	(577.5)		(665.0)
Total Other Wpn Sys	(577.5)		(665.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(171.5)		(297.2)
Construction (MILCON)	0.0	32.8	24.2
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	3754.6	4541.2	4497.5
Escalation	1707.4	2113.2	1899.3
Development (RDT&E)	(192.6)	(65.8)	(85.9)
Procurement	(1514.8)	(2033.3)	(1806.5)
Construction (MILCON)	(0.0)	(14.1)	(6.9)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	5462.0	6654.4	6396.8
b. Quantity --			
Development (RDT&E)	4	N/A	2
Procurement	300	300	268
Total	304	300	270

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Planning Estimate:
Draft SCP of January, 1984.

Approved Program:
DAE Approved Acquisition Program Baseline dated March 8, 1991.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6396.8	6654.4	6396.8
(2) Quantity	270	302	270
(3) Unit Cost	23.692	22.034	23.692
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	353.3	353.3	327.0
Less CY Adv Proc	21.0	21.0	21.0
Plus PY Adv Proc	46.9	46.9	47.7
Net Total	379.2	379.2	353.7
(2) Quantity	12	12	12
(3) Unit Cost	31.600	31.600	29.475

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1342.9	4119.1	0.0	5462.0
Previous Changes:				
Economic	-23.6	-357.1	-0.7	-381.4
Quantity	-23.8	-	-	-23.8
Schedule	-619.6	+405.8	-	-213.8
Engineering	-11.8	+833.1	-	+821.3
Estimating	+53.9	+680.0	+47.6	+781.5
Other	-	-	-	-
Support	-103.7	+312.3	-	+208.6
Subtotal	-728.6	+1874.1	+46.9	+1192.4
Current Changes:				
Economic	+0.3	-89.4	-1.2	-90.3
Quantity	-	-317.8	-	-317.8
Schedule	-	-30.7	-	-30.7
Engineering	+77.2	-63.1	-	+14.1
Estimating	-	+89.7	-14.6	+75.1
Other	-	-	-	-
Support	-	+92.0	-	+92.0
Subtotal	+77.5	-319.3	-15.8	-257.6
Total Changes	-651.1	+1554.8	+31.1	+934.8
Current Estimate	691.8	5673.9	31.1	6396.8

I3a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1150.3	2604.3	0.0	3754.6
Previous Changes:				
Quantity	-24.7	-	-	-24.7
Schedule	-497.4	+96.6	-	-400.8
Engineering	-18.4	+601.8	-	+583.4
Estimating	+47.8	+503.2	+32.8	+583.8
Other	-	-	-	-
Support	-108.0	+166.3	-	+58.3
Subtotal	-600.7	+1367.9	+32.8	+800.0
Current Changes:				
Quantity	-	-169.0	-	-169.0
Schedule	-	-6.3	-	-6.3
Engineering	+56.3	-39.2	-	+17.1
Estimating	-	+61.1	-8.6	+52.5
Other	-	-	-	-
Support	-	+48.6	-	+48.6
Subtotal	+56.3	-104.8	-8.6	-57.1
Total Changes	-544.4	+1263.1	+24.2	+742.9
Current Estimate	605.9	3867.4	24.2	4497.5

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Quantity: Decrease from four to two flight test aircraft.

Schedule: Milestone schedule adjustments to accommodate reduction in flight test program and earlier first flight of prototype aircraft, deletion of T-45B aircraft funding in accordance with Congressional direction.

Engineering: Reduction in requirements for flight testing and tooling and use of existing production engine vice an extensively redeveloped engine and emerging system changes to reduce O&S costs.

Estimating: Revision of methodology for estimating engineering

13b. Cost Variance Analysis (Cont'd):

hours, accounting and estimating adjustments to accommodate revised escalation rates and reprogramming adjustments to account for historical foreign exchange rate variances. Recategorization from schedule to estimating. Addition of FY 93 funding.

Support: Reduced manpower and material to support a two vice a four flight test article program and use of a TIS based on an adaptation of a previously developed computerized instructional system, restoral of prior Navy In House support reductions.

PROCUREMENT

Economic: Revised escalation indices.

Schedule: Revised aircraft procurement schedule.

Engineering: Revised estimates to reflect restructured system characteristics approved at DSARC I/II and design changes to correct deficiencies discovered during DT/OT IIA. Addition of cockpit upgrade and global positioning system.

Estimating: Change in dollar/pound exchange rate, addition of SAHRS as GFE. Move of program from Long Beach, CA to St. Louis, MO.

Support: Revised estimate of ILS requirements.

MILCON

Economic: Revised escalation indices.

Estimating: Revised estimate of T45TS system specific MILCON. Revised to reflect force structure issues.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indicies. (Economic)	--	0.3
Transfer of digital cockpit effort from the procurement account. (Engineering)	56.3	77.2
Total Changes	56.3	77.5

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indicies. (Economic)	--	-89.4
Decrease in aircraft quantity due to reduced Pilot Training Rate. (Quantity)	-169.0	-317.8
Schedule change associated with the decreased aircraft quantities. (Schedule)	-6.3	-30.7
Decreased ECPs of deleted aircraft; transfer of digital cockpit to RDTE. (Engineering)	-39.2	-63.1
Foreign Exchange Rate adjustment and revised McAir rates. (Estimating)	61.1	89.7
Revised ILS estimates and inclusion of depot capability. (Support)	48.6	92.0
Total Changes	-104.8	-319.3
(3) MILCON		
Revised escalation indices. (Economic)		-1.2
FY 93 increased and FY 98 deleted based on force structure and base closure decisions. (Estimating)	-8.6	-14.6
Total Changes	-8.6	-15.8

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
17.967	-1.747	0.998	-0.906	3.094	3.173	--	1.113	5.725	23.692

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

T45TS FSED CONTRACT:
MCDONNELL DOUGLAS CORP, ST. LOUIS, MO
N00019-84-C-0240, FFP
Award: October 1, 1984
Definitized: May 1, 1986

Initial Contract Price		
Target	Ceiling	Qty
$511.9	N/A	2

Current Contract Price		
Target	Ceiling	Qty
$539.6	N/A	2

Estimated Price At Completion	
Contractor	Program Manager
$708.6	$539.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Current contract price adjusted for government responsible fixes from DT/OT IIB.

Contractor estimate at completion reflects contractor claim against the government. Program Manager estimate at completion reflects current contract price pending claim resolution.

CPR information not required on this FFP contract.

b. Procurement --

T45TS FY 88 PROCUREMENT:
MCDONNELL DOUGLAS CORP, ST. LOUIS, MO
N00019-84-C-0240, FFP
Award: December 1, 1987
Definitized: December 1, 1987

Initial Contract Price		
Target	Ceiling	Qty
$429.4	N/A	12

Current Contract Price		
Target	Ceiling	Qty
$441.1	N/A	12

Estimated Price At Completion	
Contractor	Program Manager
$561.8	$441.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Current contract price changed for FY 88 Foreign Exchange Rate adjustment.

15. Contract Information: Cont'd (Then-Year Dollars in Millions)
Contractor estimate at completion reflects contractor claim against the government. Program Manager estimate at completion reflects current contract price pending claim resolution.

CPR information is not required for this FFP contract.

	Initial Contract Price		
T45TS FY 89/90/91 PROD:	Target	Ceiling	Qty
MCDONNELL DOUGLAS CORP, ST. LOUIS, MO N00019-84-C-0240, FFP Award: December 1, 1987 Definitized: N/A	$557.0	$0.0	24

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$557.0	$0.0	24	$0.0	$0.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change: None.

Contract is on a "Not To Exceed" basis. CPI information is not required for this FFP contract.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 68.4% (13 yrs/19 yrs)

(2) Percent Program Cost Appropriated: 33.3% ($2130.6 / $6396.8)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY80-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	605.7	23.1	32.0	31.0	691.8
Procurement	1127.5	353.3	327.0	3866.1	5673.9
MILCON	21.0	-	10.1	-	31.1
O&M	-	-	-	-	-
Total	1754.2	376.4	369.1	3897.1	6396.8

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Obligated	Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1980				5.1	4.2	4.2	4.2	10.6
1981				1.8	1.6	1.6	1.6	10.6
1982				5.2	4.9	4.9	4.9	7.6
1983				7.9	7.8	7.8	7.8	4.9
1984				23.9	24.3	24.3	24.3	3.8
1985				64.3	67.5	67.5	67.5	3.4
1986				112.3	121.4	121.4	121.4	2.8
1987				128.1	142.5	142.5	142.4	2.7
1988				86.4	99.4	99.4	99.4	3.0
1989				76.0	91.1	91.1	91.1	4.2
1990				21.1	26.3	26.3	26.3	4.0
1991				11.4	14.7	14.7	7.1	3.9
1992				17.3	23.1	4.3	0.2	3.1
1993				23.3	32.0			3.3
1994				21.8	31.0			3.3
Subtot	2			605.9	691.8	610.0	598.2	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Rec	Total Base Year$	Total Then-Year $ Program	Obligated	Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy								
1987				56.5	65.1	65.1	65.1	2.7
1988	12	40.1	183.8	334.7	402.3	402.3	335.5	3.0
1989	24	6.6	313.6	301.2	376.4	376.4	129.6	4.2
1990		11.0		97.2	125.9	125.9	7.1	4.0
1991		30.5		117.9	157.8	152.8	8.3	3.9
1992	12	14.6	178.9	255.7	353.3	5.0	0.1	3.1
1993	12	11.5	146.1	229.2	327.0			3.3
1994	36	8.2	352.3	518.1	763.2			3.3
1995	48	5.5	447.8	574.0	872.9			3.3
1996	48	4.9	438.8	551.3	865.1			3.2
1997	48		428.5	480.4	778.0			3.2
1998	28	14.7	257.0	351.2	586.9			3.2
Subtot	268	147.6	2746.8	3867.4	5673.9	1127.5	545.7	
Appropriation: 1205 Military Construction, Navy								
1988				7.7	9.2	9.2		3.0
1989								4.2
1990				9.3	11.8			4.0
1991								3.9
1992								3.1
1993				7.2	10.1			3.3
1994								3.3
1995								3.3
1996								3.2
1997								3.2
1998								3.2
Subtot				24.2	31.1	9.2		
Grand Total	270	147.6	2746.8	4497.5	6396.8	1746.7	1143.9	

MILCON claimant is CNET

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1988	12	12	12	12
1989	24	24	24	24
1990	24	24	0	0
1991	48	48	0	0
1992	48	48	12	24
1993	48	48	12	48
1994	48	48	36	48
1995	48	48	48	48
1996	0	0	48	48
1997	0	0	48	16
1998	0	0	28	0

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	3720.0	+777.5	4497.5	+56.7	4440.8
(TY $)	4829.3	+1567.5	6396.8	+235.7	6161.1
PAUC Cost (BY $)	12.318	4.339	16.657	+0.210	16.447
(TY $)	15.991	7.701	23.692	+0.873	22.819

17c. Production Rate Data (Cont'd):

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	DEC 87	0	DEC 87	N/A	DEC 89
Duration (in MON)	117	31	148	39	109
End Date(MON YY)	SEP 97	31	APR 00	N/A	JAN 99

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	2/2
Procurement	3/3

e. Approved Design-to-Cost Objective -- N/A.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The concept of operations of the T45TS is for total contractor logistic support (CLS), where the Navy provides the appropriate operational military personnel and flightline consumables, and the remainder is a turn key contractor operation. This program is specifically scoped to a 450 pilot training rate (PTR) per year, spread over two sites (NAS Meridian, MS and NAS Kingsville, TX). In order to meet this PTR, 157 aircraft are required to fly 720 flight hours each per year. In section b (costs), the personnel costs are specifically for military instructors, administrators, and pilot trainees. No contractor personnel are considered in this element. O&S consumables is the cost of POL and flightline consumables provided by the Navy. Maintenance consumables usually found here are included in other direct costs since they are a CLS charge. Direct depot maintenance is a complete CLS cost which includes airframe, engine, and avionics depot maintenance. Sustaining investment is also a CLS cost and includes replenishment spares and repair parts and support equipment replacement. Other direct costs are all CLS costs for maintenance material, supply, warehousing, transport, and administration. Indirect costs were not assessed due to the CLS concept. These figures are to be revised upon submittal of updated Navy Training Plan. The T45TS O&S Cost Study is dated April 1991. There is no antecedent system for the program.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per T-45/YEAR ($K)	Avg Annual Cost Per Steady State(157) $
PERSONNEL	300.7	47.2
O&S CONSUMABLES	286.0	44.9
DIRECT DEPOT MAINTENANCE	270.2	42.4
SUSTAINING INVESTMENT	46.7	7.3
OTHER DIRECT COSTS	312.0	49.0
Total	1215.6	190.8

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Depot Maintenance	---	---	0.5	---	0.5
Total	---	---	0.5	---	0.5

This data is derived from the OP-18 Exhibit (Summary of Contractor Support Services by Categories),

91-047

A-5 ASAS

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: ASAS

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
All Source Analysis System (ASAS)

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
Project Manager, ASAS
ATTN: SFAE-CC-INT
1500 Planning Research Drive
McLean, VA 22102-5099

COL Richard W. Johnson
Assigned: October 7, 1991
AV N/A COMM (703) 556-2939

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 64321 (Shared) D396 TACSIM
Project D926, DB19, DB20
PE 64321F

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4. (U) **Program Elements/Procurement Line Items (Cont'd):**

PROCUREMENT:
APPN 2035 ICN K28801 (Army)
APPN 2035 ICN BA9520 (Army)
APPN 2035 ICN BA9101 (Army) (Shared) PEO CCS

5. (U) **Related Programs:**
Tactical Simulation (TACSIM), Collection Management Support Tools (CMST), Maneuver Control System (MCS), Advanced Field Artillery Tactical Data System (AFATDS), Combat Service Support Control System (CSSCS), Forward Area Air Defense Command and Control System (FAADC2), and Common Hardware Software (CHS),

6. (U) **Mission and Description:**
As the Intelligence and Electronic Warfare (IEW) sub-system of the Army Tactical Command and Control System, the All Source Analysis System (ASAS) provides all source intelligence fusion to gain a timely and comprehensive understanding of enemy deployments, capabilities, and potential courses of action. With this knowledge, battle managers will be able to view the battlefield and more effectively conduct the land battle. ASAS is a tactically deployable ADP system used to receive and correlate data from strategic and tactical intelligence sensors/sources; produce ground battle situation displays; rapidly disseminate intelligence information; provide target nominations; help manage organic IEW assets; and, assist in providing operational security (OPSEC) support. The system is theater independent and designed to operate in peace-time, contingency, crisis, and low, mid, and high intensity wartime environments.

ASAS is being produced and fielded in two hardware configurations and three software versions. The current configuration, called Block I, was formerly planned for procurement and fielding to corps and active divisions in the years 1992 through 1997. This configuration was restructured in FY91 to include Hawkeye, an OSD-sponsored balanced technology initiative. Because of the restructuring Block I will now be fielded to the above units in the 93-94 timeframe without having had to go into full rate production. Block I is comprised of different modules depending at which intelligence support element it is located, and whether the division is heavy or light.

The Block I configuration at the Division and Corps Tactical Operations Center Support Element (TOC) is made up of the Communications Control Set AN/TYQ-40 (Common Name: Forward Sensor Interface and Control (FSIC)), which receives and transmits information from multiple sensor systems; the Data Processor Set AN/TYQ-36 (Common Name: Dual ASAS Interface Module (DAIM)), which processes intelligence data; and the Workstation, Computer Graphics

6. (U) **Mission and Description (Cont'd)**:

AN/TYQ-37 (Common Name: Portable ASAS Workstation (PAWS)), which is the primary user interface with the system.

The Block I configuration at the MI Battalion/Brigade Technical Control and Analysis Element (TCAE) is made up of the Computer Graphics Workstation AN/TYQ-52 (Common Name: HAWKEYE), which processes intelligence data; and the FSIC or Technical Control and Analysis Center AN/TYQ-130(V) (Common Name: TCAC), which provides communication interfaces and performs message processing for the Hawkeye. The Block II system configuration begins production in FY98. It is made up of objective hardware modules using Army Tactical Command and Control System Common/Hardware Software (CHS) components. The CHS Communications Control Set replaces the FSIC, the CHS Data Processor Set replaces the DAIM, and the CHS Workstation Computer Graphics replaces the PAWS. Again, configurations of these modules vary between corps and division support elements and light and heavy units. Block II ASAS will begin fielding to the Army's force structure divisions, and corps units beginning in FY00. Block III is a software development effort which will bring ASAS to it's objective capabilities. It will be used with the hardware procured in Block II. There is no Block I antecedent system. Block II ASAS replaces Block I equipment with improved functionality and common hardware and software.

7. (U) **Program Highlights**:

a. (U) Significant Historical Developments --

ASAS is the Army portion of a joint program originally chartered at Congressional request to acquire an Army/Air Force fusion system to meet the critically needed requirements for an automated intelligence command and control system. As a result of Congressional review and Department of Army guidance, all modules were downsized into smaller shelters more appropriate to the battlefield environment. During FY85 the program developed the ASAS AIM Brassboard (ABB), which provided a near-real-time processing capability. The System Readiness and Verification Test for the ASAS AIM and the FSIC Module was successfully completed in October 1986. Subsequent to the test, this equipment was delivered to III Corps/2nd Armored Division.

In 1986 the Assistant Secretary of the Army (Research, Development and Acquisition) approved a directed limited procurement urgent (LPU) for the Limited Capability Configurations (LCC). The procurement contract was let in March 1987 for production of LCC's. In November 1987, the Joint Oversight Group (JOG) approved an acquisition strategy of LCC's to be delivered to Ft Hood, TX in FY89.

In February 1988, the JOG approved the expansion of the LCC acquisition to include systems to Europe.

7a. (U) **Program Highlights (Cont'd)**:

During 1989, ASAS conducted its Force Development Test and Experimentation, which provided data on the organizational and operational force structure issues, refinements of materiel, training, and maintenance concepts of the LCC ASAS, and supported the Operational Test and Evaluation Agency's continuous evaluation of ASAS.

On 10 January 1990, the Chief of Staff of the Army directed the ASAS program be restructured to field the system as quickly as possible with the minimum level of functionality acceptable to the user by converting Evolutionary Development RDT&E funds to OPA funds. A restructured program was developed. Key elements of the program are the transition to Common Hardware Software (CHS) equipment beginning in FY92 and increased OPA funding through the year FY07.

In April 1990 the Air Force notified the Joint Tactical Fusion Program Office (JTFPO) that their ENSCE program was being terminated and no Air Force funding would be provided to JTFPO after FY90. This decision was based on budget constraints and the need to use hardware being provided in the upgrade of the Tactical Air Control System (TACS).

b. (U) Significant Developments Since Last Report --
In support of Operation DESERT SHIELD/STORM, the Army Intelligence Agency (AIA) established a direct link between the ASAS Field Office and the Army Operations Center, both located at Fort Hood, Texas via a satellite link to the Southwest Asia theatre of operations. ASAS was the only fusion system available providing easy access to masses of historical data needed to successfully conduct Intelligence Preparation of the Battlefield. An ASAS enclave at III Corps constructed low level unit templates for deployed units and monitored automated databases produced by AIA, Defense Intelligence Agency, and the Joint Intelligence Center, while providing near-real time all source-fusion analysis. This was the longest single sustained operation of ASAS, significantly exceeding previous limits in traffic quantity tested in either development or training phases of the program. Portable ASAS Workstations were deployed to Southwest Asia to conduct intelligence operations, for terrain support subsystems, and to run the Rapid Air Defense Evaluation Systems in air defense brigades to place and sight PATRIOT missiles.

In March 1991, because of the success of the OSD-sponsored Balanced Technology Initiative, Artificial Intelligence Module Test Bed (nicknamed Hawkeye) during DESERT STORM/SHIELD, PM ASAS included this technology insertion in its acquisition plans. The resulting system would use previously fielded equipment, Hawkeye workstations, and

7b. (U) Program Highlights (Cont'd):

equipment acquired under the ASAS limited procurement urgent authorization to begin fielding ASAS systems in FY93. The proposed change would increase the functionality of both ASAS and Hawkeye and provide an automated intelligence processing capability at the Army's high priority, Force Package 1, units by the end of FY94, while saving the Army $171 million in RDT&E and OPA funding.

In June 1991, the redirection was briefed to the Command, Control, Communications and Intelligence Systems Committee at OSD. The committee withheld approval of the program restructure pending completion and approval of program documentation, e.g. Acquisition Strategy, Acquisition Program Baseline, and Test and Evaluation Master Plan(TEMP). On 21 November 1991, the Required Operational Capability was validated by the Joint Requirements Oversight Council and the TEMP was approved by OSD.

Much of this effort was directed by Colonel Richard Johnson, who had assumed the duties of Program Manager in October from Colonel Joseph Ganino, who had managed the ASAS project since 1984. In May 1991, the Joint Tactical Fusion Program Office, which had managed ASAS and related programs since its inception in 1983, was officially disestablished by Department of the Army General Order 11, and the project office for ASAS was placed under the Program Executive Office for Command and Control Systems.

On 4 December 1991 the C3I committee approved the program documentation and the release of the Request For Proposal (RFP) for the program's follow on Block II contract for enhanced functionality and conversion to ATCCS Hardware/Software. Because of the delay in getting approval of the redirected program, the request for proposals was released six months behind its originally scheduled date.

As a result of the restructured program, fielding of Block I systems made up of FSIC, DAIM, PAWS (ASAS modules), TCAC and Hawkeyes (BTI) will take place in FY93/FY94 to 11 high priority units and the school.

In May 1991, formal integration and testing of the Version 2 software for the Initial Operational Test and Evaluation was complete, permitting its delivery and related tests to start. By December, the software had received Defense Intelligence Agency approval to operate in the Systems high mode, the first tactical system to ever receive this accreditation, which was essential for ASAS to complete its intended purpose.

The ASAS system is expected to satisfy mission requirements.

7c. (U) **Program Highlights (Cont'd)**:

c. (U) Changes Since As Of Date --
On 13 January 1992, the APO mailed the ASAS Block II RFP to 85 bidders.

8. (U) **Threshold Breaches**:
There are currently no Acquisition Program Baseline (APB), dated 19 December 1991 breaches or unit cost breaches.

9. (U) **Schedule**:
BLOCK I

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
ASAS Acquisition Strategy	NOV 82	N/A	NOV 82
OSD/Congressional Approval of Acquisition Strategy	FEB 83	N/A	FEB 83
Implementing Contractor Award	MAR 83	N/A	MAR 83
Functional Capabilities Document Complete	DEC 83	N/A	DEC 83
Milestone II	N/A	MAR 83	MAR 83
Joint Oversight Group Meeting (ASARC/ ASARC Authority)	MAR 84	MAR 84	MAR 84
Award System Baseline Contract (Development)	DEC 84	DEC 84	DEC 84
Preliminary Design Review			
Architecture	FEB 84	FEB 84	FEB 84
Development	NOV 85	NOV 85	NOV 85
Request for Proposals	MAY 84	N/A	MAY 84
JTFP Letter of Instruction	JUL 84	N/A	JUL 84
ABB Testing	AUG 85	N/A	AUG 85
AIM/FSIC Testing	JUL 86	N/A	JUL 86
IDP	NOV 87	N/A	NOV 87
Software Release 1	NOV 87	N/A	APR 89
Software Release 2	SEP 88	N/A	MAY 91
Software Release 3	NOV 88	N/A	N/A
Directed Procurement Approval - Limited Capability Configuration	N/A	SEP 86	SEP 86
C3I Defense Acquisition Board Briefing	N/A	MAR 88	MAR 88
FDT&E	N/A	DEC 89	DEC 89
Light Contingency Configuration Phase 2 Production Start	N/A	MAR 90	MAR 90
First LCC Phase II Delivery to Ft. Hood	N/A	JUN 91	JUN 91
Version 2.0 Software Critical Design Review	N/A	APR 90	APR 90

ASAS, December 31, 1991

9a. (U) Schedule (Cont'd):
BLOCK I

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Version 2.3 Software Summary PDR	N/A	SEP 89	SEP 89
ASAS IOT&E			
Start	N/A	SEP 92	SEP 92
Complete	N/A	NOV 92	NOV 92
ASARC Program Review (Block I Materiel Release)	N/A	APR 93	MAR 93

b. (U) Previous Change Explanations --

When Air Force funds were withdrawn, the sanitization functionality of the ASAS software was delayed to release V2.1 software, enabling V2.0 software to be delivered in May 91 instead of Oct 91.
Software Release 3 was the Air Force Version. Since the Air Force is no longer with the project, there is no Release 3.
Due to Air Force withdrawal, Software Version 2.0 was split into two parts, Versions 2.0 and 2.1.
Added milestones from the baseline which is pending approval.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
Chief of Staff, Army letter, 10 Nov 1982, Subj: All Source Analysis System (ASAS) Acquisition Strategy; Letter of Instruction for Joint Tactical Fusion Program (JTFP) Special Task Force (STF), 5 July 1984.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 19 December 1991.

BLOCK II/III

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Joint Oversight Group (ASARC Authority Approves Block II)	NOV 87	NOV 87	NOV 87
DAB Program Review	N/A	JUL 92	JAN 93
Block II RDT&E Contract Award (EMD)	N/A	JUL 92	JAN 93
Preliminary Design Review	N/A	MAY 94	OCT 94

9a. (U) Schedule (Cont'd):
BLOCK II/III

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
DAB Program Review	N/A	JUL 92	JAN 93
Block II RDT&E Contract Award (EMD)	N/A	JUL 92	JAN 93
Preliminary Design Review	N/A	MAY 94	OCT 94
Critical Design Review	N/A	DEC 94	MAR 95
DT&E			
Start	N/A	MAY 96	AUG 96
Complete	N/A	SEP 96	OCT 96
IOT&E			
Start	N/A	MAR 97	MAR 97
Complete	N/A	MAY 97	APR 97
Milestone III	N/A	NOV 97	NOV 97(Ch-1)
Contract Award	N/A	FEB 98	FEB 98
First Article Test	N/A	FEB 00	FEB 00

(b)(1)

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

(Ch-1) Because of the restructuring of ASAS, Block I will be fielded to Force Package I using already procured modules and requiring only an ASARC approval for materiel release. ASAS Milestone III decision scheduled originally for February 1993 is now scheduled for November 1997 under Block II.

(Ch-2) The previous IOC was based on an ASAS that was not fully interoperable and common with ATCCS. Now that the ROC for ASAS has been phased into evolutionary blocks full IOC will not be reached until Block II is fielded. Block II will be fully interoperable with ATCCS and will be built on common hardware and software CHS II and will use open architecture.

d. (U) References --

(U) Development Estimate:
Chief of Staff, Army letter, 10 Nov 1982, Subj: All Source Analysis System (ASAS) Acquisition Strategy; Letter of Instruction for Joint Tactical Fusion Program (JTFP) Special Task Force (STF), 5 July 1984.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 19 December 1991.

ASAS, December 31, 1991

10. (U) Performance Characteristics:

BLOCK I

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

ASAS, December 31, 1991

10a. (U) Performance Characteristics (Cont'd):
BLOCK I

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) **Performance Characteristics (Cont'd):**
BLOCK I

DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)			

10a. (U) Performance Characteristics (Cont'd):
BLOCK I

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

Definition of acronyms:

MTTR - Mean Time to Repair (Unit level, in hours)
MTBOF - Mean Time Between Operational Mission Failures (hours)
TOC - Tactical Operations Center
TCAE - Technical Control and Analysis Element
Communication - Bit Error Rate 99% of the time
OD - On Demand
NRT - Near-Real-Time

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

10d. (U) Performance Characteristics (Cont'd):
BLOCK I

d. (U) References --

(U) Development Estimate:
Chief of Staff, Army letter, 10 Nov 1982, Subj: All Source Analysis System (ASAS) Acquisition Strategy; Letter of Instruction for Joint Tactical Fusion Program (JTFP) Special Task Force (STF), 5 July 1984.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 19 December 1991.

BLOCK II/III

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

ASAS, December 31, 1991

10a. (U) Performance Characteristics (Cont'd):
BLOCK II/III

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

ASAS, December 31, 1991

10a. (U) Performance Characteristics (Cont'd):
BLOCK II/III

(b)(1)

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
[redacted]					
Emplacement Time (TSE/TCAE)					
Corps (min)	N/A	45	/ 45	TBD	45
Division (min)		45	45		45
Displacement Time (TSE/TCAE)					
Corps (min)	N/A	30	/ 30	TBD	30
Division (min)		30	30		30
Maintainability (TSE)					
Mean Time to Repair (MTTR) (Unit Level) (hr)	1.0	1.0	/ 2.0	TBD	1.0
Reliability (TSE)					
Mean Time Between Operational Mission Failures (hrs)					
TSE	N/A	37.0	/ 33.0	TBD	37.0
TSE Jump	15.2	72.0	/ 65.0	TBD	72.0

(b)(1)

[redacted]

ASAS, December 31, 1991

10a. (U) Performance Characteristics (Cont'd):
BLOCK II/III

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) **Performance Characteristics (Cont'd)**:
BLOCK II/III

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

USMTF - US Message Text Format
TSE - Tactical Operations Center Support Element
TCAE - Technical Control and Anlaysis Element
FSIC - Forward Sensor Interface and Control
ENSIT - Enemy Situation
CCS - Communications Control Set
G2-TOC - Assistant Chief of Staff, Intelligence (General Staff) Tactical Operations Center

Footnotes:

1/ Due to the evolutionary nature of ASAS, the noted performance parametes represent a desired military capability for the initial fielding and Block II development of ASAS. Performance parameters of enhancements and upgrades will meet full ROC requirements and Defense Information systems Agency (DISA)/DODIIS Interoperability Standards, and will be provided during the evolutionary phase of the program.

2/ Block III will provide the remote workstation hardware module, enhance the previously developed software applications functionality, and provide new software applications in the disciplines of electronic warfare, operations security, human intelligence, imagery intelligence, and communication intelligence/electronic intelligence integration. Block III performance parameters will be provided prior to Block III Critical Design Review (CDR).

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

d. (U) References --

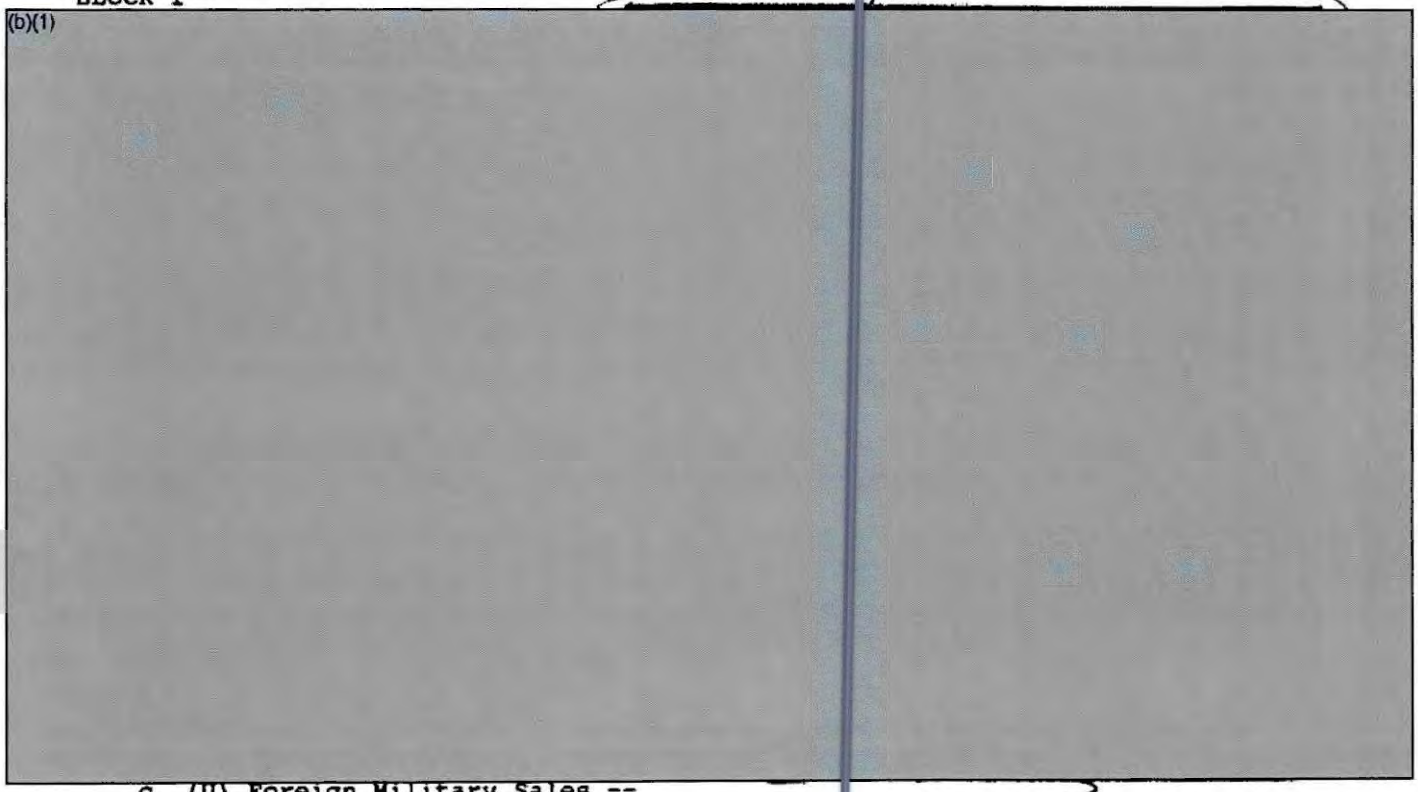
(U) Development Estimate:
Chief of Staff, Army letter, 10 Nov 1982, Subj: All Source Analysis System (ASAS) Acquisition Strategy; Letter of Instruction for Joint Tactical Fusion Program (JTFP) Special Task Force (STF), 5 July 1984.

10d. (U) Performance Characteristics (Cont'd):
BLOCK II/III

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 19 December 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)
BLOCK I

(b)(1)



c. (U) Foreign Military Sales --
Not Applicable.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
Chief of Staff, Army letter, 10 Nov 1982, Subj: All Source Analysis System (ASAS) Acquisition Strategy; Letter of Instruction for Joint Tactical Fusion Program (JTFP) Special Task Force (STF), 5 July 1984.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 19 December 1991.

11e. (U) Total Program Cost and Quantity (Cont'd):

BLOCK I

BLOCK II/III

(b)(1)

(b)(1)

[redacted]

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
Chief of Staff, Army letter, 10 Nov 1982, Subj: All Source Analysis System (ASAS) Acquisition Strategy; Letter of Instruction for Joint Tactical Fusion Program (JTFP) Special Task Force (STF), 5 July 1984.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 19 December 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

BLOCK I

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
(b)(1)			
(2) Quantity	0		
(3) Unit Cost	N/A	N/A	N/A

(C)

TOTAL ASAS

	Current Estimate	Current Year UCR Baseline
(b)(1)		

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):**

BLOCK II/III

TOTAL ASAS

(b)(1)

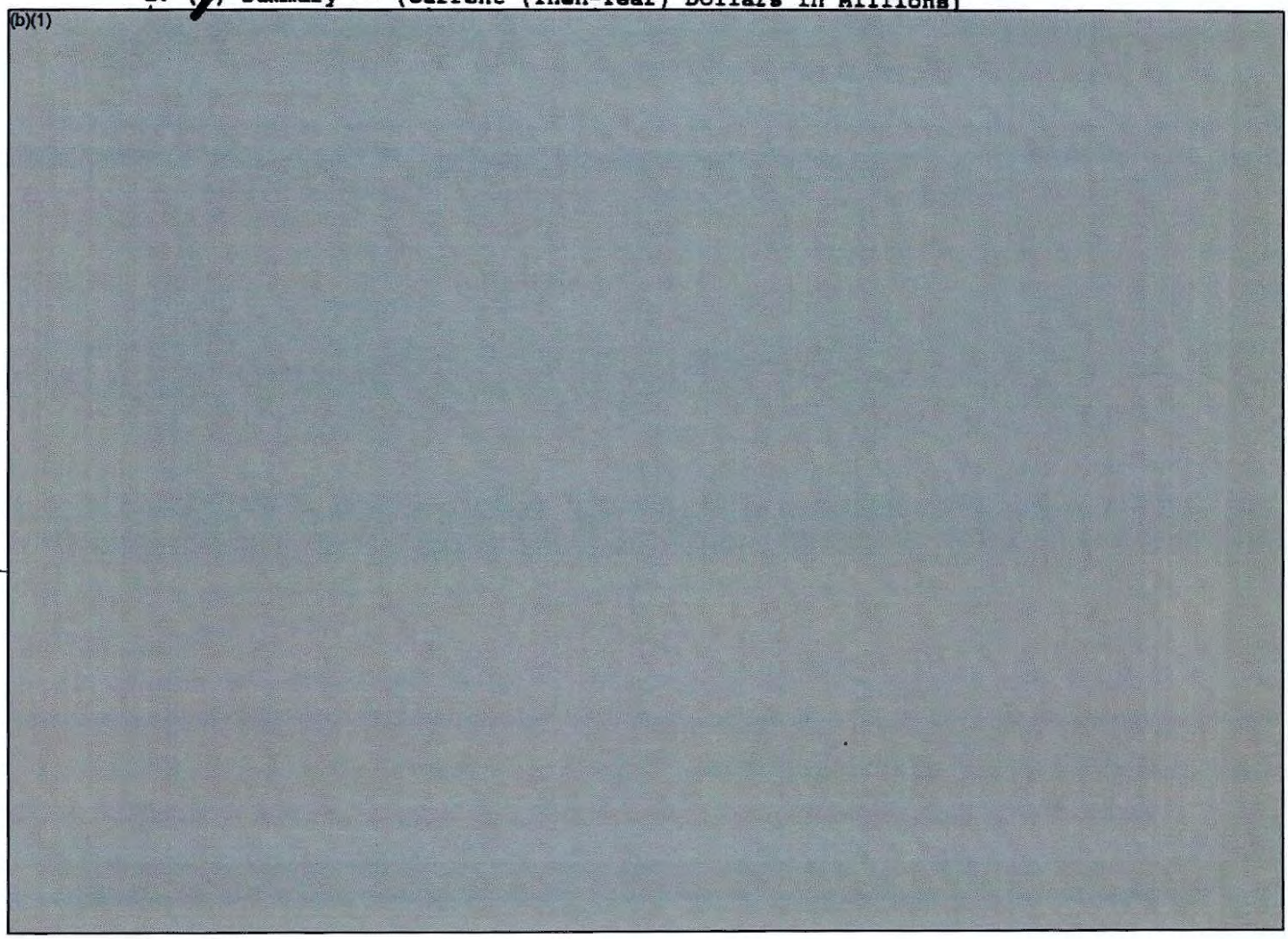
NOTE: The December 1990 SAR did not break the ASAS project out into the evolutionary acquisition blocks shown in this report. OSD directed the DAE- approved Acquisition Program Baseline be broken out by blocks; resulting in the SAR be broken out by blocks. The 509 units reported in the Dec 90 SAR represented ASAS modules to be configured into the 12 Block I and 28 Block II systems, the new unit of measure shown in the third column of the previous page. These systems are more representative of the deliverables of the ASAS project, and will be used in the December 1992 SAR. A description of these blocks can be found in paragraph 6 of this report.

The reduction in total quantity was caused by the recent restructured program. By increasing the FY92 production of Block I modules, and incorporating non-ASAS procured modules, the ASAS system can be fielded to Force Package 1 units with increased functionality, earlier, and at a reduced cost.

13. (U) Cost Variance Analysis:
Summary - All end items

a. (C) Summary -- (Current (Then-Year) Dollars in Millions)

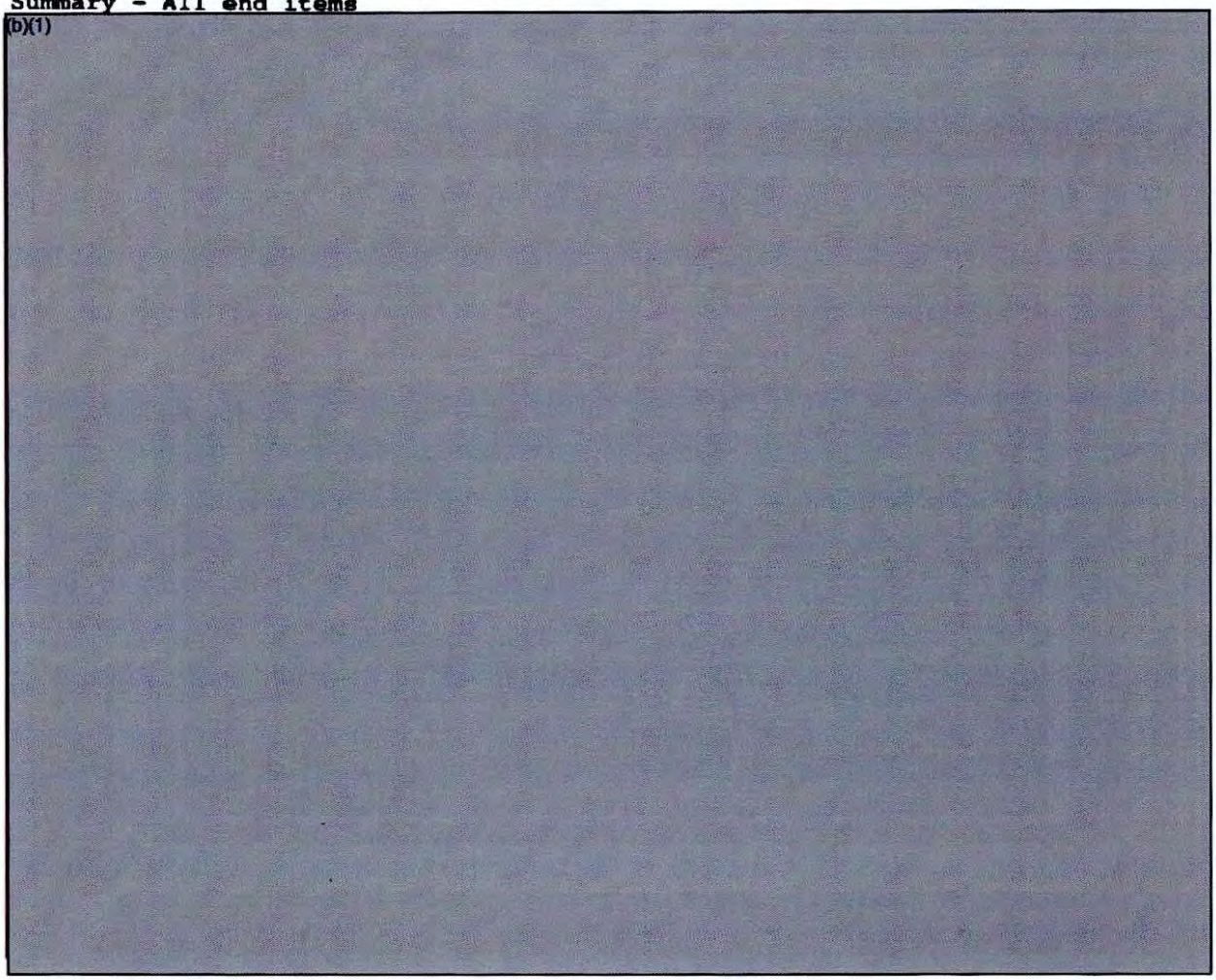
(b)(1)



13a. (U) Cost Variance Analysis (Cont'd):

Summary - All end items

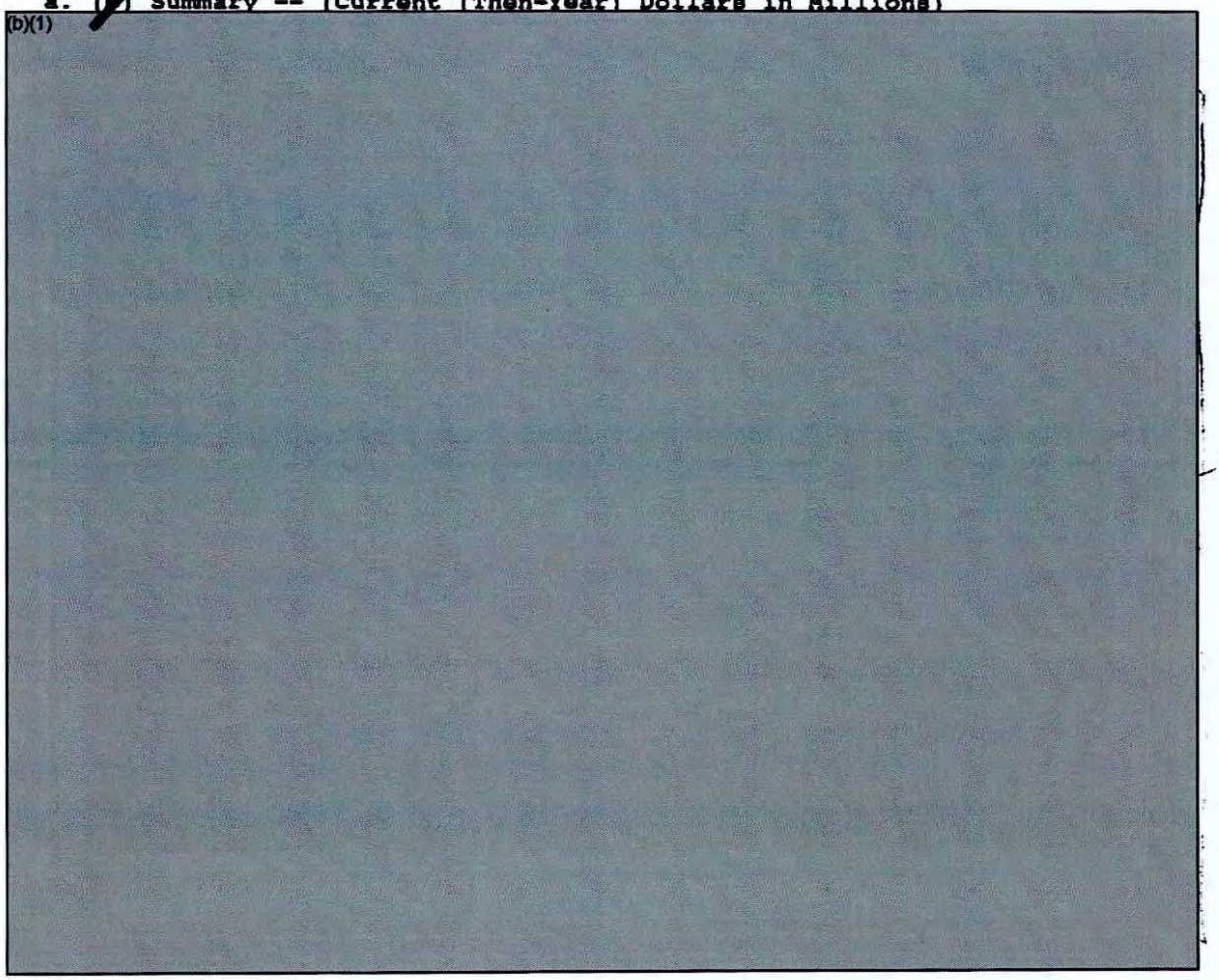
(b)(1)



13a. ([redacted]) **Cost Variance Analysis (Cont'd):**
BLOCK I

a. ([redacted]) Summary -- (Current (Then-Year) Dollars in Millions)

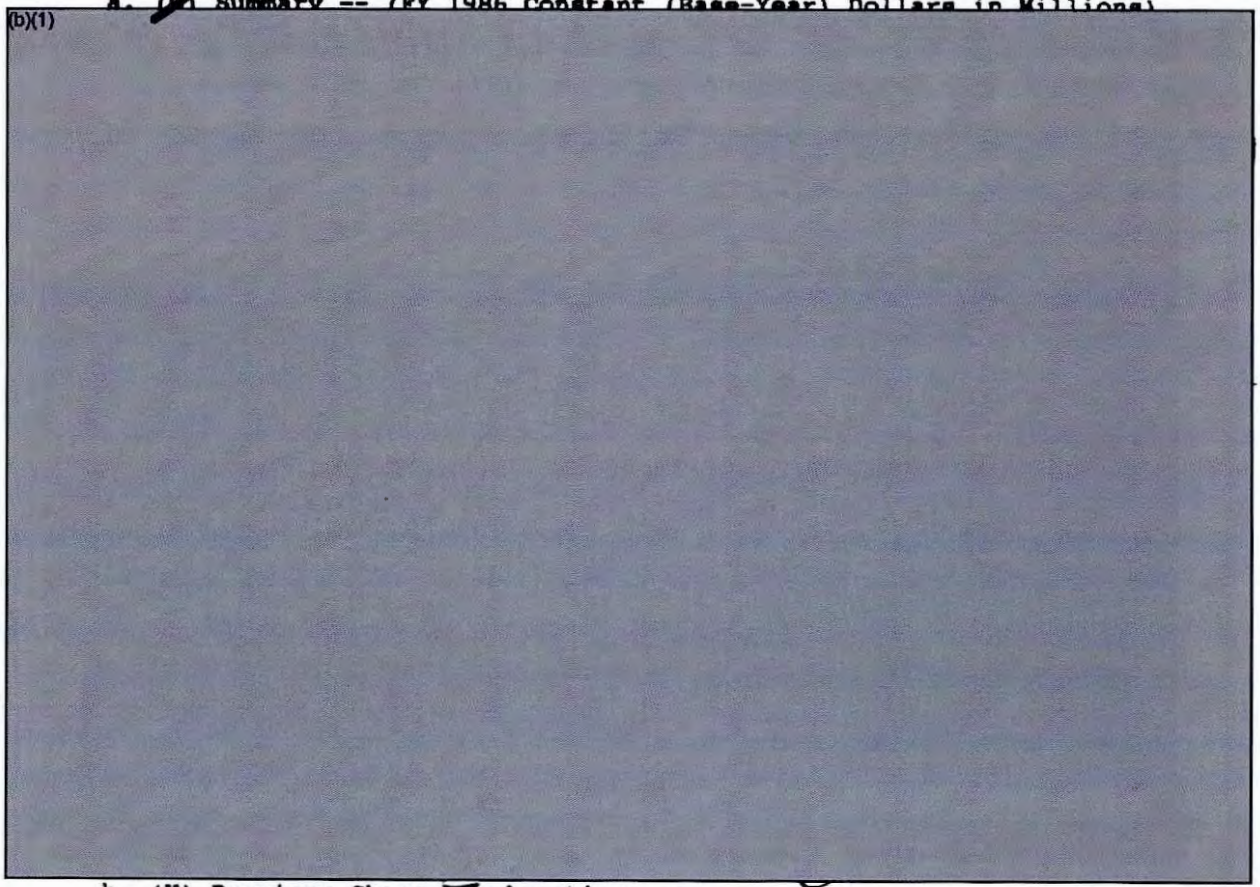
(b)(1)



13a. (U) **Cost Variance Analysis (Cont'd):**
BLOCK I

a. (U) Summary -- (FY 1986 Constant (Base-Year) Dollars in Millions)

(b)(1)



b. (U) Previous Change Explanations --

RDT&E

Economic:	Revised escalation indices.
Estimating:	Adjustment for current and prior escalation. Decrease of estimate for withdrawal of Air Force funding from FY91 and beyond.

PROCUREMENT

Economic:	Revised escalation indices. Adjustment of program change escalation for addition of inventory objective.
Quantity:	Addition of quantities to reflect program inventory objective.

13b. (U) Cost Variance Analysis (Cont'd):
BLOCK I

Estimating: Adjustment for current and prior escalation indices.
Revised program estimate dollar amounts now reflect accelerated program.
Increase program cost to include total program content beyond FYDP.
Decrease of estimating costs to reflect costs associated with inventory.
Increase in estimate for conversion of OMA to OPA dollars for FY92-FY97 for interim support, program management office salaries, direct program office costs and other program support costs.
Correction of previous SAR to convert intial spares from estimating to support.

Support: Correction of previous SAR to convert initial spares from estimating to support.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	-2.1
Adjustment for current and prior inflation offset (Estimating)	1.8	2.1
Refinement of estimate (Estimating)	23.1	30.0
Total Changes	24.9	30.0

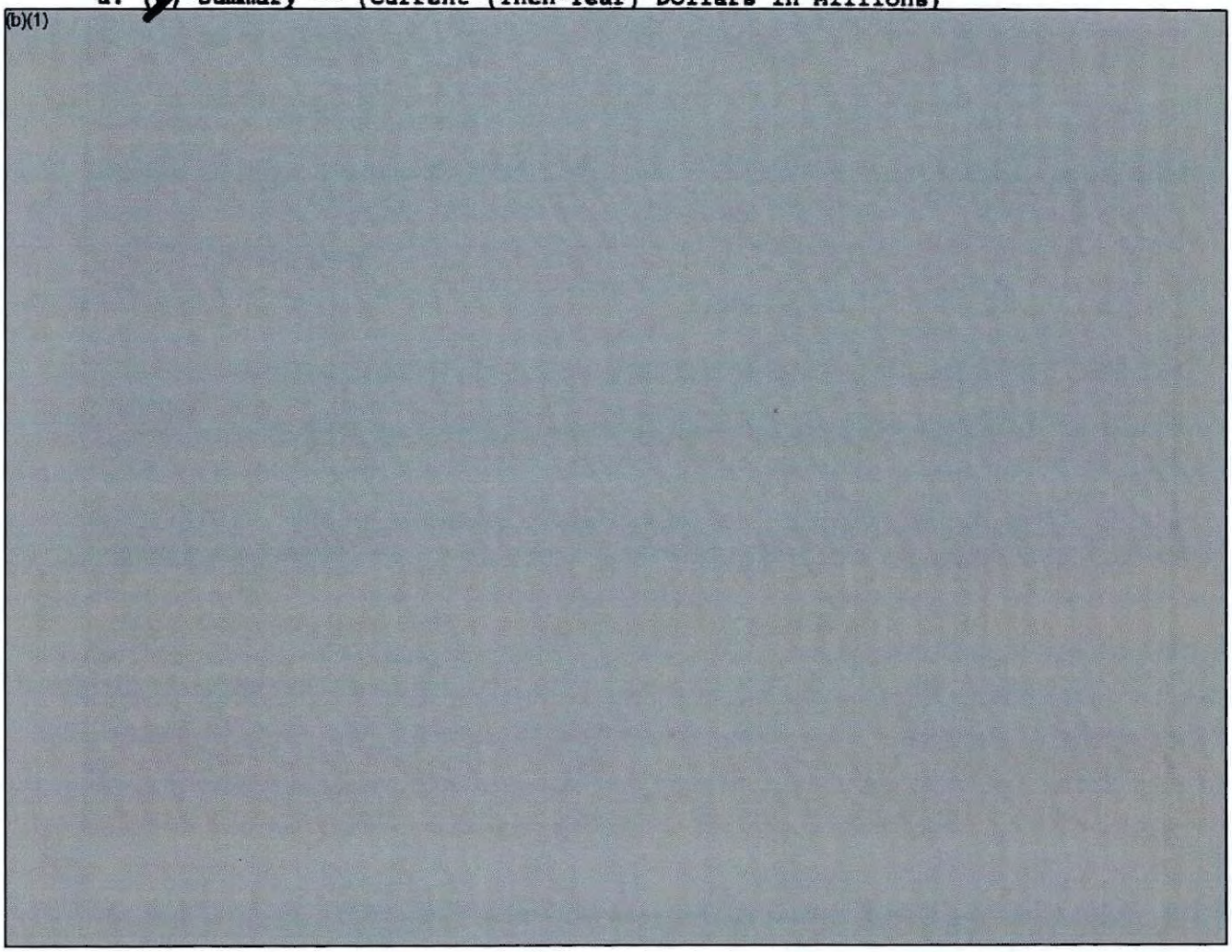
13c. (U) Cost Variance Analysis (Cont'd):
BLOCK I

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-10.3
Adjustment for program change related escalation for a negative change (Economic)	N/A	10.1
Adjustment for current and prior inflation offset (Estimating)	1.8	2.4
Decrease costs for reduction of 92 modules (Quantity)	-70.6	-99.7
Savings from restructured program (Estimating)	-97.2	-125.5
Reduction of FY87 funds to reflect actuals (Estimating)	-9.8	-10.8
Correction of previous categorization		
(Estimating)	-34.4	-41.8
(Support)	34.4	41.8
Correction of Previous OMA to OPA funding categorization		
(Estimating)	-72.2	-99.5
(Support)	72.2	99.5
Increase in estimate for other weapons system support costs (Support)	79.0	96.9
Total Changes	-96.8	-136.9

13a. (U) **Cost Variance Analysis (Cont'd):**
BLOCK II/III

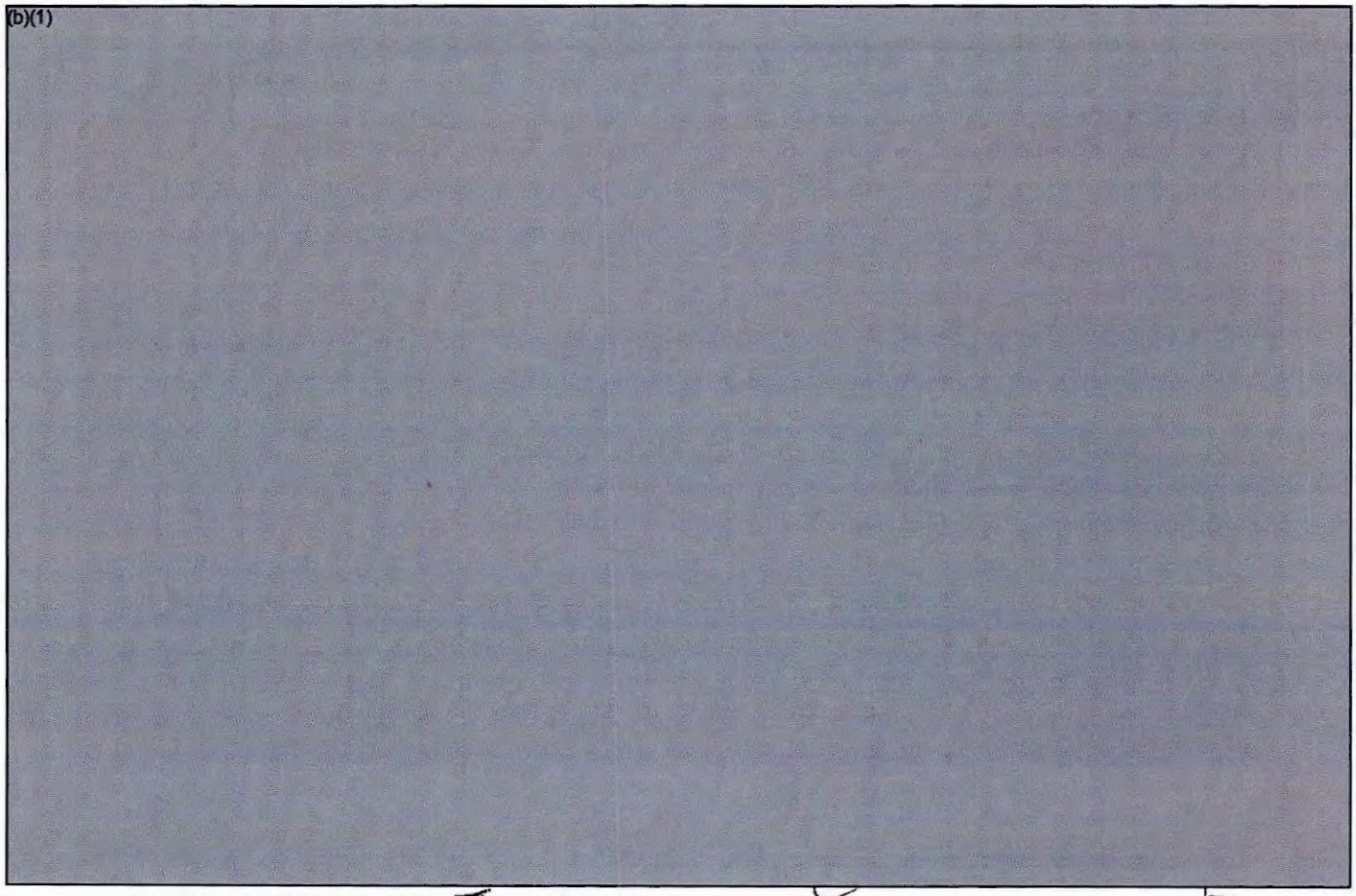
a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

(b)(1)



13a. (U) **Cost Variance Analysis (Cont'd):**
BLOCK II/III

(b)(1)



b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices and adjustment for program change related escalation.

Estimating: Adjustment for current and prior escalation Revised Program Estimate dollar amounts now reflect accelerated program. Increase program cost to include total program content beyond FYDP. Extension of estimate to include total program content.

13b. (U) Cost Variance Analysis (Cont'd):
BLOCK II/III

PROCUREMENT

Economic:	Revised escalation indices. Adjustment of program change escalation for addition of inventory objective.
Quantity:	Addition of quantities to reflect program inventory objective.
Estimating:	Adjustment for current and prior escalation indices. Revised program estimate dollar amounts now reflect accelerated program. Increase program cost to include total program content beyond FYDP. Decrease of estimating costs to reflect costs associated with inventory. Increase in estimate for conversion of OMA to OPA dollars for FY92-FY97 for interim support, program management office salaries, direct program office costs and other program support costs. Correction of previous SAR to convert initial spares from estimating to support.
Support:	Correction of previous SAR to convert initial spares from estimating to support.

c. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year	Then-Year

13c. (U) Cost Variance Analysis (Cont'd):
BLOCK II/III

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	-8.3
Adjustment for program change related escalation for negative changes (Economic)	N/A	-26.9
Adjustment for current and prior inflation offset (Estimating)	0.8	1.0
Budget reduction resulted in descoping development of remote workstations (Estimating)	-31.5	-40.5
Decrease in estimate for removal of Blocks IV & V (Estimating)	-399.4	-897.5
Refinement of estimate for Block III (Estimating)	31.8	71.6
Reduction of estimate for Block I costs (Estimating)	-23.1	-29.6
Total Changes	-421.4	-930.2

13c. (U) Cost Variance Analysis (Cont'd):
BLOCK II/III

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-158.3
Adjustment for program change related escalation for negative changes (Economic)	N/A	41.2
Savings realized for restructured program (Estimating)	-19.1	-29.3
Increase of estimate for rebuy of equipment (Estimating)	191.2	411.8
Correction of previous categorization		
(Estimating)	-615.2	-1290.3
(Support)	615.2	1290.3
Refinement of estimate for support (Support)	-234.1	-371.5
Total Changes	-62.0	-106.1

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

BLOCK I

(C) Initial Baseline Estimate to Current Estimate - -

(b)(1) [redacted]

14. (U) **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions) (Cont'd)

BLOCK II/III

(C) Initial Baseline Estimate to Current Estimate - -

(b)(1) [redacted]

15. (U) **Contract Information:** (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) ASAS:	Initial Contract Price Target	Ceiling	Qty
Jet Propulsion Laboratory, Pasadena, CA NAS - -7-918, CRRI Award: March 1, 1983 Definitized: March 1, 1983	$0.0	$0.0	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$944.3	$0.0	0	$943.9	$935.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$1.6	$-8.4
Cumulative Variances To Date (12/22/91)	$3.8	$-0.9
Net Change	$2.2	$7.5

Explanation of Change:

The favorable cost variance has increased over the year because of restructured program. Funding changes has also caused the contractor to reduce his staff. This contract is expected to end in April 1993.

The favorable cost variance of 3.8M (.4%) and the unfavorable schedule variance of -0.9M (-.1%) are within acceptable thresholds and will not impact schedule or cost based on current budget.

b.(U) Procurement --

(U) LCC Phase II CPFF:	Initial Contract Price Target	Ceiling	Qty
JPL, Pasadena, CA NAS - -7- 918, CPFF Award: March 1, 1990 Definitized: March 1, 1990	$0.0	$0.0	0

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$222.9	$0.0	0	$221.7	$223.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.5	$0.0
Cumulative Variances To Date (12/22/91)	$-0.6	$-9.9
Net Change	$-1.1	$-9.9

Explanation of Change:

The current contract price and estimates at completion reflect both the Firm Fixed Price and the Cost Plus Fixed Fee portion of LCC Phase II. The unfavorable cost variance, -$.6M or -.6%, is mostly attributable to a higher than planned spending for software licenses. It is within the acceptable threshold.

This schedule variance is caused by a resulting billing lag of one month for the subcontractor to bill JPL and one month for JPL to process the payments. The schedule variance is not an indication of a milestone slip. All delivery milestones have been met.

The LCC Phase II CPFF and FFP contract have been combined in the DAES report and therefore have been combined in this SAR submission.

Note: The National Science Foundation has listed JPL as a Federally Funded Research & Development Center under the cognizance of the National Aeronautics and Space Administration. JPL's role for the ASAS baseline phase is that of a Systems Engineering and Technical Direction (SE/TD) contractor, which includes a significant number of project management functions normally attributed to a government program office such as, technical integration and management functions associated with systems development, to include architectural design, RFP completion, competitive contracting for prototypes (JPL would let major contracts during this phase), acceptance testing, conduct government reviews and associated contract management of industrial contractors. Although JPL is the prime contractor, ASAS project office does not have a contract with JPL for the ASAS effort. JPL is performing under a Task Order against a NASA contract. JPL's role during the objective system phase (production) will be that of a System Engineering/Technical Assistance (SE/TA) contractor, providing sustaining engineering and technical assistance to the ASAS project office.

JPL's development efforts on Block I ASAS are currently planned to end in April 1993. JPL's efforts in procurement and oversight of ASAS hardware and software maintenance similarly ends in FY94 and

15. (U) **Contract Information**: Cont'd (Then-Year Dollars in Millions) FY95; respectively. JPL is involved in completing preliminary RDT&E efforts for Block II while the competitively selected contractor is chosen, expected to occur in January 1993.

16. (U) **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 21.7% (10 yrs/46 yrs)

(2) Percent Program Cost Appropriated: 24.4% ($1395.9 / $5731.2)

b. (U) Appropriation Summary -- BLOCK I

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2003)	Total
(b)(1)	[redacted]				

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2028)	Total
(b)(1)	[redacted]				

16c. (U) Program Funding Summary (Cont'd):
BLOCK I

c. (U) Annual Summary -- BLOCK I

Fiscal Year	Qty	Flyaway FY86 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1983				27.8	25.8	25.8	25.8	4.9
1984				48.2	46.4	46.4	46.4	3.8
1985				66.9	66.3	66.3	66.3	3.4
1986				142.2	145.3	145.3	145.3	2.8
1987				141.8	148.7	148.7	148.7	2.7
1988				136.0	147.9	147.9	147.9	3.0
1989				108.5	122.8	122.8	122.8	4.2
1990				75.5	88.7	88.7	88.7	4.0
1991				47.2	57.7	57.7	57.7	3.9
1992				73.4	92.6	16.2	6.9	3.1
1993				13.3	17.4			3.3
Subtot				880.8	959.6	865.8	856.5	
Appropriation: 2035 Other Procurement, Army								
1987	32		72.5	85.2	93.7	93.7	93.7	2.7
1988	28		28.3	33.2	38.2	38.2	38.2	3.0
1989	6		16.4	21.1	25.2	25.2	25.2	4.2

16c. (U) Program Funding Summary (Cont'd):
BLOCK I

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2035 Other Procurement, Army (Cont'd)								
1990	18		49.6	67.0	82.2	82.2	82.2	4.0
1991	16		22.4	26.3	33.3	33.3	9.8	3.9
1992	49		27.8	44.7	58.5	17.2		3.1
1993				43.8	59.3			3.3

(b)(1)

[redacted]

16c. (U) Program Funding Summary (Cont'd):
BLOCK I

Fiscal Year	Qty	Flyaway FY86 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1983				5.6	5.2	5.2	5.2	4.9
1984				5.8	5.6	5.6	5.6	3.8
1985				14.9	14.8	14.8	14.8	3.4
1986				25.2	25.7	25.7	25.7	2.8
1987				23.4	24.7	24.7	24.7	2.7
1988				7.1	7.7	7.7	7.7	3.0
1989				6.2	7.0	7.0	7.0	4.2
1990				7.9	9.3	9.3	9.3	4.0
Subtot				96.1	100.0	100.0	100.0	
USAF				96.1	100.0	100.0	100.0	

(b)(1) [redacted]

16c. (U) Program Funding Summary (Cont'd):
BLOCK II/III

c. (U) Annual Summary -- BLOCK II/III

Fiscal Year	Qty	Flyaway FY86 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1991				2.7	3.3	3.3	0.6	3.9
1992				15.3	19.3	0.8		3.1
1993				23.5	30.7			3.3

(b)(1)

[redacted]

[redacted]

16c. (U) Program Funding Summary (Cont'd):
BLOCK II/III

Fiscal Year	Qty	Flyaway FY86 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)

(b)(1)

16c. (U) Program Funding Summary (Cont'd):
BLOCK II/III

Fiscal Year	Qty	Flyaway FY86 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2035 Other Procurement, Army (Cont'd)

(b)(1)

[redacted]

16c. (U) **Program Funding Summary (Cont'd):**
BLOCK II/III

Fiscal Year	Qty	Flyaway FY86 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
(b)(1)								

17. (U) **Production Rate Data:**
BLOCK I

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1987	0	0	32	0
1988	0	0	28	0
1989	0	0	6	0
1990	0	0	18	0
1991	0	0	16	0
1992	0	0	49	0

17b. (U) **Production Rate Data (Cont'd):**
BLOCK [redacted]

(b)(1)

[redacted]

Item	Production Decision	(CE less PdE)	Current Estimate	(CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

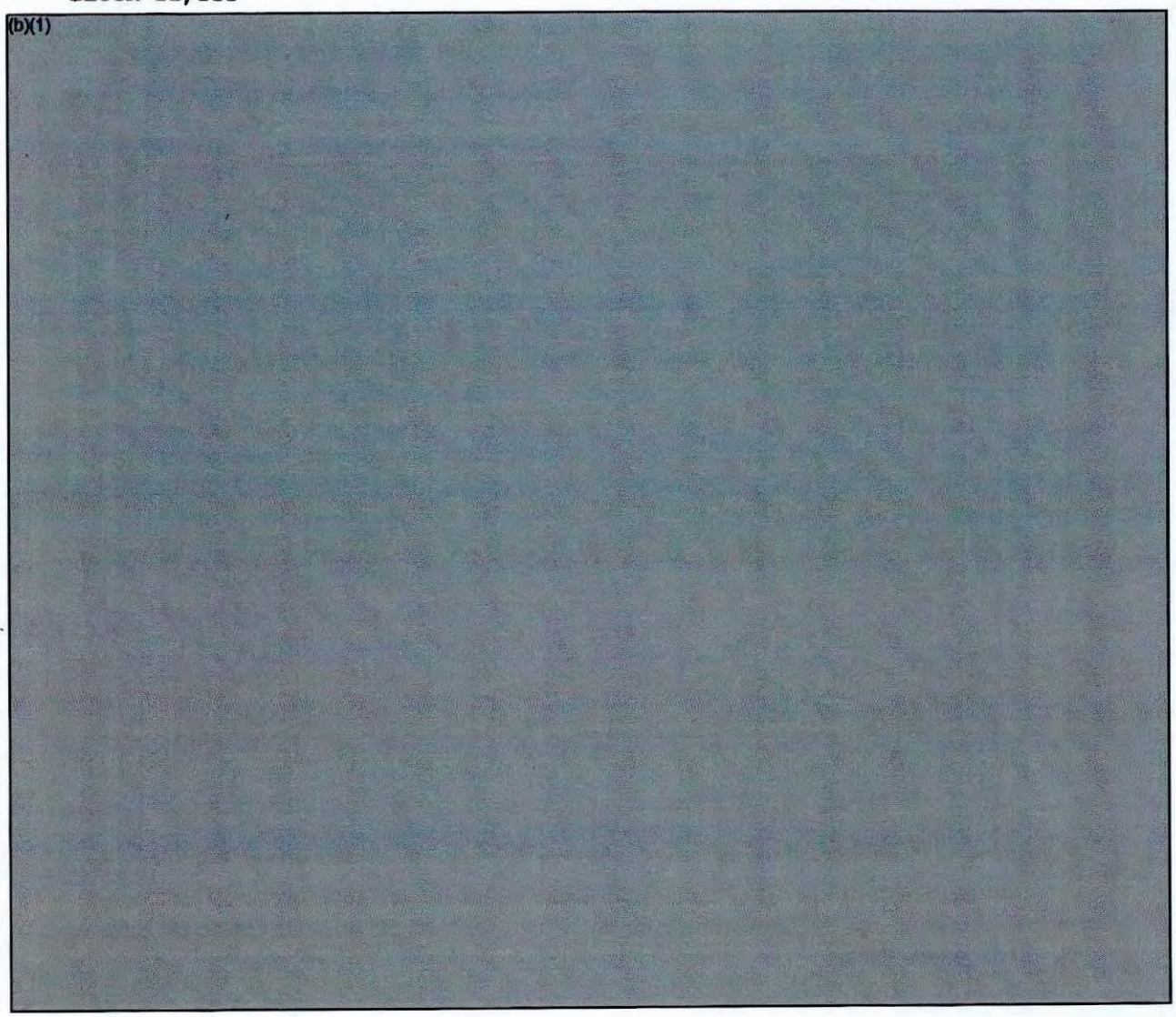
d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	100/100

e. (U) Approved Design-to-Cost Objective -- N/A.

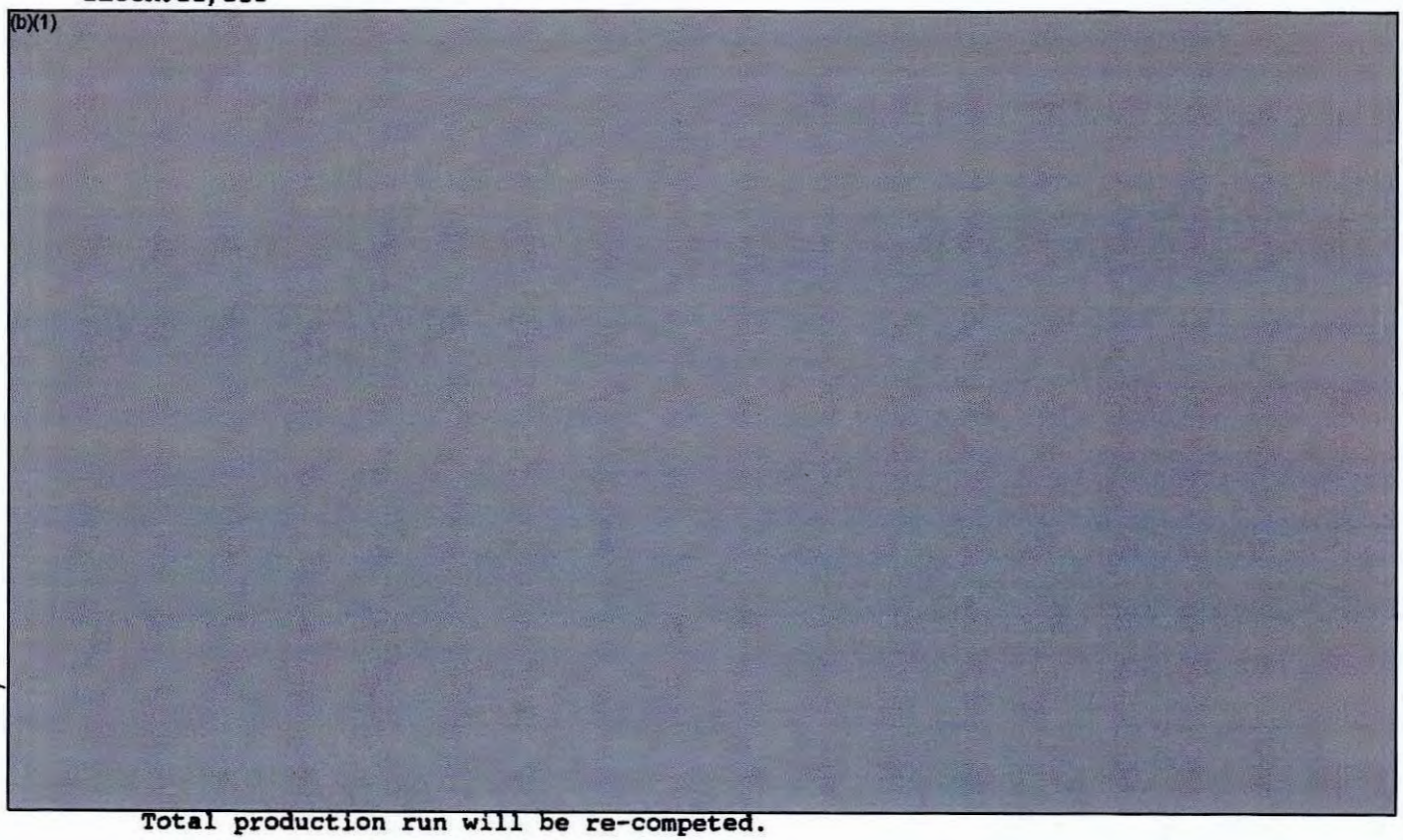
17a. (S) **Production Rate Data (Cont'd):**
BLOCK II/III

(b)(1)



17b. (U) Production Rate Data (Cont'd):
BLOCK II/III

(b)(1)



Total production run will be re-competed.

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	/
Procurement	/

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:
BLOCK I

a. (U) Assumptions and Ground Rules --

(Reference: DAB BCE 25 July 1991) The concept of operation for ASAS is a mobile battlefield management information system operating on a peacetime scenario utilizing an operating tempo of 2160 hours per year, with exception to Military Pay which is based on a wartime scenario with an operating tempo of 7555.5 hours per year. The

18a. (U) Operating and Support Costs (Cont'd):
BLOCK I

system employs a three tier maintenance concept. At the Organizational level, system malfunctions will be analyzed down to the Line Replaceable Unit (LRU); at the Intermediate (DS/GS) level, repair and replacement of unserviceable assemblies and subassemblies will be accomplished; and major overhaul and rebuilding will occur at the Depot.

The costs to operate and support the system include personnel costs of operators, maintainers, and support personnel. PCS costs are included. The sustaining materiels cost consists primarily of replenishment spares and repair parts, POL, and Modification Kits. There is no antecedent for Block I.

b. (U) Costs -- (FY 1986 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per ASAS System	Avg Annual Cost Per Antecedent
Spares & Repair Parts	0.8	N/A
Maintenance/Transp	0.3	N/A
Military Pay	2.3	N/A
O&S Consumables	0.1	N/A
Other	1.0	N/A
Total	4.5	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O & M	44.6	7.0	9.5	166.3	227.4
Total	44.6	7.0	9.5	166.3	227.4

18a. (U) Operating and Support Costs (Cont'd):
BLOCK II/III

a. (U) Assumptions and Ground Rules --

(Reference: DAB BCE, 25 July 1991) The concept of operation for ASAS is a mobile battlefield management information system operating on a peacetime scenario utilizing an operating tempo of 2160 hours per year, with exception to Military Pay which is based on a wartime scenario with an operating tempo of 7555.5 hours per year. The system employs a three tier maintenance concept. At the Organizational level, system malfunctions will be analyzed down to the Line Replaceable Unit (LRU); at the intermediated (DS/GS) level, repair and replacement of unserviceable assemblies and subassemblies will be accomplished; and major overhaul and rebuilding will occur at the Depot.

The costs to operate and support the system include personnel costs of operators, maintainers, and support personnel. PCS costs are included. The sustaining materiels cost consists primarily of replenishment spares and repair parts, POL, and Modifications Kits.

The Block II configuration differs from Block I.

b. (U) Costs -- (FY 1986 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per ASAS System	Avg Annual Cost Per Antecedent
Spares & Repair Parts	1.3	0.8
Maintenance/Transp	0.3	0.3
Military Pay	3.7	2.3
O&S Consumables	0.1	0.1
System/Proj Mgmt	0.1	0.0
Other	1.6	1.0
Total	7.1	4.5

18c. (U) Operating and Support Costs (Cont'd):
BLOCK II/III

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O & M	---	---	---	1872.8	1872.8
Total	---	---	---	1872.8	1872.8

A-26 MLRS TGW

11-025

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: MLRS TGW

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
Multiple Launch Rocket System Terminal Warhead (MLRS-TGW).

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
PROGRAM EXEC OFFICE-FIRE SUPPORT. COL WILLIAM S. TAYLOR
ATTN: SFAE-FS-ML Assigned: May 10, 1991
RSA, AL 35898-5700 AV 746-1195 COMM (205) 876-1195

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 63303A Project D216

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DEPARTMENT OF DEFENSE

5. (U) **Related Programs:**
(U) Basic MLRS: XM447 fuze, Scatterable Mine Warhead, Fire Direction Data Manager, TACFIRE, Field Artillery Meteorological Data System, Bradley Fighting Vehicle, AN/MSM-105 Test Set, Sense and Destroy Armor, Army Tactical Missile System.

[redacted]
Classified by: MLRS TGW SECURITY CLASS GUIDE 9 DEC 90-ADPM 1, 22 MAR 91.
Declassify on: OADR
Downgrade Instructions: Regarded Unclas. When Separated from [redacted] Incl/Page.

(THIS PAGE IS [redacted])

[redacted]

23 MAR 1992

93-T-0665

6. (U) Mission and Description:
(U) The concept of a TGW for the MLRS envisions the attack of armored target arrays from the above using the highly accurate and lethal submunitions dispensed from an MLRS Rocket. There is an urgent need for an autonomous, terminal homing, indirect fire-and-forget capability to defeat hard point targets such as armored vehicles and equipment before they are committed into the central battle, therefore reducing their presentation rate. The TGW for the MLRS will contain multiple submunitions packaged within the rocket warhead section. The TGW consists of a dispenser and three terminally guided submunitions (TGSM's). The primary mission of the MLRS TGW is to provide rapid fire, nonnuclear capability to destroy a wide spectrum of stationary and moving, medium hard to very hard, armored targets. The U.S. Army has been developing this warhead in cooperation with the Republic of France (FR), the Federal Republic of Germany (GE), and the United Kingdom (UK) under a memorandum of understanding (MOU) dated 3 December 1983.

(U) This system would supplement cannon and rocket artillery rather than replace equipment and/or munitions in the current inventory. The TGW will be fully integrated into the existing MLRS and be compatible with the components of the system as required in the specification for the rocket, rocket pod/container, and fire control. The Deep Attack MLRS Launcher currently under production has the capability to fire the MLRS TGW Rounds.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --

The MLRS TGW Development Program was a direct result of compliance by DA and OSD with congressional guidance to explore terminal homing options in the MLRS Program. Congress appropriated FY80 Research, Development, Test, and Evaluation (RDT&E) Funding under a separate program element to support concept definition studies for MLRS TGW. MLRS TGW is a Cooperative Development Program between the U.S., UK, FR, and GE in accordance with the July 1979 MLRS MOU and supplement number 3 to the MLRS MOU signed December 1983. Under the terms of the MOU supplement, the total International Development Program costs will be shared in the ratio of U.S. - 40 percent, and FR, GE, and UK - 20 percent each. Each country will be responsible for total funding of any internal national task they decide to do in addition to the agreed International Development Program.

The ASARC/DSARC I conducted in August/September 1984 approved entry into the Component Demonstration Substage (CDS) of the development program. Development and integration contracts were awarded on 29 November 1984 to MDTT Joint Venture and LTV Aerospace Division, respectively. MDTT Joint Venture consists of Martin

7a. (U) **Program Highlights (Cont'd)**:

Marietta Corporation (U.S.), Thomson CFS (FR), Thorn EMI Electronics (UK), Diehl GMBH and Company (GE), and MDTT, Inc. LTV Aerospace, the MLRS prime contractor, will be responsible for integration of the TGW into the Basic MLRS. LTV Aerospace and MDTT will be associate prime contractors for development of the total MLRS TGW Weapon System.

On 23 October 1986, the Joint Steering Committee (JSC)approved the contractor's recommended configuration of three TGSM's. As a result of a 17 1/2-month schedule delay in completion of CDS due to technical difficulties and revised threat, the JSC on 4 December 1986 approved a modification to the TGW Development Contract reflecting a 46-month CDS Phase. All testing planned for the CDS Phase was successfully completed. The CDS Contract was completed by MDTT on 31 March 1989.

Decision Memorandum from the Conventional Systems Committee(CSC) Review authorized entry into System Demonstration Substage (SDS) once the Army provided a plan to address certain issues at Milestone II. SDS Contract was signed 31 July 1989.

In accordance with the FY87 DOD Authorization Act, SAR's for pre-milestone II programs may reflect cost limited to the development program. Accordingly, the cost included in this report reflect the MLRS TGW development program only through SDS. In Dec 1990 DOD decided to terminate U.S. participation in MLRS TGW at the completion of SDS (FY92).

b. (U) Significant Developments Since Last Report --

The fourth of ten contract milestones associated with contractor receipt of full progress payments have been completed on schedule. This milestone demonstrated compatibility of operational flight software with the signal processing electronics design. Captive flight testing of terminal tracking hardware and algorithm was completed along with completion of the Ballistic Algorithm Test Flight Series. Hardware/software integration has been initiated to support drop and flight testing of tactical prototype submunitions in CY 92.

MLRS-TGW is expected to satisfy mission requirements.

c. (U) Changes Since As Of Date --

MLRS-TGW is not funded in the President's Budget beyond FY 92. Therefore, the U.S. will not participate in the EMD phase. The funded amount is $197.2 in Base Year FY80 dollars which falls below SAR reporting thresholds. It is expected that this will be the final SAR.

8. (U) **Threshold Breaches:**
An APB has not been approved for this program and there are no Nunn-McCurdy Unit Cost breaches.

9. (U) **Schedule:**

a. (U) Milestones --

	Planning Estimate	Approved Program	Current Estimate
Milestone I (ASARC)	AUG 84	N/A	AUG 84
Milestone I (DSARC)	SEP 84	N/A	SEP 84
Award Validation Phase Cntract	NOV 84	N/A	NOV 84
Captive Flight Test Initiated	DEC 85	N/A	MAY 87
Conventional System Committee (CSC) Program Review	N/A	N/A	MAY 88
ASARC Review	N/A	N/A	NOV 88
Component Demonstration Substage (CDS)/System Demonstration Substage (SDS) Transition Decision	N/A	N/A	FEB 89
SDS Contract Award	N/A	N/A	JUL 89
Milestone II (DAB)	MAR 87	N/A	FEB 93(Ch-1)
Engineering & Manufacturing Development (E&MD) Contract Award	N/A	N/A	MAR 93(Ch-1)
Milestone IIIA (DAB)	N/A	N/A	JUL 95(Ch-1)
LRIP Contract Award	JUN 89	N/A	AUG 85(Ch-1)
Full Scale Production Contract (FSP) Award	SEP 91	N/A	MAR 93
Milestone III (DAB)	APR 89	N/A	OCT 97

(b)(1) [redacted]

b. (U) Previous Change Explanations --

Initial milestone dates established per ASARC/DSARC I. CDS completion was delayed 17 1/2 months due to configuration changes dictated by a government-directed change in threat based on the introduction of reactive armor to the battlefield. Completion of CDS was delayed an additional six-months due to technical development difficulties and contractor multi-national program start-up delays. The start of SDS was delayed three-months due to delays in the international staffing approval process. This three-month delay resulted in corresponding three-month changes to MS/FSD, LRIP, Milestone II and Milestone IIIA. In 1989 SDS was restructured to reduce developmental risk, resulting in a 14-month increase in length to 39 months. The restructuring in turn reduced FSD by 11 months. Additional milestones to reflect measurable goals/thresholds between SDS and FSD were added.

9c. (U) **Schedule (Cont'd)**:

c. (U) Current Change Explanations --

CH 1: Completion of SDS has been delayed 4 months due to difficulties in developing Application Specific Integrated Circuits (ASIC), and delays in integrating software with the hardware. The ASIC problems have been resolved and hardware/software integration is underway. The resultant changes to Milestones are:
Milestone II changed from Oct 92 to Feb 93.
MS/FSD Contract Award changed from Nov 92 to Mar 93.
Milestone IIIA changed from Mar 95 to Jul 95.
LRIP Contract changed from Apr 95 to Aug 95.

d. (U) References --

(U) Planning Estimate:
FY 1985 President's Budget.

(U) Approved Program: None.

10. (U) **Performance Characteristics**:

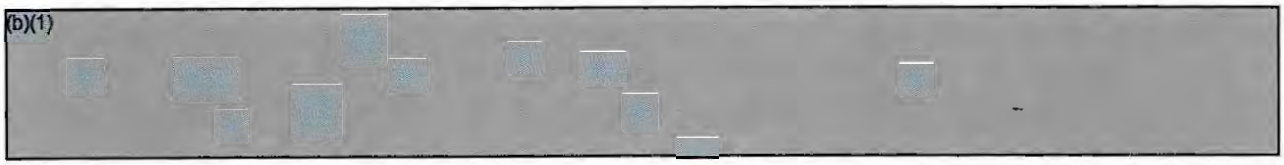
a. (U) Performance --

	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

2/ (U) TGW carrier reliability (rocket) is defined as the probalitiy that after loading on a MLRS launcher, a TGW rocket will properly pass all preflight checkouts and complete the rocket firing and flight sequence including proper carrier warhead fuzing and dispensing of any given submunition. The assigned reliability of the basic rocket less fuze and warhead is .965.

3/ (U) TGW submunition reliability is defined as the probability that a submunition will complete preflight checks and when dispensed,

(b)(1)



4/ (U) Seeker availability is defined as the mean percentage of time that the environmental conditions of clutter and weather allow the system to defeat the target arrays within the number of rockets required. It shall be calculated as the availability at 20km range against the tank BN target.

b. (U) Previous Change Explanations --

None.

c. (U) Current Change Explanations --

None.

d. (U) References --

(U) Planning Estimate:
FY 1985 President's Budget.

(U) Approved Program: None.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Planning Estimate	Approved Program	Current Estimate
Development (RDT&E)	190.7	0.0	255.7
Procurement	0.0		0.0
Flyaway	(0.0)		(0.0)
Total Flyaway	(0.0)		(0.0)
Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	190.7	0.0	255.7

11a. (U) Total Program Cost and Quantity (Cont'd):

	Planning Estimate	Approved Program	Current Estimate
Escalation	20.5	0.0	47.0
Development (RDT&E)	(20.5)	(0.0)	(47.0)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	211.2	0.0	302.7

The program acquisition costs shown in Section 11 reflect only the U.S. share of MLRS-TGW, through SDS Development. Development (RDT&E) costs have a total international development program costs of $920.3M (FY84 dollars) based on Oct 89 Baseline Cost Estimate.

b. (U) Quantity --

Development (RDT&E)	0	N/A	0
Procurement	0	N/A	0
Total	0	N/A	0

c. (U) Foreign Military Sales --
This is an International Co-development Program. There are no Foreign Military Sales to date.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Planning Estimate:
FY 1985 President's Budget.

(U) Approved Program: None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	211.2	0.0	0.0	211.2
Previous Changes:				
Economic	-8.5	-	-	-8.5
Quantity	-	-	-	-
Schedule	-4.2	-	-	-4.2
Engineering	+1.5	-	-	+1.5
Estimating	+76.6	-	-	+76.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+65.4	-	-	+65.4
Current Changes:				
Economic	-0.2	-	-	-0.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+26.3	-	-	+26.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+26.1	-	-	+26.1
Total Changes	+91.5	-	-	+91.5
Current Estimate	302.7	-	-	302.7

13a. (U) **Cost Variance Analysis (Cont'd):**

a. (U) Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	190.7	0.0	0.0	190.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-5.6	-	-	-5.6
Engineering	+1.3	-	-	+1.3
Estimating	+48.3	-	-	+48.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+44.0	-	-	+44.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+21.0	-	-	+21.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+21.0	-	-	+21.0
Total Changes	+65.0	-	-	+65.0
Current Estimate	255.7	-	-	255.7

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Schedule: Configuration changes due to government-directed threat revision caused 17 1/2-month schedule delay in CDS completion. Six-month CDS schedule extension due to technical difficulties and start-up delays. Schedule was increased 14 months to reduce developmental risk. In turn, FSD was reduced 11 months to 39 months. Maturation Full Scale Development phase deleted from current program to reflect amended budget submission, April 27, 1989. Three-month delay in start of SDS phase, due to staffing delays.

13b. (U) Cost Variance Analysis (Cont'd):

Engineering: TGSM configuration change and revised threat.

Estimating: Previous total represented the funded portion of the FYDP only and did not include total TGW development program. Refinement of costs resulting from ASARC/DSARC I decision and directed U.S. adjustment in development program to offset three month schedule slip. Cost growth associated with Improved Electronic Unit (IEU) bubble storage memory and CDS development contract. Funding decrement of $18.3M in FY90. FY91 Congressional language linked MLRS-TGW with the selection of a "Long Range" smart submunition, directing the Army to select one of several competing submunitions before March 31, 1991. Pending a decision, funding for all candidates was cut approximately 50%. The TGW share was $22.3M in FY91. FY90 below threshold reprogramming and a funding increase of $8.1M in FY92.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-0.2
Current & Prior Inflation Offset. (Estimating)	0.1	0.2
Release of FY91 funding as a result of submunition down-select decision and reprogramming actions. (Estimating)	20.9	26.1
Total Changes	21.0	26.1

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E -- (U) MLRS TGW:	Target	Initial Contract Price Ceiling	Qty
MDTT, ORLANDO, FL DAAH01-85-C-A004, CPIF Award: N/A Definitized: July 31, 1989	$295.7	N/A	0

15. (U) **Contract Information**: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$295.3	N/A	0	$298.9	$306.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$7.0	$-7.0
Cumulative Variances To Date (10/31/91)	$-10.6	$-10.0
Net Change	$-17.6	$-3.0

Explanation of Change:

The cumulative cost variance is due to technical problems with manufacture of Frequency Agile Source and Gimballed Radar Frequency Amplifier by a major subcontractor and increased effort to correct Fast Fourier Transform (FFT) Application Specific Integrated Circuit (ASIC) problems. The cumulative schedule variance reflects impact of ASIC problems and lack of availability of software and hardware for brassboard integration, prototype integration, and unit/functional testing. The Program Manager's Estimated Price at Completion has been increased due to the above cost and schedule problems.

16. (U) **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 100.0% (13 yrs/13 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($302.7 / $302.7)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY80-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	256.2	46.5	-	-	302.7
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	256.2	46.5	-	-	302.7

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1980				0.6	0.5	0.5	0.5	10.6
1981				0.3	0.3	0.3	0.3	10.6
1982				1.1	1.0	1.0	1.0	7.6
1983				2.3	2.3	2.3	2.3	4.9
1984				15.2	15.5	15.4	15.4	3.8
1985				22.9	24.1	24.1	24.1	3.4
1986				25.0	27.1	27.0	27.0	2.8
1987				35.2	39.3	39.3	39.3	2.7
1988				20.4	23.6	23.5	23.5	3.1
1989				32.5	39.1	39.1	36.7	4.2
1990				33.4	41.7	41.7	31.1	4.0
1991				32.1	41.7	37.9	34.3	3.9
1992				34.7	46.5	3.9	0.4	3.1
Subtot				255.7	302.7	256.0	235.9	
Grand Total				255.7	302.7	256.0	235.9	

Source: Reflects dollars in the January 92 President's Budget.

No funding programmed beyond FY92. U.S. participation in MLRS TGW

16c. (U) **Program Funding Summary (Cont'd):**
will cease at the completion of the SDS phase.

17. (U) **Production Rate Data:**

a. (U) Not applicable for Pre-Milestone II programs.

b. (U) Not applicable for Pre-Milestone II programs.

c. (U) Not applicable for Pre-Milestone II programs.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Not applicable for Pre-Milestone II programs.

18. (U) **Operating and Support Costs:**

Not applicable for Pre-Milestone II programs.

A-12 COMANCHE (LH)

91-055

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: COMANCHE (RAH-66)

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
Comanche Program (RAH-66)

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MAR 23 1992

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
Comanche Program Manager's Office
ATTN: SFAE-AV-RAH
4300 Goodfellow Blvd.
St. Louis, MO 63120-1798
BG Orlin L. Mullen
Assigned: July 1, 1991
AV 693-1800 COMM 314 263-1800

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 63220 Project D325
PE 64810 Project D327, DC72
PE 64216 Project DC72
PE 64223 Project D327, D397

PE 64810 Project D327/DC72 (FY88 Only)

No SECURITY Objection to PUBLIC RELEASE

23 MAR 1992

SECURITY REVIEW, ODCSINT, HQDA

5. **Related Programs:**
Air-to-Air Stinger Missile System; Anti-tank Missile System; Army Aviation Modernization Program including AH-64 and UH-60; Longbow.

6. **Mission and Description:**
The Comanche will be a lightweight, low cost, twin engine advanced helicopter that will retire the current light fleet of tactically

*** [redacted] ***

92-0652

6. **Mission and Description (Cont'd):**

obsolescent AH-1, OH-6 and OH-58 helicopters for the primary missions of armed reconnaissance and light attack. Comanche will provide leap ahead combat lethality and battlefield survivability to defeat the threat of the mid-1990s and to modernize the Army's light attack/scout fleet. The Comanche will correct the major light fleet deficiencies such as marginal night and adverse weather capability; position location/navigation accuracy; inability to self-deploy to overseas theaters of operations; and inadequate reliability, performance and survivability. Comanche improvements include light weight composite airframe structures for enhanced power to weight ratios that provide increased agility/maneuverability, increased speed and excellent high altitude/hot day performance, advanced technology target acquisition and night vision sensors which allow greater standoff range and shorter exposure time to the threat as well as effective night/adverse weather operations; the tri-service common avionics architecture which is compatible with the Air Force Advanced Tactical Fighter; and built-in diagnostics/prognostics. Comanche will be integrated into the force structure to complement the AH-64 attack helicopter.

7. **Program Highlights:**

a. Significant Historical Developments --

In March 1982, Senior Army leadership endorsed the Aviation Mission Area Analysis recommendation to replace the current light fleet with the LH at the Army Aviation Systems Program Review. Advanced development effort was initiated in October 1983, under the Advanced Rotorcraft Technology Integration (ARTI) Program. On 19 July 1985, competitive Firm Fixed Price (FFP) Full Scale Development (FSD) contracts were awarded for development of a 1200 shaft horsepower class, advanced technology engine, designated as the T800. On 19 May 1987, a Secretary of Defense Decision Memorandum was issued for the LH program that supported the need for the Army to upgrade the aviation capabilities for the light attack role and authorized continuance of LH Mission Equipment Package (MEP) design and definition effort to the extent that it was compatible with all competing airframe technologies and directed a parallel independent assessment of competing airframe technologies be made. Two independent assessments were conducted and both study teams recommended a new development conventional helicopter as the most cost and operationally effective airframe alternative for the LH. On 16 May 1988, the LH Army System Acquisition Review Council was conducted in preparation for Milestone I with the OSD Defense Acquisition Board (DAB). The DAB met on 9 June 1988, for the LH Milestone Decision I Review and gave approval for LH to proceed with Demonstration/Validation (Dem/Val) phase of the program. On 28 October 1988, the Light Helicopter Turbine Engine Company was announced the winner of the competitive T800 engine program. On

LH, December 31, 1991

7a. **Program Highlights (Cont'd):**

1 November 1988, contractor teams of Boeing Sikorsky and McDonnell/Bell began competitive LH Dem/Val efforts. On 23 August 1990, The Secretary of Defense (SecDef) completed his review of the LH based on the results of the Advanced Rotary Wing Aircraft Review. He concluded the LH program as previously structured did not take advantage of prototyping and directed the extension of the Dem/Val phase to allow for the conduct of full prototype testing before the start of FSD. The SecDef also directed that the total procurement of LHs be reduced to 1292 at an annual rate of 120. This represented the minimum requirement of LHs in the force structure. This requirement would be refined as the precise mix of heavy, mechanized and light units within the active and reserve components is determined. The total procurement quantity could range up to 1681 aircraft depending on that mix. The Army Acquisition Executive directed the Army leave open the option of procuring a total quantity of 1681 at an annual rate of 144. This option would provide additional cost benefits associated with increased quantities and production rates. The SecDef also indicated the Comanche was a prime candidate for Longbow incorporation and would be developed to facilitate future integration of the Longbow system.

b. Significant Developments Since Last Report --
A follow-on Dem/Val Prototype phase was initiated when a contract was awarded to the Boeing Sikorsky team on 12 April 1991.

The Comanche system is expected to satisfy the mission requirement.

c. Changes Since As Of Date --
On 29 January 1992, the Defense Acquisition Executive directed the restructure of the Comanche development contract to prove out all critical components, including avionics, an upgraded T-800 engine and the Longbow. In addition, on 4 February 1992, the Army Acquisition Executive directed the restructured program be accomplished within available funding and will complete the Dem/Val phase in 1997.

8. **Threshold Breaches:**
Due to the DAE directed program restructure, there are schedule breaches to the approved Acquisition Program Baseline (APB) dated 15 June 1988. A revised APB has been submitted.

LH, December 31, 1991

9. **Schedule:**

a. Milestones --	Planning Estimate	Approved Program	Current Estimate
T800 Engine FSD Contract Award	JUL 85	JUL 85	JUL 85
Milestone I (ASARC 1)	FEB 87	MAY 88	MAY 88
Milestone I (DAB 1)	MAR 87	JUN 88	JUN 88
Award Air Vehicle Phase 1/Dem Val Contracts	OCT 87	OCT 88	OCT 88
T800 FSD Downselection	SEP 88	OCT 88	OCT 88
Milestone II (ASARC II)	FEB 87	NOV 90	TBD (Ch-1)
Milestone II (DAB II)	MAR 87	DEC 90	TBD (Ch-1)
Award FSD Contracts (Phase II/FSD)	JUL 89	DEC 90	TBD (Ch-1)
First Flight	SEP 91	AUG 93	AUG 95 (Ch-1)
T800 Engine Production Contract Award	JAN 93	JUN 93	TBD (Ch-1)
DT/EUTE* Completed	NOV 93	NOV 94	TBD (Ch-1)
Milestone IIIA (LRIP)	JAN 94	NOV 94	TBD (Ch-1)
Air Vehicle Production Contract Award (LRIP)	JAN 94	NOV 94	TBD (Ch-1)
First Air Vehicle Production Delivery	JUL 95	MAR 96	TBD (Ch-1)
IOTE Completed	N/A	SEP 96	TBD (Ch-1)
Milestone (ASARC/DAB III)	JAN 94	NOV 96	TBD (Ch-1)
IOC	MAY 96	NOV 96	TBD (Ch-1)

b. Previous Change Explanations --

Milestones revised from AMC approved Acquisition Strategy (16 December 1985) to reflect 1995 IOC Acquisition strategy as approved by the Chief of Staff of the Army on 10 November 1986. Milestones were revised based upon DAE approved baseline dated 15 June 1988 (Milestone I ADM, dated 17 June 1988). Milestones changed as a result of a schedule assessment made in response to the direction contained in the SecDef letter, 23 August 1990.

c. Current Change Explanations --

Ch-1 Program restructured per DAE memorandum, 29 January 1992, subject: Implementation of Acquisition Decisions.

d. References --

Planning Estimate:
AMC Approved Acquisition Strategy (16 December 1985).

Approved Program:
DAE Approved Program Baseline on 15 June 1988.

10. Performance Characteristics:

a. Performance --	PE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
SCAT Primary Mission Gross Weight (PMGW)					
Empty Weight (lbs)	N/A	7500	/ 8200	N/A	7500
Gross Weight (lbs)	N/A	11200	/ 11900	N/A	11200
Flight Performance (Primary Mission): SCAT					
Vertical Rate of Climb (VROC) Feet per Minute (FPM) 4000 ft/95 deg F @ (PMAW)	500	500	/ 250	N/A	500
Dash Speed, Knots @ 4000 ft/95 deg F	N/A	170	/ 160	N/A	170
Single Engine Operation, Knots @ CRP 100 FPM Rate of Climb	N/A	40	/ 80	N/A	40
Crashworthiness (Vertical Impact Velocity, FPS)	N/A	38	/ 30	N/A	38
EMI/EMP Protection (Volt/M)	N/A	200	/ 100	N/A	200
Engine Size, Intermediate Rated Power at Sea Level Standard	N/A	1200	/ 1140	N/A	1233
Reliability:					
Mean Time Between Essential Maintenance Action (MTBEMA)(hrs)	4.5	5.1	/ 4.5	N/A	5.1
Mean Time Between Mission Affecting Failure (MTBMAF) (hrs)	8.4	9.5	/ 8.5	N/A	9.5
Maintainability:					
Mean Time To Repair (MTTR)(hrs)	1.0	.86	/ 1.0	N/A	.86
Maintenance Manhours per flight hr. (MMH/FH)	2.8	2.6	/ 2.8	N/A	2.6

10a. Performance Characteristics (Cont'd):

	PE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Payload SCAT Hellfire:					
Internal Missile Capacity	N/A	6	/ 4	N/A	6
External Missile Capacity	N/A	4	/ 2	N/A	4
Gun Ammo Capacity (rounds)	N/A	500	/ 300	N/A	500
Refuel/Rearm (no. of personnel-time (mins)	N/A	3-15	/ 4-30	N/A	3/15
Air Transportability in C-5 (time to load/unload)(hrs)	N/A	1	/ 2	N/A	1.0
Self Deployable (NM)	1260	1260	/ 1120	N/A	1260

b. Previous Change Explanations --

UTAS design excluded from refocused program. MTBMAF and MTTR revised to reflect changes in Reliability, Availability and Maintainability (RAM) rationale report. MMH/FH revised from 2.8 to 2.6 hours to reflect results of RAM data analysis. PMGW weapon load increased from 4 to 6 missiles to reflect analysis of LH Milestone I Cost and Operational Effectiveness Analyses (COEA). Engine size changed from 1200 to 1233 due to initial testing of T800 engine. MTBEMA changed from 4.5 to 5.1 and MTBMAF from 8.5 to 9.5 to reflect program goals instead of thresholds. Dash Speed estimate adjusted from 180 knots to 170 knots to reflect Dem/Val phase design trade-offs.

c. Current Change Explanations -- None.

d. References --

Planning Estimate:
AMC Approved Acquisition Strategy (16 December 1985).

Approved Program:
DAE Approved Program Baseline on 15 June 1988.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Planning Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	1756.2	2900.0	2552.0
Procurement	0.0	N/A	0.0
Total Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	1756.2	2900.0	2552.0
Escalation	376.8	950.0	863.5
Development (RDT&E)	(376.8)	(950.0)	(863.5)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2133.0	3850.0	3415.5
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	0	N/A	N/A
Total	0	0	0

There will be 3 Development Prototypes that will not be considered fully configured end items.

c. Foreign Military Sales -- None.

d. Nuclear Costs --
None

e. References --

Planning Estimate:
AMC Approved Acquisition Strategy (16 December 1985).

Approved Program:
DAE Approved Program Baseline on 15 June 1988.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2133.0	0.0	0.0	2133.0
Previous Changes:				
Economic	+156.2	-	-	+156.2
Quantity	-	-	-	-
Schedule	+265.4	-	-	+265.4
Engineering	+455.4	-	-	+455.4
Estimating	+1619.3	-	-	+1619.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2496.3	-	-	+2496.3
Current Changes:				
Economic	-71.8	-	-	-71.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1142.0	-	-	-1142.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1213.8	-	-	-1213.8
Total Changes	+1282.5	-	-	+1282.5
Current Estimate	3415.5	-	-	3415.5

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1756.2	0.0	0.0	1756.2
Previous Changes:				
Quantity	-	-	-	-
Schedule	+145.2	-	-	+145.2
Engineering	+301.3	-	-	+301.3
Estimating	+1115.5	-	-	+1115.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1562.0	-	-	+1562.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-766.2	-	-	-766.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-766.2	-	-	-766.2
Total Changes	+795.8	-	-	+795.8
Current Estimate	2552.0	-	-	2552.0

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation indices

Schedule: Program restructured per SecDef letter, 23 August 1990.

Engineering: LH Longbow Development

Estimating: Acquisition strategies revised to reflect varying competitive development time and prototype fly-off alternatives. Assault/utility design was excluded.

Total DAE approved baseline program added FY93 through FY96 estimate.

Program estimate reduced length and scope of

13b. Cost Variance Analysis (Cont'd):

Dem/Val effort. This reduction was in response to the DEPSECDEF 20 January 1988, ADM.

Update estimate of competitive T800 program to actuals.

Revised estimates of LH development testing, and LH prototypes

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indicies (Economic)	--	-71.8
Current and Prior Year Inflation Offset (Estimating)	8.6	11.4
Program restructured per DAE memorandum, 29 Janaury 1992, subject: Implementation of Acquisition (Estimating)	-774.8	-1153.4
Total Changes	-766.2	-1213.8

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

T800 FSD ENGINE PROGRAM:	Initial Contract Price Target	Ceiling	Qty
LHTEC, ST LOUIS, MO DAAJ09-85-C-B017, FFP I/ Award: July 19, 1985 Definitized: July 19, 1985	$207.8	N/A	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$278.5	N/A	0	$278.5	$278.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (10/31/91)	$-7.3	$-2.7
Net Change	$-7.3	$-2.7

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change:

Schedule and cost variances due to delays in completion of T800 Qualification Testing Phase of Program.

1/ The basic contract was negotiated as a FFP RDT&E effort; however the contract does contain RDT&E CPFF options.

Dem/Val Prototype:	Initial Contract Price Target	Ceiling	Qty
Boeing Sikorsky JPO, Philadelphia, PA DAAJ09-91-C-A004, CPIF/AF Award: April 12, 1991 Definitized: April 12, 1991	$1886.6	$0.0	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$1886.6	$0.0	0	$1781.3	$1781.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (10/31/91)	$-4.1	$-5.1
Net Change	$-4.1	$-5.1

Explanation of Change:

Schedule and cost variances due to design changes and difficulty in staffing as quickly as projected. Contract reflects cost and effort prior to DAE memorandum, 29 January 1992, subject: Implementation of Acquisition Decisions.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 64.3% (9 yrs/14 yrs)

(2) Percent Program Cost Appropriated: 51.6% ($1762.5 / $3415.5)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY84-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	1223.7	538.8	443.0	1210.0	3415.5
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1223.7	538.8	443.0	1210.0	3415.5

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army								
1984				1.0	1.0	1.0	1.0	3.8
1985				67.8	71.4	71.3	70.4	3.4
1986				98.6	106.9	106.9	106.9	2.8
1987				123.4	137.6	137.6	137.5	2.7
1988				109.9	127.1	127.1	126.7	3.0
1989				147.3	177.0	177.0	176.6	4.2
1990				215.5	269.0	269.0	256.2	4.0
1991				256.8	333.7	330.4	96.2	3.9

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)								
1992				401.6	538.8	1.5	0.9	3.1
1993				319.7	443.0			3.3
1994				243.8	349.0			3.3
1995				220.6	326.0			3.3
1996				196.7	300.0			3.2
1997				149.3	235.0			3.2
Subtot				2552.0	3415.5	1221.8	972.4	
Grand Total				2552.0	3415.5	1221.8	972.4	

17. Production Rate Data:

a. Not applicable for Pre-Milestone II programs.

b. Not applicable for Pre-Milestone II programs.

c. Not applicable for Pre-Milestone II programs.

d. Deliveries (Plan/Actual) -- None.

e. Not applicable for Pre-Milestone II programs.

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

A-27 MSE

91-075

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: MSE (Comm Sys)

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
Mobile Subscriber Equipment (MSE)

CLEARED
FOR OPEN PUBLICATION

MAR 18 1992

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
SFAE-CM-MSE
FORT MONMOUTH, NJ 07703-5210
AV 995-2524 COMM (908) 544-2524
COL DAVID R. GUST
Assigned: June 2, 1990

No SECURITY Objection
TO PUBLIC RELEASE
18 MAR 1992
George Bromwell
DDCS/INT, HQDA

4. **Program Elements/Procurement Line Items:**

PROCUREMENT:
APPN 2035 ICN BB 1610 (Army)

5. **Related Programs:**
None

6. **Mission and Description:**
The MSE system is a common-user, secure, self-organizing communications system which provides users with a means of communication throughout the battlefield, in either a mobile or static situation. The MSE system integrates all of the functions of a total communications system. The system consists of five major hardware elements: node centers, extension nodes (large and small), Mobile Radio telephones, System Control and terminals. The MSE will be deployed to replace the existing Corps and Division communications

OASD(PA) DPOISR 92-T-0586

*** [redacted] ***

6. **Mission and Description (Cont'd):**

systems covering the area from the Corps rear boundary to forward of the divisional maneuver brigades or a geographical area of 37,500 square km. The MSE system will provide necessary interfaces for communications with echelons above corps (EAC), the other services and NATO. Node centers will constitute the "backbone" of the MSE system and will provide connectivity to extension switches and Radio Access Units (RAUs) by means of UHF Multichannel Radio. These node centers provide a grid network that covers the entire Corps area of operation enabling subscriber access to the system anywhere in the area. The node centers are linked together by line-of-sight (LOS) radio assemblages. Each node center is linked to at least two and usually three other node centers so that communication is not lost if a link is lost or jammed. The system will automatically reroute traffic around damaged or jammed nodes or links. Extension switches provide Wire-line Terminal Subscribers (telephone, facsimile and data terminals) with a means of entry into the total area communications system. These extension switches are connected to the backbone grid network of node centers again by the LOS radio assemblages. The RAUs provide a means for Mobile Radiotelephone users to communicate with other mobile and wire telephone users throughout the area of operation. The RAUs can be collocated with a node center connected by cable or can be remoted from the node center by means of the LOS radio. The system offers subscribers a means of communication with each other on a discrete address, fixed directory basis, throughout the Corps area of operations.

7. **Program Highlights:**

a. Significant Historical Developments --

The MSE system was part of the TRI-TAC architecture and was initially identified as the division backbone communication system in the Army's INTACS Objective System, approved in Oct 76, and revalidated by TRADOC in Feb 81. The OSD Memorandum dated 13 Oct 79 approved the Joint Operational Requirement (JOR) for MSE and continued the assignment of the Army as the acquisition agent. The OSD Memorandum dated 8 Jan 80 approved the Mission Element Need Statement (MENS) for MSE. AMC was directed to proceed immediately with actions necessary to obtain the MSE system in a HQDA (DCSRDA) message dated 6 Aug 82. In Nov 82, guidance was received from the Under Secretary of the Army to procure MSE using a nondevelopmental approach. The JOR and MENS were updated and expanded to include corps and division in the MSE Operational Capabilities Document (MSEOCD) dated 24 May 84. The JOR and MENS identified MSE as a separate program from TRI-TAC and defined MSE as the corps and division common user area communication system. On 5 Nov 85, GTE was declared the winning contractor by the Secretary of the Army. On 19 Dec 85, the basic contract was signed and on 31 Dec 85, Option 1 of the contract was signed. On 19 Feb 87, Option 2 of the contract was signed. Follow-On Test and Evaluation

7a. Program Highlights (Cont'd):

(FOTE) was started on 9 Aug 88 and completed on 25 Oct 88. On 8 Dec 88, Option 3 of the contract was signed. On 8 Mar 89, Option 4 of the contract was signed. On 7 Apr 89, the existing contract option to include packet switching in MSE was executed. Field Verification Test (FVT) started on 12 Feb 90 and was completed on 23 Feb 90. Emerging results presented on 14 Mar 90 showed that MSE will provide at least a 90.4% Grade of Service (GOS) which is greater than the 90% specification requirement. On 20 Mar 90, Option 5 of the contract was signed. Of the quantity of 48 units to be fielded, twenty-three have been fielded to date.

b. Significant Developments Since Last Report --
MSE successfully utilized in Desert Storm approximately 4 Signal Battalions (20 nodes). 32nd AADCOM fielding started 21 Feb 91. The VII Corps USAREUR fielding was completed 13 Dec 91 and the start of the XVIII Corps fielding commenced on 19 Dec 91. Several major exercises were conducted during 1991 (i.e. Seneca Chieftain, Mobile Challenger I/II, 123rd CAPEX, and Caravan Guard).

Phase I of the Air Defense Artillery Interface (ADI) demonstration was successfully completed on 3 May 91. Phase II got off to a slow start due to minor glitches which were quickly overcome. Once under way, on 7 May 91, the demonstration was a success. Phase III demonstration, conducted 18-29 Jun 91 at USAREUR was a success.

The MSE system will satisfy the mission requirements.

c. Changes Since As Of Date --
Milestone NSA Data Transfer Device (DTD) Production Award changed from Jan 92 to Mar 92. MSE DTD program will be procured using the SINCGARS BECS production contract which will be awarded Mar 92.

8. Threshold Breaches:
There are currently no breaches to the Acquisition Program Baseline (APB) dated July 5, 1991 and no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --	Production Estimate	Approved Program	Current Estimate
Program Initiated	AUG 82	AUG 82	AUG 82
Issue Request for Proposal	JUL 84	JUL 84	JUL 84
Type Classification (STD) Approved	NOV 85	NOV 85	NOV 85

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
Contract Award Basic Year	DEC 85	DEC 85	DEC 85
Contract Award Option Year 1	DEC 85	DEC 85	DEC 85
Contract Award Option Year 2	FEB 87	FEB 87	FEB 87
First Article Test			
Start	JUL 87	JUL 87	JUL 87
Complete	JAN 88	JAN 88	JAN 88
First Production Delivery (On-Site)	APR 88	FEB 88	FEB 88
First Delivered Unit Basic Year	APR 88	FEB 88	FEB 88
Destination Final Acceptance Test			
Start	FEB 88	FEB 88	FEB 88
Complete	APR 88	APR 88	APR 88
First Unit Equipped	MAY 88	MAY 88	MAY 88
User Follow-on Test and Evaluation			
Start	MAY 88	MAY 88	MAY 88
Complete	SEP 88	SEP 88	SEP 88
Contract Award Option Year 3	SEP 88	SEP 88	SEP 88
First Delivered Unit Option Year 1	SEP 88	SEP 88	SEP 88
Contract Award Option Year 4	MAR 89	MAR 89	MAR 89
First Delivered Unit Option Year 2	MAR 89	MAR 89	JUN 89
Field Verification Test of 90% GOS (C-1)			
Start	N/A	N/S	JAN 90
Complete	N/A	N/S	FEB 90
Operational Evaluation of Call Compl (C-1)	N/A	N/S	MAR 90
Contract Award Option Year 5	MAR 90	MAR 90	MAR 90
First Delivered Unit Option Year 3	MAR 90	MAR 90	MAR 90
Last Delivered Unit Option Year 2	N/A	N/S	JUL 90
Last Delivered Unit Option Year 3	N/A	JUL 91	JUL 91
Contract Award Option Year 6	MAR 91	MAR 91	N/A
First Delivered Unit Option Year 4	AUG 91	AUG 91	AUG 91
NSA Data Transfer Device (DTD) Prod Award	N/A	JAN 92	MAR 92
First Delivered Unit Option Year 5	SEP 92	SEP 92	SEP 92
Last Delivered Unit Option Year 4	N/A	OCT 92	OCT 92
First DTD Delivery	N/A	SEP 93	SEP 93
Last Delivered Unit Option Year 5	N/A	OCT 93	OCT 93
Last Unit Fielding Completed	N/A	N/S	DEC 93
Award FIREFLY Dual Loop Key Generator (DLKG) Test Bed	N/A	DEC 93	DEC 93

9a. **Schedule (Cont'd):**

Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
First Fielded DTD in MSE	N/A	JAN 94	JAN 94
Award FIREFLY Digital Secure Voice Terminal (DSVT)	N/A	DEC 94	DEC 94
Last Fielded DTD in MSE	N/A	JAN 95	JAN 95
First Fielded DLRG in MSE	N/A	DEC 95	DEC 95
First Fielded DSVT in MSE	N/A	JUL 96	JUL 96
Last Fielded DLRG in MSE	N/A	DEC 96	DEC 96
Last Fielded DSVT in MSE	N/A	JUL 97	JUL 97

b. Previous Change Explanations --

First Delivered Unit Option Year 1, Option Year 2 and the Last Unit Fielding Completed Current Estimate were changed to reflect the current AAE Baseline, dated 26 Feb 90. Option Year 6 milestones were deleted due to funding reductions. Added Milestones (Last Delivered Unit Option Years 2, 3, 4, and 5) to reflect current APB Baseline, dated 26 Feb 90.

c. Current Change Explanations --

None

d. References --

Production Estimate:
FY87 President's Budget.

Approved Program:
AAE Approved Acquisition Program Baseline dated 05 July 1991.

10. **Performance Characteristics:**

a. Performance --	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Grade of Service (20% off-hook factor) (%)	N/A	90 / 90	90.4	90
Set-up Time (node) (min)	30	30 / 45	30	30
Tear Down Time (node) (min)	30	30 / 45	45	45

10a. **Performance Characteristics (Cont'd):**

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Subscriber Switchboard Capacity					
Large Command Post	176	176	/ 150	176	176
Digital Transmission Groups	8	N/A	/ N/A	8	8
Small Command Post					
Switch Version 1	N/A	26	/ 19	26	26
Digital Transmission Groups	1	N/A	/ N/A	1	1
Switch Version 2	41	41	/ 30	41	41
Digital Transmission Groups	1	N/A	/ N/A	1	1
Mobile Subscriber Affiliation Capacity (per radio access unit)	N/A	50	/ 40	50	50
System Operating Temp (deg F) 1/	-40 to 120	-40 to +120	/ -35 to +110	-40 to +120	-40 to +120
MSE Radio Equip Frequency Ranges: (Mhz)					
Ultra High Frequency					
Band I	225-400	225-400	/ 225-400	225-400	225-400
Band III	1350-1850	1350 - 1850	/ 1350 - 1850	1350 - 1850	1350 - 1850
Very High Frequency	30-88	30-88	/ 30-88	30-88	30-88

1/ Ambient temperature external to the assemblage.

b. Previous Change Explanations --

None

c. Current Change Explanations --

None

10d. **Performance Characteristics (Cont'd):**

d. References --

Production Estimate:
FY87 President's Budget.

Approved Program:
AAE Approved Acquisition Program Baseline dated 05 July 1991.

11. **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

	Production Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	0.0	0.0	0.0
Procurement	4428.5	3749.9	3902.7
Subscriber Terminals	(157.4)		(119.6)
Mobile Sub. Access	(548.2)		(403.2)
Wire Subscriber Access	(1198.2)		(888.2)
Area Coverage	(1587.4)		(1254.9)
System Control Center	(116.4)		(94.6)
Other Acq. Cost	(306.7)		(694.5)
Warranty	(166.3)		(133.8)
Contractor Fielding	(166.3)		(135.6)
Total Flyaway	(4246.9)		(3724.4)
Other Weapon system	(21.2)		(58.6)
Total Other Wpn Sys	(21.2)		(58.6)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(160.4)		(119.7)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 86 Base-Year $	4428.5	3749.9	3902.7
Escalation	705.5	806.9	656.9
Development (RDT&E)	(0.0)	(0.0)	(0.0)
Procurement	(705.5)	(806.9)	(656.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	5134.0	4556.8	4559.6
b. Quantity --			
Development (RDT&E)	0	N/A	N/A
Procurement	48	50	48
Total	48	50	48

c. Foreign Military Sales --
None

11d. Total Program Cost and Quantity (Cont'd):

d. Nuclear Costs --
None

e. References --

Production Estimate:
FY87 President's Budget.

Approved Program:
AAE Approved Acquisition Program Baseline dated 05 July 1991.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	4559.6	4556.8	4559.6
(2) Quantity	48	48	48
(3) Unit Cost	94.992	94.933	94.992
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	72.5	72.5	58.5
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	72.5	72.5	58.5
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	0.0	5134.0	0.0	5134.0
Previous Changes:				
Economic	-	+178.4	-	+178.4
Quantity	-	+83.0	-	+83.0
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-818.9	-	-818.9
Other	-	-	-	-
Support	-	-19.7	-	-19.7
Subtotal	-	-577.2	-	-577.2
Current Changes:				
Economic	-	-180.5	-	-180.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+174.9	-	+174.9
Other	-	-	-	-
Support	-	+8.4	-	+8.4
Subtotal	-	+2.8	-	+2.8
Total Changes	-	-574.4	-	-574.4
Current Estimate	-	4559.6	-	4559.6

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1986 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	0.0	4428.5	0.0	4428.5
Previous Changes:				
Quantity	-	+69.3	-	+69.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-731.2	-	-731.2
Other	-	-	-	-
Support	-	-16.7	-	-16.7
Subtotal	-	-678.6	-	-678.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+139.4	-	+139.4
Other	-	-	-	-
Support	-	+13.4	-	+13.4
Subtotal	-	+152.8	-	+152.8
Total Changes	-	-525.8	-	-525.8
Current Estimate	-	3902.7	-	3902.7

b. Previous Change Explanations --

PROCUREMENT

Economic: Revised indices.

Quantity: Addition and reduction of units.

Estimating: Change due to revision of force structure requirements, reprogramming action, and extending the program.

Support: Incorporate NET, OMA transfer, and corrections to previous data and initial spares.

13c. **Cost Variance Analysis (Cont'd):**

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised escalation rates (Economic)	N/A	-180.5
Current & Prior Year Inflation Off-set.		180.5
Adjustments to the FY90-97 program due to LCCP, Desert Storm, NET funds and DA higher priorty requirements.	3.6	4.5
Error in estimating.	135.8	170.4
(Estimating)	139.4	174.9
Correction to initial spares.	4.6	--
Correction to data (Includes Warranty, Status Reports, Nomenclature Request, Tech Manuals, Test Plans).	0.5	--
Correction to Total Package Fielding (Includes New Equipment Training & Contractor Field Service Reps).	19.6	26.2
Correction to Project Managers Office Salaries.	-11.3	-17.8
(Support)	13.4	8.4
Total Changes	152.8	2.8

14. **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
106.96	-0.04	1.73	--	--	-13.42	--	-0.24	-11.97	94.99

15. **Contract Information:** (Then-Year Dollars in Millions)

a. Procurement --

ROMTS CONTR (IK'S ONLY):	Initial Contract Price Target	Ceiling	Qty
GTE CORP, TAUNTON, MA DAAB07-86-D-K023, FFP Award: December 19, 1985 Definitized: December 19, 1985	$40.9	N/A	9416

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$37.8	N/A	9110	$38.6	$38.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract price changed from $38.6M to $37.8M due to Government's share of concurrent savings resulting from negotiated agreement to VECPV6GK023013.

For this FFP Contract, Cost and Schedule Variance information is not required.

BASIC CONTRACT:	Initial Contract Price Target	Ceiling	Qty
GTE CORP, TAUNTON, MA DAAB07-86-C-K022, FFP Award: December 19, 1985 Definitized: December 19, 1985	$4145.7	N/A	48

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$4122.2	N/A	48	$4122.2	$4122.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract price changed from $4065.2M (Dec 90 SAR) to $4122.2M due to contractual incorporation of funds for: the Light Forces Contingency Communications Packages (LCCP's)($10.7M); the integrated retrofit of the Program Control Unit, integrated retrofit of the Dual Loop Key

15. Contract Information: Cont'd (Then-Year Dollars in Millions) Generator, Purchase of antennas, Packet Switch Interface, SCC Remote Terminal ($44M); and the ECP MTT/TTY Replacement and Packet Switch Gateway Enhancement to MSE System Simulator (MSS) into the contract ($2.3M) giving a total increase of $57M.

For this FFP Contract, Cost and Schedule Variance information is not required.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 61.5% (8 yrs/13 yrs)

(2) Percent Program Cost Appropriated: 95.3% ($4347.2 / $4559.6)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY85-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	-	-	-	-	-
Procurement	4274.7	72.5	58.5	153.9	4559.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	4274.7	72.5	58.5	153.9	4559.6

16c. Program Funding Summary (Cont'd):

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY86 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2035 Other Procurement, Army								
1985	1		60.6	61.5	63.3	63.3	63.3	3.4
1986	1		303.2	315.4	335.3	335.3	335.3	2.8
1987	11		792.5	821.6	903.7	903.6	897.5	2.7
1988	12		855.2	885.9	1019.8	1019.7	922.4	3.0
1989	12		793.5	827.0	986.4	986.2	395.7	4.2
1990	11		733.9	764.2	937.4	937.0	331.1	4.0
1991			22.7	22.7	28.8	28.7	0.2	3.9
1992			45.7	55.5	72.5	5.9	1.0	3.1
1993			26.3	43.3	58.5			3.3
1994			25.2	30.8	43.0			3.3
1995			25.7	28.9	41.7			3.3
1996			22.2	25.2	37.5			3.2
1997			17.7	20.7	31.7			3.2
Subtot	48		3724.4	3902.7	4559.6	4279.7	2946.5	
Grand Total	48		3724.4	3902.7	4559.6	4279.7	2946.5	

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1985	0	1	1	1
1986	0	1	1	1
1987	0	11	11	11
1988	0	12	12	12
1989	0	12	12	12
1990	0	11	11	11

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	4428.5	-525.8	3902.7	0.0	3902.7
(TY $)	5134.0	-574.4	4559.6	0.0	4559.6
PAUC Cost (BY $)	92.260	-10.954	81.306	0.000	81.306
(TY $)	106.958	-11.966	94.992	0.000	94.992

17c. **Production Rate Data (Cont'd)**:

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	DEC 85	0	DEC 85	N/A	DEC 85
Duration (in MON)	276	0	276	0	276
End Date(MON YY)	DEC 08	0	DEC 08	N/A	DEC 08

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	23/23

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs**:

a. Assumptions and Ground Rules --

The MSE system will be utilized in a peacetime mode for 8.2 hours per day, 7 days per week with an annual operating time of 2,996.4 hours. The costs are the direct/indirect costs to support the primary personnel and to operate the system. The cost of military personnel and indirect support operations were estimated from Tables of Organization and Equipment (TOEs) developed for the MSE System. Costs applied for the military personnel were from the composite standard rates for costing military personnel services. For the nonstandard Communications-Electronics (C-E) equipment, the summary costs for replenishment spares were calculated by the Optimum Supply and Maintenance Model (OSAMM) using MTBF, washout rates and estimated qualitative data from the contractor together with weighted average unit prices developed from fixed range prices in the contract. For standard C-E equipment, estimates were developed through OSAMM using reliability data furnished by the contractor and unit price data from CECOM. the non C-E equipment costs for vehicles, generators and trailers were developed from historical data furnished by the TACOM and TROSCOM. The non C-E maintenance action costs were furnished by the contractor and the C-E maintenance action costs were obtained from the CECOM Directorate of Maintenance Engineering (DME). The petroleum, oil and lubricants (POL) cost is based on the number and type of vehicles and generators, the operating scenario (4,243 miles driven per year for active forces and 419 miles driven per year for

18a. Operating and Support Costs (Cont'd):
the reserve forces), fuel economy and cost factors for gas and oil. All the O&S costs were based on a life cycle of 17.5 years of deployment. The 17.5 year deployment is comprised of 15 years of a fully deployed MSE system plus an additional 2.5 years to account for the 6 years of a partially deployed MSE system. There is no antecedent system for MSE. The Average Annual O&S cost per MSE system is based on a quantity of 48 units which represents twenty-three division Signal Battalions, eighteen Corps Signal Battalions, one AADCOM, four separate Signal Platoons, and two training sets. All user equipment located in the division/corps areas has been included in the total program acquisition cost.

Reference: Jun 91 Baseline Cost Estimate (BCE).

b. Costs -- (FY 1986 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per MSE System	Avg Annual Cost Per (Antecedent)
Personnel	12.6	N/A
Replenishment Spares	0.7	N/A
Depot Maintenance	1.1	N/A
POL	0.2	N/A
Total	14.6	N/A

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	28.2	35.0	40.4	280.9	384.5
Total	28.2	35.0	40.4	280.9	384.5

N-35 SSN-21 / AN/BSY-2 ~~SECRET~~ 91-149

SELECTED ACQUISITION REPORT (SCS:DD-COMP(Q&A)823)
PROGRAM: SSN-21 CLASS/BSY-2

AS OF DATE: December 31, 1991

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CLEARED AS AMENDED
MAR 24 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. (U) **Designation and Nomenclature (Popular Name):**
HIGH SPEED NUCLEAR ATTACK SUBMARINE & COMBAT SYSTEM

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**

SEAWOLF PROGRAM MANAGER — RADM J.F. SHIPWAY
NATIONAL CENTER 3, ROOM 7N22 — Assigned: May 31, 1991
PMS350 — AV 222-7201 COMM 703-602-7201
ARLINGTON, VA 20362-5101

AN/BSY-2 SCS Program Manager — RADM(Sel) Scott Sears
Assigned: March 29, 1989

4. (U) **Program Elements/Procurement Line Items:**

ROTE:
PE 0604567N, 0603561N, 0603562N, 0603569N, 0603570N, 0604561N
PE 0604524N (Shared) Project S1347, S1941

92-C-0485
MAR 23 1992

~~Classified by: MULTIPLE SOURCES~~
~~Declassify on: OADR~~
~~Downgrade Instructions:~~

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~~SECRET~~

4. (U) Program Elements/Procurement Line Items (Cont'd):

PROCUREMENT:
APPN 1611 ICN 0204281N (Navy)
APPN 1810 ICN 0204283N (Navy) (Shared)
APPN 1810 ICN 0804731N (Navy) (Shared)
APPN 1810 ICN 0204281N (Navy) (Shared)
MILCON:
PE 0204896N

5. (U) Related Programs:

PE 63560N,	PROJECT S0222	SUBMARINE HULL ARRAY DEVELOPMENT (ADV)
PE 63569N,	PROJECT S1974	ADV SUB TECH
PE 64502N,	PROJECT S0742	SUBMARINE INTEGRATED ANTENNA SYSTEM
PE 64502N,	PROJECT S1411	SUBMARINE TACTICAL COMMUNICATION SYSTEM
PE 64520N,	PROJECT S0198	SUBMARINE HULL ARRAY DEVELOPMENT (ENG)
PE 64562N,	PROJECT S0236	SUBMARINE TACTICAL WARFARE SYSTEMS
PE 63367N,		ANTI-SUBMARINE WARFARE STANDOFF WEAPONS
PE 64675N,		MK 48 ADVANCED CAPABILITIES TORPEDO
PE 64367N,		TOMAHAWK
PE 64601N,		SUBMARINE LAUNCHED MOBILE MINE
PE 64503N,		SUBMARINE SONAR DEVELOPMENT
PE 64047N,		ENHANCED MODULAR SIGNAL PROCESSOR
PE 64514N,		NAVIGATION SYSTEMS
PE 63560N,		SUBMARINE HULL ARRAY DEVELOPMENT
PE 64515N,		SUBMARINE SURVEILLANCE EQUIPMENT
PE 63530N,		OVER-THE-HORIZON EQUIPMENT
PE 78017N,		HARPOON

6. (U) Mission and Description:

The SSN21 Class Attack Submarine will be quiet, fast, heavily armed, shock resistant, survivable, outfitted with an advanced combat system and capable of contending with the projected enemy threat well into the 21st century. The program provides the advanced technology prototype components and systems to design and construct the SSN21 Class attack submarine so that the Navy will be better able to aggressively seek out and destroy enemy submarines and surface ships across a broad spectrum of tactical and climatic scenarios. The SSN21 is expected to satisfy the mission requirement.

The AN/BSY-2 Submarine Combat System supports the SSN mission to conduct prompt and sustained combat operations. The warfare tasks supporting this mission are: Anti-Submarine Warfare (ASW); Anti-Surface Warfare; Strike Warfare; Special Warfare; Ocean Surveillance; Intelligence/Reconnaissance; Command, Control, and Communication (C3); Electronic Warfare; and Mine Warfare.

The AN/BSY-2 Submarine Combat System will improve upon existing combat systems to meet the expanded operational requirements of

6. (U) Mission and Description (Cont'd):

attack submarines in countering the 1990's threat. The AN/BSY-2 Submarine Combat System will provide combat control and acoustic functions to support the ship characteristics of the SSN-21.

7. (U) Program Highlights:

a. (U) Significant Historical Developments —

The SSN21 Class submarine program began July 1982 with the establishment of GROUP TANGO to assess the need for an advanced technology submarine. In December 1982, CNO directed NAVSEA to proceed with feasibility studies. SECNAV approved the conceptual design of the SSN21 in June 1983, and a new start was authorized by a Program Decision Memorandum in August 1983. In December 1983, SECNAV and SECDEF approved proceeding with preliminary design. Preliminary design contracts subsequently were awarded to Electric Boat and Newport News.

In June 1984, a Secretary of Defense Decision Memorandum, documenting the decisions of the December 1983 SECDEF Program Review, authorized the Navy to proceed with the preliminary design phase for the lead ship of the SSN 21 Class. A Logistics Review Group Audit was conducted in December 1984. The preliminary design phase for the SSN21 Class attack submarine was completed in May 1985. The NPDM and JRMB were held in July 1986 and authorization to proceed with detail design of the SSN21 was granted by OSD on 2 October 1986. Contract Design contracts with both Tenneco-Newport News Shipbuilding (NNS) and General Dynamics - Electric Boat (EB) were completed in 1986. A detail design contract with NNS as lead design yard was signed in April 1987. The contract for the SSN21 was awarded to Electric Boat Division on January 9, 1989. Ship construction commenced on 25 Oct 89. Construction has commenced on all major hull sections.

An original Submarine Combat System program, SUBACS, was initiated in 1981, with Concept Definition in March 1982. In June 1982 the program was structured into three phases. Full Scale Development began in December 1983. Technological problems caused restructuring of the program and in June 1985 the program split into two discrete segments: AN/BSY-1 and a new system, the FY89 Submarine Combat System (subsequently renamed AN/BSY-2). Design Definition of the AN/BSY-2 Submarine Combat System began in early 1986 with the award of fixed-price System Design Definition (SDD) contracts to the Missile and Surface Radar Division of RCA (subsequently acquired by General Electric Company) and Federal Systems Division of IBM. Program Milestone I approval was granted in October 1986. This design definition period resulted in the issuance of Requests for Proposals on 18 February 1987; proposals received from both SDD contractors on 6 July 1987; a Sustaining Engineering contract was awarded to General Electric Company on 11 December 1987. The original Program Baseline

7a. (U) Program Highlights (Cont'd):

Document was approved on 7 March 1988. Program Milestone II approval was granted by the Acquisition Decision Memorandum (ADM) signed 9 March 1988. The contract for Full Scale Development was awarded to General Electric Company on 31 March 1988. Limited Production options for the first AN/BSY-2 Submarine Combat System and 2 AN/BQG-5 Standalone Wide Aparature Arrays were exercised December 1988. The Software Specifications Review, establishing the allocated software baseline was conducted in September 1989. The Preliminary Design Review, which established the functional design baseline, was conducted in Oct 1989. The Critical Design Review (CDR) Executive Review was conducted 30 January 90, stabilizing electrical and mechanical interfaces to SSN-21. Follow-on CDR effort and comment resolution establishing the detailed combat system design baseline was conducted through December 1990.

SSN21 DT-II (Development Test II) will continue through FY93. Major programmatic efforts include Silencing, Target Strength Reduction, Propulsors, Advanced Ship Control, Weapons Stowage and Launch, and Submarine Survivability.

Critical Item testing successfully demonstrated the critical characteristics of Graphic Engine Repackaging Preliminary Design Review, Outboard Electronics Shock, and Wide Aperture Array Flow Noise. The Simulation/Stimulation Software Specification Review and Preliminary Design Review have been completed. Progress in combat system software development continued as planned.

b. (U) Significant Developments Since Last Report --
A combined SSN21 and AN/BSY-2 program review was held 11 January 1991 with the Defense Acquisition Board (DAB). The Acquisition Decision Memorandum was signed 15 February 1991 approving continued Low Rate Initial Production (LRIP) of SSN21 Class Submarines and AN/BSY-2 combat system through completion of operation testing FY1998.

The contract for the FY1991 SEAWOLF class submarine, the SSN22, was awarded to the Electric Boat Division of General Dynamics Corporation on 3 May 1991. The competing shipbuilder, Newport News Shipbuilding immediately filed suit in the United States District Court for the Eastern District of Virginia. On 31 July "[t]he court declared that the award of the contract to construct the SSN22 to Electric Boat violated the statutes and regulations of the United States... and is void and of no effect." The court further ordered the Navy "to conduct a resolicitation of bids, with the terms and conditions of the resolicitation such as to place the parties in the same relative position that they occupied when the Navy received the bids..." On 7 August 1991, the Court granted a stay to "its injunction against proceeding with performance under (the contract awarded to Electric

7b. (U) Program Highlights (Cont'd):

Boat for SSN22)" with certain limitations, including a prohibition against receiving material ordered thereunder or starting any fabrication. This stay is in effect during "the pendency of the defendant's appeal". A notice of appeal was filed with the court on 6 Sept 1991 with oral arguements heard December 6, 1991. The appeal process is likely to last until March 1992.

In June 1991 quality control inspections of the lead ship hull sections revealed cracks in HY-100 steel welds which will require replacement. EB submitted a Request for Equitable Adjustment for the weld replacement. On 18 December 1991 the Navy and EB reached an agreement for delayed delivery of lead ship and a new Target Price of $788.2 Million. As of 25 November 1991, required weld procedures were requalified and full construction resumed.

The AN/BSY-2 Team Trainer Program Design and Development Contract was competitively awarded to Raytheon Submarine Signal Division on 22 February 1991. AN/BSY-2 completed the Maintenance Trainer Preliminary Design (PDR). Librascope delivered eleven Computer System Display Console preproduction units supporting integration on target tactical hardware at GE's facility. CSDC critical item tests, including the display software demonstrations, were completed and supported further formal system response time testing, which is in process. The first tactical system delivery of Enhanced Module Signal Processors (Standard Electronic Module) occurred and supports integration. Thread 1 integration testing was completed and Thread 2 testing is in progress.

This system will satisfy mission requirements.

c. (U) Changes Since As Of Date —
On 28 January 1992, the SSN21 and AN/BSY-2 program was terminated after lead ship. An official rescission will be required, however, the balance of this SAR assumes program termination.

8. (U) Threshold Breaches:
The delay of one year in the lead ship delivery and the termination of the SEAWOLF Program, results in a DAE Baseline threshold breach and a Nunn McCurdy Program Acquisition Unit Cost Breach.
See section 12 for additional information.

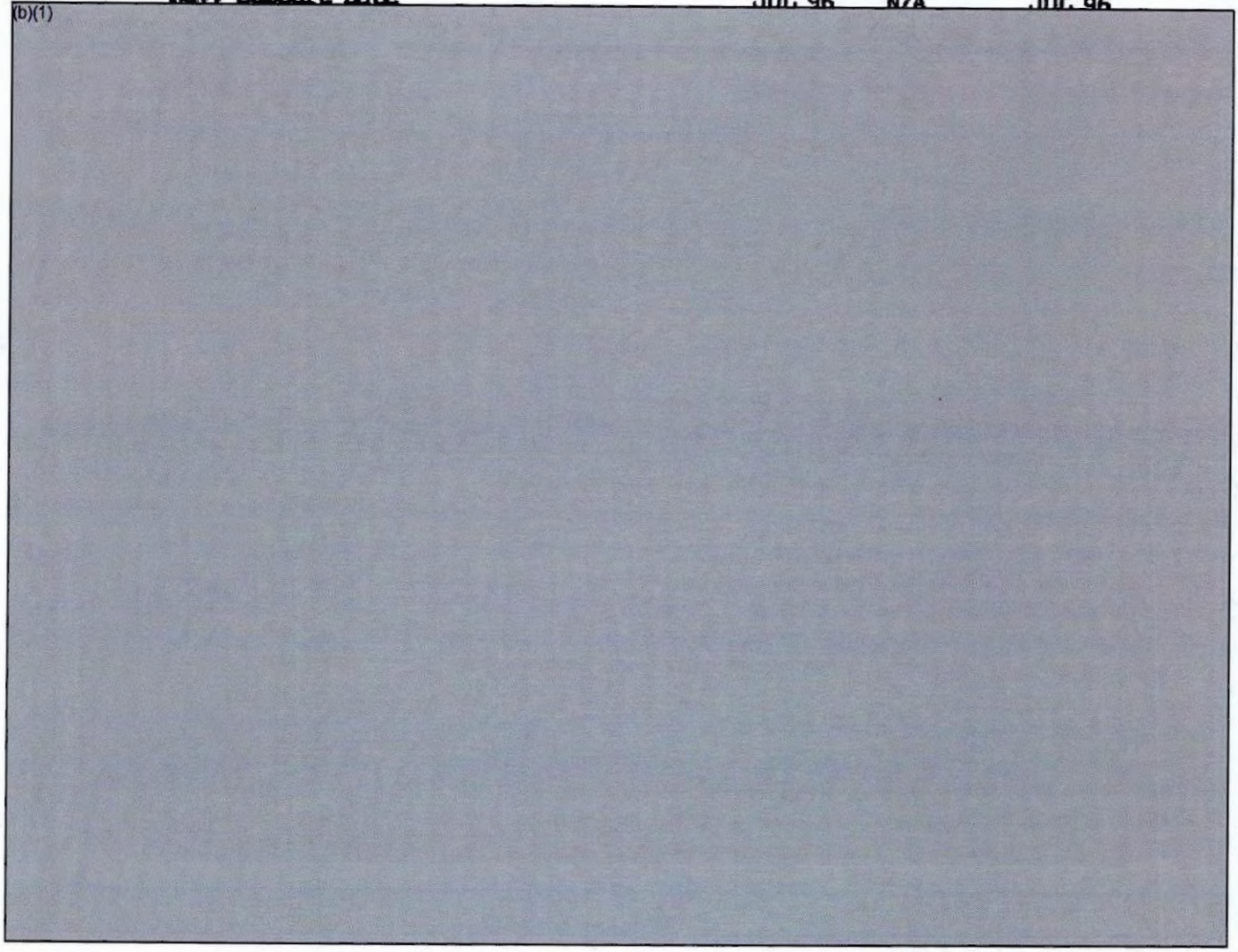
9. (U) **Schedule:**

a. (U) Milestones —	Production Estimate	Approved Program	Current Estimate
SSN-21 Submarine			
Program Initiated	JUL 82	N/A	JUL 82
Milestone I (DSARC I)	DEC 83	N/A	DEC 83
Milestone II (DSARC II)	JUN 85	N/A	JUN 85
FSD Contract Award	JUL 85	N/A	JUL 85
Milestone IIB (JRMB)	OCT 86	N/A	OCT 86
Milestone IIIA	JUN 88	JUN 88	JUN 88
First Production Contract Award	JAN 89	JAN 89	JAN 89
DAB Review	MAR 90	N/A	MAR 90
(b)(1) [redacted]			
AN/BSY-2			
System Design Definition Contract Award		N/A	
RCA Corporation	JAN 86	N/A	JAN 86
IBM Corporation	MAR 86	N/A	MAR 86
Milestone I (JRMB)	JUN 86	N/A	JUN 86
Milestone II	NOV 87	FEB 88	FEB 88
FSD Contract Award	JAN 88	N/A	MAR 88
Authorization for Limited Production (DAB)	DEC 89	N/A	DEC 89
Authorization for Limited Production (DAB)	DEC 91	N/A	JAN 91
Material Support Date (AN/BQG-5)	NOV 92	N/A	N/A
TECHEVAL (AN/BQG-5)	AUG 93	N/A	N/A
Material Support Date (AN/BSY-2)	NOV 93	N/A	NOV 93
Authorization for Limited Production (DAB)	DEC 93	N/A	N/A
(b)(1) [redacted]			

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) —	Production Estimate	Approved Program	Current Estimate
AN/BSY-2 TECHEVAL (DT IIE)	DEC 94	N/A	AUG 99(Ch-2)
Complete TECHEVAL (DT III)	DEC 94	N/A	N/A
AN/BSY-2 OPEVAL (OT IIC)	JUN 95	N/A	NOV 97
Complete OPEVAL (OT III)	JUN 95	N/A	TBD
Navy Support Date	JUL 96	N/A	JUL 96

(b)(1)



9b. (U) Schedule (Cont'd):

b. (U) Previous Change Explanations --

The FSD option was delayed two months to allow DOD Milestone II decision. (AN/BSY-2)

First HY130 Hull delayed one year due to change in procurement strategy. (SSN21)

AN/BQG-5 Material Support Dates, TECHEVAL and OPEVAL dates, and IOC have been deleted by OPNAV, due to termination of the program.

AN/BSY-2 TECHEVAL (DT-IIE) and OPEVAL (OT IIC) were realigned to agree with SEAWOLF TECHEVAL/OPEVAL dates.

DT-IIE was eliminated when TECHEVAL/OPEVAL aligned with SEAWOLF dates. Follow-on operational testing (OT III) will be scheduled after Milestone III.

Replacement milestones were approved by the Jan 91 DAB.

c. (U) Current Change Explanations --

Change 1: Due to termination of the SEAWOLF Program after lead ship, these milestones have either been delayed, are no longer applicable or are to be determined.

Change 2: HY100 welds have delayed the delivery of lead ship and associated milestones by one year, or to be determined.

Change 3: CCAPS program has been terminated.

Change 4: OPNAV changed AN/BQG-5 planned installation from SSN688 Class forward fit to backfit on SSN710 resulting in delay driven by interface design changes. Cabinet deliveries are planned to SSN710 in Nov 92, with complete AN/BQG-5 system deliveries planned for May-June 1993.

d. (U) References --

(U) Production Estimate:
Production Estimates: DCP, SEAWOLF (SSN21) Class Submarine dated 11 May 1988.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated January 28, 1992.

[redacted]

10. (U) Performance Characteristics:

a. (U) Performance —	PdE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
SSN-21 Submarine				
Length (ft)	353	N/A / N/A	N/A	353
Beam Max (ft)	40	N/A / N/A	N/A	40
Draft Nav (ft)	34	N/A / N/A	N/A	34
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(b)(1)

[redacted]

[redacted]

10a. (U) Performance Characteristics (Cont'd):

	Approved Program	Demonstrated	Current
(b)(1)			

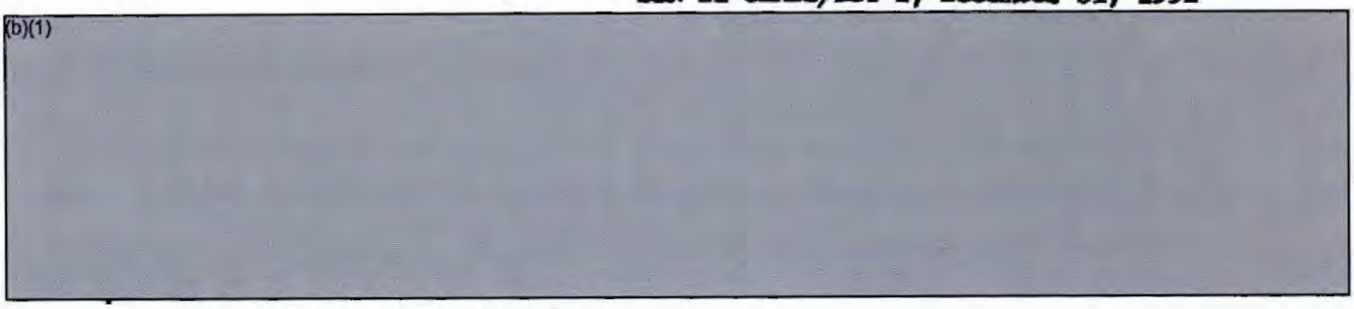
10a. (U) **Performance Characteristics (Cont'd):**

	Approved Program	Demon-strated	Current
(b)(1)	[redacted]		

10a. (U) Performance Characteristics (Cont'd):

	Approved Program	Demonstrated	Current
(b)(1)			

(b)(1)



c. (U) Current Change Explanations --

Current estimates are under review.

d. (U) References --

(U) Production Estimate:
Production Estimates: DCP, SEAWOLF (SSN21) Class Submarine dated 11 May 1988.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated January 28, 1992.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	4335.0	3903.4	3903.4
Procurement	15686.3	3496.3	3496.3
Basic Ship Costs	(8083.6)		(1509.8)
GFE	(5952.8)		(1335.5)
Other Sailaway	(111.0)		(13.9)
OF/PD	(570.2)		(59.9)
Presidents Budget			(416.9)
Total Flyaway	(14717.6)		(3336.0)
OPN	(0.0)		(0.0)
AN/BSY-2 OPN	(968.7)		(160.3)
Total Other Wpn Sys	(968.7)		(160.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	98.6	25.3	25.3
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	20119.9	7425.0	7425.0

11a. (U) Total Program Cost and Quantity (Cont'd):

	Production Estimate	Approved Program	Current Estimate
Escalation	1619.2	96.6	96.6
Development (RDT&E)	(-125.0)	(-133.6)	(-133.6)
Procurement	(1735.1)	(228.2)	(228.2)
Construction (MILCON)	(9.1)	(2.0)	(2.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	21739.1	7521.6	7521.6

b. (U) Quantity —

Development (RDT&E)	0	N/A	0
Procurement	12	1	1
Total	12	1	1

c. (U) Foreign Military Sales — None.

d. (U) Nuclear Costs —
$1106.3M

e. (U) References —

(U) Production Estimate:
Production Estimates: DCP, SEAWOLF (SSN21) Class Submarine dated 11 May 1988.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated January 28, 1992.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	7521.6	33627.0	7521.6
(2) Quantity	1	12	1
(3) Unit Cost	7521.60	2802.25	7521.60

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. (U) Current Procurement —	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	69.2	69.2	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	256.1	256.1	0.0
Net Total	325.3	325.3	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
c. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (BY90$)	7425.0	33627.0	7425.0
(2) Unit Cost	7425.00	2802.25	7425.00

d. (U) Current Procurement —	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (BY90$)	59.8	59.8	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	221.5	221.5	0.0
Net Total	281.3	281.3	0.0
(2) Unit Cost	N/A	N/A	N/A

e. (U) Changes from the Baseline Report - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	4719.350	168.41
(2) CPUC (TY$)	0.000	N/A
(3) PAUC Quantity	-11	-91.67
(4) PAUC (BY90$)	4622.750	164.97
(5) CPUC (BY90$)	0.000	N/A

f. (U) Changes from the Previous SAR - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	0.0	0.00
(2) CPUC (TY$)	0.0	N/A
(3) PAUC Quantity	0	0.00
(4) PAUC (BY90$)	0.0	0.00
(5) CPUC (BY90$)	0.0	N/A

g. (U) Initial SAR (DEC 88)
(1) Program Acquisition Cost (TY$) — 1573.6
(2) Program Acquisition Cost (BY$) — 1447.6

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

h. (U) Unit Cost Changes.

(1) (U) PAUC —

The change in the Program Acquisition Unit Cost is solely attributable to the termination of ship construction after lead ship.

(2) (U) CPUC —

Not required.

i. (U) Impact of Performance or Schedule Changes on Unit Cost.

Not required.

j. (U) Program Management and Control.

Not required.

k. (U) Cost Control Actions. - None.

l. (U) Contract Information (In Millions of Then-Year Dollars) —

(U) (1) Contractor(s): GENERAL ELECTRIC COMPANY
(2) Contract Title: AN-BSY-2
(3) Contract Number:N00024-88-C-6150
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): N/A
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of ??/??/??	N/A	N/A
Previous SAR	N/A	N/A
Current values	N/A	N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	N/A	N/A

(7) (U) Explanation of Variances. - None.

(8) (U) Impact of Variances on Contract. - None.

(9) (U) Impact of Variances on Unit Costs. - None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

(U) (1) Contractor(s): GENERAL DYNAMICS
(2) Contract Title: SSN21 CONSTRUCTION
(3) Contract Number:N00024-89-C-2000
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): N/A
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of ??/??/??	N/A	N/A
Previous SAR	N/A	N/A
Current values	N/A	N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	N/A	N/A

(7) (U) Explanation of Variances. - None.

(8) (U) Impact of Variances on Contract. - None.

(9) (U) Impact of Variances on Unit Costs. - None.

(U) (1) Contractor(s): TENNECO
(2) Contract Title: SSN21 DETAIL DESIGN
(3) Contract Number:N00024-87-C-2046
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): N/A
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of ??/??/??	N/A	N/A
Previous SAR	N/A	N/A
Current values	N/A	N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	N/A	N/A

(7) (U) Explanation of Variances. - None.

(8) (U) Impact of Variances on Contract. - None.

(9) (U) Impact of Variances on Unit Costs. - None.

(U) (1) Contractor(s): Westinghouse Elec Corp
(2) Contract Title: SSN21 (NUCLEAR)
(3) Contract Number:N00024-87-C-4000
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): N/A

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of ??/??/??	N/A	N/A
Previous SAR	N/A	N/A
Current values	N/A	N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	N/A	N/A

(7) (U) Explanation of Variances. - None.

(8) (U) Impact of Variances on Contract. - None.

(9) (U) Impact of Variances on Unit Costs. - None.

(U) (1) Contractor(s): General Electric Company
(2) Contract Title: SSN21 (NUCLEAR)
(3) Contract Number:N00024-87-C-4001
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): N/A
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of ??/??/??	N/A	N/A
Previous SAR	N/A	N/A
Current values	N/A	N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	N/A	N/A

(7) (U) Explanation of Variances. - None.

(8) (U) Impact of Variances on Contract. - None.

(9) (U) Impact of Variances on Unit Costs. - None.

(U) (1) Contractor(s): GENERAL DYNAMICS
(2) Contract Title: SSN22 CONSTRUCTION
(3) Contract Number:N00024-91-C-2902
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): N/A

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of ??/??/??	N/A	N/A
Previous SAR	N/A	N/A
Current values	N/A	N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	N/A	N/A

(7) (U) Explanation of Variances. - None.

(8) (U) Impact of Variances on Contract. - None.

(9) (U) Impact of Variances on Unit Costs. - None.

m. (U) Contracts Exceeding Contract Cost Baseline Thresholds. — None.

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	4210.0	17421.4	107.7	21739.1
Previous Changes:				
Economic	+89.3	+1040.5	+5.9	+1135.7
Quantity	-	+3138.8	-	+3138.8
Schedule	-	+6336.5	-	+6336.5
Engineering	+144.8	-	-	+144.8
Estimating	+513.9	+934.9	-30.6	+1418.2
Other	-	-	-	-
Support	+54.6	-340.7	-	-286.1
Subtotal	+802.6	+11110.0	-24.7	+11887.9
Current Changes:				
Economic	-192.7	-529.1	-2.6	-724.4
Quantity	-	-21894.3	-	-21894.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1050.1	-846.6	-53.1	-1949.8
Other	-	-	-	-
Support	-	-1536.9	-	-1536.9
Subtotal	-1242.8	-24806.9	-55.7	-26105.4
Total Changes	-440.2	-13696.9	-80.4	-14217.5
Current Estimate	3769.8	3724.5	27.3	7521.6

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	4335.0	15686.3	98.6	20119.9
Previous Changes:				
Quantity	-	+1676.8	-	+1676.8
Schedule	-	+4353.8	-	+4353.8
Engineering	+127.8	-	-	+127.8
Estimating	+393.8	+839.2	-28.8	+1204.2
Other	-	-	-	-
Support	+52.3	-304.9	-	-252.6
Subtotal	+573.9	+6564.9	-28.8	+7110.0
Current Changes:				
Quantity	-	-16892.7	-	-16892.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1005.5	-755.6	-44.5	-1805.6
Other	-	-	-	-
Support	-	-1106.6	-	-1106.6
Subtotal	-1005.5	-18754.9	-44.5	-19804.9
Total Changes	-431.6	-12190.0	-73.3	-12694.9
Current Estimate	3903.4	3496.3	25.3	7425.0

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised Indices SSN21 and AN/BSY-2

Engineering: Block Upgrade program added (AN/BSY-2)

Cost estimate for transitioning from EMSP Standard Electronic Module (SEM) format B to SEM format E (AN/BSY-2)

Estimating: Revised program requirements (SSN21)
Refined cost estimates (SSN21)
reduced lab tasking (AN/BSY-2)
Partial funding for OPEVAL missile procurements (AN/BSY-2)

Support: AN/BSY-2 Team Trainer tactical equipment

13b. (U) Cost Variance Analysis (Cont'd):

reprogrammed from FY91 OPN
LSA conversion reprogrammed from FY91 O&M,N

PROCUREMENT

Economic:	Revised Indices
Quantity:	Deletion of 3 hulls in FY94 as a result of large lot procurement (SSN21)
	Two AN/BQG-5 Team Trainers deleted (AN/BSY-2)
	Addition of 3 hulls (FY98-2, FY99-1)
Schedule:	3 hulls in FY92 to FY93 (SSN21)
	Change in acquisition strategy reflecting 75% reduction in planned submarine construction workload
Estimating:	Refined Program Requirements and large lot procurement savings (SSN21)
	Refinement of estimates to reflect later contract/pricing data (SSN21)
	Revised test equipment and spares estimates (AN/BSY-2)
	Reduced SSF configuration and upgrades; reduced TUE for FY93 and FY94 (AN/BSY-2)
Support:	Revised Outfitting and Post Delivery requirements (SSN21)
	FY91 AN/BSY-2 Team Trainer reprogrammed to RDT&E (AN/BSY-2)
	Revised cost estimates for Maintenance Trainers, Team Trainer Tactical and Trainer Unique Equipment, and associated spares (AN/BSY-2)
	Addition of OPN costs

MILCON

Economic:	Revised Indices
Estimating:	Refined Program Requirements

c. (U) Current Change Explanations —

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Indices (Economic)	—	-192.7
Program Termination (Estimating)	-1005.5	-1050.1
Total Changes	-1005.5	-1242.8

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised Indices (Economic)	—	-529.1
Program Termination (Quantity)	-16892.7	-21894.3
Reduction in Quantity (Estimating)	-839.2	-934.9
Refined Cost Estimate (Estimating)	83.6	88.3
Program Termination (Support)	-1128.8	-1560.3
OF/PD Refined Cost Estimate (Support)	22.2	23.4
Total Changes	-18754.9	-24806.9
(3) MILCON		
Revised Indices (Economic)	—	-2.6
Program Termination (Estimating)	-24.4	-30.1
Incorrect addition of Non SEAWOLF specific project (Estimating)	-20.1	-23.0
Total Changes	-44.5	-55.7

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Prod Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
3875	-24	-2405	—	—	76	—	52	-2301	1574

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1812	411	1172	6337	145	-532	—	-1823	5710	7522

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E —

(U) AN-BSY-2:

GENERAL ELECTRIC COMPANY, SYRACUSE, NY
N00024-88-C-6150, FPIF
Award: December 11, 1987
Definitized: December 11, 1987

Initial Contract Price		
Target	Ceiling	Qty
$965.5	$1097.7	2

Current Contract Price		
Target	Ceiling	Qty
$996.0	$1132.4	2

Estimated Price At Completion	
Contractor	Program Manager
$1017.1	$1077.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-53.1	$-24.8
Cumulative Variances To Date (09/29/91)	$-87.1	$-44.5
Net Change	$-34.0	$-19.7

Explanation of Change:

The change in cost variance is primarily attributed to increased costs in display and weapons software at Librascope and combat system services software at GE Moorestown. The change in schedule variance is primarily attributed to hardware manufacturing delays at GE Moorestown and GE Syracuse, and software development delays at GE Syracuse. The Program Manager's estimated price at completion, which is based on contractor cost and schedule performance to date, increased by $26.4 since the last SAR. Note: The initial and current contract prices and estimated prices at completion do not include the $35.9M performance incentive pool.

b. (U) Procurement —

(U) SSN21 CONSTRUCTION:

GENERAL DYNAMICS, GROTON, CT
N00024-89-C-2000, FPIF
Award: January 9, 1989
Definitized: January 9, 1989

Initial Contract Price		
Target	Ceiling	Qty
$726.0	$928.7	1

Current Contract Price		
Target	Ceiling	Qty
$788.2	$1009.2	1

Estimated Price At Completion	
Contractor	Program Manager
$952.6	$933.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-27.4	$-27.9
Cumulative Variances To Date (09/30/91)	$-30.1	$-70.9
Net Change	$-2.7	$-43.0

Explanation of Change:

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)
The schedule variance has declined due to the weld issue which has delayed delivery of lead ship one year.

(U) SSN21 DETAIL DESIGN:
TENNECO, Newport News, VA
N00024-87-C-2046, CPFF
Award: April 30, 1987
Definitized: April 30, 1987

	Initial Contract Price		
	Target	Ceiling	Qty
	$333.0	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$532.5	N/A	0	$662.5	$632.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-53.2	$-38.9
Cumulative Variances To Date (09/30/91)	$-81.7	$-53.1
Net Change	$-28.5	$-14.2

Explanation of Change:

The negative cost and schedule variances are attributable to the degree of technical complexity of the drawings being delivered and the significant increase of drawings required to support the shipbuilder.

(U) SSN21 (NUCLEAR):
Westinghouse Elec Corp, Monroeville, PA
N00024-87-C-4000, CPFF
Award: November 7, 1986
Definitized: November 7, 1986

	Initial Contract Price		
	Target	Ceiling	Qty
	$70.2	N/A	N

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$240.7	N/A	N	$350.0	$350.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	N/A	N/A
Net Change	$0.0	$0.0

Explanation of Change: None.

The Navy has waived the cost/schedule control systems requirement for Naval Nuclear Propulsion Program procurements.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) SSN21 (NUCLEAR):
General Electric Company, Schenectady, NY
N00024-87-C-4001, CPFF
Award: November 7, 1986
Definitized: November 7, 1986

Initial Contract Price		
Target	Ceiling	Qty
$88.0	N/A	N/A

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$299.3	N/A	N/A	$310.0	$310.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	N/A	N/A
Net Change	$0.0	$0.0

Explanation of Change: None.

The Navy has waived the cost/schedule control system requirement for Naval Nuclear Propulsion Program procurements.

(U) SSN22 CONSTRUCTION:
GENERAL DYNAMICS, GROTON, CT
N00024-91-C-2902, FPIF
Award: May 3, 1991
Definitized: May 3, 1991

Initial Contract Price		
Target	Ceiling	Qty
$610.2	$758.3	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$610.2	$758.3	1	$0.0	$717.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	N/A	N/A
Net Change	$0.0	$0.0

Explanation of Change: None.

Contract is in litigation.

16. (U) **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. (U) Program Status —

(1) Percent Program Completed: 70.6% (12 yrs/17 yrs)

(2) Percent Program Cost Appropriated: 99.0% ($7445.3 / $7521.6)

b. (U) Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY81-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	3319.5	450.3	-	-	3769.8
Procurement	3579.0	69.2	-	76.3	3724.5
MILCON	27.3	-	-	-	27.3
O&M	-	-	-	-	-
Total	6925.8	519.5	-	76.3	7521.6

c. (U) Annual Summary —

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1981			20.7	20.7	15.2	15.2	15.2	10.6
1982			30.7	30.7	23.7	23.7	23.7	7.6
1983			29.9	29.9	24.1	24.1	24.1	4.9
1984			157.4	157.4	131.6	131.6	131.6	3.8
1985			334.0	334.0	288.0	288.0	287.3	3.4

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1986			457.4	457.4	405.7	405.7	404.3	2.8
1987			435.9	435.9	398.1	398.1	391.0	2.7
1988			470.0	470.0	443.6	443.6	427.8	3.0
1989			519.4	519.4	510.8	510.3	479.7	4.2
1990			518.4	518.4	530.3	530.3	453.7	4.0
1991			517.7	517.7	548.4	538.4	279.9	3.9
1992			411.9	411.9	450.3	168.0	7.8	3.1
Subtot			3903.4	3903.4	3769.8	3477.0	2926.1	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1987			376.4	376.4	375.0	375.0	297.5	1.5
1988			251.2	251.2	257.6	257.6	208.2	2.3
1989	1		1691.7	1691.7	1785.3	1650.5	572.9	2.8
1990			539.9	539.9	586.3	586.2	210.2	1.3
1991			357.1	357.1	400.0	1444.1	173.1	1.3
1992			59.8	59.8	69.2	28.9		3.1
1993								3.3
1994			14.3	14.3	17.6			3.3

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1995			30.0	30.0	38.1			3.3
1996			12.2	12.2	16.0			3.2
1997			3.4	3.4	4.6			3.2
Subtot	1		3336.0	3336.0	3549.7	4342.3	1461.9	
Appropriation: 1810 Other Procurement, Navy								
1990			140.1	140.1	152.2	152.2	28.2	4.0
1991			20.2	20.2	22.6			4.4
Subtot			160.3	160.3	174.8	152.2	28.2	
Appropriation: 1205 Military Construction, Navy								
1991				25.3	27.3	27.3		4.4
Subtot				25.3	27.3	27.3		
Grand Total	1		7399.7	7425.0	7521.6	7998.8	4416.2	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates — None.

Production rates not required since production is less than 6 per year.

b. (U) Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	7425.0	N/A	N/A
(TY $)	N/A	N/A	7521.6	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	7425.000	N/A	N/A
(TY $)	N/A	N/A	7521.600	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) —

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective — N/A.

18. (U) **Operating and Support Costs:**

16a. (U) Operating and Support Costs (Cont'd):

a. (U) Assumptions and Ground Rules —

The O&S cost driving characteristics for the SEAWOLF Class are that each ship has a 30 year service life, displaces 9150 tons, has a crew of 134 officers/enlisted and a maintenance cycle which has 1 refueling overhaul (18 months) at midlife and 8 SRAS (2 months each). There are 32-33 months between depot level availabilities. (The source for this information is the CAIG - Cost Analysis Improvement Group dated 30 April 1990.

The O&S costs are under review.

b. (U) Costs — (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SHIP	Avg Annual Cost Per SHIP
PERSONNEL	3.6	N/A
O&S CONSUMABLES	3.5	N/A
DIRECT DEPOT MAINTENANCE	20.2	N/A
OTHER DIRECT COSTS	3.7	N/A
INDIRECT COSTS	5.9	N/A
Total	36.9	N/A

c. (U) Contractor Support Costs — None.

The SEAWOLF program has no O&MN or industrial fund contractor support costs.

N-39 T-AO OILER

91-084

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: T-AO 187 OILER

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. **Designation and Nomenclature (Popular Name):**
T-AO 187 CLASS FLEET OILER

2. **DoD Component:** Navy

3. **Responsible Office and Telephone Number:**
Zachary Taylor Building (NC #3)
2531 Jefferson Davis Highway
Arlington, VA 20362-5101

CAPT Theodore Doroshenk, USN
Assigned: August 2, 1991
AV 332-3507 COMM (703) 602-3507

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604567N (Shared) Project 1803 (Shared), 0857 (Shared)
PE 0603564N (Shared) Project 0408 (Shared)
PROCUREMENT:
APPN 1611 ICN 5025 (Navy)

5. **Related Programs:**

AOE 6 CLASS FAST COMBAT SUPPORT SHIP

No Security Objection to Publication
92-0018
1992
Chief of Naval Operations, Department of the Navy

*** [redacted] ***

OASD(PA) DFOISR 92-T-0643

6. **Mission and Description:**
MISSION: The T-AO 187 Fleet Oiler Class operates independently or as a unit of an underway replenishment group to furnish petroleum/oil/lubricants (POL) products to fleet operating forces. The ship transports bulk POL from shore depots to Fast Combat Support Ships (AOE), Replenishment Oilers (AOR), and other Fleet Oilers (AO and T-AO) effecting delivery and consolidation underway. The ship delivers bulk POL and delivers and receives fleet freight, mail, and personnel and replenishes combatants and support forces underway and in port. The ship is capable of replenishing from five stations simultaneously.

DESCRIPTION: A 180,000 barrel capacity twin screw, 20 knot sustained speed, diesel driven Fleet Oiler with a 677'5" overall length, a 97'5" foot beam, and a 36'0" maximum navigational draft. Accommodations are for 137, including: ship's company 104 (Military Sealift Command crew 96, growth 8), Navy Command, Control, and Communications Team 23, and transient personnel 10.

7. **Program Highlights:**
a. Significant Historical Developments --
The T-AO 187 Fleet Oiler Class program was approved by NDCP #S0859 on 7 DEC 81. A production contract for the first four ships (T-AOs 187, 188, 189, and 190) was awarded to Avondale Industries Inc. (AII) on 12 NOV 82. The last of these ships was delivered on 22 OCT 87.

A contract for T-AO 191 and 192 was awarded to Penn Ship on 5 MAY 85; options for T-AOs 194 and 196 were executed on 26 FEB 86 and 12 FEB 87, respectively. On 28 AUG 89, the contract with Penn Ship was terminated by default due to non-performance. On 16 NOV 89, a contract was awarded to Tampa Shipyards Inc. (TSI) to complete construction of T-AOs 191 and 192. The contract was definitized on 29 JUN 90. The Best Estimated Delivery Dates (BEDD) for T-AO 191 and 192 are 29 OCT 92 and 30 JUN 93, respectively.

In order to comply with the Navy's requirement that the Penn Ship contract be completed at a cost not greater than the Government's total liability (ceiling plus escalation), Penn Ship and AII negotiated a transfer agreement for T-AOs 194 and 196 on 16 JUN 88. Under the terms of this agreement, AII contracted to complete these two ships at a firm fixed price. T-AOs 194 and 196 were delivered on 18 MAR 91 and 6 DEC 91, respectively.

The T-AO 193 was awarded to AII on 28 JUN 85; options for T-AOs 195 and 197 were executed on 27 FEB 86 and 12 FEB 87 respectively. T-AOs 193, 195, and 197 were delivered on 13 SEP 88, 2 AUG 89, and 6 JUL 90 respectively.

A contract for T-AO 198 was awarded to AII on 20 JUN 88; an option

7a. **Program Highlights (Cont'd)**:

for follow ships (T-AOs 200, 202, and 204) was exercised on 6 OCT 88 and for the second flight (T-AOs 199, 201, and 203) on 24 MAR 89. The BEDDs are as follows: T-AO 198 (7 JUL 92), T-AO 199 (26 MAR 93), T-AO 200 (31 AUG 92), T-AO 201 (31 JAN 94), T-AO 202 (31 AUG 93), T-AO 203 (30 NOV 94), and T-AO 204 (30 JUN 94).

b. Significant Developments Since Last Report -- T-AOs 194 and 196 were delivered on 18 MAR 91 and 6 DEC 91, respectively.

This system will satisfy mission requirements.

c. Changes Since As Of Date -- None.

8. **Threshold Breaches**:
There are no breaches to the Approved Program Baseline (APB) dated 22 APR 91 and no Nunn-McCurdy unit cost breaches.

9. **Schedule**:

a. Milestones --

	Production Estimate	Approved Program	Current Estimate
CNO Executive Board	JUN 80	JUN 80	JUN 80
Milestone I (DSARC)	MAR 80	MAR 80	MAR 80
Characteristics Approved	FEB 81	FEB 81	FEB 81
DCP #S0859 Approved	DEC 81	DEC 81	DEC 81
Production Contract Award	NOV 82	NOV 82	NOV 82
Exercise Option for T-AO 188	N/A	JAN 83	JAN 83
Exercise Option for T-AO 189/190	N/A	NOV 83	NOV 83
Production Started (First Ship)	APR 84	APR 84	APR 84
Award of T-AO 191/192 (Second Source)	N/A	MAY 85	MAY 85
Award of T-AO 193 (Lead Source)	N/A	JUN 85	JUN 85
Launch 1st Ship	AUG 85	OCT 85	OCT 85
Exercised Option for T-AO 194/195	N/A	FEB 86	FEB 86
Exercised Option for T-AO 196/197	N/A	FEB 87	FEB 87
Award Contract for T-AO 198/199	N/A	N/A	DEL
Award Contract for T-AO 198	N/A	JUN 88	JUN 88
Exercise Option for T-AO 200/201	N/A	N/A	DEL
Exercise Option for T-AO 200/202/204	N/A	OCT 88	OCT 88
Exercise Option for T-AO 199/201/203	N/A	MAR 89	MAR 89
Exercise Option for T-AO 202/203	N/A	N/A	DEL
Exercise Option for T-AO 204	N/A	N/A	DEL
Acceptance Trials: 1st Ship	JUL 86	N/A	SEP 86

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
Delivery: 1st Ship	SEP 86	N/A	DEC 86
Initial Operating Capability	NOV 86	NOV 86	FEB 87
Last T-AO Delivery	AUG 93	JUN 94	NOV 94 (Ch-1)

b. Previous Change Explanations --

LAUNCH 1ST SHIP: The delay from AUG 85 to OCT 85 was due to reduction gear/on-board repair parts shortages.

INITIAL OPERATING CAPABILITY: The delay from NOV 86 to FEB 87 was due to the change in the fitting out period caused by delay in delivery.

LAST T-AO DELIVERY: The delay from AUG 93 to JUN 94 was due to the buyout of the T-AO 187 Class Program in FY 89 vice FY 90.

c. Current Change Explanations --

(Ch-1) LAST T-AO DELIVERY: The delay from JUN 94 to NOV 94 is due to the ripple effect of delays in delivery of earlier ships. For example, T-AO 194 delivery was delayed due to late receipt of PENN SHIP material; T-AO 196 failed to adequately demonstrate part of the Acceptance Trials, which necessitated retesting.

d. References --

Production Estimate:
NDCP #S0859 approved 7 DEC 81.

Approved Program:
NAE approved Acquisition Program Baseline dated 22 April 1991.

10. Performance Characteristics:

a. Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Length Overall (ft)	677'5"	667'5"	/ 677'5"	677'5"	677'5"
Beam, maximum (ft)	97'5"	97'5"	/ 97'5"	97'5"	97'5"
Draft, navigational (ft)	36'0"	36'0"	/ 36'0"	36'0"	36'0"

10a. **Performance Characteristics (Cont'd)**:

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Displacement (long tons)	40000	40000	/ 40000	40000	40000
Propulsion:					
No. of Diesel Engines	2	2	/ 2	2	2
No. of Shafts (Controllable Reversible Pitch Propellers)	2	2	/ 2	2	2
Shaft Horse Power (each)	16000	16000	/ 16000	16000	16000
Accommodations	137	137	/ 137	137	137
Maximum Speed (kts)	20	20	/ 20	20	20
Endurance (NM)	6000	6000	/ 6000	6000	6000
Cargo (bbls)	180000	180000	/ 180000	180000	180000
Armament	0	0	/ 0	0	0

b. Previous Change Explanations -- None.

c. Current Change Explanations -- None.

d. References --

Production Estimate:
NDCP #S0859 approved 7 DEC 81.

Approved Program:
NAE approved Acquisition Program Baseline dated 22 April 1991.

11. **Total Program Cost and Quantity:** **(Current Estimate in Millions of Dollars)**

	Production Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	15.8	15.3	15.3
Procurement	2591.9	2460.4	2637.8
Sailaway	(2518.4)		(2533.7)
Total Sailaway	(2518.4)		(2533.7)
Other Weapon Systems Cost	(73.5)		(0.0)
Total Other Wpn Sys	(73.5)		(0.0)
Peculiar Support	(0.0)		(104.1)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	2607.7	2475.7	2653.1
Escalation	583.0	298.5	283.2
Development (RDT&E)	(0.4)	(-0.6)	(-0.6)
Procurement	(582.6)	(299.1)	(283.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	3190.7	2774.2	2936.3
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	17	18	18
Total	17	18	18

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Production Estimate:
NDCP #S0859 approved 7 DEC 91.

Approved Program:
NAE approved Acquisition Program Baseline dated 22 April 1991.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2936.3	2774.2	2936.3
(2) Quantity	18	18	18
(3) Unit Cost	163.13	154.12	163.13
b. Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	23.1	23.1	19.4
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	23.1	23.1	19.4
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. **Cost Variance Analysis**:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	16.2	3174.5	0.0	3190.7
Previous Changes:				
Economic	-	-144.3	-	-144.3
Quantity	-	+177.6	-	+177.6
Schedule	-	-65.9	-	-65.9
Engineering	-	-	-	-
Estimating	-1.5	-380.4	-	-381.9
Other	-	-	-	-
Support	-	-2.0	-	-2.0
Subtotal	-1.5	-415.0	-	-416.5
Current Changes:				
Economic	-	-44.5	-	-44.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+200.9	-	+200.9
Other	-	-	-	-
Support	-	+5.7	-	+5.7
Subtotal	-	+162.1	-	+162.1
Total Changes	-1.5	-252.9	-	-254.4
Current Estimate	14.7	2921.6	-	2936.3

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	15.8	2591.9	0.0	2607.7
Previous Changes:				
Quantity	-	+166.4	-	+166.4
Schedule	-	-13.9	-	-13.9
Engineering	+0.7	-	-	+0.7
Estimating	-1.2	-309.8	-	-311.0
Other	-	-	-	-
Support	-	+25.8	-	+25.8
Subtotal	-0.5	-131.5	-	-132.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+172.6	-	+172.6
Other	-	-	-	-
Support	-	+4.8	-	+4.8
Subtotal	-	+177.4	-	+177.4
Total Changes	-0.5	+45.9	-	+45.4
Current Estimate	15.3	2637.8	-	2653.1

b. Previous Change Explanations --

RDT&E
Engineering: Higher RDT&E effort costs.
Estimating: Twin Skeg alternative cancelled; contract design requirements reduced accordingly.

PROCUREMENT
Quantity: One additional ship added to the program in FY 91.
Schedule: Addition of three ships in FY 89 (for a total of 5) and deletion of FY 90 and FY 94 ships to reflect this consolidation.
Estimating: Repricing based on prior years shipbuilding experience.
Overrun to FY 85-87 ships.

13b. **Cost Variance Analysis (Cont'd)**:

Support: Change in Outfitting (OF) material and Post Delivery (PD) allowances. Change in prior year asset recoupment.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Correction of Support and Estimating Variances previously reported.		
Reclassification of Support variance to estimating variance (BY$). (Estimating)	9.6	12.8
Reclassification of (Support)	-9.6	-12.8
Revised economic escalation indices. (Economic)	N/A	-44.5
Current & Prior Inflation Offset. (Estimating)	37.0	43.0
Increase to configure three T-AOs with double hulls. (Estimating)	126.0	145.1
Change in Outfitting and Post Delivery Allowances. (Support)	14.4	18.5
Total Changes	177.4	162.1

14. **Program Acquisition Unit Cost (PAUC) History**: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
187.69	-10.49	-0.56	-3.66	--	-10.06	--	0.21	-24.56	163.13

15. **Contract Information**: (Then-Year Dollars in Millions)

a. Procurement --

T-AO 194/196:	Initial Contract Price Target	Ceiling	Qty
AVONDALE INDUSTRIES, INC., NEW ORLEANS, LA N00024-85-C-2131, FFP Award: June 16, 1988 Definitized: June 16, 1988	$176.5	N/A	2

15. **Contract Information**: **Cont'd** (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$189.3	N/A	2	$206.5	$210.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-31.2	$-6.5
Cumulative Variances To Date (12/31/91)	$-35.1	$-5.7
Net Change	$-3.9	$0.8

Explanation of Change:

The factors contributing to the COST variances were labor and overhead rates higher than budgeted rates and variances from rework and recovery efforts necessitated by delays.

NOTE: Estimated Price at Completion exceeds the Current Contract Ceiling Price.

T-AO 198-204:	Initial Contract Price		
	Target	Ceiling	Qty
AVONDALE INDUSTRIES, INC., NEW ORLEANS, LA N00024-88-C-2050, FFP Award: June 20, 1988 Definitized: June 20, 1988	$97.6	N/A	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$706.3	N/A	7	$689.2	$770.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-6.7	$45.8
Cumulative Variances To Date (12/31/91)	$-28.9	$4.6
Net Change	$-22.2	$-41.2

Explanation of Change:

The factors contributing to the COST variances were inadequate production manhour budgets and labor and overhead rates that were higher than budgeted rates.

NOTE: Estimated Price at Completion exceeds the Current Contract Ceiling Price.

15. **Contract Information**: Cont'd (Then-Year Dollars in Millions)

T-AO 191/192:	Initial Contract Price Target	Ceiling	Qty
TAMPA SHIPYARDS, INC., TAMPA, FL N00024-90-C-2300, FPI Award: November 16, 1989 Definitized: June 29, 1990	$47.1	$49.0	2

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$57.3	$59.6	2	$57.8	$66.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Tampa Shipyards Inc. has not yet submitted an acceptable CPR.

This contract is a complex combination of fixed price and cost elements. Current labor-only target price (FPI) applies to in-house Tampa Shipyards, Inc. (TSI) labor. Material (cost reimbursable) includes additional production material and normally subcontracted effort. On-board repair parts (OBRP) and additional requirements (fixed-price) applies to procurement of initial spares and open/inspect/repair of vendor supplied equipment.

NOTE: Estimated Price at Completion exceeds the Current Contract Ceiling Price.

16. **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 78.6% (11 yrs/14 yrs)

(2) Percent Program Cost Appropriated: 98.9% ($2904.9 / $2936.3)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY82-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-95)	Total
RDT&E	14.7	-	-	-	14.7
Procurement	2867.1	23.1	19.4	12.0	2921.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	2881.8	23.1	19.4	12.0	2936.3

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Obligated	Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1982				12.8	12.0	12.0	12.0	7.6
1983				1.0	1.0	1.0	1.0	4.9
1984				0.3	0.3	0.3	0.3	3.8
1985				0.3	0.3	0.3	0.3	3.4
1986				0.1	0.1	0.1	0.1	2.8
1987				0.8	1.0	1.0	1.0	2.7
Subtot				15.3	14.7	14.7	14.7	

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1982	1		171.3	171.3	173.5	173.5	173.5	7.5
1983	1		134.4	134.5	138.3	138.3	138.3	3.8
1984	2		261.0	261.0	273.3	273.3	273.3	3.6
1985	3		578.8	579.6	618.0	568.9	508.4	2.1
1986	2		243.8	252.8	275.3	268.0	256.8	1.1
1987	2		238.7	243.8	271.1	260.3	248.6	1.5
1988	2		220.5	227.7	260.6	240.1	203.3	2.3
1989	5		685.2	690.0	812.7	627.6	301.6	2.8
1990				16.3	19.7	9.6	5.1	1.3
1991				19.7	24.6	19.0	2.5	1.3
1992				17.9	23.1	2.0		3.1
1993				14.6	19.4			3.3
1994				6.4	8.8			3.3
1995				2.2	3.2			3.3
Subtot	18		2533.7	2637.8	2921.6	2580.6	2111.4	
Grand Total	18		2533.7	2653.1	2936.3	2595.3	2126.1	

17. **Production Rate Data**:

a. Annual Production Rates -- None.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	2653.1	N/A	
(TY $)	N/A	N/A	2936.3	N/A	
PAUC Cost (BY $)	N/A	N/A	147.394	N/A	N/A
(TY $)	N/A	N/A	163.128	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date (MON YY)	N/A	N/A	N/A	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	9/9

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs**:

a. Assumptions and Ground Rules --

The T-AO 187 Class Fleet Oiler is designed to operate independently or as a unit of an underway replenishment group, furnishing petroleum-oil-lubricant (POL) products to operating forces. The O&S costs associated with this ship class is based on a useful life of 25 years. Ship design parameters indicate that each ship will consume about 63,600 BBL of fuel each year. Direct personnel costs involve

18a. Operating and Support Costs (Cont'd):
the annual cost for civilian mariners plus the embarked Navy Military Detachment. Personnel retirement costs are not included in these costs. Direct operating costs include the cost of fuel, repair parts, supplies, training, expended stores, and purchased services. Direct maintenance is based on annual costs of $3.9M; indirect costs include overhead. The baseline used to derive the estimates are an average of the FY 91 Actuals, five-year maintenance cost averages, and the FY 92 approved expenses.

b. Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per T-AO 187 Class	Avg Annual Cost Per T-AO 143 Class
Direct Personnel	4.7	5.6
Direct Operations	5.4	5.8
Direct Maintenance	3.9	5.8
Indirect Costs	0.7	0.7
Total	14.7	17.9

c. Contractor Support Costs -- None.

AF-23 SRAM II / SRAM-T [redacted]

11-C-9

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: SRAM II/T AGM 131A/B

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
AGM-131A/B Short Range Attack Missile (SRAM) II/T

2. (U) **DoD Component:** USAF

3. (U) **Responsible Office and Telephone Number:**
SRAM II Program Office
Aeronautical Systems Division
Wright-Patterson AFB
Dayton, OH 45433-6503

Col Michael Kostelnik
Assigned: September 16, 1991
AV 785-5080 COMM (513) 255-5080

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0603364F Project 633182
PE 0604244F Project 633182
PE 0604245F Project 643951
PROCUREMENT:
APPN 3020 ICN ADVASM (Air Force)

CLEARED
MAR 5 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW
DEPARTMENT OF DEFENSE

10

Classified by: SRAM II/T Security Classification Guide, 01 Jun 89
Declassify on: Originating Agency Determination Required (OADR)
Downgrade Instructions: Not Subject to Automatic Downgrade

SAF/PAS
92-242 -T

(THIS PAGE IS [redacted])

92-0436

[redacted]

5. (U) Related Programs:
SRAM II: B-1B & B-2; SRAM T: F-15

6. (U) Mission and Description:
(U) SRAM II: The SRAM II program develops an improved nuclear air-to-surface missile to replace the aging AGM-69A Short Range Attack Missile (SRAM). SRAM II will be capable of penetrating advanced defensive threats from stand-off ranges to strike hardened/defended and relocatable targets. Primary carrier aircraft will be the B-1B and B-2. Major program activities include: developing a new rocket motor providing high missile velocities and increased range; developing a guidance system that will provide high accuracy even with extended ranges; incorporating changes in the missile shape/design to reduce radar observability; and integrating a new warhead with modern safety features. These improvements, relative to the existing SRAM, are required because the Soviet target base is becoming harder and more heavily defended and because we must hold relocatable targets at risk.

(U) SRAM T: The SRAM T program develops a tactical variant of the SRAM II missile to provide the Tactical Air Forces (TAF) with a survivable, standoff, nuclear air-to-surface missile. SRAM T will be carried on the F-15E, F-111, and NATO dual-capable aircraft; stored in the weapons storage vault; and incorporated into the TAF mission planning system. The mission profile of TAF aircraft carrying SRAM T missiles consists of cruising to the target area with mixed loads (offensive & defensive), launching either low or high altitude, and recovering at the launch base or an alternate recovery base. Major SRAM T configuration differences from SRAM II will be limited to the warhead and software.

It should be noted that the SRAM T program is dependent upon the successful completion of the SRAM II development program.

7. (U) Program Highlights:
a. (C) Significant Historical Developments --
(U) SRAM II: The SRAM II program was a new start in FY85. The decision to initiate the program was made in Sep 82, following an unsuccessful attempt to establish a new production source for the existing SRAM A rocket motor. An accelerated acquisition approach was chosen for SRAM II because of the need to field an operational system in the early 1990s. Thus, the normal Concept Exploration and Demonstration/Validation Phases were combined to form a System Definition Phase. A competition was conducted and contracts were awarded (Feb 85) to three major aerospace contractors (Boeing Aerospace, Martin Marietta Orlando Aerospace, and McDonnell Douglas Astronautics) for system definition studies and component risk reduction testing. In addition, integration study contracts were awarded to Rockwell and Boeing Military Airplane Company for B-1B

7a. (U) Program Highlights (Cont'd):

integration.

(U) In Aug 85, after four months of detailed trade studies by the three contractors and a two-month Air Force evaluation of the trade studies, decisions were made on two key missile characteristics. A missile size of approximately two-thirds of the existing SRAM A was selected to allow carriage of twelve missiles on a modified B-1B multipurpose launcher. For missile propulsion, a solid rocket motor was chosen since this technology met all performance requirements at the least estimated cost. Risk reduction work, including firings of full-scale rocket motor candidate designs and tests of candidate missile inertial navigation units using test bed aircraft to simulate bomber and missile flights, was successfully completed.

(b)(1)



(U) An advanced design phase contract (fixed price incentive firm with award fee and options for FSD and Low Rate Initial Production) was awarded to Boeing Aerospace on 30 Apr 87. This contract award was delayed from Jan 87 to 30 Apr 87 to allow completion of a Congressionally-directed report comparing the cost effectiveness of a re-motored SRAM A versus a SRAM II and an in-production warhead versus a new warhead. Congressional language within the FY87 Department of Defense Authorization Act required submission of this report prior to obligating any FY87 funds. Following a Defense Acquisition Board (DAB) Milestone II meeting on 22 Jul 87, the Acquisition Decision Memorandum, authorizing FSD, was signed 19 Aug 87 and the FSD contract option was exercised on 25 Aug 87. Related B-1B carrier aircraft integration FSD contracts were awarded to Boeing Military Airplane Company and Rockwell International on 28 and 31 Aug 87, respectively. Major subsystem Preliminary Design Reviews (PDRs) are complete. The Ada compiler was selected, and the decision was made to continue the Ada operational flight software development. The missile warhead interface control drawings were signed by both

7a. (U) Program Highlights (Cont'd):

the Department of Energy and Boeing Aerospace. An engineering change proposal to increase the diameter of the missile to accomodate a heavier warhead was put on the basic contract Dec 88. The larger diameter reduced the potential number of missiles carried on the B-1B multipurpose launcher from twelve to ten.

(U) The first jettison test of a SRAM II missile was successfully conducted on 20 Dec 89.

(U) In the 31 Dec 90 SAR reporting period, the SRAM II program experienced threshold breaches in schedule, cost, and performance as a result of numerous technical/programmatic problems. These problems included rocket motor grain cracking, interpulse thermal barrier problems, inadequate case insulation, missile guidance computer throughput and memory inadequate to handle greatly expanded software requirements, software development delays, and deletion of production funding necessary to provide B-1B assets required to meet First Assets Delivery (FAD). Rocket motor problems delayed Critical Design Review (CDR) 15 months from the 31 Dec 89 schedule. The threshold for range (low-low profile) and Circular Error of Probability (CEP) was not met in the Dec 90 SAR. In addition, the SRAM II program experienced a 126.4% Program Acquisition Unit Cost (PAUC) breach as a result of several factors, the primary reason being a reduction in missile quantity from 1633 to 700 causing development and production fixed costs to be prorated over a much smaller quantity.

(U) As a result of the program cost, schedule, and performace breaches, the Service Acquisition Executive (SAE), Mr. Welch, directed a comprehensive independent review of the program, which was conducted in the Oct-Nov 90 timeframe. The review group concluded that the SRAM II program was executable, but required restructuring to lower risk.

(U) Due to Boeing Aerospace and Electronics (BA&E's) failure to meet contractual schedule reqirements and in anticipation of their breaching future contract schedule milestones, as well as performance specifications, a Cure Notice was sent to BA&E on 10 Sep 90. BA&E's response, received 27 Nov 90, included a plan which addressed cost, schedule, and performance concerns. This plan was evaluated by the program office, the Strategic Air Command (user), and the supporting command. A quick look assessment was completed and briefed to the SAE on 13 Dec 90.

(U) SRAM T: The Supreme Headquarters Allied Powers Europe (SHAPE) Nuclear Weapons requirements Study - 1985 (NWRS-85) established the requirement for a survivable standoff nuclear air-to-surface missile

7a. (U) Program Highlights (Cont'd):

for European tactical fighters. In May 88, the Defense Acquisition Board (DAB) directed a Milestone 0 on the Tactical Air-to-Surface Missile (TASM). The Milestone 0 effort consisted of an expedited concept definition phase to assess the feasibility of satisfying the TASM requirement with a variant of the SRAM II, a variant of the Supersonic Low Altitude Target (SLAT) program, or the development of a totally new system. The Concept Definition Phase concluded with a system concept paper and Milestone I approval in Sep 88. SRAM II was selected to satisfy the TASM requirement and authority was given to proceed with TASM pre-Full Scale Development (FSD) activities.

(U) In Nov 88 the Department of Energy (DOE) began Phase II to develop a tactical warhead to meet the TASM requirements. Boeing Aerospace and Electronics (BA&E) began a study in Dec 88 to identify the changes necessary to modify SRAM II to meet the tactical environment with minimum cost, schedule, and development risk. The study dealt with aircraft interface, navigation and alignment, warhead interface, maintenance, operational concept development, and planning for FSD. In Jul 89, BA&E presented their recommended SRAM T configuration. Also in Jul 89, DOE selected the warhead candidate which would fit the existing SRAM II nosecone and have the least impact on SRAM T development.

(U) The SRAM T program was briefed to the Strategic Systems Committee (SSC) in Sep 89. That same month, BA&E submitted their contract proposal for SRAM T development. The SRAM T Milestone II was briefed to the DAB on 27 Nov 89, with an Acquisition Decision memorandum issued 30 Nov 89 authorizing milestone II go-ahead. The F-15E/SRAM T integration contract was awarded on 18 Jul 90.

b. (U) Significant Developments Since Last Report -- SRAM II: On 27 Sep 91, President Bush ordered immediate termination of the SRAM II program. The SRAM II program office received official notification of termination with a revised SRAM II PMD dated 7 Oct 91 which directed the SRAM II program office to terminate all full scale development (FSD)/procurement activities. Selected residual tasks primarily regarding the B-1B and F-15 were continued per PEO direction. Remaining FY91 funds were authorized to fund termination activities. The following accomplishments were achieved since the Dec 90 SAR and prior to program termination.

(U) Boeing submitted their revised "restructure" proposal on 22 May 91 in response to the 10 Sep 90 cure notice. The consideration offered in the proposal was inadequate. In addition, Boeing did not offer to extend the production options beyond Sep 93. During discussions with Boeing, a framework for a compromise position was discussed which allowed sharing of the $300-400M Boeing production

7b. (U) Program Highlights (Cont'd):

loss for the first 400 missiles. Details of this agreement were in work when the termination of the program was ordered by President Bush.

(U) Due to the delay in the Nunn McCurdy certification of the SRAM II program (triggered by the 126.4% PAUC increase in the 31 Dec 90 SAR cycle), the program office was unable to obligate any SRAM II funds on the prime contract with Boeing. The suspension of obligation authority began in May 91.

(U) Congress did not appropriate the requested FY91 B-1B/SRAM II modification funds.

(U) Since the Aug 90 rocket motor failure, several rocket motor fixes were incorporated including: 1) improved thermal barrier bead design; 2) improved thermal barrier splice joint bonding; 3) three piece clamping plate for improved inspection/installation of the thermal barrier; and 4) removal of the nozzle back-up O-ring. Numerous component tests and full scale tests verified these fixes. In late May 91, we successfully tested a SRAM II rocket motor (incorporating all fixes) under the same conditions as the Aug 90 failure. Since May 91, five additional full scale motor tests increased our confidence in the adequacy of the motor design. Accordingly, Rocket Motor CDR occurred at the end of Aug 91.

(U) The Operational Flight Software (OFS) development was proceeding according to the schedule developed after the cure notice. Block A was successfully integrated. Throughput and memory requirements closely matched predictions and were within specification requirements.

(U) In an effort to better manage cost and schedule performance, and thereby better manage the program, Boeing requested approval for an Over-Target Baseline (OTB) in Dec 90. Approval by the government was granted in late Apr 91. A team comprised of program office, ASD cost performance measurement staff, and DPRO personnel met with Boeing in Jul 91 to ensure the contractor had properly implemented the OTB. The team reviewed sample cost accounts and schedules to verify that the appropriate fixes were in place to allow Boeing to deliver meaningful cost and schedule data to the government. Boeing delivered the first Cost Performance Report (CPR) incorporating the OTB in Jul 91.

(U) Flight tests of the SRAM II on the B-1B continued throughout the year. All of the planned captive integration testing with the initial release of missile Operational Flight Software (OFS) was successfully completed. These tests demonstrated proper interface of the B-1B aircraft avionics systems with the SRAM II missile systems

7b. (U) Program Highlights (Cont'd):

and verified proper function of the missile avionics systems during captive carry. Specific functions demonstrated were missile turn-on and initialization, missile navigation system alignment, Built-In-Test (BIT), launch countdown, simulated launch, and navigation during simulated free flight. All identified discrepancies were corrected in the next release of the OFS. The last two aft bay jettisons, all four planned forward bay jettisons, and the last static ejection from the forward bay were successfully completed. These tests completed all planned separation tests and demonstrated safe SRAM II separation characteristics from all three B-1B weapons bays throughout the launch envelope. Range compatibility testing was completed at White Sands Missile Range (WSMR).

(U) This will be the final SAR for the SRAM II program. President Bush ordered termination of the program on 27 Sep 91. There were no deliverable production assets. This SAR will not be used for unit cost reporting.

(U) The SRAM II system was expected to satisfy the mission requirements.

SRAM T:

(U) On 27 Sep 91, President Bush ordered immediate termination of the SRAM II program. The program office received official notification of this termination from Secretary Cheney on 28 Sep 91. A revised SRAM T PMD dated 7 Oct 91 directed the SRAM T program office to terminate FSD activities. FY91 funds were authorized for termination activities for the program. The following accomplishments were achieved since the Dec 90 SAR and prior to program termination.

(U) SRAM T maintenance discussions concluded in early 1991 in a coordinated USAFE and PACAF two level missile maintenance concept.

(U) The early Vibration Fly Around (EVFA) test of a SRAM T aboard an F-15E aircraft was completed with a total of 13 flights/21 flight hours. Data acquired during this flight would be used to analyze the integrity of the missile while employed in the tactical environment. Initial indications were that flight test data closely approximated predictions. This was a very successful flight test program and risk reduction effort. Analyses of the data was nearing completion when termination of the SRAM T program was ordered by the President.

(U) The funding levels for SRAM T as stated in the FY92 President's

7b. (U) Program Highlights (Cont'd):

Budget were not sufficient to execute the directed program. A revised integrated program schedule was developed and coordinated with the F-15 system program office, the contractors (Boeing and McAir), and DOE. This schedule was to be the basis of the program restructure.

(U) This will be the final SAR for the SRAM T program. There will be no production deliverable assets. This SAR will not be used for unit cost reporting.

(U) The SRAM T system was expected to satisfy the mission requirements.

c. (U) Changes Since As Of Date --
None.

8. (U) Threshold Breaches:
(U) SRAM II: Schedule, performance, and program acquisition unit cost thresholds have been breached in the Acquisition Program Baseline dated 28 October 1991. Rocket motor problems have resulted in the slip of Critical Design Review (CDR) 15 months, and all other subsequent schedule milestones have slipped at least one year. Range (for low-low profile) and CEP performance thresholds will not be met.

SRAM T: None.

9. (U) Schedule:
SRAM II

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Milestone II (JRMB)	AUG 87	AUG 87	AUG 87
Critical Design Review (CDR) Complete	MAY 89	DEC 91	DEC 91
First Live Launch	SEP 90	APR 92	APR 92
DT&E/IOT&E (concurrent)			
Start	N/A	OCT 89	OCT 89(Ch-1)
Complete	N/A	OCT 95	JAN 95(Ch-2)
IOT&E Dedicated			
Start	N/A	MAY 94	APR 94(Ch-3)
Complete	N/A	FEB 95	JAN 95(Ch-4)
Low Rate Initial Production (LRIP) Start	N/A	AUG 93	SEP 93(Ch-5)
Milestone IIIA	JUL 91	N/A	N/A

9a. (U) Schedule (Cont'd):
SRAM II

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Milestone IIIB	OCT 92	N/A	N/A
LRIP Program Review	N/A	AUG 93	JUL 93(Ch-6)
Milestone III	OCT 92	MAR 95	JAN 95(Ch-7)
First Assets Delivery (FAD)/ IOC (50 missiles)	APR 93	DEC 95	DEC 95
Systems Concept Paper	FEB 85	N/A	N/A
Preliminary Design Review	NOV 87	N/A	N/A

b. (U) Previous Change Explanations --

(U) Critical Design Review changed from N/A to May 89 and First Live Launch changed from N/A to Sep 90 to reflect USD(A) memo, 14 Dec 88.

(U) Slips for Critical Design Review, First Live Launch, Milestone IIIA (DAB) Low Rate Production, and Milestone IIIB (DAB) were caused by the time required to correct second pulse rocket motor propellant grain cracking.

(U) First Assets Delivery (FAD)/IOC (50 Missiles) slipped due to propellant grain cracking and lack of B-1B production funding for SRAM II integration. This lack of funds will delay nuclear certification and delivery of B-1B and launcher assets necessary to achieve FAD. As a result FAD was delayed 12 months to 3rd quarter of FY94.

(U) Due to technical difficulties encountered with the software and rocket motor development, CDR slipped 15 months from Sep 90 to Dec 91. As a result of the slip in the completion of CDR, First Live Launch slipped 12 months and Milestone III (formerly Milestone IIIB) slipped from 3rd Quarter FY93 to Feb 95.

(U) First Assets Delivery (FAD)/IOC slipped from 3rd Quarter of FY94 to Dec 95. Rocket motor and software development slips and the lack of B-1B production funding for SRAM II integration would have delayed delivery of assets necessary to achieve FAD.

c. (U) Current Change Explanations --

(Ch 1) DT&E/IOT&E (Concurrent) Start is a new baseline schedule milestone for the SRAM II program.

(Ch 2) DT&E/IOT&E (Concurrent) Complete is a new baseline schedule milestone for the SRAM II program.

9c. (U) Schedule (Cont'd):

SRAM II

(Ch 3) IOT&E Dedicated Start is a new baseline schedule milestone for the SRAM II program.

(Ch 4) IOT&E Dedicated Complete is a new baseline schedule milestone for the SRAM II program.

(Ch 5) Low Rate Initial Production Start is a new baseline schedule milestone for the SRAM II program.

(Ch 6) LRIP Program Review is a new baseline schedule milestone for the SRAM II program.

(Ch 7) Milestone III changed from Feb 95 to Jan 95. This change is due to the correction of an administrative error.

d. (U) References --

(U) Development Estimate:
Acquisition Decision Memorandum, dated August 19, 1987

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 28 Oct 1991.

SRAM T

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Systems Concept Paper	SEP 88	N/A	SEP 88
Milestone II (DAB)	NOV 89	N/A	NOV 89
Preliminary Design Reveiw	JAN 92	N/A	JAN 92
Critical Design Review	MAR 93	N/A	MAR 93
Milestone III	SEP 96	N/A	SEP 96
First Assets Delivery (FAD)	MAR 98	N/A	MAR 98

b. (U) Previous Change Explanations --

(U) None.

c. (U) Current Change Explanations --

(U) None.

9d. (U) Schedule (Cont'd):
SRAM T

d. (U) References --

(U) Development Estimate:
FY92-93 President's Budget.

(U) Approved Program: None.

10. (U) Performance Characteristics:
SRAM II

a. (U) Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Carriage	N/A	B-1B & B-2	/ B-1B & B-2	N/A	B-1B&B-2	(CH-1)
Size						
Length (in)	168	168	/ 168	N/A	168	
Diamter (in)	16	N/A	/ N/A	N/A	16	
(b)(1) [redacted]						
Reliability						
Air Vehicle Reliability excluding warhead (at IOC plus 2 yrs)	0.95	N/A	/ N/A	N/A	N/A	
Mission Reliability	N/A	.98	/ .95	N/A	.98	(CH-4)
Dormant Reliability	N/A	.98	/ .95	N/A	.98	
Availability	0.95	.98	/ .95	N/A	.98	(CH-5)
Air Vehicle Exchange (time to exchange missile on launcher) (hrs)	N/A	1.00	/ 1.25	N/A	N/A	
Warhead Exchange Time (hrs)	N/A	1.00	/ 1.50	N/A	N/A	(CH-6)
Air Vehicle MTTR* (excluding warhead removal, in hrs)	N/A	2.00	/ 3.00	N/A	N/A	

10a. (U) Performance Characteristics (Cont'd):

SRAM II

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Air Vehicle MTTR (including warhead removal, in hrs)	N/A	3.00	/ 4.50	N/A	N/A
BIT Effectiveness (%)	N/A	99	/ 98	N/A	N/A
BIT False Alarm (%)	N/A	1	/ 2	N/A	N/A
Air Vehicle MTTT (short, in min)	N/A	.50	/ 1.00	N/A	N/A
Air Vehicle MTTT (long, in hrs)	N/A	1.00	/ 1.50	N/A	N/A
(b)(1)					
Weight (lbs)	2100	N/A	/ N/A	N/A	1893

(b)(1)

MTTR = Mean Time to Repair
MTTT = Mean Time to Turn

b. (U) Previous Change Explanations --

(U) System Specifications updated. Maturity of design and a change in the reliability/availability of the raceway concept have reduced weight goal projections.

(b)(1)

(U) Reliability has been segregated into two parts: Mission Reliability and Dormant Reliability. Air Vehicle Reliability

10b. (U) Performance Characteristics (Cont'd):

SRAM II consists of both Mission and Dormant Reliability. Mission Reliability is the probability of successfully completing its mission of alert, captive carry, and free flight. Dormant Reliability is the probability of withstanding the storage and transportation environment after base acceptance and before acceptance for alert. Breaking this into its component parts is more descriptive.

(U) Availability current estimate changed from 0.98 to 0.95 because of a change in measurement methodology from the previous estimate.

(b)(1) [redacted]

c. (U) Current Change Explanations --

(U) (Ch 1) Carriage not specified in previous SAR submissions.

(U) (Ch 2) Range (High/High) changed from 190 nmi to 179 nmi due to degradation in rocket motor performance brought about to solve the motor performance and angle of attack limitations.

(b)(1) [redacted]

(U) (Ch 4) Mission Reliability changed from 0.95 to 0.98 based on current contractor projections.

(U) (Ch 5) Availability changed from 0.95 to 0.98 based on current contractor projections.

(U) (Ch 6) Warhead Exchange Time (hrs) was labelled "Payload Exchange Time (hrs)" in previous SAR submission.

d. (U) References --

(U) Development Estimate:
Acquisition Decision Memorandum, dated August 19, 1987

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 28 Oct 1991.

10d. (U) Performance Characteristics (Cont'd):

SRAM T

a. (U) Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Mission Reliability	TBD	N/A	/ N/A	N/A	N/A	(CH-1)
Dormant Reliability	TBD	N/A	/ N/A	N/A	N/A	(CH-2)
Availability excluding Warhead	0.95	N/A	/ N/A	N/A	.95	
Size		N/A	/ N/A			
Length (in)	168	N/A	/ N/A	N/A	168	
Diameter (in)	16	N/A	/ N/A	N/A	16	
Weight (pounds)	1893	N/A	/ N/A	N/A	1893	

(b)(1) [redacted]

(U) NOTES:

(U) The following parameters are further defined using the notes listed below:

- Notes 1,2, and 3 apply to the Lethality parameter
- Notes 1,2,3, and 4 apply to the Low Launch, High Trajectory parameter
- Notes 1,2, and 5 apply to the Low/Lofted Launch; High Trajectory parameter

Notes:

(b)(1) [redacted]

10b. (U) Performance Characteristics (Cont'd):
SRAM T

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

(U) (Ch 1) Mission Reliability changed from TBD to N/A due to cancellation of the program.

(U) (Ch 2) Dormant Reliability changed from TBD to N/A due to cancellation of the program.

d. (U) References --

(U) Development Estimate:
FY92-93 President's Budget.

(U) Approved Program: None.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)
SRAM II

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	860.6	656.6	645.0
Procurement	859.9	0.0	14.4
Airframe	(168.6)		(0.0)
Motor	(224.8)		(0.0)
Navigation	(345.0)		(0.0)
Other Flyaway	(0.0)		(0.0)
Nonrecurring Flyaway	(0.0)		(0.0)
Total Flyaway	(738.4)		(0.0)
Other Wpn Sys	(87.6)		(14.4)
Total Other Wpn Sys	(87.6)		(14.4)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(33.9)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 83 Base-Year $	1720.5	656.6	659.4
Escalation	672.9	168.4	166.7
Development (RDT&E)	(222.3)	(168.4)	(160.3)
Procurement	(450.6)	(0.0)	(6.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2393.4	825.0	826.1

11b. (U) Total Program Cost and Quantity (Cont'd):

SRAM II

b. (U) Quantity --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	0	0	0
Procurement	1633	0	0
Total	1633	0	0

Excludes 30 RDT&E prototypes that are not considered fully configured. 100 Low Rate Initial Production (LRIP) units approved at Milestone II.

c. (U) Foreign Military Sales -- None.

(b)(1) [redacted]

e. (U) References --

(U) Development Estimate:
Acquisition Decision Memorandum, dated August 19, 1987

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 28 Oct 1991.

SRAM T

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	264.4	0.0	61.8
Procurement	436.4	0.0	0.0
Airframe	(65.1)		(0.0)
Motor	(113.0)		(0.0)
Navigation	(163.6)		(0.0)
Other Flyaway	(61.8)		(0.0)
Nonrecurring Flyaway	(0.0)		(0.0)
Total Flyaway	(403.5)		(0.0)
Other Weapon Systems	(30.6)		(0.0)
Total Other Wpn Sys	(30.6)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(2.3)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 83 Base-Year $	700.8	0.0	61.8

11a. (U) Total Program Cost and Quantity (Cont'd):
SRAM T

	Development Estimate	Approved Program	Current Estimate
Escalation	505.8	0.0	19.0
Development (RDT&E)	(118.3)	(0.0)	(19.0)
Procurement	(387.5)	(0.0)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1206.6	0.0	80.8

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	565	0	N/A
Total	565	0	0

Excludes 28 RDT&E prototypes that are not considered configured. No Low Rate Initial Production (LRIP) units approved at Milestone II.

Excludes units that are considered non-fully configured.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
FY92-93 President's Budget.

(U) Approved Program: None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

SRAM II

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	826.1	2234.6	826.1
(2) Quantity	0	700	0
(3) Unit Cost	N/A	3.192	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

SRAM II

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. (U) Current Procurement —	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

SRAM T

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	80.8	1206.6	80.8
(2) Quantity	0	565	0
(3) Unit Cost	N/A	2.136	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

b. (U) Current Procurement —	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) Cost Variance Analysis:
SRAM II

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1082.9	1310.5	0.0	2393.4
Previous Changes:				
Economic	+14.3	+111.3	-	+125.6
Quantity	-	-524.8	-	-524.8
Schedule	-	+46.2	-	+46.2
Engineering	+97.2	+58.2	-	+155.4
Estimating	+72.7	-7.7	-	+65.0
Other	-	-	-	-
Support	-	-26.2	-	-26.2
Subtotal	+184.2	-343.0	-	-158.8
Current Changes:				
Economic	-11.2	-28.4	-	-39.6
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+5.7	+0.5	-	+6.2
Other	-456.3	-775.7	-	-1232.0
Support	-	-143.1	-	-143.1
Subtotal	-461.8	-946.7	-	-1408.5
Total Changes	-277.6	-1289.7	-	-1567.3
Current Estimate	805.3	20.8	-	826.1

13a. (U) Cost Variance Analysis (Cont'd):
SRAM II

a. (U) Summary -- (FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	860.6	859.9	0.0	1720.5
Previous Changes:				
Quantity	-	-308.7	-	-308.7
Schedule	-	-	-	-
Engineering	+74.0	+40.2	-	+114.2
Estimating	+26.5	-8.8	-	+17.7
Other	-	-	-	-
Support	-	-21.5	-	-21.5
Subtotal	+100.5	-298.8	-	-198.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+4.3	+0.3	-	+4.6
Other	-320.4	-461.4	-	-781.8
Support	-	-85.6	-	-85.6
Subtotal	-316.1	-546.7	-	-862.8
Total Changes	-215.6	-845.5	-	-1061.1
Current Estimate	645.0	14.4	-	659.4

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised economic escalation indices.
Engineering: Engineering change to increase missile size.
Estimating: Revised B-1B integration estimate.
Adjustment for current and prior inflation.
Revised estimate for Engineering Change Orders.
Funding reduced in FY91 because of Critical Design Review (CDR) delay.
Increased associate contractors/test center costs due to schedule delays caused by rocket motor and software technical problems.
Revised estimate to include engineering change

13b. (U) Cost Variance Analysis (Cont'd):

SRAM II

proposals and other contract costs erroneously omitted from the FY91 President's Budget.

PROCUREMENT

Economic:	Revised economic escalation indices.
Quantity:	Decrease of 933 missiles in total buy quantity.
Schedule:	Contract option for first low-rate production slipped one year due to development delays.
	Adjusted schedule costs associated with missile quantity reduction.
	Production start delayed from FY92 to FY93 due to development problems.
Engineering:	Revised estimate for increased missile size.
	Adjusted engineering costs associated with missile quantity reduction.
Estimating:	Inflation rate increases were not incorporated into FY91 President's Budget.
	Adjustment for current and prior year escalation.
	Adjusted Estimating costs associated with missile quantity reduction.
	Refinement of production estimate based upon increased design complexity and business base changes.
Support:	Revised estimates for initial spares, Electronic Test Set maintenance, and Tech Mod savings.
	Deleted installation modification kits from program office estimate.
	Inflation rate increases were not incorporated into FY91 President's Budget.
	Initial Spares were deleted due to decision to fund within O&M Appropriation.
	Adjustment for current and prior year escalation.
	Revised estimate in initial spares.
	Reinstatement of required FY94 and out support funding.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year

13c. (U) Cost Variance Analysis (Cont'd):
SRAM II

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices. (Economic)	N/A	-11.2
Current and prior year inflation offset. (Estimating)	4.3	5.7
Termination of the SRAM II program by order of the President, 27 Sep 91. PMD termination, 7 Oct 91. (Other)	-320.4	-456.3
Total Changes	-316.1	-461.8
(2) PROCUREMENT		
Revised economic escalation indices (Economic)	N/A	-28.4
Current and prior year inflation offset. (Estimating)	0.3	0.5
Termination of the SRAM II program by order of the President, 27 Sep 91. PMD termination, 7 Oct 91. (Other)	-461.4	-775.7
Reduction in support costs due to PMD termination. (Support)	-71.2	-117.4
Reduction in spares due to PMD termination. (Support)	-14.4	-25.7
Total Changes	-546.7	-946.7

13a. (U) Cost Variance Analysis (Cont'd):
SRAM T

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	382.7	823.9	0.0	1206.6
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-6.3	-28.3	-	-34.6
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.9	-	-	+0.9
Other	-296.5	-738.3	-	-1034.8
Support	-	-57.3	-	-57.3
Subtotal	-301.9	-823.9	-	-1125.8
Total Changes	-301.9	-823.9	-	-1125.8
Current Estimate	80.8	0.0	-	80.8

13a. (U) Cost Variance Analysis (Cont'd):
SRAM T

a. (U) Summary -- (FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	264.4	436.4	0.0	700.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.7	-	-	+0.7
Other	-203.3	-403.5	-	-606.8
Support	-	-32.9	-	-32.9
Subtotal	-202.6	-436.4	-	-639.0
Total Changes	-202.6	-436.4	-	-639.0
Current Estimate	61.8	-	-	61.8

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

(Dollars in Millions)
Base-Year Then-Year

13c. (U) **Cost Variance Analysis (Cont'd):**
SRAM T

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices. (Economic)	N/A	-6.3
Current and prior year inflation offset. (Estimating)	0.7	0.9
Termination of the SRAM II program by order of the President, 27 Sep 91. PMD termination, 7 Oct 91. (Other)	-203.3	-296.5
Total Changes	-202.6	-301.9
(2) PROCUREMENT		
Revised economic escalation indices. (Economic)	N/A	-28.3
Termination of the SRAM II program by order of the President, 27 Sep 91. PMD termination, 7 Oct 91. (Other)	-403.5	-738.3
Reduction in support costs due to PMD termination. (Support)	-30.6	-53.2
Reduction in spares due to PMD termination. (Support)	-2.3	-4.1
Total Changes	-436.4	-823.9

14. (U) **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

SRAM II
a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1.877	-0.020	--	0.054	--	-0.404	--	-0.041	-0.411	1.466

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions) (Cont'd)

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1.466	--	--	--	--	--	--	--	--	N/A

SRAM T

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.136	--	--	--	--	--	--	--	--	N/A

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) SRAM II:

Boeing Aerospace, Seattle, WA
F33657-86-C-0012, FPIF
Award: April 30, 1987
Definitized: April 30, 1987

Initial Contract Price		
Target	Ceiling	Qty
$214.4	$234.3	N/A

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$310.9	$342.2	N/A	$608.7	$608.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-137.8	$-18.7
Cumulative Variances To Date (08/31/91)	$-25.7	$-8.9
Net Change	$112.1	$9.8

Explanation of Change:

NOTE: Advanced Design Phase initiated 30 April 1987; Full Scale Development authorization received 19 August 1987; Estimated Completion Date identified with First Assets Delivered (FAD).

The contractor's request for an overtarget baseline (OTB) estimate

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) was approved in Apr 91. The OTB methodology was for a single-point adjustment of both cost and schedule variances. All variances (except Hercules) were set to zero. As of the OTB estimate approval date, Hercules maintained a cost variance of -$19.2M and a schedule variance of -$5.9M (current variances are -$21.6M cost and -$6.5M schedule). This revised baseline was incorporated in the contractor's Jun 91 Cost Performance Report (CPR).

The positive net change figures for both cost and schedule variances are due to the implementation of the Over-Target Baseline (OTB) which was approved in Apr 91 and implemented in Jun 91. The Single Point Adjustment methodology stated that all cost and schedule variances be set equal to $0 and Budgeted Cost of Work Scheduled (BCWS) and Budgeted Cost of Work Performed (BCWP) be set equal to Actual Cost of Work Performed (ACWP).

The unfavorable cost variance was caused by the rocket motor subcontractor (Hercules). The major reason for the subcontractor cost variance is due to the magnitude of problems related to the Advanced Preliminary Flight Readiness Test Missile (APM-1) failure investigation. The current program office estimate at completion indicates a target cost overrun of approximately $326M. The government's liability is limited to the ceiling price of the contract.

The unfavorable schedule variance was caused by the subcontractor (Hercules) experiencing major schedule slips while trying to solve problems with the case and propellant development.

The changes in Current Contract Price are attributable to added scope to the contract over the past year.

The changes in Estimated Price at Completion is due to implementation of the Over-Target Baseline (OTB) in Jun 91.

(U) SRAM T:	Initial Contract Price		
	Target	Ceiling	Qty
Boeing Aerospace, Seattle, WA F33657-86-C-0012, FPIF Award: April 3, 1990 Definitized: April 3, 1990	$181.7	$199.1	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$180.2	$197.4	0	$180.2	$197.4

15. (U) **Contract Information: Cont'd** (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$3.2	$0.0
Cumulative Variances To Date (08/31/91)	$4.2	$-3.2
Net Change	$1.0	$-3.2

Explanation of Change:

Positive cost variance is due to SRAM T non discrete work package effort. Majority of effort for SRAM T was level of effort.

Negative increase in schedule variance is due to the fact that efforts for SRAM T could not proceed until SRAM II CDR had been accomplished. SRAM II CDR schedule slipped to the right, causing SRAM T efforts to slip as well.

16. (U) **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 100.0% (8 yrs/8 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($906.9 / $906.9)

b. (U) Appropriation Summary -- SRAM II

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY84-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	805.3	-	-	-	805.3
Procurement	20.8	-	-	-	20.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	826.1	-	-	-	826.1

NOTE: Below are the Section 16.a. "Percent Program Completed" and the "Percent Program Cost Appropriated" for the individual SRAM II and SRAM T. If calculated separately, the following percentages would apply:

SRAM II Percent Program Completed: 100.0% (8 yrs/8 yrs)

16b. (U) Program Funding Summary (Cont'd):

SRAM II

SRAM II Percent Program Cost Appropriated: 100.0% ($826.1/$826.1)

b. (U) Appropriation Summary -- SRAM T

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY90-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	80.8	-	-	-	80.8
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	80.8	-	-	-	80.8

SRAM T Percent Program Completed: 100.0% (2 yrs/2 yrs)
SRAM T Percent Program Cost Appropriated: 100.0% ($80.8M/$80.8M)

c. (U) Program Summary -- Complete Program

Fiscal Year	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: RDT&E - All Sources							
1984			5.9	6.3	6.3	6.3	3.8
1985			11.0	12.0	12.0	12.0	3.4
1986			26.5	29.7	29.7	29.7	2.8
1987			56.2	65.2	65.2	65.2	2.7
1988			115.8	138.9	138.1	130.3	3.0
1989			158.9	198.5	188.0	139.0	4.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: RDT&E - All Sources (Cont'd)							
1990			163.2	210.5	209.0	126.3	4.0
1991			107.5	144.2	135.4	66.3	3.9
Subtot			645.0	805.3	783.7	575.1	
Appropriation: Procurement - All Sources							
1990			7.5	10.7	3.2		4.0
1991			6.9	10.1	8.6		3.9
Subtot			14.4	20.8	11.8		
Grand Total			659.4	826.1	795.5	575.1	

c. (U) Annual Summary -- SRAM II

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 3600 Research, Development, Test + Eval, AF								
1984				5.9	6.3	6.3	6.3	3.8
1985				11.0	12.0	12.0	12.0	3.4

16c. (U) Program Funding Summary (Cont'd):
SRAM II

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1986				26.5	29.7	29.7	29.7	2.8
1987				56.2	65.2	65.2	65.2	2.7
1988				115.8	138.9	138.1	130.3	3.0
1989				158.9	198.5	188.0	139.0	4.2
1990				163.2	210.5	209.0	126.3	4.0
1991				107.5	144.2	135.4	66.3	3.9
Subtot				645.0	805.3	783.7	575.1	
Obligations and expenditures reflect program office records as of 31 Dec 91.								
Appropriation: 3020 Missile Procurement, Air Force								
1990				7.5	10.7	3.2		4.0
1991				6.9	10.1	8.6		3.9
Subtot				14.4	20.8	11.8		
Grand Total				659.4	826.1	795.5	575.1	

16c. (U) Program Funding Summary (Cont'd):
SRAM T

c. (U) Annual Summary -- SRAM T

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1990				41.9	54.1	54.1	23.3	4.0
1991				19.9	26.7	25.1	5.7	3.9
Subtot				61.8	80.8	79.2	29.0	
Grand Total				61.8	80.8	79.2	29.0	

Obligations and expenditures reflect program office records as of 31 Dec 91.

17. (U) Production Rate Data:
SRAM II

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1991	42	0	0	0
1992	112	0	0	0
1993	300	0	0	0
1994	400	0	0	0
1995	400	0	0	0
1996	433	0	0	0
1997	0	0	0	0

(U) Annualized Production Rate "Development Estimate" should be 42.9 units in 1991 and 112.5 units in 1992.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	659.4	N/A	N/A
(TY $)	N/A	N/A	826.1	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	N/A	N/A	N/A
(TY $)	N/A	N/A	N/A	N/A	N/A

17c. (U) Production Rate Data (Cont'd):

SRAM II

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) —

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

SRAM T

a. (U) Annual Production Rates -- None.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	61.8	N/A	N/A
(TY $)	N/A	N/A	80.8	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	N/A	N/A	N/A
(TY $)	N/A	N/A	N/A	N/A	N/A

17c. (U) Production Rate Data (Cont'd):
SRAM T

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:
SRAM II

a. (U) Assumptions and Ground Rules --

Operating and Support (O&S) costs in the Dec 89 SAR were based on 15 years of operating and support costs for a 1633 missile buy consisting of seven years of ramp-up and eight years of steady state. This quantity included missiles for alert and training requirements as well as missiles in maintenance and unprotected storage and missiles used for Operation Test Launches (OTLs) and the surveillance program.

The Logistics Support Cost model, the Munitions Design Trade Model, and discrete estimates (based on operational requirements) were the basic methodologies used. Calculated and predicted mean time between failures (MTBF's) and AFLC cost and planning factors were used as inputs to the models. Strategic Air Command's Unit Manning Document was used for manpower loadings.

Software modification costs were based on SRAM A history.

Depot maintenance costs included manpower and materials for component repair, repair of Non-Tactical Test Instrumentation Kits (NTIKs), surveillance testing and repair, and depot supply. Interim Contractor Support (ICS) costs were obtained from a negotiated contract option.

18a. (U) Operating and Support Costs (Cont'd):
SRAM II

Site activation costs were estimated based on manpower loading and the activation scenario.

Total 15 year O&S cost: $422.8M in BY83$.

The program office was preparing the annual cost estimate when termination of the program was announced.

b. (U) Costs -- (FY 1983 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Base	Avg Annual Cost Per Base
ICS	0.0	N/A
SATAF - Government	0.0	N/A
Base Oper and Maint	24.1	N/A
Installation Support	6.8	N/A
Personnel Acq & Training	1.6	N/A
Depot Non-Maintenance	0.6	N/A
Depot Maintenance	0.8	N/A
Sustaining Investment	2.4	N/A
Total	36.3	N/A

18c. (U) Operating and Support Costs (Cont'd):
SRAM II

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	4.7	4.3	4.3	---	13.3
Industrial Fund	---	---	---	---	---
Total	4.7	4.3	4.3	---	13.3

Above O&S costs were calculated based on a total SRAM II missile buy of 1633 missiles.

O&S costs for a 700 missile buy were never determined due to termination of the program. It should be noted that reducing the missile buy by 57% (1633 to 700) would not necessarily lower the O&S costs by the same amount due to fixed costs in some elements.

The Logistics Support Cost model, used to calculate and report SRAM II O&S costs, is not compatible with existing SRAM A information. Consequently, comparison of SRAM II O&S cost data to antecedent SRAM A cost data is inappropriate.

SRAM T

a. (U) Assumptions and Ground Rules --

O&S costs from the 1989 program office estimate were based on 15 years of operating and support costs for a 565 missile buy consisting of four years of ramp-up and eleven years of steady state. Methodologies used were the same as for SRAM II. Since the Tactical Air Command (TAC) Unit Manning Document was [redacted] manpower loadings were estimated based on current levels.

Total 15 year O&S cost: $220.5M in BY83$.

The program office was preparing the annual cost estimate when termination of the program was announced.

18b. (U) Operating and Support Costs (Cont'd):
SRAM T

b. (U) Costs -- (FY 1983 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Base	Avg Annual Cost Per Base
Warhead Equipment	0.0	N/A
Warhead Shipment	0.0	N/A
SATAF - Government	0.0	N/A
Base Oper and Maint	2.8	N/A
Installation Support	2.3	N/A
Personnel Acq & Training	1.6	N/A
Depot Non-Maintenance	1.4	N/A
Depot Maintenance	1.4	N/A
Sustaining Investment	3.0	N/A
Total	12.5	N/A

c. (U) Contractor Support Costs -- None.

AF-11 F-22 (ATF)

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1-103

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: F-22

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
F-22 (Formerly Advanced Tactical Fighter)

2. (U) **DoD Component:** USAF

3. (U) **Responsible Office and Telephone Number:**
F-22 SYSTEM PROGRAM OFFICE
AERONAUTICAL SYSTEMS DIVISION
WRIGHT-PATTERSON AFB
DAYTON, OH 45433-6503

MAJ GEN JAMES A. FAIN, JR.
Assigned: December 1, 1986
AV 785-4167 COMM (513) 255-4167

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AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0603109F (Shared) Project 622273
PE 0603230F
PE 0604227F (Shared) Project 663143
PE 0604239F
PE 0604250F (Shared) Project 643389, 643393, 643786

Classified by: F-22 SPO, 15 APR 00
Declassify on: OADR
Downgrade Instructions: Not Subject to Automatic Downgrade

SAF/PAS
92-231 -T
92 0472

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[redacted]

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4. (U) Program Elements/Procurement Line Items (Cont'd):

PROCUREMENT:
APPN 3010 ICN ATF000 (Air Force)

NOTE: PE 0604239F is the only RDT&E program element with funding after FY 91. The other PEs are shown for information as they are included in the total program funding.

5. (U) Related Programs: None.

6. (U) Mission and Description:
The F-22 (previously known as the Advanced Tactical Fighter (ATF)) Program will develop the next-generation air superiority fighter for introduction in the early 2000s. The F-22 is designed to penetrate enemy airspace and achieve a first-look, first-kill capability against multiple targets. The F-22 Engineering & Manufacturing Development (EMD, previously known as Full Scale Development (FSD)) phase will be based on the Weapon System Specification formulated from data developed during the previous ATF Demonstration/Validation (Dem/Val) (Prototype) phase. The EMD program will consist of design, fabrication, and development testing of 11 EMD flight test vehicles (9 single and 2 dual seat) and 33 engines; updating of the Avionics Flying Laboratory (AFL) and using it to develop and integrate the EMD avionics suite; and design and development of the F-22 support and training system. The F-22 program, from the outset, has placed balanced emphasis on performance, survivability, reliability/maintainability and affordability. The F-22 is characterized by a low observable, highly maneuverable airframe, new engine capable of supersonic cruise without use of afterburners, and advanced integrated avionics.

7. (U) Program Highlights:
a. (U) Significant Historical Developments —
Seven weapon system contractors participated in the ATF concept development phase prior to May 1984. The Joint Advanced Fighter Engine program awarded two contracts in September 1983 to build demonstrator engines with new technologies required to support the ATF mission. ATF Dem/Val began in October 1986. The aircraft contractors were Lockheed, teamed with General Dynamics and Boeing; and Northrop, teamed with McDonnell Douglas. Additionally, General Electric (GE) and Pratt and Whitney were awarded contracts to develop prototype Advanced Tactical Fighter Engines (ATFEs). Each aircraft contractor team conducted risk reduction demonstrations and trade studies to refine their concept, fabricate and demonstrate integrated avionics, and construct and flight test two prototype air vehicles with the prototype ATFEs. The first major contractual milestone, the System Requirements Review (SRR), was held in May 1987 with the contractors presenting results of performance and cost trade studies.

7a. (U) Program Highlights (Cont'd):

In response to Congressional language requiring use of advanced integrated avionics, the ATF System Program Office (SPO), in concert with the Army's Light Helicopter (LHX) and the Navy's Advanced Tactical Aircraft (ATA) program offices, formed the Joint Integrated Avionics Working Group (JIAWG). The JIAWG had its kickoff meeting in January 1987. JIAWG is comprised of both government and contractor representatives for the ATF, the LHX and ATA programs. The JIAWG initially published a Common Avionics Baseline (CAB) set of specifications on 1 June 1987 and periodically reviews and updates the CAB as required. This effort will continue through the EMD phase. The engine and airframe contracts were modified to include trade studies for a Naval variant to the ATF in 1989. Also in 1989, Dem/Val Phase II was added to both engine contracts, increasing the contract values by $300M, to protect the EMD schedule. A Defense Acquisition Board (DAB) review in October 1989 resulted in a 6-month extension of the Dem/Val phase of the program. In 1990, TAC's requirement for a dual-seat trainer was added (increasing the RDT&E units from 9 to 11), the maximum production rate was reduced from 72 per year to 48, and the Major Aircraft Review (MAR) resulted in a two-year delay in production start and an associated two-year extension of EMD. Each airframe contractor flew two prototype air vehicles (PAVs)—one with two GE engines and one with two Pratt and Whitney engines. Northrop's first flight was 27 August 1990 and Lockheed's was 29 September 1990. The final EMD Request For Proposal (RFP) was released to the contractors 1 November 1990. On 2 January 1991, both air vehicle contractor teams and both engine contractors submitted proposals for EMD, Pre-Production Verification (PPV) option, and Navy Dem/Val Phase III programs.

b. (U) Significant Developments Since Last Report --
On 23 April 1991, the Secretary of the Air Force announced the winners of the Source Selection: Lockheed (teamed with General Dynamics and Boeing) for the air vehicle and integration of the overall weapon system and Pratt & Whitney for the engine. Following the downselect, the SPO restructured to support an Integrated Product Development (IPD) concept and on 1 August 1991, the Program Director presided over a ceremony officially redesignating the ATF SPO as the F-22 SPO. The same day as the renaming, an Acquisition Decision Memorandum (ADM) authorizing the F-22 EMD and long lead for four PPV air vehicles was signed. This Milestone II approval followed Defense Acquisition Board (DAB) reviews on 27 June 1991 and 25 July 1991. On 2 August 1991, EMD contracts were awarded to Lockheed and Pratt & Whitney. Both contracts are Cost Plus Award Fee (CPAF). The F-22 EMD contracts also contained options for a Navy Dem/Val phase III and Navy task assignments. While the Dem/Val phase III options expired 2 January 1992, the Navy has exercised the task assignment option on the Lockheed contract and continues to monitor the F-22 program and

7b. (U) Program Highlights (Cont'd):

conduct technology applicability studies. A similar task assignment option is available on the Pratt & Whitney contract until 2 July 1992. In December 1991, JIAWG released a new version of the CAB based on results of commonality work between the F-22 Lockheed team and the RAH-66 Comanche (previously known as the LHX or LH) Boeing Sikorsky team. Consequently, common avionics between the F-22 and RAH-66 Comanche will be compliant with the specifications and standards contained in this CAB.

The F-22 as currently planned will satisfy its mission requirements.

c. (U) Changes Since As Of Date --
A Milestone II (MS II) Acquisition Program Baseline (APB) was signed 3 February 1992 and is shown as the Approved Program. This SAR now reflects the transition from a Planning Estimate (PE) to a Development Estimate (DE).

8. (U) Threshold Breaches:
There are currently no APB (dated February 3, 1992) breaches or unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Planning Estimate	Approved Program:DE	Current Estimate
Mission Element Need Statement	NOV 81	N/A	NOV 81(Ch-1)
Concept Development Contract Award	SEP 83	N/A	SEP 83(Ch-1)
Milestone I (DSARC)	SEP 85	OCT 86	OCT 86
Dem/Val Contract Award (Airframe only)	OCT 85	OCT 86	OCT 86
Early Operational Assessment			
Start	N/A	OCT 86	OCT 86(Ch-3)
Complete	N/A	MAR 91	MAR 91(Ch-3)
System Requirements Review	N/A	MAY 87	MAY 87
System Design Review	N/A	NOV 89	NOV 89
Prototype First Flight	N/A	JUN 90	AUG 90
Milestone II (DAB)	DEC 88	JUN 91	JUN 91
EMD Contract Award	N/A	AUG 91	AUG 91(Ch-2)
Preliminary Design Review Complete	N/A	OCT 92	OCT 92(Ch-3)
Critical Design Review Complete	N/A	OCT 93	OCT 93(Ch-3)
Engine Initial Flight Release	N/A	OCT 94	OCT 94(Ch-3)
PPV Long Lead	N/A	JAN 95	JAN 95(Ch-3)
First Flight 1/ DT&E	N/A	SEP 95	SEP 95(Ch-3)

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Planning Estimate	Approved Program:DE	Current Estimate
Start	N/A	SEP 95	SEP 95(Ch-3)
Complete	N/A	DEC 99	DEC 99(Ch-3)
PPV Contract Award	N/A	JAN 96	JAN 96(Ch-3)
Low Rate Initial Production (LRIP) Decision	N/A	OCT 96	OCT 96(Ch-3)
Low Rate Production Contract Award	N/A	JAN 97	JAN 97(Ch-3)
LRIP First Delivery	N/A	JAN 99	JAN 99(Ch-3)
Dedicated IOT&E			
Start	N/A	JUN 99	JUN 99(Ch-3)
Complete	N/A	SEP 99	SEP 99(Ch-3)
Milestone III	DEC 91	DEC 99	DEC 99(Ch-4)
High Rate Production Contract Award	N/A	JAN 01	JAN 01(Ch-3)
Initial Operational Capability	SEP 95	TBD	TBD
Organic Organizational Maintenance Capability	N/A	TBD	TBD (Ch-3)
Required Assets Availability (RAA) 2/	N/A	OCT 02	OCT 02(Ch-3)
Organic Depot Activation	N/A	TBD	TBD (Ch-3)

1/ First flight must be accomplished prior to PPV lot buy contract award.
2/ Required Assets Availability (RAA) is agreed to date by the developing/supporting command and using/operating command where sufficient equipment, personnel, and logistics elements are available to operating command to begin trial period for equipment operation and support capability.

b. (U) Previous Change Explanations --

Milestone I and Dem/Val Contract Award changed due to the delay in obtaining program approval from senior Air Force personnel.

Milestones I, II, III, Dem/Val Contract Award and IOC were changed due to redirection of the Dem/Val phase of the program to include prototyping, to align with Packard Commission recommendations, reduce concurrency in the program, and be consistent with DAB Milestone II and III projections.

Milestones II, III and IOC were again changed to reflect budget realities in the FY90/91 President's Budget (PB), and to align with a new schedule that further reduced concurrency between EMD and Production.

Milestone II was also changed to reflect the 6-month extension of the

9b. (U) Schedule (Cont'd):
Dem/Val Phase.

IOC was changed because the criteria was being redefined.

Milestones for Requirements Review Complete, System Design Review, and Prototype First Flight were added to reflect the 14 December 1988 approved DAE baseline.

Prototype First Flight was adjusted from December 1989 to March 1990 to reflect the schedule projected for qualification status of equipment required for first flight.

Prototype First Flight was actually accomplished in August 1990.

Milestone III was to be replaced by Milestone IIIA and IIIB as directed by the Major Aircraft Review (MAR) in March of 1990. Milestone IIIA was subsequently planned for December 1996 and Milestone IIIB for December 1999, although these were not approved APB milestones.

c. (U) Current Change Explanations --

(Ch-1) These milestones are not included in the MS II APB and will not be carried forward as part of the Development Estimate. They are reflected here for transitional purposes only and will not be shown in future SARs.

(Ch-2) EMD contract award was changed from July 1991 to August 1991 to reflect the actual award date.

(Ch-3) These items were added with the new MS II APB.

(Ch-4) Current estimate has been changed from N/A to December 1999. In accordance with the DAB MS II review, Milestones IIIA and IIIB have been replaced by a single MS III currently planned for December 1999.

d. (U) References --

(U) Planning Estimate:
Advanced Tactical Fighter, Mission Element Need Statement, approved by Defense Resources Board 23 November 1981.
Statement of Operational Need dated 9 November 1984.
FY86 President's Budget, 1 February 1985.

(U) Approved Program;DE:
DAE approved Acquisition Program Baseline dated 3 February 1992.

10. (U) **Performance Characteristics:**

a. (U) Performance --	PE	Approved Program;DE Objective/Threshold	Demon-strated Perf	Current Estimate
Combat Radius (at optimum altitude)(nm)				

(b)(1)

10a. (U) Performance Characteristics (Cont'd):

PE	Approved Program;DE Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)	[redacted]		

10a. (U) Performance Characteristics (Cont'd):

NOTE: USD(A) Risk Assessment Items are included here for consistency with the MS II APB. While these items may provide some insight to program maturity, they are not considered critical performance parameters, and, individually, should not be construed as good indicators of overall program health.

* Classification/control is [redacted] beyond the level of this document.

1/ Internal payload only -- cc indicates compressed carriage.
2/ Loads determined by Computer-Aided Load Manifest (CALM) given 24 PAA and 30 day wartime sortie rate sustainability-no additional support, third world operating base/austere site.
3/ Effectiveness will be based on open air testing of the FY99 planned operational version of the F-15 and EMD version F-22 versus the most capable threat fighter then available, or simulation thereof, and ground elements of a simulated integrated air defense system, as described in the F-22 system Threat Assessment Report (STAR). The performance parameter for Mission Effectiveness of the planned F-15 for FY99 will be defined by the improvements to the F-15 funded through the end of FY95.
4/ Not intended as operational test parameters.

b. (U) Previous Change Explanations --

Break Rate was changed to Sortie Gen Rate in the APB.

Values for Combat Radius, Missile Load and Maneuverability were changed by a revised APB, October 1990. This APB also added Reliability, Maintainability as a performance characteristic.

c. (U) Current Change Explanations --

(Ch-1) Both the Approved Program and Current Estimate have been changed to reflect the MS II APB values.

(Ch-2) Combat Radius (Subsonic Mission) replaces Escort Radius (Subsonic) to be consistent with the MS II APB. Escort Radius is shown for transitional purposes only and will be deleted in the next SAR.

(Ch-3) The correct security classification in accordance with the ATF Security Classification Guide, 15 Apr 90, is [redacted] Change 1 also applies.

(Ch-4) These items are not critical performance parameters and, therefore, are not included in the MS II APB. These items are shown for transitional purposes only and will be deleted in the next SAR.

10c. (U) Performance Characteristics (Cont'd):

(Ch-5) Current estimate is better than threshold.

(Ch-6) MTBM (inherent failures) and MTBM (total failures) are shown for transitional purposes only and will not be shown in future SARs as they are replaced by a single MTBM value for consistency with the MS II APB.

(Ch-7) Sustained Combat Speed and Acceleration are shown for transitional purposes only and will not be shown in future SARs as they are replaced by Supercruise parameters for consistency with the MS II APB.

(Ch-8) USD(A) Risk Assessment Items have been added for consistency with the MS II APB.

d. (U) References --

(U) Planning Estimate:
Advanced Tactical Fighter, Mission Element Need Statement, approved by Defense Resources Board 23 November 1981.
Statement of Operational Need dated 9 November 1984.
FY86 President's Budget, 1 February 1985.

(U) Approved Program;DE:
DAE approved Acquisition Program Baseline dated 3 February 1992.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Planning Estimate	Approved Program;DE	Current Estimate
Development (RDT&E)	13883.3	16560.0	16833.9
Procurement	0.0	43510.0	43980.6
Airframe			(21485.7)
Engines			(5993.7)
Avionics			(9250.6)
Total Flyaway	(0.0)		(36730.0)
			(1032.1)
Total Other Wpn Sys	(0.0)		(1032.1)
Peculiar Support	(0.0)		(2352.8)
Initial Spares	(0.0)		(3865.7)
Construction (MILCON)	0.0	200.0	200.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	13883.3	60270.0	61014.5

11a. (U) Total Program Cost and Quantity (Cont'd):

	Planning Estimate	Approved Program:DE	Current Estimate
Escalation	1410.7	38839.0	35380.9
Development (RDT&E)	(1410.7)	(2969.0)	(2708.5)
Procurement	(0.0)	(35762.0)	(32575.7)
Construction (MILCON)	(0.0)	(108.0)	(96.7)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	15294.0	99109.0	96395.4

NOTE: The Planning Estimate has been escalated from BY85 to BY90 using a factor of 1.178 based on program rates published 22 January 1992. This change was required for consistency with the MS II APB.

NOTE: Peculiar Support includes Intermediate Contractor Support (ICS) and Common Support Equipment (CSE).

b. (U) Quantity --

Development (RDT&E)	0	N/A	0
Procurement	0	648	648
Total	0	648	648

Excludes 12 non-fully configured units from the Planning Estimate and 11 from the Development Estimate.

NOTE: Only long lead items for four pre-production verification (PPV) aircraft are approved at this time. A Defense Acquisition Board (DAB) review will be held prior to long lead commitment for the first Low Rate Initial Production (LRIP) award and exercising the option for the four PPV aircraft.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:
Advanced Tactical Fighter, Mission Element Need Statement, approved by Defense Resources Board 23 November 1981.
Statement of Operational Need dated 9 November 1984.
FY86 President's Budget, 1 February 1985.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 3 February 1992.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	96395.4	96395.4	96395.4
(2) Quantity	648	648	648
(3) Unit Cost	148.76	148.76	148.76
b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	15294.0	0.0	0.0	15294.0
Previous Changes:				
Economic	-46.0	-	-	-46.0
Quantity	+92.9	-	-	+92.9
Schedule	+831.7	-	-	+831.7
Engineering	-109.8	-	-	-109.8
Estimating	+344.4	-	-	+344.4
Other	-	-	-	-
Support	+430.2	-	-	+430.2
Subtotal	+1543.4	-	-	+1543.4
Current Changes:				
Economic	-303.9	-3172.4	-11.3	-3487.6
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+2527.9	-	-	+2527.9
Other	-	-	-	-
Support	+481.0	+456.7	-	+937.7
Subtotal	+2705.0	-2715.7	-11.3	-22.0
Total Changes	+4248.4	-2715.7	-11.3	+1521.4
Adjustments	-	+79272.0	+308.0	+79580.0
Current Estimate	19542.4	76556.3	296.7	96395.4

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	13883.3	0.0	0.0	13883.3
Previous Changes:				
Quantity	+7.1	-	-	+7.1
Schedule	-	-	-	-
Engineering	-97.2	-	-	-97.2
Estimating	+349.3	-	-	+349.3
Other	-	-	-	-
Support	+373.2	-	-	+373.2
Subtotal	+632.4	-	-	+632.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1935.1	-	-	+1935.1
Other	-	-	-	-
Support	+383.1	+470.6	-	+853.7
Subtotal	+2318.2	+470.6	-	+2788.8
Total Changes	+2950.6	+470.6	-	+3421.2
Adjustments	-	+43510.0	+200.0	+43710.0
Current Estimate	16833.9	43980.6	200.0	61014.5

NOTE: Planning estimate base year has been revised from 1985 to 1990.

NOTE: Adjustment adds Procurement and MILCON required after MS II approval.

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices.

Quantity: Reduction in EMD aircraft from 12 to 9 because of prototyping in Dem/Val. In 1990, TAC's requirement for a dual-seat trainer was added increasing the

13b. (U) Cost Variance Analysis (Cont'd):

RDT&E units from 9 to 11.

Schedule: Milestone I decision delayed, revision of program estimate to reflect funding constraints and fiscal year funding adjusted to reflect rephasing of development effort. An additional year added to EMD delayed start of production therefore reducing concurrency. EMD funding profile was rephased for a 6-month Dem/Val extension. As a result of the MAR in 1990, an additional two years were added to the EMD program, again delaying start of production and further reducing concurrency.

Engineering: USAF realignment of electronic efforts, FY89 congressional addition of Integrated Electronic Warfare System/Integrated Communication Navigation Identification Avionics (INEWS/ICNIA) and deletion of Seek Spartan funding.

Estimating: Adjustment for prior and current year escalation, updated estimating methodology, increased engine funding, congressional reductions, addition of INEWS/ICNIA effort including prototype modules and the increase in EMD estimate for higher level of testing. Reinstatement of previous engine reductions, and FY89 and FY90 Congressional reductions reducing test and the scope of the Dem/Val Phase II engine efforts in FY89 and FY90. An increase for the additional engine, airframe, ground and flight test due to additional year of EMD. Increase in FY91 for Dem/Val extension to add additional risk reduction efforts. Addition of flight test hours due to additional two years in EMD. Increase for refinement of avionics estimate. Estimating methodologies revised based on Dem/Val experience.

Support: Simulator funding added to program estimate. Increase due to increase in quantity and change in estimating methodology.

c. (U) Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year

13c. (U) **Cost Variance Analysis (Cont'd):**

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices (Economic)	--	-303.9
Increase in airframe due to contractor specific configuration, weight increase, composite complexities (Estimating)	2254.3	2742.7
Increase in avionics due to contractor specific configuration and increased definition (Estimating)	532.6	701.6
Engine increase due to contractor specific configuration and estimate refinement (Estimating)	457.8	552.8
System Test refinement of flight test estimate (Estimating)	-1183.8	-1350.0
Decrease in Engineering Change Orders (ECOs) due to factor change (Estimating)	-167.7	-163.6
Adjustment for current and prior year escalation change (Estimating)	41.9	44.4
Increase in support areas due to increased factor base and estimate refinement (Support)	383.1	481.0
Total Changes	2318.2	2705.0
(2) PROCUREMENT		
Revised economic escalation indices (Economic)	--	-3172.4
Increase for ICS and CSE (Support)	470.6	456.7
Total Changes	470.6	-2715.7
(3) MILCON		
Revised economic escalation indices (Economic)	--	-11.3
Total Changes	--	-11.3

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
N/A	--	--	--	--	--	--	--	--	148.758

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) F-22 EMD (LASC):	Initial Contract Price		
	Target	Ceiling	Qty
LOCKHEED CORPORATION, Marietta, GA F33657-91-C-0006, CPAF Award: August 2, 1991 Definitized: August 2, 1991	$9550.1	N/A	11

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$9556.5	N/A	11	$0.0	$9556.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Initial Contract Target includes 4% base fee only. Current Contract Target includes 4% base fee plus award fee earned to date.

NOTE: New contract award following MS II approval. CPR data incomplete as contractor has not yet established a firm baseline.

(U) EMD ENGINE (P&W):	Initial Contract Price		
	Target	Ceiling	Qty
PRATT&WHITNEY ACFT GRP, WEST PALM BEACH, FL F33657-91-C-0007, CPAF Award: August 2, 1991 Definitized: August 2, 1991	$1375.1	N/A	33

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1380.6	N/A	33	$0.0	$1380.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Initial Contract Target includes 4% base fee only. Current Contract Target includes 4% base fee plus award fee earned to date.

NOTE: New contract award following MS II approval. CPR data incomplete as contractor has not yet established a firm baseline.

Dem/Val Contracts:

Northrop Corporation, Hawthorne, CA	F33657-86-C-2087
Lockheed Coporation, Burbank, CA	F33657-86-C-2085
GE/Sanders, Nashua, NH	F33657-86-C-2144
TRW/WEC, Redondo Beach, CA	F33657-86-C-2145
Pratt & Whitney Acft Grp, West Palm Beach, FL	F33657-83-C-0092
General Electric Company, Cincinnati, OH	F33657-83-C-0281

NOTE: The Dem/Val contracts were Firm Fixed Price (FFP) contracts with no CPR requirement. These contracts were completed with the MS II approval and EMD contract award. The Dem/Val contracts are listed here for transitional purposes only and will be deleted in the next SAR.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 28.6% (10 yrs/35 yrs)

(2) Percent Program Cost Appropriated: 5.8% ($5597.3 / $96395.4)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2017)	Total
RDT&E	3976.3	1621.0	2224.3	11720.8	19542.4
Procurement	-	-	-	76556.3	76556.3
MILCON	-	-	-	296.7	296.7
O&M	-	-	-	-	-
Total	3976.3	1621.0	2224.3	88573.8	96395.4

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1983				24.8	20.0	20.0	20.0	4.9
1984				40.7	34.1	34.1	34.1	3.8
1985				104.9	90.8	90.8	90.8	3.4
1986				171.5	152.1	152.1	152.1	2.8
1987				324.1	297.2	297.2	297.2	2.7
1988				532.1	504.4	504.4	504.4	3.1
1989				810.6	800.1	800.1	790.7	4.2
1990				1102.2	1124.2	1124.2	1116.8	4.0

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1991				898.6	953.4	952.8	890.2	3.9
1992				1480.4	1621.0	1151.8	4.7	3.1
1993				1966.7	2224.3			3.3
1994				2186.2	2553.5			3.3
1995				2042.0	2462.6			3.3
1996				1491.8	1855.8			3.2
1997				1169.1	1501.2			3.2
1998				1551.9	2056.2			3.2
1999				692.2	946.9			3.2
2000				244.1	344.6			3.2
Subtot				16833.9	19542.4	5127.5	3901.0	

NOTE: Obligated and expended amounts reflect program office records as of 15 January 1992.

Appropriation: 3010 Aircraft Procurement, Air Force								
1995				66.7	85.8			3.3
1996	4	241.0	323.0	729.6	956.0			3.2
1997	4	72.0	368.8	859.1	1165.3			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
1998	12		1230.8	1564.4	2182.8			3.2
1999	24	12.8	1875.8	2304.8	3322.9			3.2
2000	36	45.5	2523.8	3052.5	4540.3			3.2
2001	48		3068.4	3514.4	5391.6			3.2
2002	48		2871.5	3375.3	5343.7			3.2
2003	48		2738.0	3232.7	5281.7			3.2
2004	48		2638.5	3122.6	5265.1			3.2
2005	48		2559.9	3013.4	5243.7			3.2
2006	48		2495.5	2933.1	5267.4			3.2
2007	48		2441.1	2866.3	5312.0			3.2
2008	48		2394.3	2813.2	5380.6			3.2
2009	48		2353.4	2746.9	5421.9			3.2
2010	48		2317.1	2706.3	5512.5			3.2
2011	48		2284.1	2633.6	5534.2			3.2
2012	40		1874.7	2050.5	4437.7			3.2
2013				170.5	380.9			3.2
2014				121.3	279.6			3.2
2015				59.8	142.3			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
2016				30.0	73.8			3.2
2017				13.6	34.5			3.2
Subtot	648	371.3	36358.7	43980.6	76556.3			
Appropriation: 3300 Military Construction, Air Force								
1998				82.3	110.8			3.2
1999				21.7	30.1			3.2
2000				8.3	11.9			3.2
2001				38.8	57.5			3.2
2002				8.0	12.2			3.2
2003				5.1	8.0			3.2
2004				8.8	14.3			3.2
2005								3.2
2006				6.4	11.1			3.2
2007								3.2
2008								3.2
2009				3.4	6.4			3.2
2010				11.8	23.1			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 3300 Military Construction, Air Force (Cont'd)

2011								3.2
2012				5.4	11.3			3.2
Subtot				200.0	296.7			
Grand Total	648	371.3	36358.7	61014.5	96395.4	5127.5	3901.0	

First year of MILCON is planned for FY 98. PE not yet assigned.

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1996	4	N/A	4	N/A
1997	4	N/A	4	N/A
1998	12	N/A	12	N/A
1999	24	N/A	24	N/A
2000	36	N/A	36	N/A
2001	48	N/A	48	N/A
2002	48	N/A	48	N/A
2003	48	N/A	48	N/A
2004	48	N/A	48	N/A
2005	48	N/A	48	N/A
2006	48	N/A	48	N/A
2007	48	N/A	48	N/A
2008	48	N/A	48	N/A
2009	48	N/A	48	N/A
2010	48	N/A	48	N/A
2011	48	N/A	48	N/A
2012	40	N/A	40	N/A

17b. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	61014.5	N/A	N/A
(TY $)	N/A	N/A	96395.4	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	94.158	N/A	N/A
(TY $)	N/A	N/A	148.758	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	JAN 96	N/A	N/A
Duration (in MON)	N/A	N/A	222	N/A	N/A
End Date(MON YY)	N/A	N/A	JUL 14	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	/
Procurement	/

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The Operating and Support (O&S) cost estimate is based on the analysis completed in May 1991 during the F-22 EMD Source Selection.

The F-22 concept of operation is a 24 aircraft fighter squadron with a utilization rate of 360 flight hours/year (FH/Yr) per aircraft. The F15C is the antecedent to the F-22; both are two engine air-to-air fighters with similar operational concepts. The F-15C comparison estimate was based on standard F-15C cost and planning factors from

18a. (U) Operating and Support Costs (Cont'd):
AFR 173-13 (US Air Force Cost and Planning Factors). This regulation is updated on the Air Force Cost Analysis Agency Bulletin Board Service and was current as of 22 Feb 91.

The wartime scenario was used to estimate the maintenance manpower. A peacetime operating scenario was assumed for estimating all other O&S cost elements. No unique cost differences were attributed between F-22 combat and training-coded squadrons. Estimate assumptions and ground rules for the F-15C are the same as for the F-22.

The cost elements in Section b., below, are structured and organized according to guidelines established by the OSD Cost Analysis Improvement Group (CAIG) as found in AFR 173-13. The Unit Mission Personnel cost element contains the lower level cost elements of squadron aircrew, direct maintenance, and unit staff, security & other personnel. HQ TAC has identified 10 direct maintenance officers and 367 enlisted personnel per squadron for the F-22 vs the AFR 173-13 standard manning factors of 11 officers and 609 enlisted for the F-15C. The F-22 plans to have a 2-level avionics maintenance concept which would delete all base avionics intermediate shops (AIS).

The Unit Level Consumption element contains Petroleum, Oil and Lubricants (POL), Aircraft Maintenance Materiel and Training Ordnance. The composite jet fuel price of $.56/gallon (Base Year 1990$), as per AFR 173-13, was used to calculate POL costs.

The Depot Maintenance element contains the cost of personnel and material required to perform maintenance or modification of aircraft and components. It includes airframe maintenance, propulsion rework component repair, and software maintenance. In accordance with Air Force Cost Analysis Agency guidance, this estimate does not contain general and administrative fixed overhead costs.

The Sustaining Investment element consists of Replenishment Spares, Replacement Support Equipment and Spares, and Class IV Modifications and Spares. The Installation Support Personnel element contains the pay and allowances for personnel not directly assigned to the unit but required for the unit to perform its mission in peacetime; included personnel are Base Operating Support (BOS), Real Property Maintenance (RPM), and Medical. The Indirect Personnel Support element contains the non-pay portion of installation support, medical O&M non-pay, and permanent change of station (PCS). The Depot Support element contains depot non-maintenance functions divided into General Depot Support and Second Destination Transportation. The Acquisition and Training element contains the recurring cost to acquire and train replacement officer and enlisted personnel to support the unit.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per F-22 Squadron	Avg Annual Cost Per F-15C Squadron
Unit Mission Personnel	15.7	22.5
Unit Level Consumption	13.0	13.2
Depot Maintenance	8.6	13.8
Sustaining Investment	9.2	19.0
Installation Support Per	2.4	3.0
Indirect Personnel Suppo	4.4	6.5
Depot Support	1.7	2.1
Acquisition and Training	5.7	6.2
Total	60.7	86.3

c. (U) Contractor Support Costs -- None.

The cost table above provides a summary level comparison of annual squadron operating costs for the F-22 and the F-15C. F-22 O&S costs are estimates of an average composite CONUS/Overseas squadron (60% CONUS, 40% Overseas). F-15C values are provided normalized with the F-22 at 360 Flight Hours/Aircraft/Year.

Contractor support costs will begin in FY98. However, a Balance to Complete cannot be adequately estimated as the system support concept is not yet fully definitized.

AE-22 SMALL ICBM

91 043

SECRET

Not Releasable to Foreign Nationals

SELECTED ACQUISITION REPORT (SAR):DD-COMP(OSA)823)
PROGRAM: SMALL MISSILE

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
FEB 27 1992

10

1. (U) Designation and Nomenclature (Popular Name):
None assigned to date (SMALL ICBM)

2. (U) DoD Component: USAF

DIRECTOR, FREEDOM OF INFORMATION AND SECURITY REVIEW (PA), DEPARTMENT OF DEFENSE

3. (U) Responsible Office and Telephone Number:

PROGRAM DIRECTOR FOR SMALL ICBM	COL HOWARD J. MITCHELL
BALLISTIC MISSILE ORGANIZATION	Assigned: December 18, 1990
HQ BMD/MG	AV 876-7848 COMM (714) 382-7848
NORTON AFB, CA 92409-6468	

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4. (U) Program Elements/Procurement Line Items:

USAF/PAS

92-085 -T

RDT&E:
PE 0604312F (Shared)

5. (U) Related Programs:
Peacekeeper in Minuteman Silos; Peacekeeper Rail Garrison; Rapid Execution and Combat Targeting

92-0338

OASD(PA) DFOISR

Classified by: Multiple Sources
Declassify on: Originating Agency Determination Required (OADR)
Downgrade Instructions: (Not Subject to Automatic Downgrade)

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6. (U) Mission and Description:
The mission of the Small ICBM weapon system is to enhance the deterrent posture of US strategic forces. The Small ICBM must be able to exact a prohibitively high price-to-attack from any potential aggressor and, should deterrence fail, survive to effectively attack the full spectrum of designated targets with nuclear weapons. The system must provide a prompt, hard target retaliatory capability. The Small ICBM missile has three solid propellant stages capable of delivering one reentry vehicle to a range of more than 6000 nautical miles. The missile is capable of deploying in a nuclear hardened mobile launcher. The Small ICBM is not programmed to replace an existing system.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
In Apr 83, the President's Commission on Strategic Forces (Scrowcroft Report) recommended beginning engineering development of a single warhead ICBM weighing about 30,000 lbs and having flexibility for development in several basing modes. The President endorsed the report, as did Congress in the Authorization Act of 1984. In Sep 83, the report of the Small Missile Independent Advisory Group (Shriever Report) provided an acquisition strategy to the AFSC Commander for the System Definition, Pre-Full Scale Development (Pre-FSD) and FSD phases, and led to three years of competitive pre-operational prototype tests. The President decided in December 1986 to proceed into FSD with a 37,000 lb class, single warhead ICBM carried on a nuclear hardened mobile launcher (HML) deployed initially at Minuteman launch facilities. A major restructure of the program due to budget cuts was contractually implemented on 1 Apr 88 with a significant descope in basing development and a partial termination of missile development. In May 89, the first flight test, FTM-1, was conducted achieving 85% of the flight test objectives. Approximately 70 seconds into the flight, the nozzle on the second stage solid fuel rocket failed, and the missile was command destructed after 128 seconds of flight. The investigation into the Stage II anomaly led to a redesign of the stage with a carbon phenolic exit cone. On 14 Jul 89, the Small ICBM Program Office received direction to implement a two-phase restart program in support of a 1997 First Assets Delivered (FAD) and Initial Operational Capability (IOC). Phase I focused on missile development. Phase II resumed basing full-scale development in FY92 in support of a 1997 FAD/IOC. Restart supplemental contract agreements were awarded to six of the ten Small ICBM associate contractors. During the countdown for the second flight test (FTM-2) launch on 3 Nov 90, the Instrumentation and Range Safety System (IRSS) failed to transition to airborne power. The flight was rescheduled for Apr 91.

7b. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report —
Due to recent OSD policy directives favoring the use of cost-reimbursement type contracts over fixed price incentive fee (FPIF) contracts, the four remaining restart contracts (Thiokol, Rockwell, Martin-Marietta and Boeing) were awarded as cost plus contracts. The second flight test, FTM-2A, was launched successfully on 18 Apr 91. The missile flew approximately 4,000 nautical miles in about 30 minutes. The reentry vehicle landed in its assigned target area at the U.S. Army Kwajalein Atoll in the Pacific Ocean. The test missile was fitted with the new Stage II carbon phenolic nozzle. All systems performed nominally. On 27 Sep 91, President Bush announced cancellation of the mobility portion of the Small ICBM program. On 28 Sep 91, the SECDEF directed immediate implementation of the President's guidance. The Small ICBM program office terminated the Boeing contract on 11 Oct 91, halting all mobile basing activities. The FY 92 Appropriations Bill was signed by the President on 26 Nov 91 in which $434M was provided to the Small ICBM program. On 6 Dec 91, the President signed the FY 92 Defense Authorization Act authorizing funds in FY 92 for Small ICBM R&D but prohibits DOD from obligating any of the funds unless the SECDEF certifies that a sufficient amount of those funds will be obligated to conduct a viable R&D program on mobile basing options. On 10 Dec 91, the program office was directed by the Air Force to implement a restructured silo-based program incorporating a 2001 FAD. This program fields a 37,000 lb class, three stage, single reentry vehicle missile with an advanced inertial measurement unit (AIMS).

This will be the final SAR submittal for the Small ICBM Program due to Presidential direction to cancel the program; the program is more than 90% expended.

This system would have satisfied all mission requirements.

c. (U) Changes Since As Of Date --
During his State of the Union Address on 28 Jan 92, the President directed cancellation of the Small ICBM Program. Termination notices were issued to the Small ICBM contractors on 31 Jan 92.

8. (U) Threshold Breaches:
There are no Acquisition Program Baseline (APB) (dated 8 Mar 91) breaches and no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate	
Initial Program Mgmt Directive (Pres. directive)	SEP 83	N/A	SEP 83	
Milestone II (JRMB)	DEC 86	DEC 86	DEC 86	
System Design Review	MAR 87	MAY 87	MAY 87	
Program Partial Termination Direction	N/A	APR 88	APR 88	
First Flight Test	MAR 89	MAY 89	MAY 89	
Program Restart Direction	N/A	JUL 89	JUL 89	
Basing Full Scale Development Restart	N/A	OCT 91	OCT 91	
Production Advanced Buy	N/A	OCT 93	N/A	(Ch-1)
Low-Rate Initial Production Contract Award	DEC 89	JAN 95	N/A	(Ch-1)
First Assets Delivered (IOC)	DEC 92	DEC 97	N/A	(Ch-1)
Supportability Assessment Review	N/A	MAY 98	N/A	(Ch-1)
Milestone III	N/A	MAY 98	N/A	(Ch-1)
Full Rate Production Contract Award	N/A	MAY 98	N/A	(Ch-1)

b. (U) Previous Change Explanations --

-- The SDR slipped two months due to the slip of the planned FSD decision from Oct 86 to Dec 86.

-- Due to reductions in Procurement and MILCON, IOC slipped to Dec 97.

-- When the program was restructured to terminate on 30 Sep 89 and funding limitations were imposed, direction was changed to fly when ready. A Mar 89 First Flight date was retained as an approximate goal rather than a required milestone date. There was no programmatic reason or pressure to fly as early as Mar 89 since the program was scheduled to terminate. The missile was ready in May 89.

-- First contract award for production and FAD/IOC slipped due to scheduled termination of the program. The Current Estimate dates reflect the restart program schedule supporting a Dec 97 FAD.

-- The FY92-97 FYDP contained no MILCON or Procurement funds to support production, therefore, the Current Estimate date for schedule milestones after Production Advanced Buy changed to "To Be Determined" (TBD).

c. (U) Current Change Explanations --

(Ch-1) Change reflects termination of the Small ICBM program as directed by the President during his 28 Jan 92 State of the Union

9c. (U) Schedule (Cont'd):
Address.

d. (U) References --

(U) Development Estimate:
Secretary of Defense Memorandum, 1 November 1983, and National Security Decision Directive, 10 July 1985.

(U) Approved Program:
DAE Approved Acquisition Program Baseline, dated 8 March 1991.

10. (U) Performance Characteristics:

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate	
Payload (# of MK21 RVs)	N/A	N/A / N/A		1	(CH-1)
Range (nm)	6000	6000 / 6000		6124	(CH-2)

(b)(1)

[redacted]

Accuracy is defined in terms of Circular Error Probable (CEP), a statistical measure defined as the radius of a circle centered at the aimpoint within which 50% of the reentry vehicles can be expected to fall.

b. (U) Previous Change Explanations --

-- Approved Program and Current Estimate was changed from 30,000 lb to 37,000 lb missile in accordance with the sense of Congress expressed in the FY 87 Authorization Conference report.

10b. (U) Performance Characteristics (Cont'd):

-- Payload reflects USD(A) baseline approval.

-- Payload was changed to reflect one RV. The missile could carry two RVs, but this would change the weight, performance and cost estimates.

c. (U) Current Change Explanations --

(Ch-1) Payload current estimate was changed to reflect one RV as directed by the Air Force on 10 Dec 91.

(Ch-2) Range current estimate was updated to reflect latest data from the second flight test, FTM-2A.

(b)(1) [redacted]

d. (U) References --

(U) Development Estimate:
Secretary of Defense Memorandum, 1 November 1983, and National Security Decision Directive, 10 July 1985.

(U) Approved Program:
DAE Approved Acquisition Program Baseline, dated 8 March 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	9776.6	5631.1	3261.4
Procurement	22207.2	16732.0	0.0
Flyaway	(9044.4)		(0.0)
Total Flyaway	(9044.4)		(0.0)
Other Weapon Systems	(7121.4)		(0.0)
Total Other Wpn Sys	(7121.4)		(0.0)
Peculiar Support	(4191.0)		(0.0)
Initial Spares	(1850.4)		(0.0)
Construction (MILCON)	1727.2	1819.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	33711.0	24182.1	3261.4

11a. (U) Total Program Cost and Quantity (Cont'd):

	Development Estimate	Approved Program	Current Estimate
Escalation	11016.9	17679.4	413.7
Development (RDT&E)	(1873.2)	(1519.5)	(413.7)
Procurement	(8470.3)	(14549.7)	(0.0)
Construction (MILCON)	(673.4)	(1610.2)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	44727.9	41861.5	3675.1

RDT&E Total reflects the FY 93 Amended President's Budget and corresponding FYDP. Funds provided in FY 92 are in accordance with Presidential direction to terminate the Small ICBM program.

b. (U) Quantity --

Development (RDT&E)	0	N/A	0
Procurement	623	608	N/A
Total	623	608	0

Excludes 22 RDT&E quantities in the Development Estimate and 16 in the Current Estimate which are not fully configured end items.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
Secretary of Defense Memorandum, 1 November 1983, and National Security Decision Directive, 10 July 1985.

(U) Approved Program:
DAE Approved Acquisition Program Baseline, dated 8 March 1991.

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3675.1	7434.2	3675.1
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

In accordance with section 2433, Title 10 USC, unit cost shall not apply, since the President's Budget does not contain funding for any fully configured end items.

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	11649.8	30677.5	2400.6	44727.9
Previous Changes:				
Economic	+113.0	+249.6	+7.3	+369.9
Quantity	+457.9	-12604.8	-	-12146.9
Schedule	-	-	-	-
Engineering	+250.0	-	-	+250.0
Estimating	+45.7	-14.6	-	+31.1
Other	-5082.2	-	-2407.9	-7490.1
Support	-	-18307.7	-	-18307.7
Subtotal	-4215.6	-30677.5	-2400.6	-37293.7
Current Changes:				
Economic	-90.3	-	-	-90.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-3668.8	-	-	-3668.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-3759.1	-	-	-3759.1
Total Changes	-7974.7	-30677.5	-2400.6	-41052.8
Current Estimate	3675.1	-	-	3675.1

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	9776.6	22207.2	1727.2	33711.0
Previous Changes:				
Quantity	+300.0	-9044.4	-	-8744.4
Schedule	-	-	-	-
Engineering	+175.1	-	-	+175.1
Estimating	+9.6	+5.9	-	+15.5
Other	-4477.6	-5.9	-1727.2	-6210.7
Support	-	-13162.8	-	-13162.8
Subtotal	-3992.9	-22207.2	-1727.2	-27927.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-2522.3	-	-	-2522.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-2522.3	-	-	-2522.3
Total Changes	-6515.2	-22207.2	-1727.2	-30449.6
Current Estimate	3261.4	0.0	-	3261.4

b. (U) Previous Change Explanations --

RDT&E

Economic: -- Revised Economic Escalation Indices

Quantity: -- Addition of 6 RDT&E units resulting from restart of program in Jul 89

Engineering: -- Funds added as a planning wedge for possible changes identified through accomplishment of studies recommended by the Drell Commission.

Estimating: -- Adjustment for Current and Prior Year Escalation
-- Withdrawal of 1989 and 1990 Budget Authority
-- Non-programmatic cuts taken in the FY 92-97 FYDP
-- Program funds added in FY 98 to adjust for FY

13b. (U) Cost Variance Analysis (Cont'd):

92-97 FYDP cuts
-- Adjustment to correct Base Year content of Dec 89 SAR

Other:
-- Deletion of 19 Flight Test Units due to program partial termination in Apr 88 and Congressional recision action in FY 87 funding line
-- Amended FY 90/91 President's Budget with remaining missile and basing development leading toward a 1997 IOC
-- Correction for miscategorization of addition of 7 flight test units due to Amended FY90/91 Presidents Budget in May 89 for continuance of the program

PROCUREMENT

Economic:
-- Revised Economic Escalation Indices

Quantity:
-- Deletion of 623 Missiles due to program partial termination in Apr 88

Estimating:
-- Advanced procurement funds
-- Deletion of advanced procurement funds in FY 92-97 FYDP

Other:
-- Adjustment to correct Base Year content of 30 June 89 SAR

Support:
-- Deletion of support requirement associated with 623 missiles

MILCON

Economic:
-- Revised Economic Escalation Indices

Other:
-- Program reduction caused by replanned FY89 and beyond President's Budget

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Economic Escalation Indices (Economic)		-90.3
Adjustment for Current And Prior Year Escalation (Estimating)	11.7	14.8
Deletion of RDT&E funds in FY 92-97 FYDP resulting from program termination (Estimating)	-2534.0	-3683.6
Total Changes	-2522.3	-3759.1

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Total Changes	--	--
(3) MILCON		
Total Changes	--	--

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
71.794	--	--	--	--	--	--	--	--	N/A

In accordance with section 2433, Title 10 USC, unit cost reporting shall not apply, since the President's Budget does not contain funding for any fully configured end items.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E —

(U) G&C Integration (FSD):	Initial Contract Price Target	Ceiling	Qty
Rockwell International, Anaheim, CA F04704-87-C-0077, FPIF/AF Award: October 5, 1987 Definitized: November 30, 1987	$501.1	$529.2	N/A

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$191.4	$198.3	3	$191.1	$191.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-0.1	$-0.1
Cumulative Variances To Date (10/31/91)	$-0.4	$-2.3
Net Change	$-0.3	$-2.2

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change:

Cost variance change ($-0.3M) is due to unplanned test bed radiation tests, additional material required to support evaluation of the analog/digital switch design and additional manpower applied to complete digital Application Specific Integrated Circuits (ASIC). Schedule variance change ($-2.2M) is due to late billing receipt for guidance and control assembly test support equipment, slip in completion of the electronic computer assembly ASIC design effort and slip in completion of battery studies. The changes in the current contract target and ceiling prices and both estimated prices at completion are due to negotiated contract changes to support the second flight test, FTM-2A and provide an electronic computer assembly test bed. No program impact. This contract is 98% complete.

The new CPAF contract, F04704-C-91-0054 was terminated on 31 Jan 92 in accordance with Presidential direction to terminate the Small ICBM program.

(U) Stage II:	Initial Contract Price		
	Target	Ceiling	Qty
Aerojet, Sacramento, CA F04704-87-C-0050, FPIF/AF Award: December 23, 1986 Definitized: December 23, 1986	$186.4	$201.2	N/A

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$365.9	$390.1	16	$370.8	$370.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-7.3	$-4.4
Cumulative Variances To Date (10/31/91)	$-6.0	$-3.5
Net Change	$1.3	$0.9

Explanation of Change:

The favorable cost variance change ($1.3M) is primarily due to Aerojet's inability to hire manufacturing engineers (ME's) early in the program and tooling modifications accomplished in-house versus an outside vendor. The schedule variance change ($0.9M) is primarily due to the completion of the nozzle failure analysis and FTM-2 redesign efforts. Currently a significant contributor to the schedule variance is the lag in tooling design and fabrication caused by the lack of ME's early in the program. ME's are on board now and

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) full schedule recovery is expected in Mar 92. The changes in current contract and target prices are due to negotiated contract changes for special tooling. The increases in both estimated prices at completion are due to additional effort required to support the final preliminary design review as well as negotiated contract changes. No program impact.

This contract was terminated on 31 Jan 92 in accordance with Presidential direction to terminate the Small ICBM Program. The amount to be terminated will be $163M.

(U) Stage III:
Hercules, Inc, Magna, UT
F04704-87-C-0051, FPIF/AF
Award: December 23, 1986
Definitized: December 23, 1986

Initial Contract Price		
Target	Ceiling	Qty
$173.3	$189.1	N/A

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$252.7	$268.5	16	$251.5	$251.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-1.8	$-1.4
Cumulative Variances To Date (10/31/91)	$-2.0	$-1.9
Net Change	$-0.2	$-0.5

Explanation of Change:

The cost variance change ($-0.2M) is due to changes in the baseline due to a contract adjustment to adhere to Cost Accounting Standards (CAS). The schedule variance change ($-0.5M) is due to delays in nozzle testing and test hardware delivery by a subcontractor and in-house tooling design and fabrication. The increases in current contract target and ceiling prices and both estimated prices at completion are due to negotiated contract changes for a replacement flight test motor and thrust vector actuator system for a development test. No program impact.

This contract was terminated on 31 Jan 92 in accordance with Presidential direction to terminate the Small ICBM Program. The amount to be terminated will be $106.75M

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) Assembly & Test:	Initial Contract Price Target	Ceiling	Qty
Martin Marietta Corp, Denver, CO F04704-85-C-0039, FPIF/AF Award: June 26, 1985 Definitized: June 26, 1985	$333.5	$376.0	N/A

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$441.4	$447.0	3	$441.8	$441.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-0.8	$-0.8
Cumulative Variances To Date (10/31/91)	$-5.9	$0.5
Net Change	$-5.1	$1.3

Explanation of Change:

The positive schedule variance change ($1.3M) is due to completion of a number of residual tasks. The cost variance change ($-5.1M) is primarily due to final contract negotiations and proposal preparation for the Engineering and Manufacturing Development contract. The changes in current contract target price and ceiling price are due to negotiated contract changes. No program impact. This contract is 95% complete.

The new CPAF contract, F04704-91-C-0047 was terminated on 31 Jan 92 in accordance with Presidential direction to terminate the program.

(U) Stage I:	Initial Contract Price Target	Ceiling	Qty
Thiokol Corporation, Brigham City, UT F04704-91-C-0015, CPAF Award: April 15, 1991 Definitized: December 13, 1991	$106.6	N/A	14

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$106.5	N/A	14	$106.5	$106.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (10/31/91)	$0.4	$-0.7
Net Change	$0.4	$-0.7

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change:

The cost variance ($0.4M) is the result of lower than anticipated manning levels. The schedule variance ($-0.7M) is caused by delays in the case tooling fabrication pending resolution of the case redesign evaluation. No program impact.

This contract was terminated on 31 Jan 92 in accordance with Presidential direction to terminate the Small ICBM Program. The amount to be terminated will be $71M.

This is the first report of the new CPAF contract, F04704-91-C-0015 in the SAR. It replaces the previous Stage I contract, F04704-87-C-0052 which was completed in Apr 91.

(U) Hard Mobile Basing:
Boeing Company, Seattle, WA
F04704-91-C-0017, CPAF
Award: April 15, 1991
Definitized: N/A

Initial Contract Price		
Target	Ceiling	Qty
$14.1	N/A	N/A

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$14.1	N/A	0	N/A	N/A

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (09/23/91)	$-0.2	$-0.1
Net Change	$-0.2	$-0.1

Explanation of Change:

The cost and schedule variances were nominal, with no reported cost areas breaking any contractual thresholds.

This letter contract was awarded in Apr 91. This cost type contract was not negotiated and was terminated on 11 Oct 91 in accordance with Presidential direction to terminate mobile basing activities. The last CPR was received on 23 Sep 91.

This is the first report of the new CPAF contract F04704-91-C-0017. It replaces the previous Hard Mobile Basing contract, F04704-87-C-0054 which is 95% complete.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 100.0% (9 yrs/9 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($3675.1 / $3675.1)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY84-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	3510.5	164.6	-	-	3675.1
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3510.5	164.6	-	-	3675.1

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1984				321.9	328.3	327.8	324.2	3.8
1985				434.6	458.5	458.2	456.8	3.4
1986				538.1	581.2	577.8	572.6	2.8
1987				734.2	820.1	819.4	811.0	2.7
1988				606.1	700.0	696.7	686.2	2.9

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1989				273.4	328.9	325.9	297.4	4.3
1990				70.6	87.8	87.7	70.3	4.0
1991				159.1	205.7	196.1	111.2	3.9
1992				123.4	164.6	99.5	10.8	3.1
Subtot				3261.4	3675.1	3589.1	3340.5	
Grand Total				3261.4	3675.1	3589.1	3340.5	

Obligations and Expenditures reflect program office records as of 24 Jan 92.

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates -- None.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	3261.4	N/A	
(TY $)	N/A	N/A	3675.1	N/A	
PAUC Cost (BY $)	N/A	N/A	N/A	N/A	N/A
(TY $)	N/A	N/A	N/A	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	16/16
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) **Operating and Support Costs:**

a. (U) Assumptions and Ground Rules --

None.

The Small ICBM program was terminated as a result of the President's State of the Union Address and therefore will not go into production.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- None.

AF-24 TITAN IV

91-014

~~UNCLASSIFIED~~ ~~UNCLASSIFIED~~

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: TITAN IV (CELV)

AS OF DATE: December 31, 1991

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1. Designation and Nomenclature (Popular Name):
Titan IV, formerly CELV, now Expendable Launch Vehicle (ELV)

2. DoD Component: USAF

3. Responsible Office and Telephone Number:
Titan IV (CELV)
Space Systems Division
PO BOX 92960
Los Angeles AFB, CA 90009-2960

Col Charles F. Stirling
Assigned: October 3, 1989
AV 833-0210 COMM (310) 363-0210

4. Program Elements/Procurement Line Items:

RDT&E:
PE 0305171F (Shared), 0304111F (Shared), 0305144F, 0305119F (Shared)
PROCUREMENT:
APPN 3020 ICN MSBSTR (Air Force) (Shared)
APPN 3020 ICN MS0299 (Air Force)
APPN 3080 ICN 834600 (Air Force)
MILCON:
PE 0305119F

CLEARED
MAR 5 1992

5. Related Programs:
Defense Support Program (DSP); Milstar; Defense Satellite Communication System (DSCS); Space Shuttle Operations-Inertial Upper Stage (IUS); Classified Payloads

SAF/PAS
92-278 -T

~~UNCLASSIFIED~~ ~~UNCLASSIFIED~~

6. Mission and Description:
The Titan IV program will not replace any defense programs. It will assure continued access to space for the nation's highest priority space systems. The Titan IV system evolved from the basic family of Titan systems, namely the Titan IIIB, C, D, E, and 34D, which have contributed to national space objectives for more than 25 years. The Titan IV consists of a liquid propellant core of two stages with a pair of large solid rocket motors (SRM) attached to the core to provide the initial stage of boost from liftoff. The development of a new solid rocket motor upgrade (SRMU) will provide increased reliability, producibility, and performance. While a variety of upper stages may be compatible with the booster, the two upper stages baselined for use on the Titan IV are the Inertial Upper Stage (IUS) and the Titan/Centaur. When configured with the Centaur, a single stage liquid propellant restartable upper stage, the Titan IV/Centaur is capable of placing a 10,000-pound payload into Geosynchronous Earth Orbit (GEO). The Titan IV/IUS configuration is capable of placing a 5,200-pound payload into GEO. When configured without an upper stage (NUS), the Titan IV/NUS can place a 31,000-pound payload into a 100-nmi circular, polar orbit. The Titan IV was designated a DAB program in July 1991.

7. Program Highlights:
a. Significant Historical Developments --
Development of the Titan IV program is in direct response to a National Security Decision Directive which directed the DOD to provide assured access to space for critical DOD satellites. The initial contract for development, qualification, and production of 10 Titan IVs with Centaur upper stages was awarded in February 1985. This contract included the activation and operation of a single Titan IV/Centaur launch facility at Cape Canaveral AFS, FL (CCAFS). The program has since completed Preliminary Design Reviews for all major subsystems including the new SRMU. The first Titan IV was launched in June 1989 and successfully placed a payload into space. The Titan IV system has not undergone any IOT&E.

As a result of the 28 January 1986 Space Shuttle Challenger accident, the DOD embarked on a recovery plan which included the acquisition of 13 additional Titan IV boosters, activation and operation of an existing Titan launch pad at Vandenberg AFB, CA (VAFB), the design and development of a new Titan IV/Centaur launch pad at VAFB and STS/Titan IV dual compatibility for some AF satellites launched from the east coast. The resulting 23-vehicle Titan IV program was placed on contract in December 1987, and was structured to account for the impacts of the April 1986 Titan 34D accident and the June 1986 NASA/Centaur cancellation.

The DOD later embarked on an increased capacity plan which included the modification of an additional launch pad at CCAFS, the

7a. Program Highlights (Cont'd):

acquisition of 18 additional Titan IV boosters and associated facility and plant enhancements. The current 41-vehicle program was definitized in December 1989.

During 1990, launches were conducted on 8 June and 12 November which successfully placed satellites into orbit. Initial Launch Capability (ILC) for the first VAFB launch facility was achieved on 25 October 1990. The first Centaur upper stage was shipped to the Cape Canaveral launch facility for launch processing on 17 December 1990.

In March 1991, a fourth successful launch was achieved, the first from VAFB. We also received program management direction that deleted the requirement to activate SLC-6 as a Titan IV launch pad. On April 1, 1991, an explosion occurred during the static firing test of the SRMU Preliminary Qualification Motor No. 1 (PQM-1). This test accident caused significant damage to the test facility and required a modification of the SRMU propellant grain configuration. PQM-1' is a planned retest in Spring 1992 followed by four qualification motor firings through Summer 1993. SRMU ILC has now been delayed from April 1992 to August 1993.

b. Significant Developments Since Last Report --
The Launch Complex 40 (LC-40) change order was definitized in November 1991. LC-40 will provide a second Titan IV launch pad at Cape Canaveral. On September 11, 1991, Martin Marietta was authorized to start production slowdown in order to match reduced launch rate requirements. Contract negotiations are currently underway and contract definitization is anticipated in March 1992. The Solid Motor Assembly and Readiness Facility (SMARF) at Cape Canaveral was turned over to the Air Force on October 31, 1991 under budget and ahead of schedule. On November 8, 1991, a fifth Titan IV was successfully launched, the second from VAFB.

The Titan IV system continues to satisfy mission requirements.

c. Changes Since As Of Date -- None.

8. Threshold Breaches:
The Titan IV program is experiencing seven breaches of the 4 Jan 1991 Acquisition Program Baseline (APB) -- three schedule milestone slips of 6 months or more, two performance threshold breaches, and two cost breaches. The breaches involve schedule delays in the Titan IV/Centaur ILC, SRMU Static Firing, and the SRMU ILC milestones. Current SRM and SRMU performance projections for Titan IV/NUS Low Earth Polar Orbit missions are causing the performance threshold breaches. The cost breaches are due to current estimates for development and procurement exceeding the 15 and 5 percent cost

8. Threshold Breaches (Cont'd):

thresholds, respectively. A program deviation report and revised APB has been submitted as required.

Additionally, the costs of extending the program by four years to FY 2004 resulted in a Nunn-McCurdy breach of 23.65%.

9. Schedule:

a. Milestones --		Development Estimate	Approved Program	Current Estimate
Initial Contract Award		FEB 85	FEB 85	FEB 85
Production Start		OCT 85	N/A	OCT 85
System Preliminary Design Review		APR 86	N/A	APR 86
Critical Design Review		NOV 86	NOV 86	OCT 86
Addition of 13 Vehicles		N/A	DEC 87	DEC 87
First Core Delivery to CCAFS		N/A	JAN 88	JAN 88
First Delivery to CCAFS		FEB 88	N/A	APR 88
Initial Launch Capability (ILC)				
Titan IV/IUS		OCT 88	FEB 89	FEB 89
Titan IV/NUS (WTR)		N/A	OCT 90	OCT 90
Titan IV/Centaur		N/A	JUN 91	FEB 92(Ch-1)
SLC-40		N/A	SEP 92	JUL 92
SLC-7 (2nd West Coast Pad)		N/A	JUN 96	N/A
Centaur Structural Test	1/	N/A	JUL 89	APR 91
SRMU Static Firing (PQM-1)		N/A	FEB 91	MAY 92(Ch-2)
SRMU ILC		N/A	APR 92	AUG 93(Ch-3)

1/ The initial Centaur Structural Test was completed in Nov 89. Additional tests derived from that program are scheduled to be completed by Apr 91.

b. Previous Change Explanations --

Due to favorable progress driven by the Preliminary Design Review, the Systems Critical Design Review was held one month ahead of schedule. Progress made by the core contractor allowed delivery of the first core to CCAFS ahead of schedule. However, delays in deliveries of the payload fairing and solid rocket motors caused a delay in delivery of the final vehicle components from February to April 1988. The delay in the Titan IV/NUS ILC at VAFB to December 90 was caused by the requirement for additional electrical mods to the Mobile Service Tower (MST) and the need to complete ground system tests. The Titan IV/NUS WTR ILC was subsequently achieved three months early in October 1990. The delayed launch of the first Titan IV caused a slip in the TIV/Centaur ILC due to derived scheduling conflicts. The requirement for a second west coast launch pad

9b. Schedule (Cont'd):
(SLC-6) was deleted. Previous LC-40 ILC of fourth quarter FY92 was further refined to reflect a July 1992 ILC. The initial Centaur structural test (Jul 89) was completed in November 1989. Additional Centaur structural tests were completed in April 1991. The Centaur ILC slipped from June 1991 to August 1991 due to a launch delay of Titan IV-6. This delay impacted facility modifications necessary for Centaur. Centaur ILC slipped again from August 1991 to November 1991 due to Centaur separation ring redesign and test in preparation for the ILC and failure of Atlas Centaur during May 1991 launch. The crane accident in September 1990 at Edwards AFB damaged the test stand, delaying the PQM-1 test until April 1991, and delayed the SRMU ILC to May 1992. The SRMU static firing (PQM-1') slipped from February 1991 to April 1992 because of the SRMU PQM-1 test explosion occurring on 1 April 1991. The PQM-1 test failure also delayed the SRMU ILC from May 1992 to August 1993.

c. Current Change Explanations --

(Ch-1) The Centaur ILC slipped from November 1991 to February 1992 due to additional inspections for contaminations resulting from the Commercial Atlas/Centaur (AC-70) failure.

(Ch-2) The SRMU static firing (PQM-1') will slip from April 1992 to May 1992 due to production schedule delays for the test 'aft skirt' which is the attachment between the SRMU and the test stand.

(Ch-3) The SRMU ILC slipped from May 1992 to August 1993 due to the PQM-1 test failure. This was reported in the June 91 SAR.

d. References --

Development Estimate:
FY87 President's Budget, February 1986.

Approved Program:
DAE Approved Acquisition Program Baseline dated 04 January 1991.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
System Reliability (%)	98	98 / 96	100	96
Payload to Geosynchronous Orbit (k-lbs) (Titan IV/Centaur)				

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
SRM	10.0	10.0	/ 10.0	10.2	10.2	(CH-1)
SRMU	N/A	11.5	/ 11.5	11.5	11.5	
Payload to Geosynchronous Orbit (K-lbs) (Titan IV/IUS)						
SRM	N/A	5.0	/ 5.0	5.2	5.2	
Payload to Low Earth Polar Orbit (k-lbs) (Titan IV/NUS)						
SRM	N/A	32.0	/ 32.0	31.4	31.4	(CH-2)
SRMU	N/A	40.0	/ 40.0	38.8	38.8	

Note: Centaur structural limit is 11.5 K-lbs. Payload to GEO for TIV Centaur/SRMU could be increased with structural modifications to the Centaur. No current direction or funding exists to modify the Centaur for increased capability. Demonstrated performance is based on test and analysis data.

b. Previous Change Explanations --

Performance Objectives/Thresholds for payload to low earth polar (Titan IV/NUS) are being updated in the APB (31.1 for SRM and 38.8 for SRMU) to reflect requirements in the 2 Apr 91 System Operational Requirements Document.

c. Current Change Explanations --

(Ch-1) Current estimate for the Titan IV/Centaur/SRM has increased from 10.0 to 10.2 due to updated engineering analysis.

(Ch-2) Current estimate for Titan IV/NUS/SRM was revised from 31.1 to 31.4 due to updated engineering analysis. Operating Command SORD requires 31.1K.

d. References --

Development Estimate:
FY87 President's Budget, February 1986.

Approved Program:
DAE Approved Acquisition Program Baseline dated 04 January 1991.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	579.7	1813.5	2541.4
Procurement	1570.8	7523.3	13183.4
Flyaway	(1106.6)		(10047.1)
Total Flyaway	(1106.6)		(10047.1)
Other Wpn Sys	(464.2)		(3136.3)
Total Other Wpn Sys	(464.2)		(3136.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	105.3	97.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 85 Base-Year $	2150.5	9442.1	15821.8
Escalation	378.7	2166.2	6852.2
Development (RDT&E)	(61.4)	(285.6)	(748.5)
Procurement	(317.3)	(1854.9)	(6074.3)
Construction (MILCON)	(0.0)	(25.7)	(29.4)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2529.2	11608.3	22674.0
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	10	55	65
Total	10	55	65

In addition to the 65 vehicles reported in the SAR, NASA is procuring 7 vehicles to bring the program total to 72. All vehicles will be procured by 2003 instead of 2000 as reported in the previous SAR. In addition, all vehicles will be launched by 2004; this will require an additional 4 years of program infrastructure relative to the previous SAR.

c. Foreign Military Sales -- None.

d. Nuclear Costs --
None.

e. References --

Development Estimate:
FY87 President's Budget, February 1986.

Approved Program:
DAE Approved Acquisition Program Baseline dated 04 January 1991.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	22674.0	18337.5	22674.0
(2) Quantity	65	65	65
(3) Unit Cost	348.83	282.12	348.83
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	820.1	820.1	1082.4
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	820.1	820.1	1082.4
(2) Quantity	6	6	6
(3) Unit Cost	136.68	136.68	180.40

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
c. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (BY85$)	15821.8	13102.6	15821.8
(2) Unit Cost	243.41	201.58	243.41
d. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (BY85$)	605.7	605.7	774.2
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	605.7	605.7	774.2
(2) Unit Cost	100.95	100.95	129.03

e. Changes from the Baseline Report - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	66.716	23.65
(2) CPUC (TY$)	0.000	N/A
(3) PAUC Quantity	0	N/A
(4) PAUC (BY85$)	41.834	20.75
(5) CPUC (BY85$)	0.000	N/A

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

f. Changes from the Previous SAR - (JUN 91 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	65.9	23.29
(2) CPUC (TY$)	-32.7	-19.31
(3) PAUC Quantity	N/A	N/A
(4) PAUC (BY85$)	41.1	20.32
(5) CPUC (BY85$)	-21.4	-17.49

g. Initial SAR (DEC 85)
(1) Program Acquisition Cost (TY$) -- 2529.2
(2) Program Acquisition Cost (BY$) -- 2150.5

h. Unit Cost Changes.

(1) PAUC --

The PAUC is driven by a 4 year program extension to support a reduced launch rate. Reduced launch rate also drives the requirement for vehicle and subsystem storage. The storage requirement is new to the program. Production slowdown for the current contract and planned future buys also drives an increase to unit costs.

(2) CPUC -- None.

i. Impact of Performance or Schedule Changes on Unit Cost.

While no single program milestone slip has affected the PAUC, the overall slowdown/stretchout of the program has increased the PAUC (see schedule change). The cost impact of the SRMU recovery plan, which is currently being staffed, remains to be determined.

j. Program Management and Control.

Col Charles F. Stirling

k. Cost Control Actions.

No special actions will be implemented as a result of this breach. However, we continue to use the following methods to control costs:

(1) The January 91 Single Best Estimate (SBE) adjusted for content changes in the FY92 President's Budget and reflected in the Dec 90 SAR continues as the basis for the financial baseline from which to manage the program.

(2) Enhanced oversight and scrutiny utilizing C/SCSC tools will

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):
continue to maintain cost control. Planning is currently underway to implement these enhancements in both the current contract and planned 42+ procurement.

(3) Emphasis on baseline management will continue.

(4) The contractor has implemented a cost reduction plan consisting of 13 initiatives, identifying $53.2 million in cost reductions. Continual cost reduction efforts will be implemented over the life of the program.

(5) Current estimating methodologies in the SEE and the overall program estimate are in the process of being validated by an Independent Cost Estimate (ICE). Both the ICE and Program Office Estimate will be evaluated as part of a DAB review for the total program scheduled in July 1992.

1. Contract Information (In Millions of Then-Year Dollars) --

(1) Contractor(s): Martin Marietta
(2) Contract Title: Titan IV
(3) Contract Number:F04701-85-C-0019
(4) Actual Cost of Work Performed (ACWP) to date: 5506.0
(5) Percent contract completed (BCWP/target cost): 61.78
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of 12/31/90	$-301.3/-8.04%	$-185.7/-4.72%
Previous SAR	$-348.9/-7.98%	$-124.1/-2.76%
Current values	$-414.9/-8.15%	$-206.4/-3.90%
Change from the baseline SAR	$-113.6/-0.11%	$-20.7/+0.82%
Change from the previous SAR	$-66.0/-0.17%	$-82.3/-1.14%

(7) Explanation of Variances. -

The unfavorable cost variance is due to engineering changes, new and reworked tooling requirements, additional design and test complexities, design and qualification problems at Hercules Aerospace Corporation, increased manpower in support of facility activation by VAFB operations, and increased manpower to support test facilities at Chemical Systems Division. The negative schedule variance is due to late deliveries of subcontract components at Chemical Systems Division, part shortages at General Dynamics, and qualification testing delays at Hercules Aerospace Company.

Note: Contract F04701-85-C-0019 is categorized as FPIF/CPFF/CPAF/AF/CS/CR/MSI/FFP and includes RDT&E, Procurement and O&M.

12. **Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):**

(8) Impact of Variances on Contract. - None.

(9) Impact of Variances on Unit Costs. - None.

m. Contracts Exceeding Contract Cost Baseline Thresholds. -- None.

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	641.1	1888.1	0.0	2529.2
Previous Changes:				
Economic	+19.6	+580.4	+7.8	+607.8
Quantity	-	+8995.6	-	+8995.6
Schedule	-	+638.8	+5.0	+643.8
Engineering	+308.4	-2283.4	-	-1975.0
Estimating	+1087.0	+3753.7	+141.7	+4982.4
Other	-	-	-	-
Support	+597.6	+2012.1	-	+2609.7
Subtotal	+2012.6	+13697.2	+154.5	+15864.3
Current Changes:				
Economic	-28.3	-346.2	-0.6	-375.1
Quantity	-	-	-	-
Schedule	+150.8	+979.5	-	+1130.3
Engineering	+367.0	-	-	+367.0
Estimating	+146.7	+1194.8	-27.5	+1314.0
Other	-	-	-	-
Support	-	+1844.3	-	+1844.3
Subtotal	+636.2	+3672.4	-28.1	+4280.5
Total Changes	+2648.8	+17369.6	+126.4	+20144.8
Current Estimate	3289.9	19257.7	126.4	22674.0

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	579.7	1570.8	0.0	2150.5
Previous Changes:				
Quantity	-	+6465.0	-	+6465.0
Schedule	-	-	-	-
Engineering	+262.8	-1595.1	-	-1332.3
Estimating	+813.4	+2785.1	+118.6	+3717.1
Other	-	-	-	-
Support	+480.4	+1669.4	-	+2149.8
Subtotal	+1556.6	+9324.4	+118.6	+10999.6
Current Changes:				
Quantity	-	-	-	-
Schedule	+85.0	+521.8	-	+606.8
Engineering	+236.3	-	-	+236.3
Estimating	+83.8	+763.7	-21.6	+825.9
Other	-	-	-	-
Support	-	+1002.7	-	+1002.7
Subtotal	+405.1	+2288.2	-21.6	+2671.7
Total Changes	+1961.7	+11612.6	+97.0	+13671.3
Current Estimate	2541.4	13183.4	97.0	15821.8

b. Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices.

Engineering: Design effort for satellite dual compatibility; Continued effort for a second west coast Titan IV launch pad development at VAFB, CA; SRMU development FY94-95.

Estimating: Recurring payload integration for additional payloads; Acceleration of compression of nonrecurring payload integration; Transfer to procurement of funds for previously designated shuttle missions; Transfer of outyear funds from procurement; Gramm/Rudman/Hollings reductions; Adjustment for outyear escalation; Lower Centaur

13b. Cost Variance Analysis (Cont'd):

unit price as a result of negotiations; Funding for Centaur development and projected contractor overrun, additional FCRC support for increased program scope, facility design support for the Solid Motor Assembly and Readiness Facility (SMARF) and Centaur Processing Facility (CPF); Vehicle configuration design changes; Payload integration of missions due to increased program scope for FY96-97; Single Best Estimate (SBE) update for SRMU development amortization; reduced outyear mission model requirements (from 75 to 65 vehicles); extended program three years thru 2000; addition of M Account funds to offset prior year overrun; prior year adjustment in user funding; deletion of SLC-6 development; negotiated cost adjustment for LC-40 and CPF.

Support: Additional support equipment for accelerated activation at the CCAFS, FL, launch site; Facility design for the new Centaur Processing Facility and upgrades to the SRM testing facility at CCAFS, FL; Design of modernized AGE at CCAFS, FL to support increased program scope and duration; Second west coast launch pad modification to change from shuttle to Titan IV capability at VAFB, CA. Partial funding for LC-40 facility upgrade to protect Mars Observer mission schedule.

PROCUREMENT

Economic: Revised economic escalation indices.

Quantity: Additional hardware costs (from 10 to 75 vehicles); Reduced vehicle quantity (from 75 to 65).

Schedule: Change due to rephasing of production build schedule; Accelerated buy of original 23 vehicles.

Engineering: Additional hardware to accommodate satellite dual compatibility and mission requirements precluding Centaur upper stages; Initial hardware for an upgraded solid rocket motor; Mission requirements preclude the need to procure Centaur upper stages for eleven Titan IVs; Tooling to support an increased production rate at contractor's facility.

Estimating: Recategorization of Flyaway/Support cost reported in December 1985 SAR, procurement of additional tooling; Transfer from RDT&E of funds for previously designated shuttle missions; Transfer of outyear funds to RDT&E; Outyear Centaur procurement due to STS/Centaur cancellation; Deletion of classified user operation and maintenance funds; Gramm/Rudman/Hollings reductions; Funding

13b. Cost Variance Analysis (Cont'd):

reductions due to budget cycle reviews; Unit price benefits of increased quantity buy; Adjustment for current and prior year escalation changes and outyear escalation; Realignment of outyear funds to support programmatic changes; Increased government involvement in plant inspections; Additional tooling to support higher productivity capacity; Additional FCRC engineering support as a result of increased program scope; Procurement of an additional payload fairing to support satellite integration on Titan IV; Contractor launch incentives required through FY97 for additional vehicles; Propellant requirements through FY97 for additional vehicles; Payload integration of additional missions due to increased program scope; Decrease in unit price due to negotiation of the follow-on buy; Production hardware changes due to vehicle configuration changes; Revised user vehicle cost estimate; Revised propellant estimate; Revised contractor incentive plan; Multiyear rephase funding adjustment; Incremental funding adjustment for users; Communication equipment for second west coast pad at VAFB, CA; Addition of M Account funds to offset prior year overrun; Prior year adjustment in user fund allocation.

Support: Accelerated procurement of support equipment at the CCAFS, FL, launch site and recategorization of Flyaway/Support costs reported in December 1985 SAR; Initial AGE and communication equipment requirements to support increased launch requirements at CCAFS, FL and VAFB, CA; AGE requirements for second west coast launch pad at VAFB, CA; AGE requirements at CCAFS, FL to support increased program scope and duration (includes new SMARF). Additional AGE for LC-40 and the Centaur Processing Facility; Deletion of SLC-6 AGE and communication equipment; Transfer of launch processing costs from the Operations and Maintenance to the Procurement appropriation.

MILCON

Economic: Revised economic inflation indices.

Schedule: Change due to rephasing of build schedule.

Estimating: Adjustment for outyear escalation; Realignment of the second Titan IV launch pad costs into outyears; Funds added for SMARF and the Centaur Processing Facility at CCAFS, FL; Realignment of construction costs for the SMARF and Centaur Processing Facility

13b. Cost Variance Analysis (Cont'd):
at CCAFS, FL; Adjustment for current and prior year escalation offset; Refined costs for Centaur Processing Facility based on contractor proposal. Reduction in SLC-6 facility costs related to deletion of AGE and communication equipment requirements.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices (Economic)	N/A	-28.3
Adjustment for current and prior year escalation offset (Estimating)	6.9	8.3
Impact on integration costs due to program stretch-out from FY00 to FY04 (Schedule)	85.0	150.8
Impact to integration (FY00 and prior), hardware storage and SRMU costs due to program stretch-out (Estimating)	67.1	122.5
Refinement of estimate for CPF AGE and SLC-4E modification costs (Estimating)	9.8	15.9
Engineering required for planned P3I and range safety design modifications, FY96-02 (Engineering)	236.3	367.0
Total Changes	405.1	636.2

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Correction to Dec 90 SAR entry; adjustment for current and prior year offset (Estimating)	8.0	9.0
Correction to Dec 90 SAR entry; adjustment for current and prior year offset (Support)	-8.0	-9.0
Recategorization of Jun 91 SAR cost change from estimating to support. (Estimating)	-3.3	-101.6
Recategorization of Jun 91 cost change from estimating to support (Support)	3.3	101.6
Revised economic escalation indices (Economic)	N/A	-346.2
Adjustment for current and prior year escalation offset (Estimating)	36.4	47.7
Adjustments to vehicle launch requirements to comply with Oct 91 SLAG; four more years of launches; same quantity (Schedule)	334.6	671.1
Impact to average unit cost due to slowed down production schedule (Schedule)	187.2	308.4
Additional cost impact of stretched program on incentives, propellants, manifest planning, and integration (Estimating)	467.2	830.8
Impact to production costs on the Titan IV contract due to program stretch-out (Estimating)	313.2	458.4
Adjustment to prior year funding to reflect actuals (Estimating)	-57.8	-49.5
Updated estimate to reflect four additional years of launch ops and	787.0	1364.0

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
impacts to other support requirements (Support)		
Additional technical support for SRMU production (Support)	208.9	372.8
Adjustment for current and prior year escalation offset (Support)	11.5	14.9
Total Changes	2288.2	3672.4
(3) MILCON		
Revised economic escalation indices (Economic)	N/A	-0.6
Adjustment for current and prior year escalation offset (Estimating)	-0.5	-0.6
Reduction in SMARF funding due to contract underrun (Estimating)	-21.1	-26.9
Total Changes	-21.6	-28.1

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
252.92	3.58	-75.62	27.29	-24.74	96.87	--	68.52	95.90	348.83

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

Titan IV:	Initial Contract Price Target	Ceiling	Qty
Martin Marietta, Denver, CO F04701-85-C-0019, FPIF Award: February 28, 1985 Definitized: March 1, 1985	$2095.8	$2287.8	10

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$9093.7	$9747.1	41	$9602.1	$9703.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-348.9	$-124.1
Cumulative Variances To Date (12/31/91)	$-414.9	$-206.4
Net Change	$-66.0	$-82.3

Explanation of Change:

Explanation of change in target and ceiling prices: The following Titan Program effort was added to the -0019 contract since the previous report: Titan IV Production Restructure, Unified Payload Integration, Solid Rocket Motor (SRM) Production Slowdown, Long Lead for three additional SRMs, Restoration of Phillips Lab, SRM/Solid Rocket Motor Upgrade (SRMU) Follow-on buy and engineering change activities.

Explanation of current changes: The increase in cost variance is due to a forward pricing rate impact experienced by the contractor and an increase of the subcontractor's estimate at completion. The schedule variance increase is attributed to the PQM-1 test failure.

Explanation of cumulative changes: The unfavorable Cost Variance is due to engineering changes, new and reworked tooling requirements, additional design and test complexities, design and qualification problems at Hercules Aerospace Corporation, increased manpower in support of facility activation by VAFB operations, and increased manpower to support test facilities at Chemical Systems Division. There is a potential requirement for increased budget in the outyears due to unfavorable contractor cost variance and SRMU test delays. The negative schedule variance is due to late deliveries of subcontract components at Chemical Systems Division, part shortages at General Dynamics, and qualification testing delays at Hercules Aerospace Company.

Impact Statement: Current and prior year variances for RDT&E ($40M) as well as Procurement ($45M) contract line items (CLINs) will result in raising the CLIN billing prices above target as soon as funds are identified to cover the FY87-FY89 variances.

Notes: Contract F04701-85-C-0019 is categorized as FPIF/CPFF/CPAF/AF/CS/CR/MSI/FFP and includes RDT&E, Procurement, and O&M.

SLC-6 contract (F04703-90-C-0004) was terminated in April 1991.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 40.0% (8 yrs/20 yrs)

(2) Percent Program Cost Appropriated: 37.5% ($8497.2 / $22674.0)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY85-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2004)	Total
RDT&E	1708.2	141.5	142.8	1297.4	3289.9
Procurement	5734.0	820.1	1082.4	11621.2	19257.7
MILCON	69.4	24.0	33.0	-	126.4
O&M	-	-	-	-	-
Total	7511.6	985.6	1258.2	12918.6	22674.0

Note: RDT&E FY86, FY87, and FY88 amounts include the purchase of two RDT&E-funded Centaurs originally designed for the Shuttle RDT&E missions.

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1985				32.9	33.6	33.6	33.6	3.4
1986				247.3	258.4	258.4	258.4	2.8
1987				162.5	175.7	175.7	175.7	2.7

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1988				298.9	333.9	333.9	333.2	3.0
1989				339.9	395.3	395.3	393.8	4.2
1990				290.3	348.9	348.2	333.7	4.0
1991				129.9	162.4	146.4	84.9	3.9
1992				109.7	141.5	45.4	0.3	3.1
1993				107.2	142.8			3.3
1994				50.4	69.3			3.3
1995				66.9	95.0			3.3
1996				62.8	92.2			3.2
1997				156.6	236.9			3.2
1998				166.1	259.5			3.2
1999				89.4	144.1			3.2
2000				79.3	131.9			3.2
2001				63.3	108.7			3.2
2002				38.2	67.7			3.2
2003				30.4	55.5			3.2
2004				19.4	36.6			3.2
Subtot				2541.4	3289.9	1736.9	1613.6	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force								
1985		42.7	69.7	112.4	118.5	118.5	118.5	3.4
1986		36.9	385.4	471.6	519.7	519.7	519.7	2.8
1987	2	90.5	575.3	753.3	864.0	864.0	864.0	2.7
1988	6	193.0	639.8	948.3	1130.4	1130.4	1087.3	3.0
1989	5	215.4	494.2	880.7	1086.8	1086.8	759.4	4.2
1990	5	164.0	538.4	850.4	1082.6	1081.8	432.2	4.0
1991	5	233.1	330.3	710.9	932.0	900.3	165.4	3.9
1992	6	270.1	101.9	605.7	820.1	127.0		3.1
1993	6	341.4	209.6	774.2	1082.4			3.3
1994	6	387.3	232.6	823.7	1188.6			3.3
1995	2	307.4	293.4	774.6	1153.4			3.3
1996	2	237.1	249.8	665.8	1023.3			3.2
1997	3	248.5	362.5	782.1	1240.4			3.2
1998	3	237.8	582.8	1002.1	1640.4			3.2
1999	5	222.6	561.3	966.1	1631.8			3.2
2000	3	182.9	497.7	855.7	1491.4			3.2
2001	4	106.7	197.7	479.1	861.9			3.2
2002	1	90.9		265.6	493.0			3.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force (Cont'd)								
2003	1	62.9		237.4	454.8			3.2
2004		53.4		223.6	442.0			3.2
Subtot	65	3724.6	6322.4	13183.3	19257.5	5828.5	3946.5	
Appropriation: 3080 Other Procurement, Air Force								
1995		0.1		0.1	0.2			3.3
Subtot		0.1		0.1	0.2			
Appropriation: 3300 Military Construction, Air Force								
1990				46.4	59.4	43.2	33.0	4.0
1991				7.9	10.0			3.9
1992				18.3	24.0			3.1
1993				24.4	33.0			3.3
Subtot				97.0	126.4	43.2	33.0	
Grand Total	65	3724.7	6322.4	15821.8	22674.0	7608.6	5593.1	

Note: Obligation and expenditure information reflects official accounting records as of 31 Dec 91.

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1987	1	1	2	2
1988	3	3	6	6
1989	2	2	5	11
1990	2	2	5	11
1991	2	2	5	11
1992	0	0	6	11
1993	0	0	6	11
1994	0	0	6	2
1995	0	0	2	0
1996	0	0	2	0
1997	0	0	3	0
1998	0	0	3	0
1999	0	0	5	0
2000	0	0	3	0
2001	0	0	4	0
2002	0	0	1	0
2003	0	0	1	0

Note: Titan IV was designated a DAB program in July 1991. There has been no DAB Milestone III production decision. The information provided as the "Production Estimate" comes from the first SAR submitted after the program began production (31 Dec 85).

17b. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2150.5	+13671.3	15821.8	+3502.5	12319.3
(TY $)	2529.2	+20144.8	22674.0	+5433.0	17241.0
PAUC Cost (BY $)	215.050	28.362	243.412	+53.885	189.528
(TY $)	252.920	95.911	348.831	+83.585	265.246

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	FEB 85	0	FEB 85	N/A	FEB 85
Duration (in MON)	92	143	235	128	107
End Date(MON YY)	OCT 92	143	SEP 04	N/A	JAN 94

Cost Variance Note: Maximum Economic costs do not reflect the costs for any additional tooling or other potential nonrecurring costs. Costs shown here represent only a lower hardware unit cost resulting from an increased production rate.

Schedule Variance Note: Current program requirements do not reflect the need to increase production to the maximum rate.

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	16/16

e. Approved Design-to-Cost Objective -- N/A.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The costs for launch processing are based on actual contract values for the current Titan IV program and were transferred from operation and support costs to procurement costs in conjunction with the FY92/93 President's Budget. Thus, these costs are not included below. Range costs continue to be carried as operation and support costs. Range costs are based on current and historical data from the Titan IV and Titan 34D programs.

b. Costs -- (FY 1985 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Titan IV Launch	Avg Annual Cost Per Titan 34D Launch
Range Support	7.5	7.5
Total	7.5	7.5

c. Contractor Support Costs -- None.

Note: All costs described in Section 18.b. are "per launch" and not "average annual."

AF-14 JSTARS

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91-1065

SELECTED ACQUISITION REPORT (RCS:DD-COMP(O&A)823)
PROGRAM: Joint STARS

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
   Joint STARS

2. (U) **DoD Component:** USAF

3. (U) **Responsible Office and Telephone Number:**
   Joint STARS Program Office
   Electronic Systems Division
   Hanscom AFB, MA 01731-5000

   Col Harry H. Heimple
   Assigned: September 1, 1989
   AV 478-5725 COMM (617)377-5725

4. (U) **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 0603770F
   PE 0604270F (Shared) Project 3894 (Shared)
   PE 0604616F, 0604770D, 0604770F
   PROCUREMENT:
   APPN 3010 ICN 27581F (Air Force)

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FOR OPEN PUBLICATION
AS AMENDED
MAR 5 1992 10
DIRECTOR, DEPARTMENT OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

SAF/PAS

92-227 -T

~~Classified by: Joint STARS Classification Guide dated 31 Jul 87~~
~~Declassify on: OADR~~
~~Downgrade Instructions: Not Subject to Automatic Downgrade~~

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4. (U) Program Elements/Procurement Line Items (Cont'd):

MILCON:
PE 0604770F

5. (U) Related Programs:

Global Positioning System (GPS), Joint Tactical Information Distribution System (JTIDS), Single Channel Ground Air Radar System (SINCGARS), Inertial Navigation Unit (INU), HAVE QUICK, HAVE SYNC.

6. (U) Mission and Description:

The Joint Surveillance Target Attack Radar System (Joint STARS) is a Joint Army and Air Force Program, with the Air Force as lead service. The Joint STARS system provides real-time wide area surveillance of the battlefield and rear echelons. Joint STARS is unique because it detects and tracks enemy armor, vehicles, and troops over a wide area in real-time using moving target indicator (MTI) and synthetic aperture radar (SAR) techniques. Joint STARS also provides precise real-time targeting information to direct attack aircraft, friendly artillery, and standoff missile batteries thereby reducing interdiction missions. Joint STARS unique capabilities can give the Corps Commander a near real-time look at enemy first and second echelon force buildups, force movements, and the enemy's scheme-of-maneuver on the battlefield. This early information on the enemy's battle plan will allow friendly forces to act, before the enemy plan is executed and maneuver with economy of force to engage the enemy at a time and place of the Corps Commander's own choosing.

7. (U) Program Highlights:

a. (U) Significant Historical Developments --

In May 82, an OSD/USDRE memorandum directed that a Joint Air Force/Army Program Management Office be established, under Air Force lead, to develop a single multi-mode target acquisition and weapon guidance system. The Joint STARS Program resulted from this directive and was organized from PAVE MOVER and SOTAS Program Offices. Based on the May 84 agreement by Air Force and Army Chiefs of Staff, the joint program began development of the airborne segment using the E-8A (a Boeing 707-320 class aircraft converted to military use). Following the meeting of the Defense System Acquisition Review Council in Aug 85 (Milestone IIA), a Secretary of Defense Decision Memorandum directed initiation of Full Scale Development (FSD) of the airborne segment. On 27 Sep 85 the FSD contract for the airborne segment of Joint STARS was awarded to Grumman Aerospace Corporation. Boeing Military Airplane Company, a subcontractor to Grumman Melbourne Systems Division (GMSD), completed refurbishment and modification of the first Joint STARS FSD aircraft and delivered it to GMSD, Jul 87. Due to the complexity of the software design task,

7a. (U) Program Highlights (Cont'd):

the software development schedule was restructured into incremental builds with emphasis on Wide Area Surveillance. In 1987, software algorithms for extracting moving targets from tough clutter models were successfully tested with three operational but not flight qualified Programmable Signal Processors working together at the Grumman laboratories. All the computers and software that control the mechanical (elevation) movement of the radar were programmed and tested using an antenna mass simulator. The basing of all Joint STARS (airborne) testing was consolidated to the contractor's facility in Melboune, FL, for test efficiency, although numerous military test ranges will still be used. The OSD-directed Operational Utility Evaluation (OUE) I was completed during 1987 and concluded that the proposed Joint STARS system was the only alternative that would meet the Air Force/Army requirements under realistic conditions. The study also concluded Joint STARS would survive in European wartime conditions and that survivability would be enhanced by an electronic self defense suite. In Apr 88, the first flight test of the Joint STARS aircraft took place and the System Preliminary Design Review (PDR) was conducted. Milestone IIB was completed with a signed Air Force Acquisition Decision Memorandum, dated 5 Jul 88. This direction approved procurement of 21 new 707 aircraft vs 10 used, a Self Defense Suite (SDS) development, Mission and Flight Simulators, and Reliability Improvements. The first Phase IV radar flight occurred on 22 Dec 88. During Dec 88, the first increment of the Critical Design Review (CDR) was conducted and an operating Joint STARS radar flew for the first time. Under the Airborne Radar Demonstrator (ARDS) Program, the Joint STARS began a technical data exchange with the UK and France and a Ground Station Module (GSM) was deployed to the UK. The Acquisition Decision Memorandum (ADM) signed by Defense Acquisition Executive (DAE) on 9 Nov 89 approved the restructured program as presented by the Air Force, which resulted in direction for used 707 aircraft as the Joint STARS platform. The program completed an Early Look deployment in Europe in Feb 90. Operation Field Demonstration was performed during Sep-Oct 90, which involved a detailed system demonstration in conjunction with 4 GSMs. The follow-on FSD contract, which includes a third FSD aircraft in a production configuration baseline, was awarded in Nov 90. Both E-8A test aircraft and 6 GSMs were deployed to Desert Shield/Storm in Jan 91. Both aircraft returned from Saudi Arabia on 6 March after a very successful deployment. $18.1M of FY91 3400 (O&M), $26.0M of FY91 3600 (RDT&E), and $9.9M of FY92 3600 (RDT&E) funds were appropriated by Congress to cover Joint STARS Desert Storm deployment costs. The 3400 funds ($18.1M) are not included in the SAR. In Apr 91, Robins AFB, GA, was selected as the Main Operating Base (MOB). To help compensate for program delay associated with Desert Storm, a System Level Performance Evaluation (SLPE) was added to determine maturity of the

7a. (U) Program Highlights (Cont'd):

system and other data to satisfy exit criteria for the advanced buy decision in Jan 92. On the 18th of June, the Conventional Systems Committee (CSC) reviewed and approved this concept and the program impacts due to Fall '90 fact of life changes and Desert Storm involvements.

b. (U) Significant Developments Since Last Report --

Since the Jun 91 SAR report, there has been considerable activity on the program. On 17 September at the Air Force Association Luncheon, the Joint STARS Government/Industry Team received the Von Karmann award in recognition for superb contributions to Desert Storm. Also in September, System Level Performance Evaluation (SLPE), a government conducted test which gathered data to support a second quarter FY92 Advanced Buy Decision, was begun. The results of SLPE fully supported the exit criteria and a written report was forwarded to the Conventional Systems Committee on 13 Dec 91.

On 15 Nov, the Joint STARS Four Star Summit convened at Langley AFB. It was chaired by Gen McPeak, Air Force Chief of Staff and Gen Sullivan, Army Chief of Staff. The summit examined Joint STARS operating command requirements, system requirement changes, operational concept changes resulting from lessons learned in Desert Storm, and the status of the development program. On another matter, both Chiefs accepted a recommendation to maintain a contingency capability by keeping the development and production representative aircraft in a condition that would allow two aircraft to be deployed within 60 days. All involved in the summit process considered the experience worthwhile and believe the process has established a stronger, more stable footing for executing the Joint STARS Program.

The Appropriations Conference actions were reported in the Congressional Record on 18 Nov. The conferees agreed to provide Joint STARS $311.9M in FY92, the budget request. The conferees also increased our budget request from $62.7M in advance procurement to support the production of one aircraft to $125.4M to initiate production of two Joint STARS aircraft. Although Congressional appropriation will result in advanced procurement effort for two aircraft in FY92, no congressional action was taken to add the second aircraft in FY93. With respect to the FY91 restrictions placed on contractor support to the program office, the conferees relaxed the restrictions allowing us to maintain FY91 engineering/management contractor support levels and organically backfill additional requirements.

This system will satisfy mission requirements.

7c. (U) Program Highlights (Cont'd):

c. (U) Changes Since As Of Date --

The CSC will review the Program status for the Advanced Buy Decision on 28 January. In preparation, the JPO pre-briefed the CSC and the OSD CAIG working groups on 10 January.

8. (U) Threshold Breaches:
There are no breaches to the Acquisition Program Baseline dated 27 Nov 91 and there are no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Milestone IIA	SEP 85	SEP 85	SEP 85
FSD Contract Award	SEP 85	SEP 85	SEP 85
Preliminary Design Review (PDR) Hardware	MAY 86	N/A	MAY 86
PDR Software	MAR 87	N/A	MAR 87
Critical Design Review (CDR) Hardware	DEC 86	N/A	DEC 86
First Test Flight	APR 88	APR 88	APR 88
Milestone IIB	APR 88	APR 88	APR 88
System CDR	NOV 88	NOV 88	NOV 88
Contractor Flight Test Start	APR 89	APR 89	APR 89
Operational Field Demo I	N/A	JUL 90	SEP 90
System-level Perf. Verf.-start	NOV 90	SEP 91	OCT 91(Ch-1)
DT&E/IOT&E Start	FEB 91	JUN 91	OCT 91(Ch-2)
Milestone III	DEC 91	N/A	N/A
Milestone IIIA	N/A	MAR 93	MAR 93
Software Support Facility Delivery	N/A	MAR 95	MAR 95
Flight/Mission Simulator Delivery	N/A	DEC 95	DEC 95
Milestone IIIB	N/A	SEP 95	SEP 95
Self Defense Suite (SDS) Flight Test	DEC 92	JUN 95	JUN 95
SDS Production Decision	OCT 93	MAR 97	MAR 97
First Aircraft Delivery to TAC	MAR 94	SEP 95	SEP 95
First Training Squad Ready for Trng	N/A	DEC 95	DEC 95
Depot Activation	N/A	DEC 95	DEC 95
First SDS Installation	JAN 95	N/A	DEC 97
SDS Test Complete	N/A	SEP 96	SEP 96
IOC	SEP 96	MAR 97	MAR 97
Program Mgt Responsiblity Transfer (PMRT)	N/A	MAR 97	N/A
Mature Reliability	N/A	SEP 98	SEP 98

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Last Aircraft Delivery	SEP 00	N/A	SEP 00

b. (U) Previous Change Explanations --

Delay in SDS program due to reduction in funding by PBD 904. SLPV and GDT&E/IOT&E rescheduled to agree with OCT 89 DAB restructured program. Milestone III broken out into IIIA (Low Rate Production) and IIIB (Full Production). Milestones were TBD as the Joint STARS System could not meet ADM directed schedule requirements with the inadequate funding directed in the FY 91 Amended President's Budget. Operational Field Demo milestone added to SAR reporting. Milestones reported as TBD were changed to reflect FY92/93 President's Budget.

c. (U) Current Change Explanations --

(Ch-1) SLPV estimate changed from Mar 91 to Oct 91 to reflect actual start date.

(Ch-2) DT&E/IOT&E milestone changed from Jun 91 to Oct 91 to reflect actual start date.

d. (U) References --

(U) Development Estimate:

ADM dated 5 Jul 88, subject "Joint Surveillance Target Attack Radar System: Milestone IIB Acquisition Decision Memorandum".

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 27 Nov 1991.

10. (U) Performance Characteristics:

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

10a. (U) Performance Characteristics (Cont'd):

	Approved Program	Demon-strated	Current
(b)(1)	[redacted]		

10a. (U) Performance Characteristics (Cont'd):

(b)(1)

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Reliability - MTBCF (hrs)	62	65	/ 62	TBD	71	(CH-1)
Integrated fault detection/isolation (%)	95	100	/ 100	TBD	100%	
Effective time on station (ETOS%)	N/A	90	/ 73	TBD	90	(CH-1)
Fix rate 2/						
Air (%)	N/A					
in 20 minutes 3/		50	/ 3	TBD	5%	(CH-1)
in 30 minutes		75	/ 7	TBD	7%	
in 45 minutes		90	/ 25	TBD	72%	(CH-1)
Ground (%)	N/A					
in 4 hrs		50	/ 15	TBD	15%	
in 8 hours		75	/ 38	TBD	38%	
in 12 hours		85	/ 50	TBD	50%	
Break rate (%) 4/	N/A	12	/ 16.5	TBD	16.5	
*Aircraft Mission Time	N/A	N/A	/ N/A	TBD	9 hrs	
*Mission Capable Rate	N/A	N/A	/ N/A	TBD	80%	
*PME MTTR						
* LRU	N/A	N/A	/ N/A	TBD	40 min	
* SRU	N/A	N/A	/ N/A	TBD	80 min	
*BIT Detect	N/A	N/A	/ N/A	TBD	72%	
* Isolate LRU	N/A	N/A	/ N/A	TBD	78%	
* 3	N/A	N/A	/ N/A	TBD	76%	
* 1	N/A	N/A	/ N/A	TBD	56%	

Refer to the Mar 1990 Acquisition Program Baseline for conditions under which the goals and thresholds are to be accomplished.

GENERAL COMMENT: All Demonstrated Performance input comes from results of the System Level Performance Evaluation (SLPE) sorties flown between 27 Aug and 12 Sep 91.

* Denotes Non-APB data elements.

(b)(1)

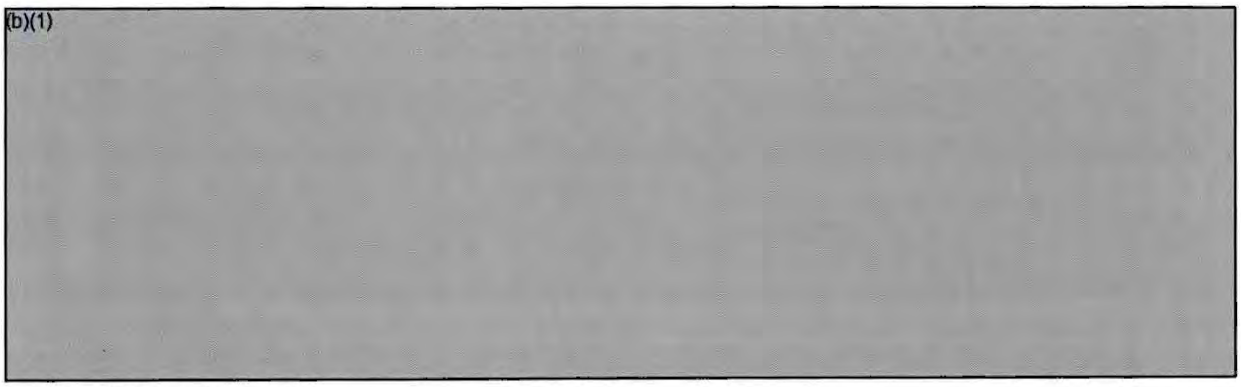


b. (U) Previous Change Explanations --

The current values were updated to match approved APBs. New APB characteristics were added.

c. (U) Current Change Explanations --

(b)(1)



d. (U) References --

(U) Development Estimate:

ADM dated 5 Jul 88, subject "Joint Surveillance Target Attack Radar System: Milestone IIB Acquisition Decision Memorandum".

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 27 Nov 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	1448.2	1993.6	2059.7
Procurement	3192.8	2759.1	2647.2
Recurring	(2481.1)		(2139.0)
Non-Recurring	(182.7)		(11.0)
Total Flyaway	(2663.8)		(2150.0)
Other Wpn Sys	(286.4)		(173.5)
Total Other Wpn Sys	(286.4)		(173.5)
Peculiar Support	(0.0)		(98.7)
Initial Spares	(242.6)		(225.0)
Construction (MILCON)	87.8	104.1	109.8
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 83 Base-Year $	4728.8	4856.8	4816.7
Escalation	2013.1	2091.5	2554.0
Development (RDT&E)	(315.0)	(532.4)	(621.9)
Procurement	(1658.1)	(1496.7)	(1865.9)
Construction (MILCON)	(40.0)	(62.4)	(66.2)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	6741.9	6948.3	7370.7
b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	21	19	19
Total	21	19	19

Approved Program and Current Estimate procurement quantity include two FSD aircraft refurbished in FY98.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:

ADM dated 5 Jul 88, subject "Joint Surveillance Target Attack Radar System: Milestone IIB Acquisition Decision Memorandum".

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 27 Nov 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	7370.7	7531.0	7372.7
(2) Quantity	19	19	19
(3) Unit Cost	387.93	396.37	388.04
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	137.3	137.3	387.8
Less CY Adv Proc	125.4	125.4	50.7
Plus PY Adv Proc	0.0	0.0	62.7
Net Total	11.9	11.9	399.8
(2) Quantity	0	0	1
(3) Unit Cost	N/A	N/A	399.80

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1763.2	4850.9	127.8	6741.9
Previous Changes:				
Economic	+22.9	+626.1	+13.3	+662.3
Quantity	-	-370.1	-	-370.1
Schedule	+84.3	+66.5	-	+150.8
Engineering	+371.8	-732.9	-	-361.1
Estimating	+429.1	+410.2	-23.1	+816.2
Other	-	-	-	-
Support	-	-90.7	-	-90.7
Subtotal	+908.1	-90.9	-9.8	+807.4
Current Changes:				
Economic	-26.7	-129.0	-4.5	-160.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+37.0	-88.8	+62.5	+10.7
Other	-	-	-	-
Support	-	-29.1	-	-29.1
Subtotal	+10.3	-246.9	+58.0	-178.6
Total Changes	+918.4	-337.8	+48.2	+628.8
Current Estimate	2681.6	4513.1	176.0	7370.7

13a. (U) **Cost Variance Analysis (Cont'd):**

a. (U) Summary -- (FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1448.2	3192.8	87.8	4728.8
Previous Changes:				
Quantity	-	-234.2	-	-234.2
Schedule	+56.9	-	-	+56.9
Engineering	+250.2	-412.3	-	-162.1
Estimating	+283.6	+240.7	-15.2	+509.1
Other	-	-	-	-
Support	-	-73.2	-	-73.2
Subtotal	+590.7	-479.0	-15.2	+96.5
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+20.8	-108.0	+37.2	-50.0
Other	-	-	-	-
Support	-	+41.4	-	+41.4
Subtotal	+20.8	-66.6	+37.2	-8.6
Total Changes	+611.5	-545.6	+22.0	+87.9
Current Estimate	2059.7	2647.2	109.8	4816.7

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised inflation indices.

Schedule: Program rephasing from FY94 to FY98 to accommodate reductions.

Engineering: Revised FSD requirements for used vs. new aircraft.

Estimating: Adjustment for current and prior year escalation changes. Budgetary reprogrammings and reductions. Revised estimate to reflect current funding. Increased requirements from realignment of Oct 89 DAB to FY92/93 PB. Supplemental appropriation to cover Desert Storm deployment costs. Restoration of Electronic Warfare funding for Self Defense Suite.

13b. (U) Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic:	Revised economic inflation indices.
Quantity:	Reduction from 21 to 19 aircraft.
Schedule:	Deferral of 2 units to FY98. Realigned production profile from FY91-FY98 to FY92-FY99.
Engineering:	Decrease in production requirements due to change from new to used aircraft platform.
Estimating:	Refinement and rephasing of program estimate. Revised estimate to reflect current funding. Increase in program estimate for learning as a result of decreased quantities.
Support:	Increase to initial spares and support equipment associated with the realigned production profile. Decrease in initial spares and support equipment requirements associated with the change in new vs. used platforms.

MILCON

Economic:	Revised inflation indices.
Estimating:	Revised estimate to reflect current funding. Budgetary reduction of FY93 funds. Revised estimate to reflect site change.

c. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year	Then-Year

13c. (U) **Cost Variance Analysis (Cont'd):**

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation rates (Economic)	N/A	-26.7
Realignment of funds for contract management of Defense Business Operating Fund (Estimating)	-10.4	-15.3
Reduction of Program Office contract support by Congressional action (Estimating)	-2.3	-3.4
Reprogramming of FY91 funds to the Sensor Fuzed Weapon Program (Estimating)	-0.2	-0.3
Addition of FY99 funding to extend Program Office operations (Estimating)	27.7	47.9
Adjustment for current and prior year escalation (Estimating)	6.9	9.2
Reduction of FY92 funds to reflect contract manpower travel savings per Congressional action (Estimating)	-0.5	-0.6
Revised estimate to reflect current funding (Estimating)	-0.3	-0.4
Reduction of FY90 to reflect actual costs (Estimating)	-0.1	-0.1
Total Changes	20.8	10.3

13c. (U) **Cost Variance Analysis (Cont'd):**

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised economic escalation rates (Economic)	N/A	-129.0
Current year offset (Estimating)	0.9	1.3
Realignment to support acceleration of advanced procurement for two aircraft (Estimating)	1.6	--
Realignment of funds for contract management of Defense Business Operating Fund (Estimating)	-30.9	-52.1
Reduction of program office contract support by Congressional action (Estimating)	-0.2	-0.3
Realignment of FY98 funding to reflect actual requirement (Estimating)	-24.5	-45.0
Revised estimate to reflect current funding (Estimating)	4.0	7.3
Realignment of initial spares funds for Stock Fund implementation (Support)	-20.3	-33.8
Reprogramming of common support equipment funds to Joint STARS (Support)	2.8	4.7
Realignment of Ground Support Systems effort from Flyaway to Other Weapon Systems (Estimating)	-58.9	-99.4
Realignment of Ground Support Systems effort from Flyaway to Other Weapon Systems (Support)	58.9	99.4
Total Changes	-66.6	-246.9
(3) MILCON		
Revised economic escalation rates (Economic)	N/A	-4.5
Current year inflation offset (Estimating)	0.4	0.5
Reprogramming Depot ATF funding to Joint STARS (Estimating)	1.7	2.4
Addition of FY98 funding (Estimating)	32.9	56.1
Revised estimate to reflect current funding (Estimating)	2.2	3.5
Total Changes	37.2	58.0

13c. (U) **Cost Variance Analysis (Cont'd):**

	(Dollars in Millions) Base-Year	Then-Year
(4) O & M		
Total Changes	--	--

14. (U) **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
571.4	-3.4	-430.2	2.9	95.9	45.7	--	38.7	-250.4	321.0

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
321.0	26.43	14.32	7.94	-19.01	43.52	--	-6.31	66.89	387.9

15. (U) **Contract Information:** (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) JOINT STARS - Basic FSD:	Initial Contract Price Target	Ceiling	Qty
Grumman Aerospace, Melbourne, FL F19628-85-C-0053, FPIF Award: September 27, 1985 Definitized: September 27, 1985	$657.0	$657.0	2

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$912.9	$928.2	2	$928.2	$928.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-240.7	$-64.2
Cumulative Variances To Date (11/30/91)	$-269.4	$-59.4
Net Change	$-28.7	$4.8

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change:

The cost variance increase is due to the contractor's unanticipated increased effort for software and test. The schedule variance decrease is due to the contractor's completion of software and test activities in excess of new work scheduled during the period.

(U) JSTARS - Follow-on FSD:	Initial Contract Price		
	Target	Ceiling	Qty
Grumman Aerospace, Melbourne, FL F19628-90-C-0197, CPIF Award: November 2, 1990 Definitized: N/A	$523.1	$530.6	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$535.9	$543.8	1	$535.9	$543.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$6.9	$0.2
Cumulative Variances To Date (11/30/91)	$4.6	$-4.6
Net Change	$-2.3	$-4.8

Explanation of Change:

The decrease in the favorable cost variance is due to the contractor increasing manpower. The increase in the negative schedule variance is due to the contractor being late to plan on engineering design and aircraft modification. The net changes in the cost and schedule variance are not significant in relation to the undefinitized contract target price.

Prices shown are not to exceed. The NTE target price is 113% of the NTE target cost. The contract is scheduled to be definitized in JUN 92.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 61.1% (11 yrs/18 yrs)

(2) Percent Program Cost Appropriated: 26.8% ($1977.9 / $7370.7)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY82-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-99)	Total
RDT&E	1480.0	341.8	355.9	503.9	2681.6
Procurement	-	137.3	387.8	3988.0	4513.1
MILCON	-	18.8	-	157.2	176.0
O&M	-	-	-	-	-
Total	1480.0	497.9	743.7	4649.1	7370.7

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1982				33.5	32.6	32.6	32.6	7.6
1983				30.7	31.3	31.3	31.2	4.9
1984				38.7	41.0	41.0	41.0	3.8
1985				44.4	48.6	48.6	48.6	3.4
1986				139.3	156.1	156.1	156.1	2.8
1987				258.8	300.2	300.2	298.1	2.7
1988				275.8	330.7	330.7	303.3	3.0
1989				183.8	229.6	228.8	222.4	4.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1990				71.2	91.8	91.8	81.5	4.0
1991				162.5	218.1	216.4	79.3	3.9
1992				246.8	341.8	105.3	3.1	3.1
1993				248.9	355.9			3.3
1994				144.0	212.7			3.3
1995				60.8	92.7			3.3
1996				33.1	52.1			3.2
1997				29.9	48.5			3.2
1998				29.8	50.0			3.2
1999				27.7	47.9			3.2
Subtot				2059.7	2681.6	1582.8	1297.2	

Accounting data as of 16 Jan 92.

Appropriation: 3010 Aircraft Procurement, Air Force

1992				90.6	137.3			3.1
1993	1	4.0	196.3	247.8	387.8			3.3
1994	2		287.1	356.1	575.1			3.3

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
1995	2		279.5	429.6	716.2			3.3
1996	4	7.0	443.0	562.5	967.5			3.2
1997	5		501.1	561.4	996.5			3.2
1998	5		414.0	374.2	685.5			3.2
1999				25.0	47.2			3.2
Subtot	19	11.0	2121.0	2647.2	4513.1			

Note: The 1988 buy of 15 includes refurbishment of 2 FSD test articles.

Appropriation: 3300 Military Construction, Air Force								
1992				13.4	18.8			3.1
1993								3.3
1994				7.5	11.2			3.3
1995				13.9	21.6			3.3
1996				27.4	43.8			3.2
1997				9.1	15.0			3.2
1998				38.5	65.6			3.2
Subtot				109.8	176.0			

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 3300 Military Construction, Air Force (Cont'd)

Grand Total	19	11.0	2121.0	4816.7	7370.7	1582.8	1297.2	

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- None.

b. (U) Cost Variance -- None.

c. (U) Schedule Variance -- None.

Since production is less than six per year, production rate information is not required pursuant to 10 USC Section 2432.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

O&S costs were based on 19 used Boeing 707 aircraft. The support concept priced assumed Government two level (organizational/depot) support of the prime mission equipment (PME). The airframe support will be Government organizational level support, a mixture of Government and contractor support for intermediate level maintenance, requirements and contractor support for depot level requirements. The O&S costs of the PME and airframe were estimated individually and then added together to estimate the total system level O&S costs. The PME costs were estimated by the prime contractor using a Government supplied Life Cycle Cost model. The airframe costs were estimated by

18a. (U) Operating and Support Costs (Cont'd):
the Government using the Cost-Oriented Resources Estimating (CORE) model contained in AFR 173-13. The planned buy program was used to estimate the actual O&S costs incurred with an End of Year aircraft population used to estimate the magnitude and timing of the O&S costs. Significant O&S cost drivers fall into four categories: Personnel, Unit Consumption, Depot Maintenance, and Sustaining Investment. The source of the data was Tab 6C, Program Office Joint STARS O&S Cost Estimate, June 1990.

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per year for 15 yr est.	Avg Annual Cost Per
Personnel	122.2	N/A
Unit Consumption	27.3	N/A
Depot Maintenance/Non-Ma	50.4	N/A
Sustaining Investment	26.8	N/A
Total	226.7	N/A

c. (U) Contractor Support Costs -- None.

Not separately addressed, included in Depot Maintenance category.

There is no antecedent system to Joint STARS; this system is a new start.

AF-21 SFW

~~CONFIDENTIAL~~

91-018

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: SENSOR FUZED WEAPON

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
MAR 5 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
SFW, CBU-97/B

2. (U) DoD Component: USAF

3. (U) Responsible Office and Telephone Number:

ASD/YB	COL DONALD C. PULLEY
AERONAUTICAL SYSTEMS DIVISION	Assigned: October 31, 1988
EGLIN AFB, FL 32542-5000	AV 872-5382 COMM (904) 882-5382

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0604602F (Shared) Project 643244
PE 0604604F (Shared) Project 643086
PE 0604607F Project 642961
PROCUREMENT:
APPN 3080 ICN 813520 (Air Force) (Shared)

SAF/PAS
92-226 -T

~~Classified by: SFW Security Classification Guide, 1 Jun 91~~
~~Declassify on: Not Subject to Automatic Downgrade~~
~~Downgrade Instructions: OADR~~

(THIS PAGE IS ~~UNCLASSIFIED~~)

92-0424

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5. (U) Related Programs:
SUU-64/B Tactical Munitions Dispenser
CNU-411 Container
FZU-39 Proximity Sensor
SEEK EAGLE
AIWS

6. (U) Mission and Description:

The objective of the Sensor Fuzed Weapon (SFW) program is to develop and produce a conventional munition capable of multiple kills per pass against operating armored vehicles, air defense units, and other support vehicles. The SFW does not replace any existing system but will enhance current capabilities. The requirement for SFW is the HQ TAC System Operational Requirements Document (SORD) (TAF 302-78-I/II/III-A (Revision 2), 6 Nov 91).

7. (U) Program Highlights:
a. (U) Significant Historical Developments --

During formulation of the FY85 Program Objective Memorandum, the Air Force segregated the development of conventional submunitions from the development and integration of these submunitions into a weapon system. This decision was made to preclude termination of promising submunition designs in the event of termination of its carrier. The Risk Reduction Phase, the first of two development phases, was successfully completed in Sep 85. In Oct 85, after a successful Preliminary Design Review (PDR), SAF/AL authorized the SFW program to proceed into the Full Scale Development (FSD) phase. The Dec 86 Selected Acquisition Report (SAR) implemented the new Development Estimate baseline that was transitioned in the 30 Jun 86 SAR. The 30 Sep 87 SAR, based on numerous contractor and government tests, revised several of the program milestones. During 1988 a pre-Critical Design Review (CDR) test program was successfully completed allowing Textron to begin fabricating hardware for the Development Test and Evaluation (DT&E)/Initial Operational Test and Evaluation (IOT&E) program. CDR was closed out in Aug 89. Due to test failures, schedule delays, and budget changes, the program was restructured in Jun 89. This restructure was approved by SAF/AQ on 27 Nov 89. The culmination of these events resulted in a greater than six month slip in five major milestones and increased the production acquisition unit cost by 21 percent. The FY91 President's Budget incorporated the restructured program as modified and $10M (FY91) was transferred to the Army to support production transition. However, the Multi-Staged Improvement Program (MSIP) was not supported due to limited funds. DT&E testing began in Dec 88. The 29 DT&E missions conducted through 31 Dec 90, including countermeasure testing, were successful. In addition, 20 of 20 Live Fire tests were successfully completed. SEEK EAGLE testing began on

7a. (U) Program Highlights (Cont'd):

13 Apr 90. Forty-six weapons were successfully launched during the initial phase of SEEK EAGLE (ballistic and safe separation). The SFW was certified ready for IOT&E by the Program Executive Officer (PEO) in Aug 90 and a total of six successful IOT&E missions had been accomplished through Dec 90. Functional Configuration Audit (FCA) was completed on 31 Dec 90. Projectile Reliability testing was under way and progressing satisfactorily. Textron Defense System (TDS) submitted three Request for Equitable Adjustments (REEAs) totalling $60.2M. As of Dec 90, two of the requests were negotiated and we anticipated that we would resolve the third at a value significantly lower than requested. Quantities were reduced from 19,803 to 16,726 due to the FY92 President's Budget funding constraints. The Dec 90 SAR reflected the acquisition program strategy consistent with this reduction.

b. (U) Significant Developments Since Last Report --
On 18 Dec 90 the Systems Program Office (SPO) presented an SFW Acquisition Strategy briefing to industry. Thirty four companies participated and based on that participation we made adjustments to our acquisition strategy. The formal Acquisition Strategy Panel was held at Eglin AFB on 12 Feb 91. DT&E testing was completed 11 Apr 91 and the final DT&E test report was submitted to the PEO on 5 Jul 91. IOT&E testing at Nellis was very successful with all 50 submunitions properly deploying 199/200 projectiles over the target arrays...a 99.5 percent reliability using the 6 Nov 91 SORD reliability definition. Average kill per pass for tests at Nellis was almost twice the requirement. IOT&E testing was successfully completed on 5 Dec 91 with a ripple launch of four SFW's from an F-16. The Air Force Operational Test and Evaluation Center (AFOTEC) final test report will be published in Mar 92 highlighting that the weapon exceeded both the kills per pass and reliability requirements. The Office of the Test Directorate (OTD) projectile countermeasure susceptibility test series at Sandia began 17 Jun 91 and was completed 28 Jun 91. Testing indicated no new areas of projectile susceptibility. Overall, the testing program is demonstrating that the system is meeting or exceeding all user requirements. Projectile Manufacturing Technology (MANTECH) Detector Qualification tests were completed at Sandia National Laboratories with the MANTECH sensor passing all the required tests. The second phase of SEEK EAGLE Ballistic Verification testing phase began at Eglin in Dec 91 and is ongoing. A $24.8M settlement was reached for a total of the three REEAs (total original value $60.2M). $14.2M of the $24.8M has been paid and sources have been identified to pay off the balance during 3Qtr of FY92. The Low Rate Initial Production (LRIP) 1 proposal for a planned quantity of 98 CBU-97/Bs and 108 SEEK EAGLE units was negotiated within the approved funding and satisfies the Congressional Language. Contract award is anticipated after Defense

7b. (U) Program Highlights (Cont'd):

Acquisition Board (DAB) approval. The SFW DAB Program Review on LRIP has slipped from Sep 91 to Mar 92. This slip on LRIP occurred because of the desire to have a negotiated LRIP 1 contract prior to the Conventional Systems Committee (CSC) Review on 19 Dec 91, additional reviews following the CSC, and the impact of the FY93 President's Budget. Based on HQ TAC/CC Decision, 4 Oct 91, the SFW procurement objective was reduced to 10,000. This reduction will result in a breach to the Nunn-McCurdy Program Acquisition Cost (PAUC) baseline established in the Dec 90 SAR.

c. (U) Changes Since As Of Date --
Integration of JSAL and AIWS. Program restructured and funding was reduced by $493.6M over the FY93-97 period. The Defense Acquisition Board (DAB) was held on March 16, 1992, resulting in LRIP approval.

8. (U) Threshold Breaches:
There is a Nunn-McCurdy breach of a 36.7 percent (Then-Year dollars) in the PAUC baseline. This increase is a result of reducing the procurement objective to 10,000 weapons and cost estimating changes based on negotiated versus projected values for the FY92 LRIP and Not to Exceed (NTE) values for FY93 and FY94 and a small increase to the Research, Development, Test and Evaluation (RDT&E) program. The RDT&E increase resulted from settlements of the RFEAs submitted by TDS. There are several schedule breaches and a 34.1 percent average unit procurement cost breach to the Acquisition Program Baseline dated 17 April 1990. A revised APB will be approved in conjunction with the upcoming DAB on March 16, 1992.

9. (U) Schedule:

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Advanced Development Contract Award	JUL 84	N/A	JUL 84
Preliminary Design Review (Risk Reduction Phase Complete)	OCT 85	N/A	OCT 85
Milestone II (SAF/AL)	NOV 85	NOV 85	NOV 85
DT&E Start	N/A	DEC 88	DEC 88
Many-On-Many Test	N/A	JUL 89	JUL 89
Critical Design Review Complete	JUL 87	AUG 89	AUG 89
IOT&E Start	N/A	JUL 90	AUG 90
DAB Program Review 1/	NOV 88	SEP 91	MAR 92(Ch-1)
Production Contract Award	DEC 88	DEC 91	MAR 92(Ch-2)
Complete DT&E/IOT&E	JUN 89	MAR 92	MAR 92

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Lot 2 Contract Award	N/A	DEC 92	JUN 93(Ch-3)
Lot 3 Contract Award	N/A	DEC 93	JAN 94(Ch-4)
Milestone III (DAB) 2/	N/A	SEP 94	DEC 94
(b)(1)			
Program Management Responsibility Transfer (PMRT)	N/A	SEP 96	N/A (Ch-6)

1/ Formerly shown as Milestone IIIA (DAB)
2/ Formerly shown as Production Decision IIIB.

b. (U) Previous Change Explanations --

The CDR date was moved from Jul 87 to Oct 87 based on contractor hardware procurement and test delays. It was then slipped from Oct 87 to Mar 88 due to design problems on the Bomb Live Unit (BLU)-108/B structure and verification/validation of design improvements. DT&E/IOT&E completion slipped from Jun 89 to Apr 90 due to the CDR adjustment, the necessity to accommodate a cold weather test environment requirement and nonavailability of DT&E test assets delaying DT&E start. The Program Review (Milestone IIIA) was slipped from Nov 88 to Aug 89 due to the slip in CDR. The subsequent slip from Aug 89 to Mar 90 allowed more of the IOT&E testing to be completed prior to the Program Review. The production contract award milestone was changed from Dec 88 to Dec 90 as a direct result of the slips in CDR and IOT&E. CDR was held Apr 88 with final design approval Aug 89. As a result of two test failures, design changes, schedule delays and budget impacts, the program was restructured. This restructure slipped DT&E/IOT&E completion to Jan 92 and submission of final test reports to Mar 92, DAB Program Review to Sep 91, and Production Contract Award to Dec 91. Due to the FY91 PB impact, the IOC estimate was revised by HQ TAC. IOT&E was delayed until Tactical Munitions Dispenser (TMD) anomalies found in early SEEK EAGLE testing were resolved and a plan for completing the F-16 Operational Flight Plan (OFP) software was finalized, assuring its availability for the more complex missions scheduled later in IOT&E.

c. (U) Current Change Explanations --

(Ch-1 thru 5) These slips occurred because of the desire to have a negotiated LRIP 1 contract prior to the CSC Review on 19 Dec 91, additional reviews following the CSC, and the impact of the FY93 President's Budget.

9c. (U) **Schedule (Cont'd):**

(Ch-6) No longer applicable since AFSC/AFLC consolidation.

d. (U) References --

(U) Development Estimate:
OSD/CAIG Briefing, May 86. (Approved by OSD) (Production Estimate based on Competitive Dual Source).

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 17 April 1990.

10. (U) **Performance Characteristics:**

a. (U) Performance --	DE	Approved Program Objective	/ Threshold	Demonstrated Perf	Current Estimate
Aircraft Compatability	F-16 A/B/C/D, F-15, F-111 A/D/E/F/ G, A-10, NATO A/C A-7, B-52G/H	F-16 A/B/C/D, F-15E, F-111A/D /E/F/G, A-10, USMC/USN A/C, NATO A/C	/ F-16 A/B/C/D, F-15E, F-111 A/D/E/F/ G, A-10	F-16 A/B/C/D, F-15E, F-111 A/D/E/F/ G, F-4	F-16 A/B/C/D, F-15E, F-111 A/D/E/F/ G, A-10 1/
Shelf Life Out of Container (yr) 2/	10	15	/ 10	2/	10
Service Life (yr) 2/	1	2	/ 1	1	1
Weight (lb Class Munition)	1000	1000	/ 1000	925	1000
Delivery 3/					
Altitude FT AGL	200	200	/ 200	228	200
Altitude FT MSL	20000	20000	/ 20000	18700	20000
Attitude (degrees)	+45 to -45	+45 to -45	/ +45 to -45	+15 to -45	+45 to -45
Airspeed (KCAS)	200 to 650	250 to 700	/ 250 to 650	250 to 648	200 to 650
Acceleration (Gs)	-.5 to +5	+0.5 to + 5	/ +0.5 to +5	-.5 to +4	-.5 to +5
Targets	Footnote 4/				
(b)(1)					
System Reliability 6/	0.90	0.94	/ 0.89	.83	.89

1/ Future compatibility with B-52 and NATO aircraft.
2/ Worldwide climatic conditions assumed for shelf and service

10a. (U) Performance Characteristics (Cont'd):
life. Service life denotes out-of-container time, including multiple aircraft flights.

3/ The employment envelope has the following corners: 1/ 600 FT/250 KCAS, 2) 200 FT/*** KCAS, 3) 200 FT/650 KCAS, 4) 20000 FT/650 KCAS and 5) 20000 FT/250 KCAS. The A-10 will drop the SFW at altitudes commensurate with safe escape. Acceleration will be as imposed by aircraft/store/dispenser interface.

4/ Primary: Main Battle Tanks, APCs, & Armored Artillery.
Secondary: Trucks & other Support Vehicles

(b)(1)

[redacted]

6/ The SFW will have a 0.79 system hardware reliability (HR) based on a conditional probabilty tree approach. HR will be defined in terms of expected numbers of projectiles functioning per number of projectiles available to function. HR is a function of the reliabiltiy of the following systems which make up the SFW:SUU-66/B TMD, KMU-488/B, BLU-108/B submunition (10 each), and the projective (40 each).

b. (U) Previous Change Explanations --

Airspeed was changed to 200-650 KCAS (threshold) and 200-700 KCAS (goal) per the 11 May 89 SORD. Aircraft compatibility was changed by deleting the F-4 and adding suffix designators for the A-7, F-15, F-16, and F-111. The A-7 and B-52 aircraft requirements were deleted per HQ TAC Msg 131313Z Nov 89 and HQ SAC Msg 291356Z Dec 89. The USMC/USN aircraft elements were added per the 11 May 89 SORD. The System Reliability objective has changed from 0.90 to 0.94 per TAC message. This value has been included as part of our SORD update.

c. (U) Current Change Explanations — None.

d. (U) References --

(U) Development Estimate:
OSD/CAIG Briefing, May 86. (Approved by OSD) (Production Estimate based on Competitive Dual Source).

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 17 April 1990.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	80.0	121.3	130.4
Procurement	1139.8	1543.2	1044.7
Flyaway	(1127.7)		(1034.9)
Total Flyaway	(1127.7)		(1034.9)
Other Weapon Systems	(12.1)		(9.8)
Total Other Wpn Sys	(12.1)		(9.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 79 Base-Year $	1219.8	1664.5	1175.1
Escalation	1186.0	2213.9	1690.7
Development (RDT&E)	(47.7)	(79.6)	(85.7)
Procurement	(1138.3)	(2134.3)	(1605.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2405.8	3878.4	2865.8

Production dollars and quantity reflects the current program acquisition strategy. The quantities realized with our current acquisition strategy total 10,000 units.

b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	14000	19803	10000
Total	14000	19803	10000

Excludes 155 RDT&E units which are considered non-fully configured end items.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
OSD/CAIG Briefing, May 86. (Approved by OSD) (Production Estimate based on Competitive Dual Source).

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 17 April 1990.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2865.8	3511.5	2865.8
(2) Quantity	10000	16726	10000
(3) Unit Cost	0.287	0.210	0.287
b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	95.7	95.7	18.6
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	95.7	95.7	18.6
(2) Quantity	98	98	23
(3) Unit Cost	0.977	0.977	0.809

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
c. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (BY79$)	1175.1	1461.4	1175.1
(2) Unit Cost	0.118	0.087	0.118
d. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (BY79$)	47.4	46.3	8.9
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	47.4	46.3	8.9
(2) Unit Cost	0.484	0.472	0.387

e. (U) Changes from the Baseline Report - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	0.077	36.67
(2) CPUC (TY$)	0.000	N/A
(3) PAUC Quantity	-6726	-40.21
(4) PAUC (BY79$)	0.031	35.63
(5) CPUC (BY79$)	0.012	2.54

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

f. (U) Changes from the Previous SAR - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	0.0	0.00
(2) CPUC (TY$)	0.0	0.00
(3) PAUC Quantity	-6726	-40.21
(4) PAUC (BY79$)	0.0	0.00
(5) CPUC (BY79$)	0.0	0.00

g. (U) Initial SAR (JUN 86)
(1) Program Acquisition Cost (TY$) -- 2405.8
(2) Program Acquisition Cost (BY$) -- 1219.8

h. (U) Unit Cost Changes.

(1) (U) PAUC --

There is a Nunn-McCurdy breach of 36.7 percent (Then-Year dollars) and 35.6 percent (Base-Year dollars) in the Program Acquisition Unit Cost (PAUC) baseline established in the Dec 90 SAR. This increase is a result of reducing the procurement objective to 10,000 weapons (HQ TAC/CC Decision, 4 Oct 91) and cost estimating changes based on negotiated versus projected values for the FY92 LRIP.

(2) (U) CPUC -- None.

i. (U) Impact of Performance or Schedule Changes on Unit Cost. - None.

j. (U) Program Management and Control.

PROGRAM EXECUTIVE OFFICER: MGen Stephen M. McElroy, AFPEO/TS
PROGRAM DIRECTOR: Col Donald C. Pulley, ASD/YB
PROGRAM MANAGER: Lt Col Alan C. Ray, ASD/YBP

k. (U) Cost Control Actions.

Reviews of pertinent cost information are performed on a regular basis. The cost/schedule performance status is analyzed and briefed to the Program Director at least weekly in order to monitor contractor cost activity. The Cost Performance Report (CPR) is formally briefed monthly. All significant variances and trends are reviewed for an understanding of their causes and potential effects on the program. Contractor schedules are analyzed weekly and the schedule network reviewed to evaluate program schedule status. A schedule control board is convened on a monthly basis to ensure that all schedules are up-to-date and assess program review. In addition, the contract strategy for the SFW contract further provides outyear

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd): cost visibility/control by including enabling language to allow incorporation of Low Rate Initial Production (LRIP) 2 and NTE prices for LRIP 3, Full Rate Production FRP 1 and FRP 2.

1. (U) Contract Information (In Millions of Then-Year Dollars) --

(U) (1) Contractor(s): Textron Defense Systems
(2) Contract Title: SFW (PTP)
(3) Contract Number:F08635-84-C-0182
(4) Actual Cost of Work Performed (ACWP) to date: 8.5
(5) Percent contract completed (BCWP/target cost): 46.50
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of 12/29/91	N/A/0.00%	$-0.8/-4.40%
Previous SAR	N/A/0.00%	N/A/0.00%
Current values	N/A/0.00%	$-0.8/-4.40%
Change from the baseline SAR	N/A/0.00%	N/A/0.00%
Change from the previous SAR	N/A/0.00%	$-0.8/-4.40%

(7) (U) Explanation of Variances. -

NOTE: The Production Transition Program (PTP) program only is being reported in this section and does not impact the program breach.

Change in Schedule Variance is due to delays in subcontract deliveries and a longer than planned recovery effort in electronics activities.

(8) (U) Impact of Variances on Contract. - None.

(9) (U) Impact of Variances on Unit Costs. - None.

m. (U) Contracts Exceeding Contract Cost Baseline Thresholds. -- None.

13. (U) **Cost Variance Analysis:**

a. (U) Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	127.7	2278.1	0.0	2405.8
Previous Changes:				
Economic	-1.0	+354.1	-	+353.1
Quantity	+5.9	+136.7	-	+142.6
Schedule	-	+700.4	-	+700.4
Engineering	-	-	-	-
Estimating	+69.3	-160.4	-	-91.1
Other	-	-	-	-
Support	-	+0.7	-	+0.7
Subtotal	+74.2	+1031.5	-	+1105.7
Current Changes:				
Economic	-0.7	-179.6	-	-180.3
Quantity	-	-677.1	-	-677.1
Schedule	-	+255.3	-	+255.3
Engineering	-	-	-	-
Estimating	+14.9	-55.3	-	-40.4
Other	-	-	-	-
Support	-	-3.2	-	-3.2
Subtotal	+14.2	-659.9	-	-645.7
Total Changes	+88.4	+371.6	-	+460.0
Current Estimate	216.1	2649.7	-	2865.8

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	80.0	1139.8	0.0	1219.8
Previous Changes:				
Quantity	+3.6	+165.2	-	+168.8
Schedule	-	+96.7	-	+96.7
Engineering	-	-	-	-
Estimating	+38.1	-61.7	-	-23.6
Other	-	-	-	-
Support	-	-0.3	-	-0.3
Subtotal	+41.7	+199.9	-	+241.6
Current Changes:				
Quantity	-	-261.3	-	-261.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+8.7	-31.7	-	-23.0
Other	-	-	-	-
Support	-	-2.0	-	-2.0
Subtotal	+8.7	-295.0	-	-286.3
Total Changes	+50.4	-95.1	-	-44.7
Current Estimate	130.4	1044.7	-	1175.1

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised economic escalation indices.

Quantity: Increased RDT&E units by five for Life Cycle Surveillance Testing and eight units for IOT&E.

Estimating: Offset to quantity increase - reduced management flexibility in executing program; adjustment for prior year escalation; addition of funds in FY87 Appropriations Bill to accelerate SFW program development; adjustment for Air Force assessments - reduced scope of effort to accelerate SFW development; increase for SEEK EAGLE test requirements; increase for Pre-Production Process Verification, additional testing and SPO support

13b. (U) Cost Variance Analysis (Cont'd):

requirements; increase due to RDT&E funds provided for Multi-Staged Improvement Program (MSIP) and to support TAC in accomplishing the Cost & Operational Effectiveness Assessment (COEA).

PROCUREMENT

Economic: Revised economic escalation indices.

Quantity: Increased flyaway costs to procure 5,803 additional SFWs in accordance with the revised Program Management Directive (PMD) to incorporate latest assessment of Air Force quantity requirements; total quantities reduced by 3,077 units.

Schedule: Impact of revised schedule in accordance with the revised PMD to incorporate latest assessment reflected in FY88-92 Non-nuclear Consumables Annual Analysis (NCAA); first procurement buys scheduled for FY89 changed to FY91; production schedule increased by one year; rephasing of procurement buy schedule; correction to variance categorization in Dec 89 SAR.

Estimating: New pricing methodology used Risk Reduction Hardware Actuals; competition starts two years earlier; costs savings resulted from a revised Alternate Source Strategy; estimating change associated with 3,077 units since SAR baseline; correction to variance categorization in Dec 89 SAR; current acquisition strategy and the incorporation of production transition reflects a net savings.

Support: Increased data costs associated with 5,803 SFWs added to the program; price adjusted based on actuals; decreased data cost associated with the reduced quantities.

c. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year	Then-Year

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation indices. (Economic)	--	-0.7
Program assessment (ANSER) and Air Staff Budget Authority adjustment. (Estimating)	-0.1	-0.3
Funds removed in order to support Desert Storm. (Estimating)	-0.6	-1.1
Increase for negotiated Request for Equitable Adjustments (REEA). (Estimating)	9.3	15.5
Increase to support Cost & Operational Effectiveness Assessment (COEA). (Estimating)	0.1	0.1
Adjustment to equal actual expended dollars. (Estimating)	--	0.7
Total Changes	8.7	14.2
(2) PROCUREMENT		
Revised economic escalation indices (Economic)	--	-114.3
Procurement objective reduced from 16,726 to 10,000 weapons. (Quantity)	-261.3	-677.1
Production extended two years to reach quantity of 10,000 under current budget constraints. (Schedule)	--	255.3
Cost estimate updated to reflect: acq strategy change, and incorporation of negotiated LRIP 1 contract. (Estimating)	-31.7	-55.3
Decrease in data costs associated with the reduced quantities. (Support)	-2.0	-3.2
Economic adjustment for negative program change. (Economic)	--	-65.3
Total Changes	-295.0	-659.9

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.000	--	--	--	--	0.171	--	--	0.171	0.171

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.172	0.017	0.015	0.096	--	-0.013	--	--	0.115	0.287

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) Procurement --
(U) SFW (PTP):
Textron Defense Systems, Wilmington, MA
F08635-84-C-0182, FPIF
Award: March 23, 1991
Definitized: March 23, 1991

Initial Contract Price		
Target	Ceiling	Qty
$20.9	$22.9	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$20.8	$22.8	0	$20.8	$20.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/29/91)	$0.0	$-0.8
Net Change	$0.0	$-0.8

Explanation of Change:

Change in Schedule Variance is due to delays in subcontract deliveries and a longer than planned recovery effort in electronics activities.

NOTE: The Production Transition Program (PTP) effort is reported in this section. The FSD portion of the contract has been completed.

15. (U) **Contract Information: Cont'd** (Then-Year Dollars in Millions)
It does not impact the program breach.

16. (U) **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 45.5% (10 yrs/22 yrs)

(2) Percent Program Cost Appropriated: 10.9% ($311.8 / $2865.8)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2004)	Total
RDT&E	216.1	-	-	-	216.1
Procurement	-	95.7	18.6	2535.4	2649.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	216.1	95.7	18.6	2535.4	2865.8

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1983				2.9	4.2	4.2	4.2	4.9
1984				11.2	16.7	16.7	16.7	3.8
1985				23.1	35.4	35.4	35.4	3.4
1986				15.6	24.6	24.6	24.6	2.8

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1987				14.2	23.1	23.1	23.1	2.7
1988				17.1	28.7	26.1	22.0	3.0
1989				19.2	33.6	33.6	26.3	4.2
1990				15.0	27.1	27.1	25.2	4.0
1991				12.1	22.7	22.0	14.7	3.9
Subtot				130.4	216.1	212.8	192.2	

Total Research and Development (R&D) funding was adjusted by $.2M to reflect an Air Staff Budget Authority correction. Total appropriation does not include $.5M FY92 Unfunded Requirement for Independent Analysis Contract and $9.3M of the $24.8M for RFEAs that have been negotiated on the basic contract. We have received $6.7M FY88, $7.1M FY89, $1.3M FY90 and $.3M FY91 funds for RFEAs. An Unfunded Requirement has been processed for the RFEA balance. An FY91 decrease of $1.1 was for Desert Storm support and a $.1M decrease was for assessments.

The MSIP was an enhancement program designed to improve operational effectiveness, increase aircraft survivability and meet emerging threats of the next decade (targets/countermeasures). An initial study of $.8M was completed in Oct 91.

$10.0M FY91 Army Funds, APPN 2034, which will be used to support the PTP are not included.

Obligations and expenditures reflect program office records as of 31 Dec 91.

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY79 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3080 Other Procurement, Air Force								
1992	98	2.0	45.0	47.4	95.7			3.1
1993	23		8.8	8.9	18.6			3.3
1994	175	7.0	44.2	51.5	110.8			3.3
1995	225	2.8	42.4	45.5	101.1			3.3
1996	485	7.8	64.2	72.6	166.3			3.2
1997	815	9.3	89.3	99.5	235.1			3.2
1998	1078	5.0	105.8	111.8	272.9			3.2
1999	1142	4.0	104.5	109.6	275.9			3.2
2000	1219		105.7	106.8	277.4			3.2
2001	1243		104.0	105.1	281.8			3.2
2002	1300		105.2	106.3	294.0			3.2
2003	1300		102.9	104.0	296.9			3.2
2004	897		75.0	75.7	223.2			3.2
Subtot	10000	37.9	997.0	1044.7	2649.7			
Grand Total	10000	37.9	997.0	1175.1	2865.8	212.8	192.2	

Total production funding is in agreement with the FY93 President's Budget. Total production funding does not include $12.9M appropriated in FY92 for SEEK EAGLE.

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1989	400	0	0	N/A
1990	745	0	0	N/A
1991	1275	0	0	N/A
1992	1500	0	98	N/A
1993	2000	0	23	N/A
1994	2500	0	175	N/A
1995	2700	0	225	N/A
1996	2880	0	485	N/A
1997	0	0	815	N/A
1998	0	0	1078	N/A
1999	0	0	1142	N/A
2000	0	0	1219	N/A
2001	0	0	1243	N/A
2002	0	0	1300	N/A
2003	0	0	1300	0
2004	0	0	897	0

17b. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	1175.1	N/A	N/A
(TY $)	N/A	N/A	2865.8	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	0.118	N/A	N/A
(TY $)	N/A	N/A	0.287	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	MAR 92	N/A	N/A
Duration (in MON)	N/A	N/A	179	N/A	N/A
End Date(MON YY)	N/A	N/A	FEB 07	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	155/155
Procurement	10000/0

e. (U) Approved Design-to-Cost Objective -- N/A.

- There was no formal DTC objective established for SFW.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The SFW is a no maintenance/wooden round weapon. As such, it will require: no scheduled maintenance; limited unscheduled repairs and stockpile sampling; no shop or operational checkout, testing or test equipment; preload checks and tasks limited to quick visual checks. Field level maintenance activities will be restricted to unscheduled, exterior, on-equipment activities - i.e. corrosion control, desiccant

18a. (U) Operating and Support Costs (Cont'd):
change in the storage container, and lug and lanyard replacement. No special training, support equipment, or personnel are required to maintain the SFW system. The SFW will be compatible with existing munitions handling/loading equipment. All support equipment needed to support the SFW is already in the inventory.

The elements that account for the majority of Operating and Support costs are disposal costs, manpower, second destination transportation, and Base Year 1979 dollars. Distributing those costs over ten thousand weapons with a ten year shelf life yields a cost of approximately $80 per weapon per year.

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- None.

SFW is not a replacement weapon. There are no contractor support costs for this weapon.

A-17 JAVELIN (AAWS-M)

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: Javelin (AAWS-M)

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
   Javelin (AAWS-M) Advanced Antitank Weapon System - Medium

2. (U) **DoD Component:** Army

   Joint Participants:
   USMC

3. (U) **Responsible Office and Telephone Number:**
   Department of Army
   PEO - Fire Support
   ATTN: SFAE-FS-AM
   RedstoneArsenal, AL 35898-5720

   COL Michael A. Roddy III
   Assigned: February 6, 1992
   AV 746-4266 COMM (205) 876-4266

4. (U) **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 63612 Project D308
   PE 64611 Project D499

AS AMENDED
1992 18

~~Classified by: AAWS-M SCG, dtd 6 Sep 90~~
~~Declassify on: OADR~~
~~Downgrade Instructions: Regraded Unclass When Separated From Classified Inclosure(s)~~

(THIS PAGE IS [redacted])

[redacted]

Concur in Classification as marked
23 MAR 1992
SECURITY REVIEW, ODCSINT HQDA

OASD(PA) DFOISR 92-0662

4. (U) **Program Elements/Procurement Line Items (Cont'd):**

PROCUREMENT:
APPN 1109 ICN 038061 (Navy)
APPN 2032 ICN HO6102 (Army)
APPN 2032 ICN CA0269 (Army)
APPN 2032 ICN HO6300 (Army)

5. (U) **Related Programs:** None.

6. (U) **Mission and Description:**
The Javelin (AAWS-M) is a manportable antitank weapon system designed to provide high lethality against advanced armor and is envisioned as a simple-to-operate, easily and economically maintained, rugged and reliable infantry system for the U.S. Army and U.S. Marine Corps (USMC). The Javelin is comprised of two major components: a reusable Command and Launch Unit (CLU) and a missile sealed in a disposable launcher container. The CLU incorporates an integrated day/night sight and provides target engagement capability in adverse weather. The CLU may be used in stand alone mode for battlefield surveillance and target detection. For operation of the system, the round must be mated with the CLU. The CLU will provide a go/no-go status of the CLU and round. The missile, with a warhead designed against both conventional and reactive armor, may be used at the gunner's discretion in top attack or direct fire mode. Top attack is the normal mode of operation and direct fire mode is for engaging targets under cover. The Javelin will replace the DRAGON.

7. (U) **Program Highlights:**
a. (U) Significant Historical Developments --
In April 1984, a draft AAWS-M Required Operational Capabilities (ROC) was released to industry for comment. In September 1984, a technology briefing was given to industry and a draft Request for Proposal (RFP) was released for comment. The RFP called for a competitive design validation phase of 27 months followed by a 36-month Full Scale Development (FSD) phase and a Low Rate Initial Production (LRIP) phase. The AAWS-M Army System Acquisition Review Council (ASARC) process was completed on 16 August 1985. The Secretary of the Army Milestone Decision Review I (MDR I) approval memorandum, dated 9 October 1985, authorized the AAWS-M and the AAWS-H entry into the Proof of Principle (POP) phase, subject to Defense System Acquisition Review Council (DSARC) review. On 4 April 1986, a Joint Services Operational Requirement (JSOR) was approved by HQDA and HQMC. The AAWS-M DSARC I was held on 11 April 1986, and the Secretary of Defense Decision Memorandum (SDDM) was issued on 15 May 1986. On 2 May 1986, an AAWS-M RFP for the POP phase was released to industry. Three AAWS-M POP contracts, $30 million each for a period of performance of 27 months, were awarded on 28 August 1986 to Ford Aerospace and Communications Corporation, Hughes Aircraft Company,

7a. (U) Program Highlights (Cont'd):

and Texas Instruments, Incorporated. The FSD/LRIP RFP was released on 6 September 1988, and the proposals were received on 7 November 1988. On 9 February 1989, the Army announced that the Texas Instruments and Martin Marietta Imaging Infrared Fire-&-Forget (IIR F&F) technology was selected for the FSD contract award, contingent upon DA and OSD program approval.

The AAWS-M ASARC II process was completed on 10 March 1989. The Under Secretary of the Army Acquisition Decision Memorandum, dated 17 March 1989, authorized the AAWS-M to proceed into the FSD phase, subject to Defense Acquisition Board (DAB) review. The AAWS-M DAB II review was held on 1 June 1989, and the Secretary of Defense Acquisition Decision Memorandum (ADM) was issued on 19 June 1989 approving entry into the (FSD) phase with the infrared fire and forget focal plane array technology. Contract award to a Texas Instruments/Martin Marietta Joint Venture was completed on 21 June 1989. An Alternate Warhead Program contract was awarded 25 Oct 89 to Conventional Munitions Systems (CMS), Arlington, VA.

Javelin was selected as the popular name for the AAWS-M weapon system requirements. The OSD directed Baseline Test Program Plan was approved in April 90. Baseline Test (Phase I) for the seeker/tracker evaluation was completed on 20 Dec 90 and Baseline Test (Phase II) for the operational assessment was completed on 22 Mar 91. The final report for the Baseline Test Program was issued on 3 Jun 91. The Javelin (AAWS-M) All Up Round (AUR) facility located at Redstone Arsenal, AL was opened on 30 Apr 90. A Defense Acquisition Board (DAB) review was held 5 Dec 90 which approved a change to the Program Baseline increasing the system weight threshold to 49.5 pounds. Four of ten Guided Test Vehicle (GTV) flight scenarios were successfully completed between 17 Apr 91 and 30 Sep 91.

As a result of cost growth and technical performance problems, several Army Systems Acquisition Review Council (ASARC), Conventional Systems Committee (CSC), and Defense Acquisition Board (DAB) reviews and briefings were held during 1991. These reviews resulted in a final deskside briefing on 16 Sep 91 to the Defense Acquisition Executive (DAE). An Acquisition Decision Memorandum (ADM) was signed on 27 Sep 91 approving a restructured 54-month Engineering and Manufacturing Development (EMD) phase for the Javelin program.

Javelin (AAWS-M) is expected to satisfy mission requirements.

b. (U) Significant Developments Since Last Report --
A Government review was held on 8-9 Oct 91 at Texas Instruments (TI), Dallas, TX facility to determine if the seeker Focal Plane Array (FPA) (64x64 matrix) portion of Focal Plane Array Manufacturing (FPAM) facility should be funded by the Government. This review conducted by Government personnel and the Javelin Joint Venture resulted in a recommendation to the PEO-Fire Support to not fund the

7b. (U) Program Highlights (Cont'd):

seeker FPA portion of the FPAM facility due to lack of performance in both technical and yield rate areas. This recommendation was accepted by the PEO-Fire Support. Focal plane array deliveries from Hughes Aircraft Co.'s Santa Barbara Research Center (SBRC), who is on contract with Martin Marietta as a second source, were accelerated to meet EMD requirements. The first and second of four Office of Secretary of Defense (OSD) directed program milestones was successfully accomplished. Santa Barbara Research Center demonstrated full specification performance in 9 of 20 Focal Plane Arrays (FPAs) manufactured. Also, SBRC exceeded the laboratory Dewar yield objective of 5% with 9.45% and delivered the first tactical FPA/Dewar Assembly on 25 Nov 91, ahead of the Dec scheduled delivery.

On 12 Dec 91 the Program Executive Office (PEO) - Fire Support (FS) was briefed on the use of Interim Contractor Support (ICS) and the current status of the Contact Test Set (CTS) Test Program Set (TPS) development. The briefing was received by the Deputy PEO who concurred with the decision to use ICS for 2 1/2 years after fielding and to use the Base Station Test Facility (BSTF) for field level maintenance in lieu of CTS. Interim contractor support will include 18 months of field level support; 29 months of depot maintenance; and 29 months of supply support.

c. (U) Changes Since As Of Date --
None.

8. (U) Threshold Breaches:
There is a schedule, RDTE cost and Procurement cost breach to the Acquisition Program Baseline (APB) dated December 7, 1990. A Program Deviation Report (PDR) and an Acquisition Program Baseline (APB) Change modifying the program schedule for the Engineering and Manufacturing Development (EMD) phase from a 36-month schedule to a 54-month schedule is being staffed for approval by the Office of the Secretary of the Army (Research, Development, and Acquisition). There are no Nunn-McCurdy cost breaches.

9. (U) Schedule:

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Joint Service Op Requirement Approved	APR 86	APR 86	APR 86
Milestone I (DSARC)	MAY 86	MAY 86	MAY 86
Proof of Principle Contract Award	AUG 86	AUG 86	AUG 86
Proof of Principle Complete	DEC 88	DEC 88	DEC 88

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Milestone II (DAB)	MAY 89	MAY 89	JUN 89
FSD Contract Award	JUN 89	JUN 89	JUN 89
Pre-Prod Qual Test			
Start	JUN 90	JUN 90	JUN 90
Complete	SEP 90	SEP 90	DEC 93
Training Force Dev Test and Experimentation (FDT&E)			
Start	MAR 91	MAR 91	FEB 93
Complete	JUN 91	JUN 91	APR 93
Prototype Delivery	APR 91	APR 91	NOV 92
IOT&E			
Start	JAN 92	JAN 92	SEP 93
Complete	APR 92	APR 92	DEC 93
Milestone IIIA (DAB)	JUN 92	JUN 92	APR 94
LRIP I Contract Award	JUN 92	JUN 92	APR 94
LRIP II Contract Award	JUN 93	JUN 93	JUL 95
First LRIP Delivery	SEP 93	SEP 93	JUL 95
Prod Qual Test			
Start	SEP 93	SEP 93	AUG 95
Complete	DEC 93	DEC 93	JAN 96
Live Fire Test			
Start	FEB 94	FEB 94	DEC 95
Complete	MAY 94	MAY 94	APR 96
First Unit Equipped	FEB 94	FEB 94	APR 96
Milestone IIIB (DAB)	JUN 94	JUN 94	APR 96
Full Rate Production Contract Award	JUN 94	JUN 94	JUL 96
First Full Rate Production Delivery	JUN 94	JUN 95	JUL 97

(b)(1) [redacted]

b. (U) Previous Change Explanations --

Combination of delayed hardware deliveries and delay in obtaining safety certification for man firing of missiles during tests delayed Training FDT&E start and stop dates. IOT&E start redefined as start of actual test not start of training of personnel to perform test. IOT&E complete estimate revised by Operational Evaluation Command (OEC). On 27 Sep 91 an Acquisition Decision Memorandum (ADM) was approved which changed the Javelin Engineering and Manufacturing Development (EMD) phase from a 36-month schedule to 54-month schedule.

9c. (U) **Schedule (Cont'd)**:

c. (U) Current Change Explanations --

None.

d. (U) References --

(U) Development Estimate:
DAE Baseline Approved 15 June 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 7 December 1990.

10. (U) **Performance Characteristics**:

a. (U) Performance --

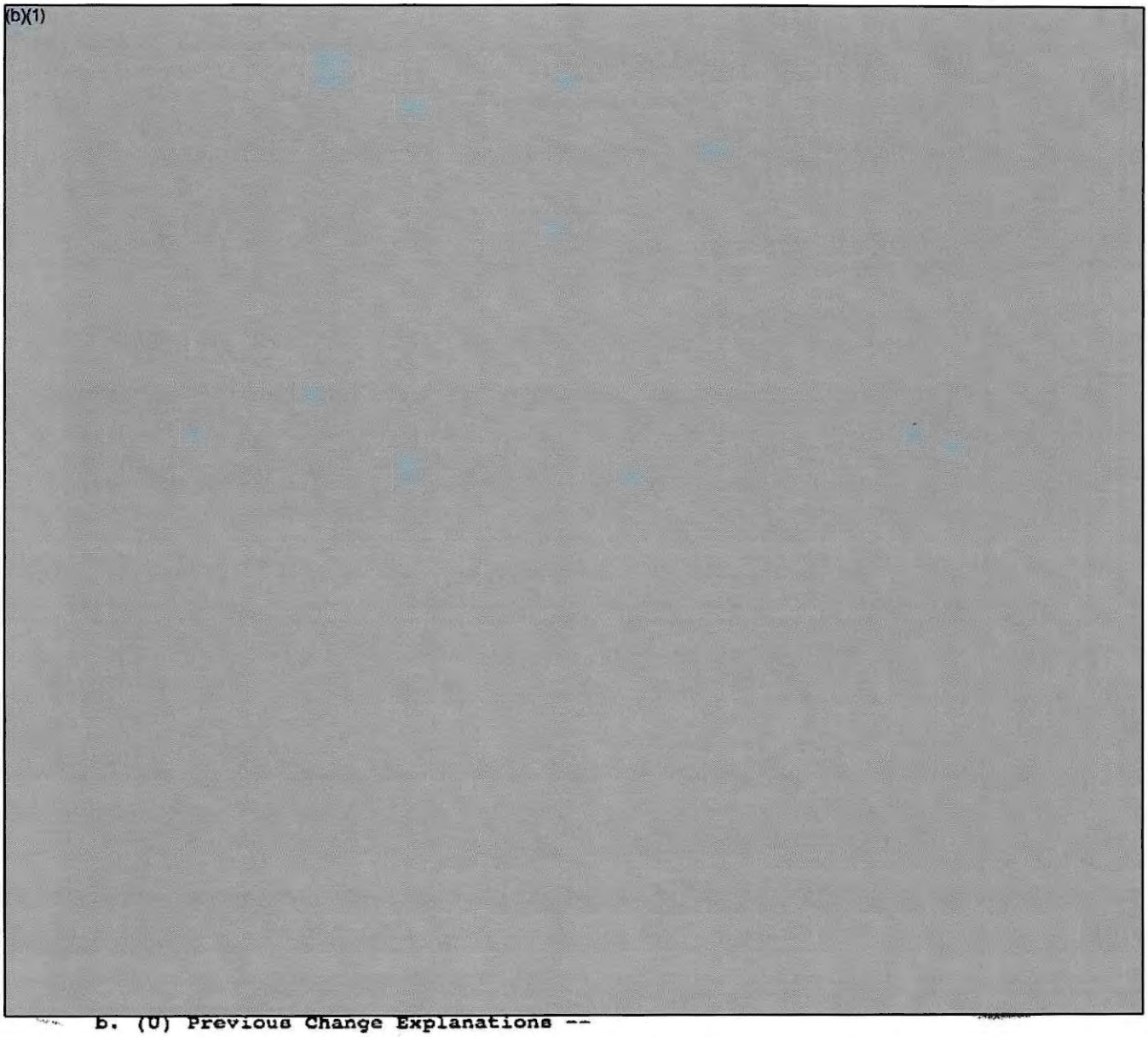
		Approved Program		Demonstrated	Current
(b)(1)					
System weight (lbs)	35	35	/ 49.5		49.2
Missile operational reliability	.89	.89	/ .82		0.85
Cmd Launch Unit MTBOMF (hrs)	126	126	/ 76		88
Cmd Launch Unit MTTR (hrs)	<1.5	<1.5	/ 1.5		<1.5

(S)

1/ (U) Full lethality must be met at this range.

2/ (U) Probability of hit given a reliable round. Hit probabilities are specified for 7 km visibility (day/night) in benign environments. Must hit a fully exposed standard NATO target (2.3m H x 2.3m W x 4.6m L) Stationary or moving (crossing velocity up to 20 km/hr) at all ranges (min to max). The hit probability must be attained given any attack azimuth or

(b)(1)



b. (U) Previous Change Explanations --

As a result of the 5 Dec 90 Defense Acquisition Board (DAB), an Acquisition Program Baseline (APB) Change was approved increasing the system weight threshold to 49.5 pounds.

10c. (U) **Performance Characteristics (Cont'd)**:

c. (U) Current Change Explanations --

None.

d. (U) References --

(U) Development Estimate:
DAE Baseline Approved 15 June 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 7 December 1990.

11. (U) **Total Program Cost and Quantity**: **(Current Estimate in Millions of Dollars)**

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	549.2	494.6	692.0
Procurement	2849.6	2895.9	3147.6
Round Flyaway	(2447.2)		(2360.0)
CLU Flyaway	(240.3)		(401.4)
Total Flyaway	(2687.5)		(2761.4)
Other Weapon System	(39.0)		(101.5)
Training Devices	(96.7)		(205.9)
Total Other Wpn Sys	(135.7)		(307.4)
Peculiar Support	(0.0)		(35.2)
Initial Spares	(26.4)		(43.6)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	3398.8	3390.5	3839.6
Escalation	537.7	780.4	1290.2
Development (RDT&E)	(-1.4)	(0.9)	(27.8)
Procurement	(539.1)	(779.5)	(1262.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	3936.5	4170.9	5129.8

Values shown include USMC program.

b. (U) Quantity --			
Development (RDT&E)	81	N/A	70
Procurement	70550	70550	70550
Total	70631	70550	70620

Excludes RDT&E prototypes that are not considered fully configured end items.

11c. (U) Total Program Cost and Quantity (Cont'd):

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
DAE Baseline Approved 15 June 1989

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 7 December 1990.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(SEP 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	5129.8	5198.4	5129.8
(2) Quantity	70620	70631	70620
(3) Unit Cost	0.073	0.074	0.073
b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	18.3
Less CY Adv Proc	0.0	0.0	18.3
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis**:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	547.8	3388.7	0.0	3936.5
Previous Changes:				
Economic	+5.3	+287.9	-	+293.2
Quantity	-	-	-	-
Schedule	+102.0	+469.7	-	+571.7
Engineering	-	+52.4	-	+52.4
Estimating	+68.7	+1.1	-	+69.8
Other	-	-	-	-
Support	-	+274.8	-	+274.8
Subtotal	+176.0	+1085.9	-	+1261.9
Current Changes:				
Economic	-5.8	-145.7	-	-151.5
Quantity	-	-	-	-
Schedule	-	-12.9	-	-12.9
Engineering	-1.0	-	-	-1.0
Estimating	+2.8	+65.4	-	+68.2
Other	-	-	-	-
Support	-	+28.6	-	+28.6
Subtotal	-4.0	-64.6	-	-68.6
Total Changes	+172.0	+1021.3	-	+1193.3
Current Estimate	719.8	4410.0	-	5129.8

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	549.2	2849.6	0.0	3398.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	+97.1	-	-	+97.1
Engineering	-	+41.3	-	+41.3
Estimating	+43.9	-10.3	-	+33.6
Other	-	-	-	-
Support	-	+202.9	-	+202.9
Subtotal	+141.0	+233.9	-	+374.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-0.9	-	-	-0.9
Estimating	+2.7	+42.9	-	+45.6
Other	-	-	-	-
Support	-	+21.2	-	+21.2
Subtotal	+1.8	+64.1	-	+65.9
Total Changes	+142.8	+298.0	-	+440.8
Current Estimate	692.0	3147.6	-	3839.6

b. (U) Previous Change Explanations --

RDT&E
Economic: revised escalation indices
Schedule: revised development schedule
Estimating: current and prior year inflation offset and revision due to technology selection; revised estimate to reflect actual costs

PROCUREMENT
Economic: revised escalation indicies
Schedule: revised delivery schedules; restructured program delayed proc 1 year
Engineering: add Built In Test Equipment (BITE) to CLU
Estimating: revised trainer cost and refined missile cost;

13b. (U) **Cost Variance Analysis (Cont'd)**:

revised hardware unut costs

Support: additional costs due to revised delivery schedule; increased support due to higher hardware costs

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indicies. (Economic)	2.7	2.9
Current % Prior Inflation Offset (Estimating)	N/A	-5.8
Revised test plan (Engineering)	-0.9	-1.0
Lower subcontractor costs (Estimating)	-0.1	-0.1
Total Changes	1.7	-4.0
(2) PROCUREMENT		
Revised escalation indicies. (Economic)	N/A	-145.7
Revised USMC delivery schedule (Schedule)	N/A	-12.9
Revised subcontractor costs (Estimating)	46.8	69.9
Correction of prior SAR variances to reconcile flyaway and support cost (Estimating)	-3.9	-4.5
Correction of prior SAR variances to reconcile flyaway and support cost (Support)	3.9	4.5
Additional costs due to revised delivery schedule (Support)	17.3	24.1
Total Changes	64.1	-64.6

14. (U) **Program Acquisition Unit Cost (PAUC) History**: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.056	0.002	--	0.008	0.001	0.002	--	0.004	0.017	0.073

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) FSD AAWS-M:	Initial Contract Price		
	Target	Ceiling	Qty
TI/MM AAWS-M, Denton, TX DAAH01-89-C-A012, CPIF Award: June 21, 1989 Definitized: June 21, 1989	$169.7	N/A	246

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$443.0	N/A	202	$443.0	$443.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-6.3	$-4.4
Cumulative Variances To Date (09/30/91)	$-7.7	$-5.7
Net Change	$-1.4	$-1.3

Explanation of Change:

Variance Analysis: Cost variances through 31 Dec 91 are due to problems in the seeker (accelerated effort to deliver 60 units by SBRC), night sight (additional effort in engineering design) and System Engineering areas. Schedule variances are due to problems in the warhead (tactical, ESAF and contact fuze), night sight, System Test and Evaluation, and System Engineering areas.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 38.9% (7 yrs/18 yrs)

(2) Percent Program Cost Appropriated: 10.9% ($557.8 / $5129.8)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY86-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2003)	Total
RDT&E	438.0	119.8	91.4	70.6	719.8
Procurement	-	-	18.3	4391.7	4410.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	438.0	119.8	109.7	4462.3	5129.8

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1986				61.8	55.1	55.1	55.1	2.8
1987				45.9	42.0	42.0	42.0	2.7
1988				31.1	29.5	29.5	29.5	3.0
1989				100.1	98.8	98.9	98.2	4.2
1990				133.5	136.7	136.7	135.2	4.0
1991				71.2	75.9	70.4	74.6	3.9
1992				108.8	119.8	31.9	5.5	3.1
1993				80.4	91.4			3.3

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)

1994				32.2	37.8			3.3
1995				27.0	32.8			3.3
Subtot	70			692.0	719.8	464.5	440.1	

Flyaway costs are not applicable to RDT&E phase. The system is comprised of rounds, CLUs and associated training devices. The round is the designated end item.

Appropriation: 2032 Missile Procurement, Army

1993			15.2	15.6	18.3			3.3
1994	1200	38.0	132.8	195.8	237.6			3.3
1995	4776	20.7	265.5	316.9	396.8			3.3
1996	5093	31.6	219.1	300.2	387.9			3.2
1997	4784	29.8	176.7	260.4	347.3			3.2
1998	4984	29.0	179.1	262.7	361.6			3.2
1999	6434		216.1	263.3	374.0			3.2
2000	7018		223.6	240.9	353.1			3.2
2001	6906		212.1	229.5	347.1			3.2
2002	7700		230.4	244.8	382.1			3.2
2003	9105		262.1	284.9	459.0			3.2

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2032 Missile Procurement, Army (Cont'd)								
Subtot	58000	149.1	2132.7	2615.0	3664.8			
Army	58070	149.1	2132.7	3307.0	4384.6	464.5	440.1	

System is comprised of rounds, CLUs, associated training devices and initial spares with the round the designated end item. Total fiscal year flyaway costs are associated with a projected buy of 58000 rounds, 5000 CLUs, and associated training devices. Procurement funds in FY 1993 are for procurement of long lead time items and do not represent complete rounds.

Appropriation: 1109 Procurement, Marine Corps								
1995	775	1.2	48.4	54.0	67.6			3.3
1996	1078	6.9	49.7	63.7	82.3			3.2
1997	1337	9.0	52.0	71.2	94.9			3.2
1998	1658	10.2	59.1	79.9	110.0			3.2
1999	2034		68.4	77.4	110.0			3.2
2000	2238		71.1	75.0	110.0			3.2
2001	2254		68.6	72.7	110.0			3.2
2002	1176		35.0	38.7	60.4			3.2
Subtot	12550	27.3	452.3	532.6	745.2			
Navy	12550	27.3	452.3	532.6	745.2			

16c. (U) **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY90 Dollars Nonrec	Flyaway FY90 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)

Appropriation: 1109 Procurement, Marine Corps (Cont'd)

Grand Total	70620	176.4	2585.0	3839.6	5129.8	464.5	440.1	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1992	1214	0	0	0
1993	5567	0	0	0
1994	10653	0	1200	0
1995	13689	0	5551	0
1996	19420	0	6171	0
1997	20007	0	6121	0
1998	0	0	6642	0
1999	0	0	8468	0
2000	0	0	9256	0
2001	0	0	9160	0
2002	0	0	8876	0

17a. (U) **Production Rate Data (Cont'd)**:

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
2003	0	0	9105	0

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	3839.6	N/A	0.0
(TY $)	N/A	N/A	5129.8	N/A	0.0
PAUC Cost (BY $)	N/A	N/A	0.054	N/A	N/A
(TY $)	N/A	N/A	0.073	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	APR 94	N/A	N/A
Duration (in MON)	N/A	N/A	122	N/A	N/A
End Date(MON YY)	N/A	N/A	JUN 04	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	17/17
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The maintenance concept for AAWS-M will be developed to conform to the existing 4-level (or less) maintenance concept for deployment and support. Unit maintenance of the system will be limited to quick and simple visual inspection, cleaning, self-test using Built In Test (BIT), and replacement of consumables (such as batteries).

Direct support maintenance will be organic at First Unit Equipped (FUE) and will consist of: system check-out using the Integrated Family Test Equipment (IFTE) Contact Test Set (CTS) Test Program Set (TPS); replacement of faulty components; and possible component screening, using the IFTE Base Station Test Facility (BSTF), and evacuation of repairable components to depot.

Interim Contractor Support (ICS) for supply support and depot level maintenance will be utilized for the first two and one-half years. Total Government organic support capability will be established in 1996. Depot maintenance will consist of complete repair of the CLU's economically repairable circuit cards, and assemblies, and components using the IFTE Commercial Equivalent Equipment (CEE). Missile Depot repair (resulting from surveillance checks) will be performed by the system's prime contractor until a Government Depot repair capability becomes economically feasible. The AAWS-M training devices will be maintained at field and depot levels via Contractor Logistics Support (CLS) contracts for the life of the system.

Fielding occurs in the 2nd year following procurement. Initial repair parts represents over 27% of the fielding program costs. Sustainment covers 20 (full deployment) years of operation, maintenance, and modification. Military pay and allowances represents over 81% of the sustainment program costs. Sustainment for the antecedent system, DRAGON, covers 33 (full deployment) years of operation, maintenance, and modification.

Personnel costs cover military pay and allowances less costs associated with permanent change of station (PCS). O & S consumables consist of petroleum, oil and lubricants plus ammunition/missiles (training ammo/missiles and war reserve). Direct depot maintenance consists of civilian labor, material, transportation, sustainment of training devices, system software maintenance and training devices software maintenance. Sustaining investment includes repair parts (incl war reserve), spares (incl ware reserve), modifications/kits and software upgrades. Other direct costs include field maintenance civilian labor, system specific replacement training, quarters, maintenance and utilities. Indirect cost consists of costs of PCS,

18a. (U) Operating and Support Costs (Cont'd):
system project management, DRAGON stockpile reliability, and other O & M and MIPA funded items less training device software maintenance and software upgrades.

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Year JAVELIN	Avg Annual Cost Per Year DRAGONII(ANTECEDENT)
PERSONNEL	113.3	113.3
O&S CONSUMABLES	0.0	0.0
DIRECT DEPOT MAINTENANCE	8.9	14.2
SUSTAINING INVESTMENT	4.7	20.9
OTHER DIRECT COST	3.2	9.5
INDIRECT COSTS	13.3	4.7
Total	143.4	162.6

c. (U) Contractor Support Costs -- None.

AAWS-M System - AAWS-M BCE, validated Aug 1989, 20 Years Sustainment, Army Only, USMC O&S Cost TBD;

Antecedent - DRAGON II Life Cycle Cost Estimate, IAAWS COEA, Oct 1988, 33 Years Sustainment, Army Only, USMC O&S Cost TBD.

DoD-2 WAM

91-044

*** UNCLASSIFIED ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: WWMCCS(ADP Mod Prog)

AS OF DATE: December 31, 1991

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1. Designation and Nomenclature (Popular Name):
   WWMCCS Automated Data Processing (ADP) Modernization (WAM)

2. DoD Component: DISA

   Joint Participants:
   WAM

3. Responsible Office and Telephone Number:
   DoD/DISA/DSSO/JM
   Program Management Office (PMO)
   701 S. Courthouse Rd.
   Arlington, VA 22204-2199
   Col Gabriel J. Alcala
   Assigned: May 15, 1991
   AV 223-6345 COMM 703-693-6345

4. Program Elements/Procurement Line Items:

   RDT&E:
   PE 33152A, 33152F, 33152N, 33154K
   PROCUREMENT:
   APPN 0300 ICN NA (DCA/DNA) DCA/DNA
   APPN 1109 ICN 8210 (Navy)
   APPN 1810 ICN 8210 (Navy)
   APPN 2035 ICN BE4100 (Army)
   APPN 3080 ICN 834040 (Air Force)
   O & M:
   PE 33152F, 33154K

CLEARED
FOR OPEN PUBLICATION
MAR 18 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

OASD(PA) DFOISR 92-T-0580

*** UNCLASSIFIED ***

5. Related Programs:
None

6. Mission and Description:
The objective of the Worldwide Military Command and Control System (WWMCCS) ADP Modernization Program (WAM) is to provide a modern worldwide information processing system which allows rapid and reliable exchanges of information to support planning for and execution of the deployment, employment and sustainment of forces in normal or crisis periods. The primary mission of WWMCCS and its information processing component, is to support the National Command Authorities, the Chairman of the Joint Chiefs of Staff, the Joint Staff, and the Commanders in Chief and their staffs with a means to plan, initiate, and efficiently execute joint conventional military operations during peace, crisis, and war. WAM will be secure from unauthorized access, data manipulation, or retrieval. The system hardware will be TEMPEST-certified as required. This program will modernize and expand the functionality of the existing standard WWMCCS ADP System.

NOTE: The WWMCCS Information System (WIS) Program with the Air Force as executive agent was terminated by the Defense Acquisition Board (DAB) on 10 February 1989. At that time some of the objectives of the WIS program were assigned to the Defense Communications Agency (DCA) now the Defense Information Systems Agency (DISA) as the WWMCCS ADP Modernization (WAM) Program. The primary focus of WAM is to provide Joint Operation Planning and Execution System (JOPES) functionality, as defined in the JOPES Required Operational Capability (ROC) and the JOPES Increment I Functional Description. The WAM program will accomplish this by incremental fielding of new JOPES software. The WAM program will also test and certify selected non-developmental ADP system components (hardware and software) needed to support JOPES or to comply with DoD standards. WWMCCS ADP sites may select needed ADPE from an "approved products" list when such acquisitions can be justified on operational need or economic bases. This approach to modernization minimizes new development by relying on testing of available commercial and government products and integrating qualified products into the existing system.

7. Program Highlights:
a. Significant Historical Developments --

On November 5, 1982, the Deputy Secretary of Defense established the WIS Joint Program Manager (WIS JPM) for the WWMCCS ADP Modernization program. The Chief of Staff, Air Force was designated Executive Agent. The WIS Joint Mission Element Needs Statement, February 1982, provided the basis for the July 1982 Report to Congress which defined the WIS architecture and development program as approved by the Joint Chiefs of Staff. The Joint Chiefs of Staff

7a. Program Highlights (Cont'd):

approved the WIS Operational and Information Requirements on July 5, 1983. On May 16, 1984, the Defense Acquisition Executive held a program review and directed the WIS to be developed and deployed in three increments. A Secretary of Defense Decision Memorandum, September 11, 1985, capped joint RDT&E funds at $835.8M (663.8M base year FY82), and affirmed tri-Service funding.

As recommended in the FY88 Appropriations Bill, the Air Force decided to consolidate the WIS management organizational structure and briefed the OSD/C3I Systems Committee in April 1988. However, on 23 December 1988 the OSD/C3I Systems Committee agreed that DCA should prepare a plan to transfer Executive Agency from the Air Force to DCA. On March 6, 1989, the Deputy Secretary of Defense approved the change and DCA's proposed approach for the modernization of the WWMCCS ADP. In September 1989 Congress directed the WAM program be reviewed by the DoD Major Automated Information Systems Review Committee (MAISRC). The Joint MAISRC/C3I System Committee meeting on 23 January 1990 endorsed the WAM program status assessment for presentation to the DAB and recommended DAB approval of program definition, schedule, testing plan, and funding estimate presented by DCA, and that program oversight should be delegated to the Joint Committee.

On 31 January 1990 the Comptroller General issued a decision upholding in part a protest by Martin Marietta Corp. against the award of the WWMCCS Workstation Contract by the USAF and recommended that the Air Force conduct an additional round of Best-and-Final-Offers (BAFO) with the three offerors who had participated in the 1989 BAFO. Since this workstation is the platform on which WAM application software is being developed, OSD delayed the Program Status Assessment for the Defense Acquisition Board (DAB) until the protest and its impact on the WAM program could be clarified.

In February 1990 the Air Force requested the Comptroller General to reconsider the recommendation to conduct additional BAFOs asserting that GAO had misinterpreted the technical requirements of the specification and that the economic interest of the Government would not be served by the delay. Martin-Marietta supported the Air Force position, and withdrew its protest. In May, the Comptroller General restated his recommendation to conduct an additional round of BAFO after technical clarification. The Air Force requested and received in July new BAFOs; Martin-Marietta declined. On 1 October 1990, the Air Force announced that the additional BAFO had resulted in a decision to continue the workstation contract originally awarded to Honeywell Federal Systems, Inc. in 1989. C Cubed, Inc., the only other participating vendor, protested.

7a. Program Highlights (Cont'd):

The continuing lack of final resolution of the protests of the Air Force Workstation contract delayed maturation of the workstation as a software development platform. These delays resulted in rescheduling of JOPES Version 4 fielding from November 1991 to April 1992; of Version 5 until Fall 1992; remaining versions will continue to be fielded at six months intervals, with Version 13 delayed to November 1996.

In April 1990, the ASD(C3I) Systems Committee approved the recommendation of the Joint Staff and the WAM PM that JOPES Version 4 continue being developed on the original workstation platform pending resolution of the workstation protest. If necessary this software would be converted to a new workstation at an appropriate time, probably FY93.

JOPES Version 1 was demonstrated at selected WWMCCS sites during Exercise Proud Eagle 90 and subsequently fielded at all WWMCCS sites during November 1989. JOPES Version 2 was not affected by the workstation situation and was fielded at all WWMCCS sites in April 1990. JOPES was extensively used to support planning and execution of Operation Desert Shield. JOPES Version 3 was fielded at all WWMCCS sites in December 1990 and continued to support Operation Desert Storm. As a result of these operations, the Joint Staff is revalidating and reprioritizing the functional requirements for the remaining versions of JOPES. No date has been set for completion.

b. Significant Developments Since Last Report --

The Joint MAISRC/C3I System Committee reviewed the status of the WAM program on 28 February 1991 and the DAB review was on 14 March 1991. The DAB approved the continued execution of the WAM program and the release of the Service and Agency FY 91 WWMCCS procurement funds. Another DAB review will be held following the first WAM OT&E, but no later than the 2nd Quarter of FY 93.

The Air Force workstation contract protest was resolved in favor of the Honeywell-MacIntosh selection in April 1991. General Telephone & Electronics (GTE) completed development of Version 4 on the SUN workstation. Testing commenced in April 1991. Version 4 was scheduled for worldwide installation February-March 1992.

As reported in the December 1990 SAR and with the DAB approval of the WAM program, the old WIS portion has been deleted and is no longer being reported.

The Baseline (FY 90 baseyear) was approved by the Agency

7b. Program Highlights (Cont'd):

Acquisition Executive on 22 April 1991. On 6 June 1991, the Acting Under Secretary of Defense/Acquisition approved the new WAM Program baseline. The baseline includes: (1) performance thresholds for the JOPES software development contract; (2) program schedule; and (3) a cost baseline of $258.4 million in RDT&E funds.

Significant progress was made in the development and integration of the Version 4 software, which is scheduled for release in early 1992. The Joint Deployment System converted code and the New Plan Build code was received and fully integrated. When the converted code is released, users will be able to do considerable processing at their individual workstations and not be totally dependent on the central processor.

In September, a general support contract which includes funding for JOPES operations and maintenance was awarded to Computer Sciences Corporation (CSC) and a JOPES Development and Integration (D&I) contract was awarded to Systems Research and Applications (SRA) Corporation. The JOPES D&I contract will support the integration of Version 5, development and integration support to numerous JOPES prototypes, and development and integration support for Versions 6 through 11.

With the Honeywell-MacIntosh WWMCCS workstation contract protest resolved, plans were made to port the Version 4 software which had been developed on a SUN workstation to the WWMCCS workstation. This work was done at the Defense Information Systems Agency (DISA) operational support facility. Porting was completed on schedule in late July. This ported software is now being integrated with the converted Joint Operation Planning System (JOPS) and the Joint Deployment System (JDS) to complete JOPES Version 4. In the Fall of 1991, a BETA version New Plan Build was evaluated at USCENTCOM, EUCOM, LANTCOM, and FORSCOM, and has been demonstrated to numerous Joint Staff, OSD, and Service flag officers and equivalents, as well as the JOPES Project Group.

During the evaluation of the software application, the user's readiness to receive Version 4 was also assessed. This assessment covered availability of WWMCCS workstations, workstation training, complexity of the new JOPES application software, and capability of technicians to maintain the system. This evaluation, coupled with the complex integration of six different software products from five different developers, resulted in a decision to delay the JOPES software system cutover by 60 days, from 6 April to 6 June 1992. The delay will be used to field a JOPES Version 4 Training package and to allow more extensive testing of the integrated standard WWMCCS ADP operating system software, WWMCCS workstation

7b. Program Highlights (Cont'd):

hardware and operating system software, and JOPES application software. Prior to the fielding of JOPES Version 4, every host WWMCCS ADP and other major command locations will be visited.

The 60 day delay also permitted the fielding of a new standard WWMCCS ADP operating system software for the host computers. This software release is neccessary for JOPES to run in a local area network (LAN) configuration. Integrated system testing and field testing at 13 locations is complete. A worldwide cutover of the new operating system is scheduled for March 21, 1992.

This system will satisfy mission requirements.

c. Changes Since As Of Date --

Due to critical deficiencies highlighted during the JOPES Version 4 Users' Evaluation (Feb 18-20, 1992), the JOPES Version 4 fielding and cutover plan has been postponed. The Director, Joint Staff, tasked DISA to complete a comprehensive evaluation of JOPES Version 4 and planned follow-on versions NLT 27 March 1992. This review identifies deficiencies, presents options, and recommends courses of action. On 26 February 1992, ASD(C3I) directed that DISA take no contract action past JOPES Version 6 in light of the "Command and Control Functional Analysis and Consolidation Review Panel (C2 FACRP) Report" which will "most certainly result in new information technology support requirements." DISA has also been working with DARPA, the Joint Staff, and C3I to explore ways to include DARPA rapid prototyping capabilities in future JOPES versions.

8. Threshold Breaches:
There are RDT&E and procurement cost breaches to the Acquisition Program Baseline of 6 June 1991. A program deviation report and APB change will be submitted as required. There are no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --	Production Estimate	Approved Program	Current Estimate
JOPES Version 4 Ready for Cutover 1/	N/A	MAR 92	JUN 92
JOPES OT&E 1 -- Force Analysis (JSE J013) COA/OPLAN/OPORD Generation (JSE J030.4)	AUG 92	SEP 92	SEP 92(Ch-1)

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
JOPES Initial Operational Capability	MAR 92	SEP 92	SEP 92(Ch-2)
In Process Review	N/A	SEP 92	SEP 92
WAM Architecture Report	N/A	MAR 93	MAR 93
Program Decision on Completion of JOPES (Increment 2)	SEP 93	SEP 93	SEP 93
JOPES OT&E 2 -- Medical Planning (JSE J016) Transportation Analysis (JSE J030.7)	FEB 94	AUG 94	AUG 94(Ch-3)
In Process Review	N/A	SEP 94	SEP 94
JOPES Version 13 Ready for Cutover 1/	MAY 96	OCT 96	OCT 96(Ch-4)
JOPES OT&E 3 -- Comparative Analysis (JSE J030.8) COA Analysis (JSE J034)	OCT 97	FEB 97	FEB 97(Ch-5)
WAM Full Operational Capability 2/	N/A	FEB 97	FEB 97
DAB (Program Status Review)	MAR 91	N/A	MAR 91
JOPES Version 2	MAY 90	N/A	MAY 90
JOPES Version 3	N/A	N/A	NOV 90
JOPES Version 7&8	NOV 93	N/A	NOV 93

1/ Ready for Cutover means the version is in the field, tested and waiting Joint Staff's decision for cutover.
2/ FOC is for JOPES Increment 1 capabilities.

b. Previous Change Explanations --

None

c. Current Change Explanations --

1. Changed from Aug 92 to Sep 92 due to a 60 day delay for user training in the field.

2. Changed from Mar 92 to Sep 92 due to WWMCCS workstation protest.

3. Changed from Feb 94 to Aug 94 due to WWMCCS workstation protest.

4. Changed from May 96 to Oct 96 due to WWMCCS workstation protest.

5. Changed from Oct 97 to Feb 97 due to WWMCCS workstation protest (Oct 97 should have been Oct 96).

9d. **Schedule (Cont'd)**:

d. References --

Production Estimate:
Draft DCP dated 3 August 1989.

Approved Program:
DAE Approved Acquisition Program Baseline dated 06 June 1991.

10. **Performance Characteristics**:

a. Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Force Analysis (JSE J013)					
Display Unit Readiness Data Screen (sec)	N/A	5	/ 90		28
COA/OPLAN/OPORD Generation (JSE J030.4					
Database Recovery of OPLAN (hr)	N/A	1	/ 3		2.5
Medical Planning (JSE J016)					
Medical Requirements Analysis Computation (hr)	N/A	1.5	/ 3		N/A
Transportation Analysis (JSE J030.7)					
Transportation Feasibility Computation (hr)	N/A	2	/ 4		N/A
Comparative Analysis (JSE J030.8)					
Comparative Analysis of Actual vs Planned Activities Supporting Joint Planning and Execution (min)	N/A	45	/ 120		N/A
COA Analysis (JSE J034)					

10a. **Performance Characteristics (Cont'd):**

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Comparison of Multiple COAs (Time to extract data and compare each COA)(hr)	N/A	1.5	/ 4		N/A
Develop OPLAN (days)					
IOC	N/A	45	/ 213		213
FOC	N/A	3	/ 120		
Develop OPORD (days)					
IOC	N/A	3	/ 7		7
FOC	N/A	3	/ 5		
Data Completeness (%)					
IOC	N/A	99	/ 35		75
FOC	N/A	99	/ 99		
Data Consistency (%)					
IOC	N/A	99	/ 35		85
FOC	N/A	99	/ 99		
Simple Query (sec)					
IOC	90	5	/ 90		90
FOC	N/A	5	/ 5		
Complex Query (min)					
IOC	3.9	3	/ 3.9		3.9
FOC	N/A	1	/ 3		
System Recovery (Disk)(Unscheduled) (hr)					
IOC	N/A	1	/ 3		2
FOC	N/A	1	/ 1		
Availability		N/A	/ N/A		
Routine Operational Availability	98%	N/A	/ N/A		98%
Crisis Operational Availability	99.8%	N/A	/ N/A		99.8%
Usability	98%	N/A	/ N/A		98%

Note:

Availability is defined as the percentage of time WAM is ready for use. WAM reliability and redundancy requirements will be incorporated into its design so that critical command and control activities will be available as specified in JCS Pub 6-03.17 and the JOPES ROC.

10a. **Performance Characteristics (Cont'd):**

Usability is defined as the time it will take to learn how to log-on through a WAM workstation to the system and access available WAM applications. The usability goal will be 8 hours of workstation OJT with the availability of a full help command function.

b. Previous Change Explanations --

None.

c. Current Change Explanations --

None.

d. References --

Production Estimate:
Draft DCP dated 3 August 1989.

Approved Program:
DAE Approved Acquisition Program Baseline dated 06 June 1991.

11. **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

a. Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	384.9	226.7	375.8
Procurement	303.1	1.8	227.3
Total Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(303.1)		(227.3)
Total Other Wpn Sys	(303.1)		(227.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	134.8	N/A	116.7
Total FY 90 Base-Year $	822.8	228.5	719.8
Escalation	134.4	31.9	105.9
Development (RDT&E)	(54.8)	(31.7)	(51.1)
Procurement	(56.7)	(0.2)	(36.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(22.9)	(N/A)	(17.9)
Total Then-Year $	957.2	260.4	825.6

11b. **Total Program Cost and Quantity (Cont'd):**

b. Quantity --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	0	0	0
Procurement	1	1	1
Total	1	1	1

There is not a generic unit of WAM, only software releases and testing and certifying selected non-developmental ADP system components (hardware and software) needed to support JOPES or comply with DoD standards. Quantity of one represents a nominal figure in order to calculate the current Procurement unit cost IAW 10 U.S.C. 2433.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Production Estimate:
Draft DCP dated 3 August 1989.

Approved Program:
DAE Approved Acquisition Program Baseline dated 06 June 1991.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 90 SAR)
(1) Cost (TY$)	825.6	957.2	957.2
(2) Quantity	1	1	1
(3) Unit Cost	825.60	957.20	957.20
b. Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	29.6	27.6	41.3
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	29.6	27.6	41.3
(2) Quantity	1	1	1
(3) Unit Cost	29.60	27.60	41.30

There is not a generic unit of WAM only software releases and testing and certifying selected non-developmental ADP system components (hardware and software) needed to support JOPES or comply

12. **Program Acquisition/Current Procurement Unit Cost Summary (Cont'd)**: with DoD standards. Quantity of one represents a nominal figure in order to calculate the current Procurement unit cost IAW 10 U.S.C. 2433.

13. **Cost Variance Analysis**:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	O&M	TOTAL
Production Estimate	439.7	359.8	157.7	957.2
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-1.9	-2.4	-1.2	-5.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-10.9	-93.2	-22.0	-126.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-12.8	-95.6	-23.2	-131.6
Total Changes	-12.8	-95.6	-23.2	-131.6
Current Estimate	426.9	264.2	134.5	825.6

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	O&M	TOTAL
Production Estimate	384.9	303.1	134.8	822.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-9.1	-75.8	-18.1	-103.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-9.1	-75.8	-18.1	-103.0
Total Changes	-9.1	-75.8	-18.1	-103.0
Current Estimate	375.8	227.3	116.7	719.8

b. Previous Change Explanations --

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised OSD inflation indices. (Economic)	--	-1.9
Net Service/Agency Congressional cuts and outyear adjustments. (Estimating)	-9.1	-10.9
Total Changes	-9.1	-12.8

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised OSD inflation indices. (Economic)	--	-2.4
Net Services/Agency adjustments with Army reducing requirements by $103M. (Estimating)	-75.8	-93.2
Total Changes	-75.8	-95.6
(3) O & M		
Revised OSD inflation indicies. (Economic)	--	-1.2
Net Service/Agency adjustments with Air Force now reporting civilian personnel pay in WWMCCS line. (Estimating)	-18.1	-22.0
Total Changes	-18.1	-23.2

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
957.2	-5.5	--	--	--	-126.1	--	--	-131.6	825.6

15. Contract Information: None.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 33.3% (3 yrs/9 yrs)

(2) Percent Program Cost Appropriated: 42.5% ($350.7 / $825.6)

16b. **Program Funding Summary (Cont'd):**

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY90-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	148.6	59.1	44.1	175.1	426.9
Procurement	71.2	29.6	33.0	130.4	264.2
MILCON	-	-	-	-	-
O&M	24.1	18.1	16.8	75.5	134.5
Total	243.9	106.8	93.9	381.0	825.6

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1990				26.9	27.7	27.7	27.7	4.0
1991				20.2	21.6	21.6	18.3	3.9
1992				12.8	14.2	3.3	1.5	3.1
1993				9.4	10.7			3.3
1994				8.0	9.5			3.3
1995				9.2	11.2			3.3
1996				8.8	11.1			3.2
Subtot				95.3	106.0	52.6	47.5	

16c. Program Funding Summary (Cont'd):
These FY90-FY97 funds are under direct control of the Army.

Appropriation: 2035 Other Procurement, Army

1990				30.1	31.2	31.2	30.1	4.0
1991				15.2	16.4	16.4	5.1	3.9
1992	1			9.0	10.0	2.9	0.8	3.1
1993				6.9	7.9			3.3
1994				6.5	7.7			3.3
1995				6.4	7.9			3.3
1996				6.1	7.8			3.2
1997				6.3	8.3			3.2
Subtot	1			86.5	97.2	50.5	36.0	
Army	1			181.8	203.2	103.1	83.5	

These FY90-FY97 funds are under direct control of the Army.

Appropriation: 1319 Research, Development, Test + Eval, Navy

1990				5.8	6.0	6.0	5.9	4.0
1991				3.7	4.0	4.0	2.9	3.9
1992				4.0	4.4			3.1
1993				3.4	3.9			3.3
1994				4.4	5.2			3.3
1995				4.1	5.0			3.3
1996				2.5	3.2			3.2
1997				1.0	1.3			3.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
Subtot				28.9	33.0	10.0	8.8	

These FY90-FY97 funds are under direct control of the Navy.

Appropriation: 1109 Procurement, Marine Corps

1990				0.2	0.2	0.2	0.2	4.0
1991				0.1	0.1	0.1	0.1	3.9
1992				0.9	1.0			3.1
1993				0.3	0.3			3.3
1994				0.8	1.0			3.3
1995				0.3	0.4			3.3
1996				0.3	0.4			3.2
1997				0.7	0.9			3.2
1998				0.7	0.9			3.2
Subtot				4.3	5.2	0.3	0.3	

These FY90-FY98 funds are under direct control of the Marine Corps.

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1810 Other Procurement, Navy								
1990				1.6	1.7	1.7	1.7	4.0
1991								3.9
1992				9.0	10.1	0.2		3.1
1993				4.9	5.6			3.3
1994				0.7	0.8			3.3
1995				2.4	2.9			3.3
1996				1.3	1.7			3.2
1997				0.9	1.2			3.2
Subtot				20.8	24.0	1.9	1.7	
Navy				54.0	62.2	12.2	10.8	

These FY90-FY97 funds are under direct control of the Navy.

Appropriation: 3600 Research, Development, Test + Eval, AF

1990				3.3	3.4	3.3	3.3	4.0
1991				1.4	1.5	1.5	1.3	3.9
1992				0.5	0.6	0.3	0.3	3.1
Subtot				5.2	5.5	5.1	4.9	

16c. Program Funding Summary (Cont'd):
These FY90-FY92 funds are under direct control of the Air Force.

Appropriation: 3080 Other Procurement, Air Force

1990				13.8	14.3	14.3	14.3	4.0
1991				6.8	7.3	6.5	7.0	3.9
1992				5.8	6.5			3.1
1993				16.7	19.2			3.3
1994				19.5	23.2			3.3
1995				14.3	17.6			3.3
1996				19.0	24.1			3.2
1997				18.0	23.6			3.2
Subtot				113.9	135.8	20.8	21.3	

These FY90-FY97 funds are under direct control of the Air Force.

Appropriation: 3400 Operation & Maintenance, Air Force

1990				11.7	11.8	11.8	11.8	4.0
1991				6.0	6.3	6.3	4.1	3.9
1992				8.9	9.7	1.6		3.1
1993				6.2	7.0			3.3
1994				6.3	7.3			3.3
1995				6.0	7.2			3.3
1996				5.6	7.0			3.2
1997				5.3	6.8			3.2
Subtot				56.0	63.1	19.7	15.9	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3400 Operation & Maintenance, Air Force (Cont'd)								
USAF				175.1	204.4	45.6	42.1	

These FY90-FY97 funds are under direct control of the Air Force.

Appropriation: 0400 RDT&E, Defense Agencies

1990				36.9	37.9	37.9	31.9	4.0
1991				43.5	46.5	42.9	22.7	3.9
1992				36.0	39.9	19.7	0.3	3.1
1993				25.8	29.5			3.3
1994				31.0	36.6			3.3
1995				27.5	33.6			3.3
1996				23.9	30.1			3.2
1997				21.8	28.3			3.2
Subtot				246.4	282.4	100.5	54.9	

These FY90-FY97 RDT&E funds are under direct control of the WAM Program Manager.

Appropriation: 0300 Procurement, Defense Agencies

1990								4.0

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 0300 Procurement, Defense Agencies (Cont'd)								
1991								3.9
1992				1.8	2.0			3.1
1993								3.3
1994								3.3
Subtot				1.8	2.0			

These FY92 procurement dollars are under direct control of the WAM Program Manager.

Appropriation: 0100 Operation & Maintenance,Defense Agencies

1990				2.4	2.4	2.4	2.0	4.0
1991				3.4	3.6	3.4	1.5	3.9
1992				7.7	8.4	4.5	0.5	3.1
1993				8.7	9.8			3.3
1994				9.5	11.1			3.3
1995				9.5	11.5			3.3
1996				10.0	12.4			3.2
1997				9.5	12.2			3.2
Subtot				60.7	71.4	10.3	4.0	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 0100 Operation & Maintenance,Defense Agencies (Cont'd)								
DoD				308.9	355.8	110.8	58.9	
Grand Total	1			719.8	825.6	271.7	195.3	

These FY90-FY97 O&M funds are under direct control of the WAM Program Manager.

17. Production Rate Data:

a. Annual Production Rates -- None.

None required since production rate is less than six per year.

b. Cost Variance -- None.

c. Schedule Variance -- None.

d. Deliveries (Plan/Actual) -- None.

e. Approved Design-to-Cost Objective -- N/A.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

Development of life cycle costs are underway and will be presented in subsequent SAR's.

b. Costs -- None.

c. Contractor Support Costs -- None.

N-32 PHALANX CIWS

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91-148

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: MK-15 PHALANX CIWS

AS OF DATE: December 31, 1991

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CLEARED FOR OPEN PUBLICATION

MAR 23 1992

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

2

1. (U) Designation and Nomenclature (Popular Name):
MK 15/Close-In Weapon System (PHALANX CIWS)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

COMMANDER
NAVAL SEA SYSTEMS COMMAND
(PMS 413)
WASHINGTON, DC 20362-5101

CAPT CHARLES P. BINGAY
Assigned: July 30, 1991
AV 332-7113 COMM (703)602-7113

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0604358N
PROCUREMENT:
APPN 1507 ICN 4110 (Navy)
APPN 1611 ICN 4110 (Navy)

No Security Objection to Open Publication
(AS AMENDED)
MAR 23 1992
Office of the Chief of
Naval Operations Dept. of the Navy

~~Classified by: OPNAVINST S5513.B~~
Declassify on: OADR
~~Downgrade Instructions: NOT SUBJECT TO AUTOMATIC DOWNGRADE~~

(THIS PAGE IS ~~UNCLASSIFIED~~)

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OASD(PA) DPOISR 92-T-0654

5. (U) Related Programs:
CG-47, LSD-41, LHD, DDG-51, AOE-6 and CVN-68 Classes are SAR reportable related programs. CV 62, AE, BB 61 amd DD 989 were related programs not included in other SARs.

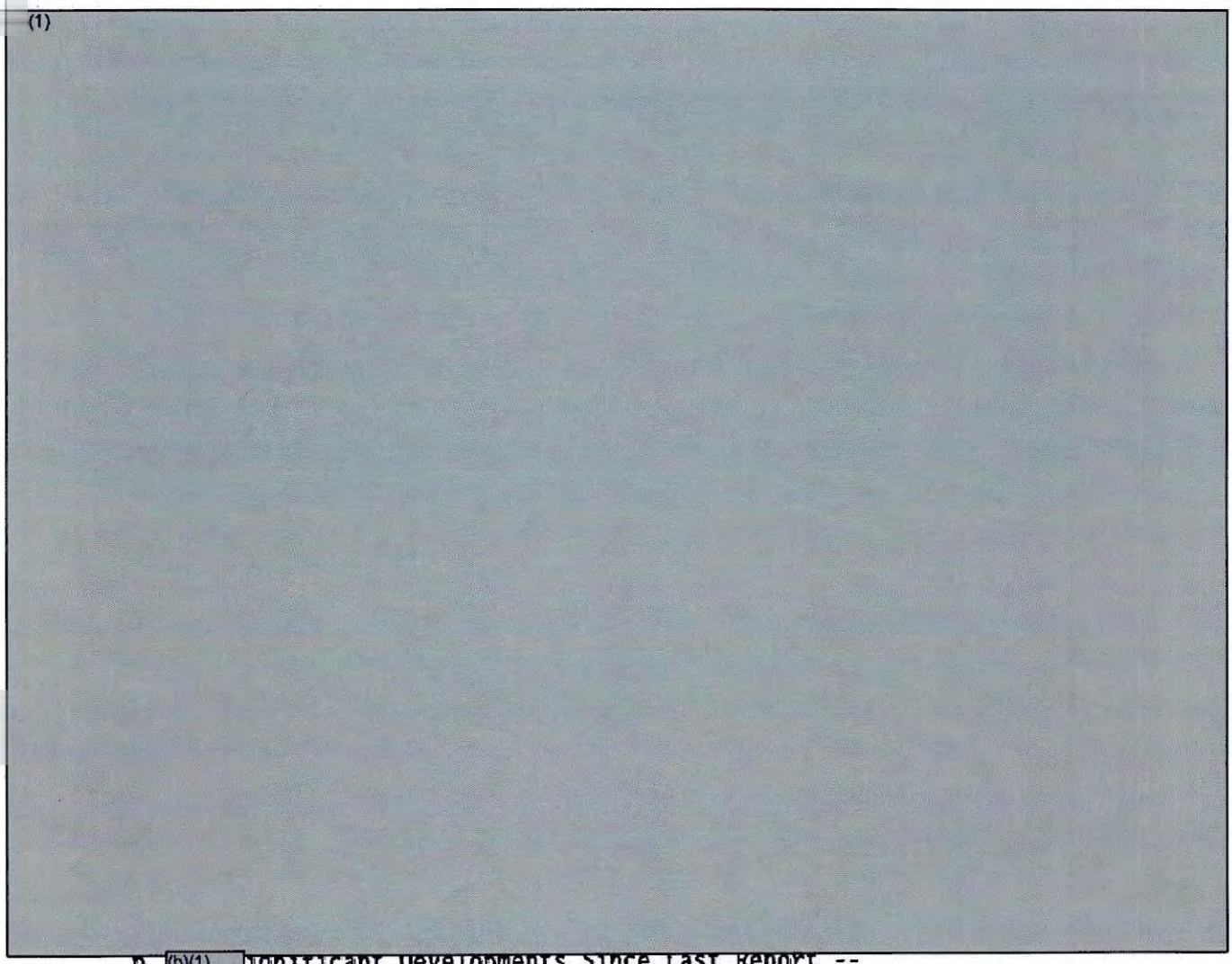
6. (U) Mission and Description:
CIWS is designed as a fast reaction terminal defense against low and high flying high speed maneuvering anti-ship missiles penetrating outer fleet defenses. CIWS is an automatic self-contained unit consisting of search and track radars, digitized fire control system and a 20 mm M61A1 gun all mounted in a single above deck structure requiring minimum interface with other ship systems. CIWS automatically detects, evaluates, tracks, and engages threats and then returns to search mode ready to detect another target. Its operations sequence is as follows: the search radar detects and evaluates a potential target by comparing measured target parameters (speed and angle of approach) with data stored in the fire control computer. After the target is declared a threat, it is handed over to the track radar. The system begins firing a stream of projectiles timed so that the projectiles arrive in the vicinity of the target when the target reaches an optimum engagement range. Thereafter, the fire control radar compares the incoming target position with the centroid of the stream of projectiles and makes any corrections required to bring it onto the target. This system does not replace an existing major weapon system, but provides a close range self defense capability that is otherwise unavailable to the fleet.

The CIWS program meets its current mission requirements.

(b)(1)

a. (b)(1) Significant Historical Developments --
(U) Nine Expanded PHALANX Introduction Commitment (EPIC) flag level review panels have convened to improve introduction of PHALANX to the fleet. SECNAV directed acceleration of PHALANX installation in deploying ships was successfully conducted and results incorporated into the design. The Block 0 configuration was not designed to meet high-speed diving threats, and introduction of Block I configuration was necessary to meet these threats. Contractor Test and Evaluation (CTE) of PHALANX Block I was conducted during the final quarter of 1984. Navy Test and Evaluation (NTE) and a comprehensive Development Test/Operational Test (DT/OT) were accomplished in the spring and summer of 1985. There was a two-month contract suspension of General Dynamics from 3 December 1985 to 2 February 1986. Approval for Limited Production (ALP) for Block I production under the FY 1986 and FY 1987 production contracts was approved on 12 March 1986. Block I land based DT was conducted to demonstrate improved radar sensitivity, fire control algorithm, and increased firing rate. At-sea DT commenced in September 1987 as directed in the July 1987 approved Test and Evaluation Master Plan (TEMP). General Electric,

(1)



b. (b)(1) Significant Developments Since Last Report --

Over the past year, the Navy has taken delivery of 34 Block I systems and 19 Block I Ordnance Alteration (ORDALT) kits from the two producers, General Dynamics/Pomona (GD/P) and General Electric/Pittsfield (GE/P). In addition, 20 systems were upgraded at Naval Surface Warfare Center, Crane Division, Louisville to the Block I configuration.

On 29 August and 30 September 1991, the Navy awarded contracts to GD/P and GE/P for a total of 27 systems and 16 ORDALTs.

Block I Baseline 2 readiness improvement has been completed and is

(b)(1)



c. (U) Changes Since As Of Date --
None.

8. (U) Threshold Breaches:
There is a development cost breach to the Acquisition Program Baseline (APB) dated 31 Dec 1988. A program deviation report and revised APB have been submitted. Approval has been deferred until the POM 94 submission. There were no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Production Estimate	Approved Program	Current Estimate
Start Engineering Dev	DEC 70	DEC 70	DEC 70
Complete At-Sea Test #1 Prototype	MAR 74	MAR 74	MAR 74
Complete At-Sea Operational Test and Evaluation	JUL 77	JUL 77	JUL 77
DSARC III	SEP 77	SEP 77	SEP 77
Initial Operational Capability on CV-66 First Prod. Run	FEB 80	FEB 80	FEB 80
Block I Testing Began	JUN 80	JUN 80	JUN 80
Block I Approval for Limited Production	JAN 84	DEC 85	DEC 85
Commence OPEVAL (BLK I)	MAY 87	DEC 87	APR 88
Block I Approval for Full Production	N/A	JAN 90	JUL 90

b. (U) Previous Change Explanations --

Block I Approval for Limited Production slipped from Jan 84 to Dec 85 due to problem development including excessive Target Motion Indicators (TMI) and Transmitter Mode Control Unit (TMCU) loss of "Standby go" indication. Corrective action confirmed and tested. OPEVAL (BLK I) slipped from Dec 87 to Apr 88 due to late delivery of Production Suitability Model, establishment of system sensitivity performance in at-sea environment, and lost range availability. BLK I Approval for Full Production was rescheduled from Aug 88 to Jan 90 to accommodate Follow-on OT&E (OT-III).

Block I Approval for Full Rate Production was granted 30 July 1990.

9c. (U) Schedule (Cont'd):

c. (U) Current Change Explanations --

None.

d. (U) References --

(U) Production Estimate:
DCP #88, Rev 1, dated 17 Nov 1977.

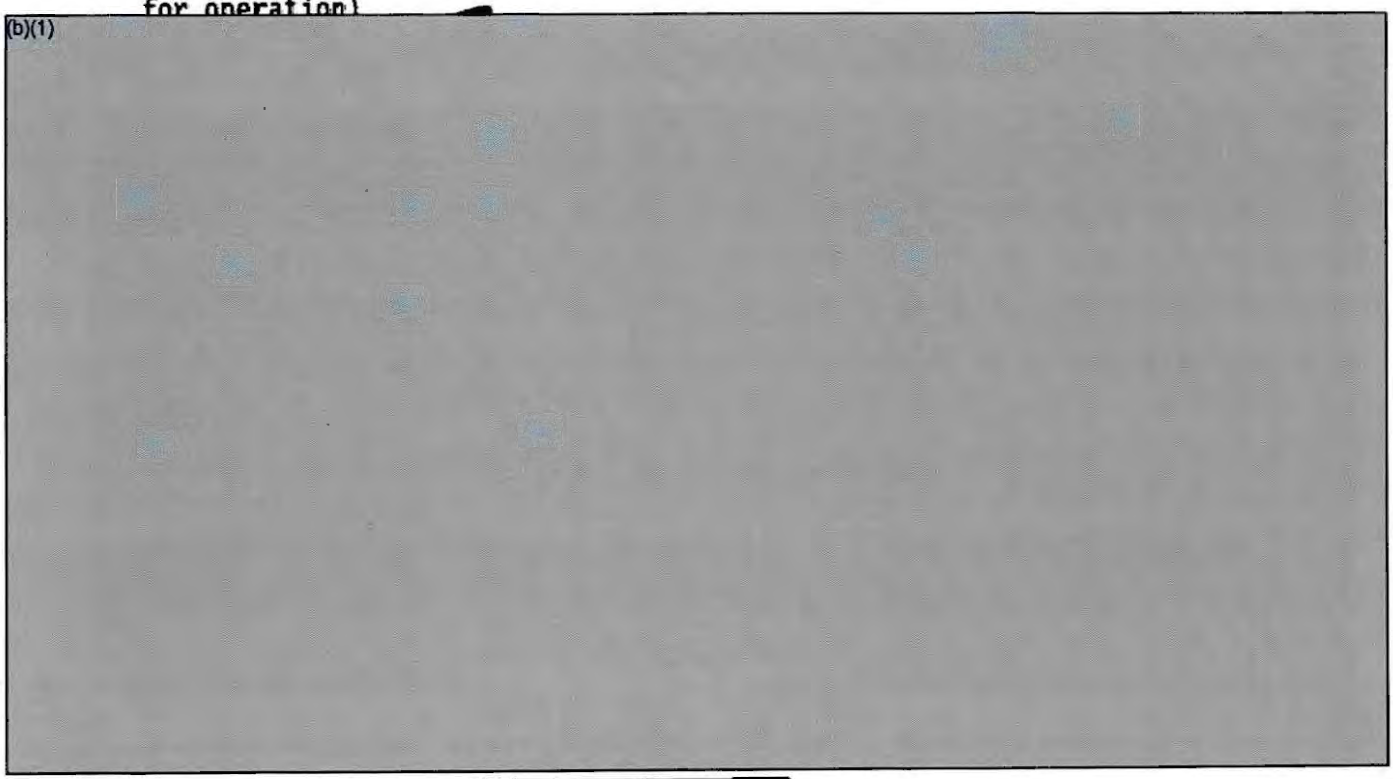
(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 31 December 1988.

10. (U) Performance Characteristics:

a. (U) Performance --

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
PHALANX CIWS BLOCK 0					
Weight (lbs)	12000	12600	/ 12600	10750	12600
Deck Space (Including space required for operation)	224	224	/ 224	224	224

(b)(1)



10a. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
PHALANX CIWS BLOCK I					
Weight (lbs)	13600	13600	/ 13600	13600	13600
Deck Space	224	224	/ 224	224	224
(Including space required for					

(b)(1)

10b. (U) Performance Characteristics (Cont'd):
the weight of the Operational Suitability Model (OSM) to 10,750 pounds. Engineering upgrades since initial delivery have increased the weight to 12,100 pounds.

PHALANX weight specifications increased as a result of manufacturing changes, engineering change proposals, and increase in weight of Outside Purchased Parts (OSP).

PHALANX CIWS BLOCK I:

PHALANX weight specification reflects Block I vice Block 0 system. Block I operational changes occur in reaction time, high stress profile reliability, inherent reliability, acquisition range and fire rate. Reaction times are reported for low and high pulse repetition frequencies (LPRF/HPRF) and vary with elevation angle (above and below 10 degrees). Block I Baseline 1 system has dual fire rate capacity. Also a nominal increase in system reliability is realized. Demonstrated Performance values reflect Block I Baseline 1 testing. Block I improvements in system reliability has improved MTBF from 70 hours to 132 hours.

c. (U) Current Change Explanations --

Ch 1 - Rounding error.

Ch 2 - Previous current estimate was a typographical error. Previous information cited Operational Availability vice Inherent Availability.

d. (U) References --

(U) Production Estimate:
DCP #88, Rev 1, dated 17 Nov 1977.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 31 December 1988.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	154.8	260.9	341.1
Procurement	2021.4	2759.1	2615.3
M61A1 GUN/BARREL	(22.5)		(23.1)
WEAPONS GROUP	(1518.0)		(1620.8)
OTHER	(212.8)		(634.8)
Total Sailaway	(1753.3)		(2278.7)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(45.3)		(50.1)
Initial Spares	(222.8)		(286.5)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 84 Base-Year $	2176.2	3020.0	2956.4
Escalation	305.5	45.9	59.3
Development (RDT&E)	(3.2)	(-47.6)	(-8.4)
Procurement	(302.3)	(93.5)	(67.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2481.7	3065.9	3015.7
b. (U) Quantity --			
Development (RDT&E)	3	0	3
Procurement	617	734	688
Total	620	734	691

c. (U) Foreign Military Sales --
Sales to date are as follows:
Australia: Qty 7, Cost $36.4M; Greece: Qty 12, Cost $69.7M; Israel: Qty 14, Cost $67.8M Japan: Qty 73, Cost $444.6M; Pakistan: Qty 7, Cost $26.9M; Portugal: Qty 3, cost $29.3M; Saudi Arabia: Qty 16, Cost $119.6M; Taiwan: Qty 16, Cost $108.1M; United Kingdom: Qty 32, Cost $162.8M; and Canada: Qty 4, Cost $16.7M. Total sales are 184 units with total dollar sales of approximately $1,082M.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Production Estimate:
DCP #88, Rev 1, dated 17 Nov 1977.

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 31 December 1988.

11e. (U) Total Program Cost and Quantity (Cont'd):

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3015.7	2987.3	3015.7
(2) Quantity	691	677	691
(3) Unit Cost	4.364	4.413	4.364
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	62.4	72.0	39.7
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	62.4	72.0	39.7
(2) Quantity	12	12	8
(3) Unit Cost	5.200	6.000	4.963

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	158.0	2323.7	0.0	2481.7
Previous Changes:				
Economic	-41.5	-270.8	-	-312.3
Quantity	-	+158.3	-	+158.3
Schedule	-	+48.9	-	+48.9
Engineering	-	+186.4	-	+186.4
Estimating	+241.7	+100.3	-	+342.0
Other	-	-	-	-
Support	-	+82.3	-	+82.3
Subtotal	+200.2	+305.4	-	+505.6
Current Changes:				
Economic	-3.6	-33.6	-	-37.2
Quantity	-	+63.2	-	+63.2
Schedule	-	+3.1	-	+3.1
Engineering	-	+2.3	-	+2.3
Estimating	-21.9	+2.6	-	-19.3
Other	-	-	-	-
Support	-	+16.3	-	+16.3
Subtotal	-25.5	+53.9	-	+28.4
Total Changes	+174.7	+359.3	-	+534.0
Current Estimate	332.7	2683.0	-	3015.7

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	154.8	2021.4	0.0	2176.2
Previous Changes:				
Quantity	-	+156.0	-	+156.0
Schedule	-	+18.3	-	+18.3
Engineering	-	+147.3	-	+147.3
Estimating	+201.9	+160.3	-	+362.2
Other	-	-	-	-
Support	-	+58.0	-	+58.0
Subtotal	+201.9	+539.9	-	+741.8
Current Changes:				
Quantity	-	+39.5	-	+39.5
Schedule	-	+0.4	-	+0.4
Engineering	-	+1.1	-	+1.1
Estimating	-15.6	+2.5	-	-13.1
Other	-	-	-	-
Support	-	+10.5	-	+10.5
Subtotal	-15.6	+54.0	-	+38.4
Total Changes	+186.3	+593.9	-	+780.2
Current Estimate	341.1	2615.3	-	2956.4

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Estimating: Net increase due to Block II requirements and the addition of program years as a continuing program.

PROCUREMENT
Economic: Revised escalation indices.
Quantity: Net quantity increase due to addition of production units to the program and the addition of program years to reflect total program requirements.
Schedule: Net increase due to schedule shifts to meet the requirements of the Fleet Modernization Program Overhaul Schedule and addition of program years to

13b. (U) Cost Variance Analysis (Cont'd):

reflect total program requirements.

Engineering: Application of Block I upgrade consisting primarily of high search elevation angle radar and increased magazine capacity to fiscal year 1986 procurement.

Estimating: Increase to estimating due to addition of requirements to reflect total program and contracts allowing revised out year hardware estimates.

Support: Net increase to support due to increased quantities and the addition of program years to reflect total program requirements.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)		-3.6
Revised cost due to addition of funds for Block II development and addition of years to reflect total program. (Estimating)	-15.6	-21.9
Total Changes	-15.6	-25.5
(2) PROCUREMENT		
Revised escalation indices. (Economic)	N/A	-33.0
Economic adjustment for negative program change. (Economic)	N/A	-0.6
Increase of 16 SCN systems in FY 97 and FY 98 to reflect total program. (Quantity)	39.5	63.2
Schedule allocation associated with SCN quantity change. (Schedule)	0.4	3.1
Engineering allocation associated with SCN quantity change. (Engineering)	1.1	2.3
Estimating allocation associated with SCN quantity change. (Estimating)	4.9	5.0
Decrease in estimated WPN installation costs. (Estimating)	-2.4	-2.4
Decrease in support equipment associated with decrease in WPN installation costs. (Support)	-0.1	-0.1
Increase in support equipment costs due to addition of SCN systems to reflect total program. (Support)	10.6	16.4
Total Changes	54.0	53.9

14. (U) **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
4.003	-0.506	-0.091	0.075	0.273	0.467	--	0.143	0.361	4.364

15. (U) **Contract Information:** None.

16. (U) **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 70.2% (17 yrs/24 yrs)

(2) Percent Program Cost Appropriated: 84.8% ($2556.5 / $3015.7)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY77-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-99)	Total
RDT&E	178.9	9.1	9.0	135.7	332.7
Procurement	2306.1	62.4	39.7	274.8	2683.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	2485.0	71.5	48.7	410.5	3015.7

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1978				183.9	123.4	121.0	121.0	6.8
1979				5.3	3.9	3.9	3.9	8.4
1980				2.6	2.1	2.1	2.1	10.6
1981				2.3	2.1	2.1	2.1	10.6
1982				1.5	1.4	1.4	1.4	7.6
1983				1.3	1.3	1.3	1.3	4.9
1984				1.2	1.2	1.2	1.2	3.8
1985				3.5	3.7	3.7	3.7	3.4
1986				4.1	4.4	4.4	4.0	2.8
1987				5.7	6.3	5.6	5.5	2.7
1988				6.4	7.4	7.4	6.8	3.0
1989				7.5	9.0	8.8	8.5	4.2
1990				5.1	6.4	6.4	6.3	4.0
1991				4.9	6.3	6.3	5.2	3.9
1992				6.8	9.1	4.5	0.6	3.1
1993				6.5	9.0			3.3
1994				39.9	56.7			3.3

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1995				25.8	37.9			3.3
1996				17.5	26.5			3.2
1997				9.3	14.6			3.2
Subtot	3			341.1	332.7	180.1	173.6	
Appropriation: 1507 Weapons Procurement, Navy								
197T			48.9	48.9	26.8	26.8	26.8	3.6
1977			43.0	43.0	25.0	25.0	25.0	3.8
1978	21		106.1	119.2	77.4	77.4	75.9	6.8
1979	19		70.6	88.6	63.4	63.4	61.2	8.7
1980	51		146.4	165.8	130.7	130.7	118.8	11.8
1981	52		155.0	177.1	155.8	155.8	152.5	11.6
1982	49		142.6	174.0	166.2	166.2	161.3	14.3
1983	37		105.3	122.5	123.7	123.9	122.8	9.0
1984	40		116.4	123.9	130.2	132.0	123.1	8.0
1985	36		140.5	145.3	157.2	155.6	153.6	3.4
1986	32		115.2	117.2	131.1	130.3	129.6	2.8
1987	24		77.2	79.4	92.0	91.3	90.5	2.7

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY84 Dollars Nonrec	Flyaway FY84 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1507 Weapons Procurement, Navy (Cont'd)								
1988	5		23.3	24.8	29.9	27.9	27.2	3.0
1989	2		15.0	15.8	19.8	18.7	18.4	4.2
1990	10		38.4	38.9	50.5	39.7	15.1	4.0
1991	11		37.4	37.4	50.1	34.1	9.8	3.9
1992				0.4	0.5	0.3		3.1
Subtot	389		1381.3	1522.2	1430.3	1399.1	1311.6	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1978	16		62.1	76.2	65.5	65.5	65.5	8.2
1979	25		72.4	88.1	77.3	77.3	77.3	9.6
1980	11		28.3	34.5	32.9	32.9	32.9	9.9
1981	16		40.2	49.1	48.3	48.3	48.3	9.6
1982	11		26.6	32.5	32.9	32.9	32.9	7.5
1983	23		57.1	69.0	71.0	71.0	71.0	3.8
1984	19		48.7	59.3	62.1	58.2	56.6	3.6
1985	15		43.7	53.2	56.7	56.6	55.8	2.1
1986	17		51.3	62.6	68.2	65.6	61.3	1.1
1987	12		40.1	48.8	54.3	50.0	43.8	1.5

16c. (U) Program Funding Summary (Cont'd):

Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)

Fiscal Year	Qty	Flyaway FY84 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
1988	24		70.3	85.8	98.2	95.4	89.1	2.3
1989	15		49.1	59.6	70.2	68.1	58.8	2.8
1990	15		53.7	65.3	79.2	67.8	15.9	1.3
1991	12		39.1	47.6	59.5	34.2	6.9	1.3
1992	12		39.3	48.0	61.9			3.1
1993	8		24.5	29.8	39.7			3.3
1994	6		18.0	21.9	30.1			3.3
1995	8		24.6	29.9	42.4			3.3
1996	10		30.8	37.6	55.1			3.2
1997	8		25.9	31.5	47.6			3.2
1998	8		25.8	31.4	49.0			3.2
1999	8		25.8	31.4	50.6			3.2
Subtot	299		897.4	1093.1	1252.7	823.8	716.1	
Grand Total	691		2278.7	2956.4	3015.7	2403.0	2201.3	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1978	0	31	37	0
1979	0	27	44	0
1980	0	66	62	84
1981	0	67	68	84
1982	0	64	60	84
1983	0	58	60	84
1984	0	51	59	84
1985	0	70	51	84
1986	0	60	49	84
1987	0	55	36	84
1988	0	33	29	16
1989	0	35	17	0
1990	0	0	25	0
1991	0	0	23	0
1992	0	0	12	0
1993	0	0	8	0
1994	0	0	6	0
1995	0	0	8	0
1996	0	0	10	0
1997	0	0	8	0

17a. (U) Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1998	0	0	8	0
1999	0	0	8	0

NOTE: The attainment of the maximum production rate may be limited by expected participation of FMS customers.

Regarding the Current Estimate, delivery period is 12 months from 1st delivery to last. Quantity shown represents actual or planned buys. Actual FMS quantities are shown but no projected FMS quantities are included.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2176.2	+780.2	2956.4	+659.9	2296.5
(TY $)	2481.7	+534.0	3015.7	+613.5	2402.2
PAUC Cost (BY $)	3.510	0.768	4.278	+0.955	3.323
(TY $)	4.003	0.361	4.364	+0.888	3.476

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	DEC 77	0	DEC 77	N/A	DEC 77
Duration (in MON)	93	168	261	114	147
End Date(MON YY)	SEP 85	168	SEP 99	N/A	MAR 90

17d. (U) Production Rate Data (Cont'd):

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	3/3
Procurement	556/556

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The concept of operation is for the weapon system to be capable of engaging enemy targets whenever the ship is deployed. Actual mission profile varies by ship class. The costs are the direct costs to support the primary personnel and to operate the weapon system (excluding base operating support personnel). The depot cost is a summary cost which includes interim contractor support, weapon system overhaul, repair of component parts, modification installation, weapon system inspection and software support. The sustaining investment consists primarily of replenishment spares and repair parts, support equipment replacement, and modification kits for prime equipment and support equipment. The other direct cost category includes cost for installation support nonpay items, such as rents and utilities plus medical supplies. The indirect costs are for permanent change of station and acquisition of program personnel, including personnel retirement. There are no antecedent programs for PHALANX.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Unit	Avg Annual Cost Per Antecedent
PERSONNEL	51.0	N/A
O&S CONSUMABLES	23.0	N/A
DIRECT DEPOT MAINTENANCE	167.0	N/A
SUSTAINING INVESTMENT	4.0	N/A
OTHER DIRECT COSTS	2.0	N/A
INDIRECT O&S COSTS	15.0	N/A
Total	262.0	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	5.9	1.5	1.5	7.1	16.0
Industrial Fund	---	---	---	---	---
Total	5.9	1.5	1.5	7.1	16.0

N-14 E-2C

91-033

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: E-2C AEW (HAWKEYE)

AS OF DATE: December 31, 1991

INDEX

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1. (U) **Designation and Nomenclature (Popular Name):**
E-2C/Carrier Based Airborne Early Warning Command and Control System

[redacted]

AS AMENDED
FOR OPEN PUBLICATION
MAR 20 1992

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**
E-2/C-2 AND ATDS PROGRAM OFFICE — CAPT JAY W SPRAGUE
PROGRAM EXECUTIVE OFFICER — Assigned: May 6, 1988
TACTICAL AIRCRAFT PROGRAMS (PMA-231) — AV 222-3251 COMM (703) 692-3251
WASHINGTON, DC 20361-1231

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0204152N Project E0463
PROCUREMENT:
APPN 1506 ICN 0195 (Navy)
MILCON:
PE 0204611N

No Security Objection to Open Publication
(AS AMENDED)
MAR 20 1992
Office of the Chief of
Naval Operations Dept. of the Navy

[redacted] by: ID 02A-38 OF OPNAVINST S5513.2B
Declassify on: [redacted] (b)(1) OADR

[redacted] (b)(1)

OASD(PA) DFOISR 92-T-0603

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5. (U) **Related Programs**:
C-2A Greyhound; Improved Engine (PE0604252N)

6. (U) **Mission and Description**:
The Grumman built E-2C "Hawkeye" is a twin-engine, carrier-based, Combat-Information-Center aircraft which extends task force defense perimeters by providing early warning of approaching enemy air and surface units and vectoring interceptors and strike aircraft to the attack. Carrying a crew of five, the E-2C also provides area surveillance, intercept, search and rescue, communication relay, and strike/air traffic control. Principal subsystems include APS-125/138/139/145 radar and ALR-73 Passive Detection Systems which allow the E-2C to detect emitters/targets well beyond radar range.

7. (U) **Program Highlights**:

a. (U) Significant Historical Developments --
The E-2C was introduced to the fleet in 1973. The automatic overland radar target tracking and Electronic Counter Counter-Measure (ECCM) features were introduced to the fleet in 1977 with the new AN/APS-125 Radar Advanced Radar Processing Systems (ARPS). The designation of the AN/APS-125 radar was changed to the AN/APS-138 in 1983 with the production incorporation and delivery of the Total Radiation Aperture Control Antenna (TRAC-A) and other radar changes. The AN/APS-139, delivered to the fleet in December 1988, improved radar ECCM performance and increased system track capacity. The first limited production AN/APS-145 aircraft was accepted in November 1990.

Update Development Program (UDP) Group II APS-145 completed OT-IIC operational testing in November 1990. The APS-145 increases the maximum radar range, improves the identification friend or foe system, automates radar system optimization and improves radar tracking. UDP DT/OT have been coordinated in the interest of economy and as a means of maximizing the use of limited assets. The UDP and T56-A-427 Engine Upgrade are programmed to reach OPEVAL concurrently in FY-92 thus allowing a realistic assessment of the operational performance of a fully integrated system. The E-2C satisfies the mission needs.

b. (U) Significant Developments Since Last Report --
This is a final SAR based on 90% deliveries. The E-2C reached 90% on December 20, 1991.

c. (U) Changes Since As Of Date --
None

8. (U) **Threshold Breaches**:
There are currently no breaches to the Approved Acquisition Program Baseline dated 12 July 1991. There are no Nunn McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --	Production Estimate	Approved Program	Current Estimate
Program Initiated (Letter Contract)	JUN 68	JUN 68	JUN 68
Definitized Contract Executed (R&D)	MAY 69	SEP 70	SEP 70
Production Contract Award	OCT 70	SEP 71	SEP 71
Navy Preliminary Evaluation I (Commenced)	JAN 72	FEB 72	FEB 72
First Flight of Production Airplane	MAY 72	SEP 72	SEP 72
Navy Preliminary Evaluation II (Commenced)	OCT 72	OCT 72	OCT 72
First Production Airplane Accepted	OCT 72	JAN 73	JAN 73
Board of Inspection and Survey (Commenced)	FEB 73	APR 73	APR 73
Fleet Introduction	APR 73	MAY 73	MAY 73
Board of Inspection and Survey (Completed)	MAR 73	NOV 73	NOV 73
IOC	NOV 73	FEB 74	FEB 74
Navy Support Date	NOV 74	DEC 75	DEC 75
First Production AN/APS-125 ARPS	DEC 76	NOV 76	NOV 76
AN/APS-125 Fleet Operational	MAY 78	MAY 78	MAY 78
APS-138 Radar/TRAC-A Antenna (Prod Delivery)	DEC 82	JUN 83	JUN 83
[redacted] High Speed Processor (Prod Delivery)	APR 87	APR 87	APR 87
[redacted] APS-139 Radar (Prod Delivery)	FEB 88	APR 88	APR 88
[redacted] APS-145 Radar (Prod Delivery)	N/A	DEC 90	NOV 90

b. (U) Previous Change Explanations --

NDCP W0463 dated 27 Apr 1988 (Approved development of an increased range APS-145 radar.)
The APS-145 was delivered early.
DAE baseline dated 30 Oct 1990.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Production Estimate:
DCP No. 26 Rev 1 dated 24 June 1971, subject "Development Concept Paper Carrier Based, Airborne Early Warning/Command and Control System (E-2C)" NDCP W0463 dated 27 April 1988, subject "Navy Decision Coordinating Paper for Carrier Based Early Warning Command and Control System (E-2C)"

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 12 July 1991.

10. (U) **Performance Characteristics**:

a. (U) Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Take off weight	51535	55000	/ 55000	55000	55000	(CH-1)
Length	56'4"	57'6"	/ 57'6"	57'6"	57'6"	
Span	80'7"	80'7"	/ 80'7"	80'7"	80'7"	
Engine						
Number	2	2	/ 2	2	2	
Type	T-56-A-8A	N/A	/ N/A	DEL	DEL	
Type		T56-A-427	/ T56-A-427	T56-A-427	T56-A-427	
Crew	5	5	/ 5	5	5	

(b)(1)

[redacted]

10a. (U) Performance Characteristics (Cont'd):

	Approved Program	Demon-strated	Current
(b)(1)			

b. (U) Previous Change Explanations --

DAE Baseline dated 31 Dec 88 and the ARB dated 16 Sep 1988 (approved limited production procurement of the T56-A-427 engine for E-2C aircraft). ARB dated 1 Dec 1988 (provided developmental and operational test results for APS-145 radar). APRB dated 30 Jul 1990 approved low rate continued production (ALRIP) for 11 engines for FY 90 and 17 for FY 91. It also approved an advance acquisition contract for 14 engines FY 91 for FY 92.

The APS-139 (Group I) aircraft represent a take off weight of 53,000 pounds as indicated in format 7. It is expected that the APS-145 (Group II) aircraft will have a take off weight of 54,400 pounds due to configuration change.

The DAE baseline was dated 30 Oct 1990.

c. (U) Current Change Explanations --

CH-1: The APS-145 (Group II) aircraft reached a take off weight of 55,000 pounds on December 6, 1991.

d. (U) References --

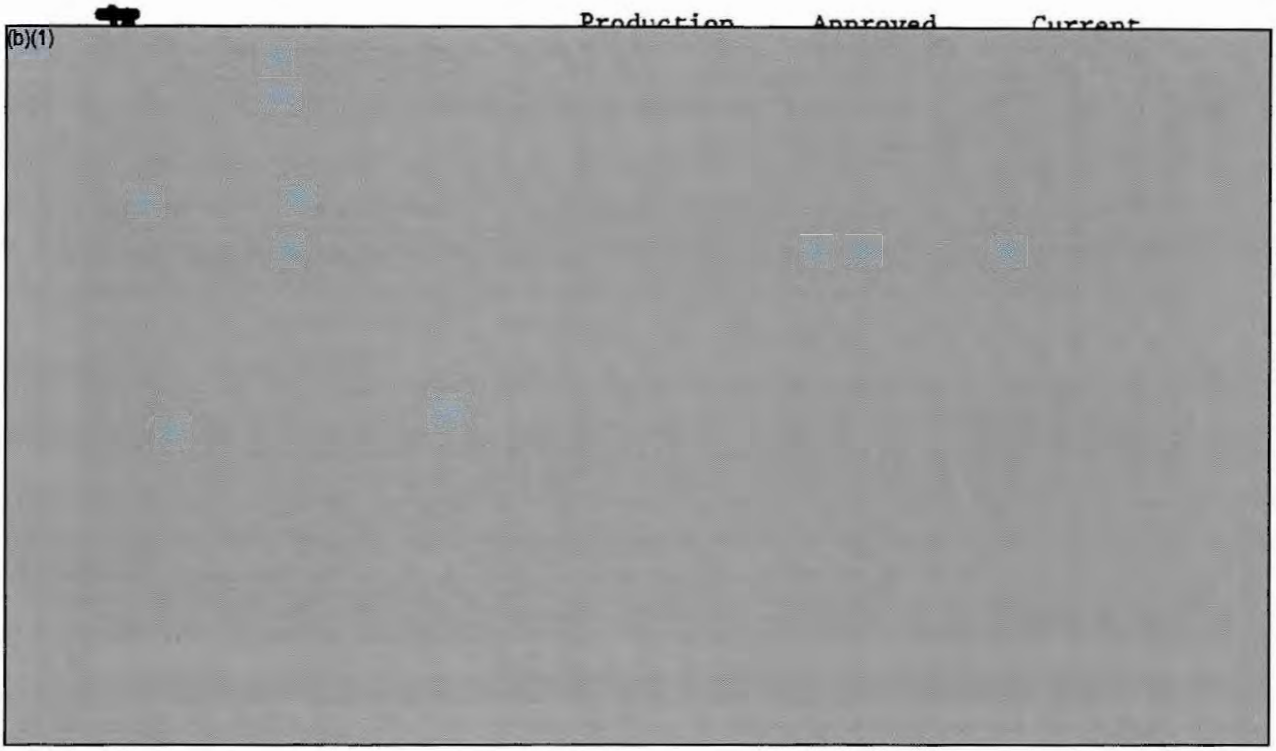
(U) Production Estimate:
DCP No. 26 Rev 1 dated 24 June 1971, subject "Development Concept Paper Carrier Based, Airborne Early Warning/Command and Control System (E-2C)" NDCP W0463 dated 27 April 1988, subject "Navy Decision Coordinating Paper for Carrier Based Early Warning Command and Control System (E-2C)"

10d. (U) Performance Characteristics (Cont'd):

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 12 July 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

(b)(1)



b. (U) Quantity --

	Production	Approved	Current
Development (RDT&E)	2	N/A	2
Procurement	125	145	139
Total	127	145	141

Approved Program Baseline Quantity for RDT&E is not shown in the APB.

c. (U) Foreign Military Sales --
Sales to date are 4 for Israel for a total of $176.4M; 13 for Japan for a total of $872.6M; 6 for Egypt for a total of $804.2M and 4 for Singapore for a total of $324.9M.

d. (U) Nuclear Costs --
None

11e. (U) Total Program Cost and Quantity (Cont'd):

e. (U) References --

(U) Production Estimate:
DCP No. 26 Rev 1 dated 24 June 1971, subject "Development Concept Paper Carrier Based, Airborne Early Warning/Command and Control System (E-2C)" NDCP W0463 dated 27 April 1988, subject "Navy Decision Coordinating Paper for Carrier Based Early Warning Command and Control System (E-2C)"

(U) Approved Program:
NAE Approved Acquisition Program Baseline dated 12 July 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6689.6	7103.2	6689.6
(2) Quantity	141	147	141
(3) Unit Cost	47.444	48.321	47.444
b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	528.6	528.6	96.2
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	38.3	38.3	0.0
Net Total	566.9	566.9	96.2
(2) Quantity	6	6	0
(3) Unit Cost	94.483	94.483	N/A

13. (U) **Cost Variance Analysis**:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	706.0	5212.3	3.2	5921.5
Previous Changes:				
Economic	-5.4	+36.8	-	+31.4
Quantity	-	+390.8	-	+390.8
Schedule	-	+189.4	-	+189.4
Engineering	+24.6	+54.5	-	+79.1
Estimating	-163.4	+447.0	-	+283.6
Other	-	-	-	-
Support	-	+208.2	-0.8	+207.4
Subtotal	-144.2	+1326.7	-0.8	+1181.7
Current Changes:				
Economic	-136.0	-33.4	-	-169.4
Quantity	-	-291.8	-	-291.8
Schedule	-	-31.2	-	-31.2
Engineering	-	-7.9	-	-7.9
Estimating	+135.1	+1550.0	-	+1685.1
Other	-	-	-	-
Support	-	-1598.4	-	-1598.4
Subtotal	-0.9	-412.7	-	-413.6
Total Changes	-145.1	+914.0	-0.8	+768.1
Current Estimate	560.9	6126.3	2.4	6689.6

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	655.7	4739.2	3.1	5398.0
Previous Changes:				
Quantity	-	+478.8	-	+478.8
Schedule	-	+97.4	-	+97.4
Engineering	+49.8	+34.3	-	+84.1
Estimating	-170.6	+337.2	-	+166.6
Other	-	-	-	-
Support	-	+162.9	-0.7	+162.2
Subtotal	-120.8	+1110.6	-0.7	+989.1
Current Changes:				
Quantity	-	-211.3	-	-211.3
Schedule	-	-17.0	-	-17.0
Engineering	-	-5.2	-	-5.2
Estimating	+326.5	+2531.6	+1.0	+2859.1
Other	-	-	-	-
Support	-	-819.3	-	-819.3
Subtotal	+326.5	+1478.8	+1.0	+1806.3
Total Changes	+205.7	+2589.4	+0.3	+2795.4
Current Estimate	861.4	7328.6	3.4	8193.4

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation rates
Engineering: Update of the Radar
Estimating: Revised cost

PROCUREMENT
Economic: Revised escalation rates
Quantity: Addition of 50 aircraft
Cost associated with quantity decreased by 30 A/C from 175 to 145
Schedule: Changed to meet inventory objective
Reduction to annual procurement quantities over FY-91-94

13b. (U) Cost Variance Analysis (Cont'd):

Changed to meet new inventory objective resulting from a quantity change (175 to 145 A/C)

Engineering: Engineering changes due to ECPs and increase quantity

Engineering change resulting from a quantity decrease from 175 to 145 A/C

Estimating: Repricing of A/C and GFE requirements including change from multiyear procurement to annual procurement

Revised estimate of A/C and GFE associated with a decrease in quantity from 175 to 145 A/C

Support: Revised estimate of support costs through FY 94 and cost to cover inventory requirements FY 95 to FY 98

Revised estimate of support requirements due to a quantity decrease from 175 to 145 A/C

MILCON

Support: Repair of training facility at Norfolk, Va.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation rates (Economic)	N/A	-136.0
Revised current estimates. Adjusted prior year estimates resulting from adjusted prior year escalation indices (Estimating)	326.5	135.1
Total Changes	326.5	-0.9
(2) PROCUREMENT		
Revised escalation rates (Economic)	N/A	-33.4
Cost associated with decrease from 145 to 139 aircraft (Quantity)	-211.3	-291.8
Schedule change resulting from a decrease from 145 to 139 aircraft (Schedule)	-17.0	-31.2
Decrease from 145 to 139 aircraft (Engineering)	-5.2	-7.9
Revised estimate of A/C and GFE. Adjusted previous 85 dollars to constant 85 dollars (Estimating)	2531.6	1550.0
Revised estimate of support requirements (Support)	-819.3	-1598.4
Total Changes	1478.8	-412.7

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(3) MILCON		
Prior year adjustment	1.0	--
Total Changes	--	--

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
46.626	-0.979	-3.928	1.122	0.505	3.026	--	1.072	0.818	47.444

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) UPDATE DEV, GP II, PT II:	Initial Contract Price Target	Ceiling	Qty
GRUMMAN AEROSPACE CORP, BETHPAGE, NY N00019-86-C-0356, FFP Award: November 30, 1986 Definitized: August 29, 1991	$54.5	$0.0	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$60.0	$0.0	0	$60.0	$60.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Increased scope of revised statement of work resulted in negotiated contract price of $60M. Contract converted to firm fixed price. CPR information is not required on this FFP contract.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) E2C JTIDS INTEGRATION:	Initial Contract Price Target	Ceiling	Qty
GRUMMAN AEROSPACE CORP, BETHPAGE, NY N00019-83-C-0337, CPIF Award: February 28, 1983 Definitized: September 28, 1984	$243.2	$0.0	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$243.2	$0.0	0	$241.8	$245.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.1	$-4.2
Net Change	$0.1	$-4.2

Explanation of Change:

For December, the GPR presents a positive cumulative cost variance of 70K/0.0% and a cumulative cost performance index of 1.00, indicating the contractor is spending $1.00 for every $1.00 of effort accomplished. Contractor notes the overrun in System Engineering is due to additional EMDU support, greater than planned expenditures for update of design and test documentation, TAAF analysis, and investigation of fatigue failures for L-304. The contractor notes the underruns are due to expenditures being less than anticipated as a result of the EMDU schedule slip and less use of material than planned. Overhead rates are higher than planned and the contractor expects this trend to continue. December reports a negative cumulative schedule variance of $4.2K/2.1% with a cumulative schedule performance index of 0.98. This cumulative SPI indicates the contractor is accomplishing approximately 98% of the effort scheduled to date. The contractor continues to note problems with the Litton Comm I/O development, late Hazeltine UMD Installation, late Teledyne IT, late deliveries of MFCDUs, and late EMDUs. The contractor also notes Loral software modifications as driving the unfavorable schedule variance. Also driving the schedule variance is the OT-IIB and OT-IIE schedule slippage. Overheads and G&A schedule variances are a result of and proportional to the schedule variance in the direct efforts.

The contractor's estimated price at completion was based on rescoping of effort not yet approved by the government.

*The estimated price at completion includes target cost, projected cost overrun of $3.2M and cost plus incentive fee.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

b.(U) Procurement --

(U) FY90 PRODUCTION A/C:	Initial Contract Price Target	Ceiling	Qty
GRUMMAN AEROSPACE CORP, BETHPAGE, NY N00019-88-C-0331, FFP Award: April 28, 1989 Definitized: May 31, 1990	$252.9	$0.0	4

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$273.7	$0.0	4	$273.7	$273.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for this FFP contracts.

(U) FY 89 PRODUCTION A/C:	Initial Contract Price Target	Ceiling	Qty
GRUMMAN AEROSPACE CORP, BETHPAGE, NY N00019-88-C-0007, FFP Award: April 29, 1988 Definitized: October 18, 1989	$339.7	$0.0	6

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$339.7	$0.0	6	$339.7	$339.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for FFP contracts.

(U) FY 91 PRODUCTION A/C:	Initial Contract Price Target	Ceiling	Qty
GRUMMAN AEROSPACE CORP, BETHPAGE, NY N00019-90-C-0002, FFP Award: March 30, 1990 Definitized: September 29, 1991	$296.8	$0.0	6

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$310.1	$0.0	6	$310.1	$310.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information is not required for FFP contracts.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 92.0% (23 yrs/25 yrs)

(2) Percent Program Cost Appropriated: 98.0% ($6557.6 / $6689.6)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY70-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94)	Total
RDT&E	547.9	6.3	6.7	-	560.9
Procurement	5472.4	528.6	96.2	29.1	6126.3
MILCON	2.4	-	-	-	2.4
O&M	-	-	-	-	-
Total	6022.7	534.9	102.9	29.1	6689.6

16c. (U) **Program Funding Summary (Cont'd)**:

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1970				414.4	161.0	161.0	161.0	5.5
1971								
1972				72.5	30.8	30.8	30.8	4.6
1973				35.3	15.9	15.9	15.9	4.4
1974				0.2	0.1	0.1	0.1	8.0
1975								10.9
1976								6.6
197T								2.9
1977								2.6
1978								6.8
1979				7.7	5.5	5.5	5.5	8.4
1980				14.0	11.1	11.1	11.1	10.6
1981				19.3	16.7	16.7	16.7	10.6
1982				19.4	17.7	17.7	17.7	7.6
1983				42.6	40.5	40.5	40.5	4.9
1984				41.2	40.6	40.6	40.6	3.8
1985				31.9	32.4	32.4	32.4	3.4

16c. (U) **Program Funding Summary (Cont'd)**:

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1986				21.0	22.0	22.0	22.0	2.8
1987				30.7	33.0	33.0	29.0	2.7
1988				19.5	21.7	21.7	20.3	3.0
1989				19.5	22.6	22.6	20.5	4.2
1990				33.7	40.6	40.6	34.5	4.0
1991				28.6	35.7	35.7	24.8	3.9
1992				4.9	6.3	4.4		3.1
1993				5.0	6.7			3.3
1994								
Subtot	2			861.4	560.9	552.3	523.4	
Appropriation: 1506 Aircraft Procurement, Navy								
1970	11			124.2	43.7	43.7	43.7	3.9
1971								
1972	9		506.6	715.3	274.8	274.8	274.8	3.8
1973			251.0	371.6	157.5	157.6	157.6	4.2
1974	8		288.5	363.1	161.3	161.3	161.3	5.8
1975	6		219.0	275.3	129.0	129.0	129.0	8.8

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
1976	6	2.0	201.2	321.5	160.7	160.7	160.7	6.6
197T	1		32.8	43.9	23.2	23.2	23.2	3.6
1977	6		195.2	282.2	156.4	156.4	156.4	3.8
1978	6		219.5	316.7	192.5	192.5	192.5	6.8
1979	6	13.8	208.4	305.3	207.6	207.6	207.6	8.7
1980	6		212.0	261.5	198.4	198.4	198.4	11.8
1981	6	25.6	183.3	279.7	236.2	236.2	236.2	11.6
1982	6	1.3	212.1	276.3	253.5	253.5	253.5	14.3
1983	6		193.3	295.5	288.4	288.4	288.4	9.0
1984	6		193.2	313.4	318.2	318.2	318.2	8.0
1985	6	30.3	187.8	303.9	317.5	317.0	317.0	3.4
1986	6	26.9	184.9	312.4	336.3	336.3	324.6	2.8
1987	10	7.2	342.9	413.4	460.5	460.5	436.6	2.7
1988	6	27.4	224.3	348.4	405.0	405.0	366.3	3.0
1989	6		243.5	310.4	375.2	375.2	331.4	4.2
1990	4	13.7	181.1	275.0	344.4	344.4	250.2	4.0
1991	6	0.6	241.2	333.9	432.1	419.9	118.0	3.9
1992	6	1.3	273.2	395.6	528.6	67.9		3.1

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1506 Aircraft Procurement, Navy (Cont'd)								
1993				69.7	96.2			3.3
1994		20.5		20.4	29.1			3.3
1995								
1996								
1997								
1998								
Subtot	139	170.6	4995.0	7328.6	6126.3	5527.7	4945.6	
Appropriation: 1205 Military Construction, Navy								
1972				0.7	0.3	0.3	0.3	5.9
1973								
1974								
1975				0.9	0.5	0.5	0.5	16.1
1976								
197T								
1977								
1978								
1979								

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1205 Military Construction, Navy (Cont'd)								
1980								
1981				1.8	1.6	1.6	1.6	10.6
1982								
1983								
1984								
1985								
1986								
1987								
1988								
1989								
1990								
1991								
Subtot				3.4	2.4	2.4	2.4	
Grand Total	141	170.6	4995.0	8193.4	6689.6	6082.4	5471.4	

17. (U) **Production Rate Data**:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1970	0	11	11	18
1971	0	0	0	18
1972	0	9	9	18
1973	0	0	0	18
1974	0	8	8	18
1975	0	6	6	18
1976	0	6	6	18
197T	0	1	1	13
1977	0	6	6	0
1978	0	6	6	0
1979	0	6	6	0
1980	0	6	6	0
1981	0	6	6	0
1982	0	6	6	0
1983	0	6	6	0
1984	0	6	6	0
1985	0	6	6	0
1986	0	6	6	0
1987	0	6	10	0
1988	0	6	6	0

17a. (U) Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1989	0	6	6	0
1990	0	6	4	0
1991	0	0	6	0
1992	0	0	6	0
1993	0	0	0	0
1994	0	0	0	0
1995	0	0	0	0
1996	0	0	0	0
1997	0	0	0	0
1998	0	0	0	0

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	5398.0	+2795.4	8193.4	0.0	8193.4
(TY $)	5921.5	+768.1	6689.6	0.0	6689.6
PAUC Cost (BY $)	42.504	15.605	58.109	0.000	58.109
(TY $)	46.626	0.818	47.444	0.000	47.444

17c. (U) Production Rate Data (Cont'd):

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	JUL 70	0	JUL 70	N/A	JUL 70
Duration (in MON)	266	18	284	192	92
End Date(MON YY)	SEP 92	18	MAR 94	N/A	MAR 78

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	2/2
Procurement	125/125

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

Flight Hours Per Aircraft Per Month	40
Number of Aircraft/Squadron	4
Consumption Rate, Gal/Hr	374.7
POL Cost, JP-5, Per Barrel, FY 90	25.2

There is no antecedent program.
Date of estimate 12/90.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1985 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Squadron	Avg Annual Cost Per (Antecedent)
Personnel	7.5	N/A
O&S Consumables	1.4	N/A
Direct Depot Maintenance	2.8	N/A
Sustaining Investment	0.9	N/A
Other Direct Costs	0.0	N/A
Indirect Costs	0.3	N/A
Total	12.9	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M,N	69.2	4.8	5.1	---	79.1
Industrial Fund	---	---	---	---	---
Total	69.2	4.8	5.1	---	79.1
Total	138.4	9.6	10.2	---	158.2

A-45 UHF FOLLOW-ON

91-088E

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: UHF FOLLOW-ON

AS OF DATE: December 31, 1991

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1. Designation and Nomenclature (Popular Name):
UHF Follow-on Communications Satellite System

2. DoD Component: Navy

3. Responsible Office and Telephone Number:
PEO for Space, Comms & Sensors
Communications Satellite Programs
PMW-146
Washington, DC 20363-5100
Mr. William R. Coffman
Assigned: February 1, 1988
AV 332-4781 COMM (703)-602-4781

4. Program Elements/Procurement Line Items:

PROCUREMENT:
APPN 1507 ICN 30243000 (Navy) (Shared)

CLEARED
FOR OPEN PUBLICATION
MAR 20 1992
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

5. Related Programs:
None.

6. Mission and Description:
The existing constellation of Ultra High Frequency (UHF) communication satellites provides key command and control links for mobile forces of the DoD and other Government Agencies. As Executive Agent, the Navy is charged with maintaining the continuity of the space segment. The UHF Follow-On Program will provide for a new generation of communication satellites to replenish the existing constellation commencing in the early 1990's.

No Security Objection to Open Publication
92-0452
MAR 20 1992
Office of the Chief of
Naval Operations Dept. of the Navy
OASD(PA) DPOISR 92-T-0608

*** [redacted] ***

7. Program Highlights:

a. Significant Historical Developments —

Due to the urgent need to satisfy DoD communication requirements, the Secretary of Defense designated the UHF Follow-On Program a major acquisition program in May 1988.

A Defense Acquisition Board (DAB) Milestone IIIA decision was made on July 22, 1988 authorizing the program to enter production. After full and open competition, a firm fixed priced contract was awarded to Hughes Aircraft Company on July 29, 1988. Congress approved a multiyear procurement of this system in the FY89 Defense Authorization Act.

The Navy's Operational Test and Evaluation Force conducted an early operational assessment concluding that the UHF Follow-On satellite system is potentially operationally effective and suitable.

As a result of a DAB program review held on May 25, 1990, the decision to proceed with the UHF Follow-On production was reaffirmed. Additionally, approval was given to add a limited Extremely High Frequency (EHF) capability pursuant to requirements promulgated by the JCS beginning with the fourth launched satellite.

The current acquisition baseline incorporating the EHF capability was signed by the Defense Acquisition Executive (DAE) on October 9, 1990.

The UHF Follow-On satellite system is expected to satisfy the mission requirement.

b. Significant Developments Since Last Report —

The performance of the current constellation of FLTSAT's and LEASAT's continues to deteriorate. FLTSAT #3 failed completely in January 1991. LEASAT #3 lost its wideband capacity, which supported 21 users, in June 1991. These failures demonstrated that satellites can fail without warning and points out the necessity of maintaining a stable UFO schedule to ensure that the minimum JCS constellation requirements are met.

Currently there are nine UFO satellites in production and authorization has been given for commercial expendable launch vehicle (ELV) services for the initial six satellites. Spacecraft #1-3, and 10 will utilize the Atlas I. Spacecraft #4-9 have EHF capability and thus require the Atlas II to compensate for the extra weight.

Significant progress is being made toward integration and testing of the first UFO satellite.

7c. Program Highlights (Cont'd):

c. Changes Since As Of Date --
None.

8. Threshold Breaches:
There are currently no Acquisition Program Baseline (APB) (dated October 9, 1990) breaches or unit cost breaches.

9. Schedule:

a. Milestones --	Production Estimate	Approved Program	Current Estimate
Designation as a Major Defense Acquisition Program	MAY 88	N/A	MAY 88
Milestone IIIA (DAB)	JUL 88	JUL 88	JUL 88
Contract award	JUL 88	JUL 88	JUL 88
System Requirement Review (SRR)	OCT 88	OCT 88	OCT 88
Product Acceptance Test & Evaluation (PAT&E)-G (Start ground testing)	NOV 88	NOV 88	NOV 88
Preliminary Design Review (PDR)	APR 89	APR 89	APR 89
Critical Design Review (CDR)	MAR 90	MAR 90	MAR 90
DAB Program Review	MAY 90	MAY 90	MAY 90
PAT&E-I (Start in-orbit testing)	SEP 92	SEP 92	SEP 92
OT-III	OCT 92	OCT 92	OCT 92
IOC	DEC 92	DEC 92	NOV 92
OT-IV (Satellite No. 4 w/EHF)	FEB 95	FEB 95	FEB 95
IOC (Satellite No. 4 w/EHF) 1/	TBD	TBD	MAY 95

1/ IOC (Satellite No. 4 W/EHF) Program Review Objective and Threshold, 60 days after #4 satellite launch

b. Previous Change Explanations —

The production estimate was adjusted to reflect the program as stated in the Acquisition Program Baseline dated October 9, 1990.

c. Current Change Explanations — None.

d. References —

Production Estimate:
Acquisition Decision Memorandum of May 30, 1990, Subj: "UHF Follow-On Communication Satellite Baseline."

Approved Program:
DAE approved Acquisition Program Baseline dated October 9, 1990.

10. Performance Characteristics:

a. Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Launch capability	Dual Launch Compatible	Dual launch compatible	/ Expendable launch vehicle	N/A	Expendable launch vehicle
Nuclear Hardening	Comply with SM-416-84 levels	Comply with SM-416-84 levels	/ Comply with SM-416-84 levels	N/A	Comply with SM-416-84 levels
Anti-jam uplink channel capacity for fleet broadcast (per satellite)	3	3	/ 1	N/A	3
Effective Isotropic Radiated Power (EIRP) and capacity for UHF channels:					
25 KHz channels w/28 dBW (channels)	3	3	/ 2	N/A	3
25 KHz channels w/26 dBW (channels)	15	15	/ 14	N/A	15
5 KHz channels w/20 dBW (channels)	21	21	/ 20	N/A	21
UHF Interoperability	Compatible with all existing UHF terminals except frequency hoppers	Compatible with all existing UHF terminals except frequency hoppers	/ Compatible with all existing UHF terminals except frequency hoppers	N/A	Compatible with all existing UHF terminals except frequency hoppers
EHF Requirements (for satellites 4-9)					

10a. Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
EHF Crossbanding	EHF uplink may be downlinked ion SHF, (20 GHZ) UHF, or both	EHF uplink may be downlinked on SHF (20 GHz), UHF, or both	/ EHF uplink may be downlinked on SHF (20 GHz), UHF or both	N/A	EHF uplink may be downlinked on SHF (20 GHZ) UHF, or both
EHF interoperability	Compatible with Milstar terminals and MIL-STD-1582	Compatible with Milstar terminals and MIL-STD-1582	/ Compatible with Milstar terminals and MIL-STD-1582	N/A	Compatible with Milstar terminals and MIL-STD-1582
EHF EIRP for Earth coverage antenna (dBW)	27	27	/ 27	N/A	27
EHF EIRP for 5 degree steerable spot beam antenna (dBW within 2.5 degree of boresight)	37	37	/ 37	N/A	37
EHF capability					
(Communication Channels)	7	7	/ 7	N/A	7
(Telemetry & Command Channel)	1	1	/ 1	N/A	1
(Broadcast uplink Channels)	3	3	/ 3	N/A	3
System Availability (%)	95	95	/ 90	N/A	95
Mean mission duration					
Years	10	10	/ 10	N/A	10
Years Design Life	14	14	/ 14	N/A	14
Fuel Quantity					
Years station keeping	14	14	/ 14	N/A	14
15 degree/day move	1	1	/ 1	N/A	1

10a. Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Cryptographically secure command & telemetry links	Successful command execution & telemetry reception using NSA approved devices	Successful command execution & telemetry reception using NSA approved devices	/ Successful command execution & telemetry reception using NSA approved devices	N/A	Successful command execution & telemetry reception using NSA approved devices
Anti-jam broadcast and command	DIA Validate NTIC threat level (Classified)	DIA validate NTIC threat level (classified)	/ DIA valdtd NTIC threat level (classified)	N/A	DIA validate NTIC threat level (classfied)
Autonomy (Up to one month): Probability of reacquisition (%)	95	95	/ 90	N/A	95
Frequency Plan 1/	As required by MJCS 68-88	As required by MJCS 68-88	/ MJCS 68-88	N/A	As required by MJCS 68-88

1/ Program review Oct 9, 1990 added EHF, UHF unchanged.

b. Previous Change Explanations —

"Launch capability" and "EHF capability" were added as baseline characteristics.

c. Current Change Explanations —

N/A

10d. Performance Characteristics (Cont'd):

d. References —

Production Estimate:
Acquisition Decision Memorandum of May 30, 1990, Subj: "UHF Follow-On Communication Satellite Baseline."

Approved Program:
DAE approved Acquisition Program Baseline dated October 9, 1990.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost —	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	0.0	0.0	0.0
Procurement	1479.1	1526.4	1504.6
Flyaway	(1479.1)		(1504.6)
Total Flyaway	(1479.1)		(1504.6)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 88 Base-Year $	1479.1	1526.4	1504.6
Escalation	237.0	318.9	319.8
Development (RDT&E)	(0.0)	(0.0)	(0.0)
Procurement	(237.0)	(318.9)	(319.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1716.1	1845.3	1824.4

b. Quantity —			
Development (RDT&E)	0	0	N/A
Procurement	10	10	10
Total	10	10	10

c. Foreign Military Sales — None.

d. Nuclear Costs —
None.

e. References —

Production Estimate:
Acquisition Decision Memorandum of May 30, 1990, Subj: "UHF Follow-On Communication Satellite Baseline."

11e. Total Program Cost and Quantity (Cont'd):

Approved Program:
DAE approved Acquisition Program Baseline dated October 9, 1990.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1824.4	1845.3	1824.4
(2) Quantity	10	10	10
(3) Unit Cost	182.44	184.53	182.44
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	253.1	253.1	311.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	86.4	86.4	3.2
Net Total	339.5	339.5	314.2
(2) Quantity	3	3	1
(3) Unit Cost	113.17	113.17	314.20

The unit cost increase from FY92 to FY93 is mainly due to ELV costs. FY92 only made annual payments for six ELV's, whereas in FY93 payments will be made for nine ELV's. In addition, FY93 includes the additional EHF costs associated with launching the more costly Atlas II models for spacecraft #4-9.

13. Cost Variance Analysis:

a. Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	0.0	1716.1	0.0	1716.1
Previous Changes:				
Economic	-	+81.2	-	+81.2
Quantity	-	-113.5	-	-113.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+40.8	-	+40.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+8.5	-	+8.5
Current Changes:				
Economic	-	-27.4	-	-27.4
Quantity	-	+113.5	-	+113.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+13.7	-	+13.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+99.8	-	+99.8
Total Changes	-	+108.3	-	+108.3
Current Estimate	-	1824.4	-	1824.4

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	0.0	1479.1	0.0	1479.1
Previous Changes:				
Quantity	-	-90.5	-	-90.5
Schedule	-	-9.2	-	-9.2
Engineering	-	-	-	-
Estimating	-	+12.6	-	+12.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-87.1	-	-87.1
Current Changes:				
Quantity	-	+89.3	-	+89.3
Schedule	-	+11.7	-	+11.7
Engineering	-	-	-	-
Estimating	-	+11.6	-	+11.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+112.6	-	+112.6
Total Changes	-	+25.5	-	+25.5
Current Estimate	-	1504.6	-	1504.6

b. Previous Change Explanations --

PROCUREMENT

Economic: Revised economic escalation rates.

Quantity: Deletion of funding for Spacecraft #10.

Schedule: Delay in funding for Expendable Launch Vehicle (ELV) services for S/C #7,8, and 9.

Estimating: Current and prior year inflation offset; addition of EHF capability; revised annual ELV payment schedule; reduced funding due to elimination of STS option.

13c. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised economic escalation indices. (Economic)	N/A	-27.4
Addition of Spacecraft #10 (Quantity)	89.3	113.5
Revised launch schedule for Spacecraft #7, 8, and 9. (Schedule)	11.7	--
Current & prior year inflation offset (Estimating)	6.5	7.5
Addition of Defense Business Operating Fund Requirements (Estimating)	3.6	4.6
Installation of UHF and EHF terminals in FY 1991. (Estimating)	1.3	1.6
Reprogram funds to procure EHF terminals from FY 1991 to FY 1990. (Estimating)	0.2	--
Total Changes	112.6	99.8

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
171.610	5.380	--	--	--	5.450	--	--	10.830	182.440

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

UHF FOLLOW-ON:	Initial Contract Price Target	Ceiling	Qty
Hughes Aircraft Company, El Segundo, CA N00039-88-C-0300, FFP Award: July 29, 1988 Definitized: July 29, 1988	$1374.7	N/A	10

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$1605.9	N/A	10	$1605.9	$1605.9

CPR information is not a requirement on this FFP contract.

The current contract price includes the addition of an EHF capability which was contained in a contract modification executed on 13 Dec 1990.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 50.0% (6 yrs/12 yrs)

(2) Percent Program Cost Appropriated: 61.6% ($1123.0 / $1824.4)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY87-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	-	-	-	-	-
Procurement	869.9	253.1	311.0	390.4	1824.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	869.9	253.1	311.0	390.4	1824.4

16c. Program Funding Summary (Cont'd):

c. Annual Summary —

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1507 Weapons Procurement, Navy								
1987				22.6	23.3	23.2	22.9	2.7
1988	1	88.3	187.4	115.7	123.9	123.9	123.2	3.0
1989				142.7	158.8	158.8	105.2	4.2
1990	2		245.3	277.1	319.5	319.5	127.9	4.0
1991	3	90.1	439.1	205.2	244.4	202.9	45.8	3.9
1992	3		367.2	205.8	253.1	206.3	180.2	3.1
1993	1		87.2	244.8	311.0			3.3
1994				129.7	170.1			3.3
1995				113.4	153.5			3.3
1996				45.2	63.2			3.2
1997				0.4	0.6			3.2
1998				2.0	3.0			3.2
Subtot	10	178.4	1326.2	1504.6	1824.4	1034.6	605.2	
Grand Total	10	178.4	1326.2	1504.6	1824.4	1034.6	605.2	

17. **Production Rate Data:**

a. Annual Production Rates — None.

b. Cost Variance — None.

c. Schedule Variance — None.

d. Deliveries (Plan/Actual) — None.

e. Approved Design-to-Cost Objective — N/A.

This section is not applicable as satellite production is funded at a rate less than six units per fiscal year.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules —

The support functions for UHF Follow-On will be similar to those required for the existing UHF communications satellite constellation. Costs are born by the Program Executive Officer for Space, Communications and Sensors and the Naval Space Command. The operations and support cost estimate was made in February 1990 in support of a SECDEF Cost Analysis Improvement Group (CAIG) review. The antecedent annualized costs listed represent the average costs for the FLTSAT satellite constellation for FY 1986 to FY 1988.

b. Costs — (FY 1988 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per UHF Follow-On	Avg Annual Cost Per FLTSAT Support
Orbital Support	1.6	2.0
Anomaly Analysis	0.0	0.6
GSE&I	0.0	0.5
Total	1.6	3.1

18c. Operating and Support Costs (Cont'd):

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&MN	2.0	0.6	0.5	2.0	5.1
Total	2.0	0.6	0.5	2.0	5.1

N-34 SLAT

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: SLAT (AQM-127A)

AS OF DATE: December 31, 1991

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1. Designation and Nomenclature (Popular Name):
AQM-127A Supersonic Low Altitude Target (SLAT)

2. DoD Component: Navy

3. Responsible Office and Telephone Number:
Program Executive Officer, Cruise Missile Project & Unmanned Aerial Vehicle Joint Project (PMA-208)
Washington, DC 20361-1208
CAPT. Ray Umbarger
Assigned: July 1, 1991
AV 222-4645 COMM 703-692-4645

4. Program Elements/Procurement Line Items:

RDT&E:
PE 0604258N
PROCUREMENT:
APPN 1507 ICN 228000 (Navy)

5. Related Programs: None.

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FOR OPEN PUBLICATION
MAR 24 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

6. Mission and Description:
The AQM-127A supersonic low altitude target is a supersonic, remotely controlled, recoverable vehicle, which is air launchable from Navy aircraft, thus capable of performing representative threat flight profiles, and incorporating target unique payload to satisfy projected antiship missile defense.

No Security Objection to Publication
92-C-0497
MAR 24 1992
Ann G. Anderson
Office of the Chief of
Naval Operations Dept. of the Navy

*** [redacted] ***

7. Program Highlights:

a. Significant Historical Developments --

On April 7, 1982, a NADEC briefing on aerial targets was held to address target deficiencies and concluded that current target vehicles could not stress the Aegis combat system to its performance boundaries. NAVMAT took the lead in developing a Navy Decision Coordinating Paper for a sea skimmer program. On 10 September 1984 a fixed-price incentive contract was awarded for the full scale engineering development phase for 15 supersonic low altitude targets. The first flight was conducted at the Pacific Missile Test Center in July 1988 with OPEVAL scheduled to conclude in June 1990.

In March 1989 flight tests were suspended as a result of technical Guidance and Control (G&C) interface deficiencies. On 13 September 1989 the Assistant Secretary of the Navy, Research, Development & Acquisition (ASN(RDA)) approved a restructured program consisting of a guidance and control (G&C) system modification, procurement of 30 Test and Evaluation targets in FY 1991 and the first production targets in FY 1993. Flight testing was scheduled to resume in July 1990 with an eight flight Navy/contractor test program, an eight flight TECHEVAL program, a ten flight OPEVAL test program and the acceleration of the Atlantic Fleet Weapons Training Facility (AFTWF) site activation to support critical DDG-51 development and operational testing in FY 1991. Subsequent Congressional reduction to the FY 1990 SLAT RDT&E budget (from $44.3M to $27.3M) and additional technical test requirements prior to resumption of flight testing resulted in revision of the restructured plan. The revisions were: delay new start operational improvement efforts from FY 1990 to FY 1991, reduce Navy field activity engineering and logistics support in FY 1990, resumption of flight test in November vice July 1990, deferring the procurement of the 30 SLAT T&E vehicles and technical data packages from FY 1991 to FY 1992.

Flight test resumed on November 9, 1990. The flight was not successful and the target was lost due to an electrical harness short that resulted in target auto-termination. The May 3, 1991 flight was similarly unsuccessful. The failure is believed to be attributable to a hardware or wiring harness problem.

The program experienced its second in-flight target failure and target loss since recommencing flight testing in early November 1990. The latest failure occurred on 3 May 1991. This failure was similar to the November failure as the target was lost during boost, just prior to ramjet transition. Telemetry data is being analyzed to determine the root cause of the failure. The contractor has applied additional management and technical resources to the program to ensure mission success. Failure analysis and corrective actions continue at contractor expense. Martin Marietta Corporation appears committed to correcting target deficiencies prior to resumption of

7a. Program Highlights (Cont'd):

flight testing. Flight testing was planned to resume in August 1991 if all corrective actions were completed.

b. Significant Developments Since Last Report --
The technical problems and associated delays in the test program caused the program to initiate a major restructuring which was to be approved/disapproved in a late April 1992 decision meeting with ASN(RDA). However, during the FY-92 budget process the HAC recommended the SLAT program be zeroed. The SAC recommended $34,712M and directed the Navy to conduct an analysis of target capabilities, projected threats and alternatives. The Appropriations Conference cancelled the SLAT program and specifically denied funds for continued development. Although the language allowed flight tests of the remaining targets, delays and lack of funding precluded flight tests.

Close out of the program was initiated in December 1991. This is a final SAR: program is 94% expended.

c. Changes Since As Of Date --
None.

8. Threshold Breaches:
There are currently five milestone Approved Program Baseline breaches: Milestone IIC from September 1991 to October 1992, DTE from January 1992 to July 1992, OTE from September 1992 to March 1993, Milestone III from January 1993 to December 1994, and IOC (T&E) from January 1994 to March 1995. There is a Nunn McCurdy unit cost breach due to program termination. Unit cost exception information is provided in section 12.

9. Schedule:

a. Milestones --	Development Estimate	Approved Program	Current Estimate	
Milestone I	APR 82	APR 82	APR 82	
Milestone II (NPDM)	JUL 84	JUL 84	JUL 84	
FSD Contract Award	SEP 84	N/A	SEP 84	
Preliminary Design Review	NOV 85	N/A	NOV 85	
Critical Design Review	MAR 86	N/A	MAR 86	
First Flight (FSD Hardware)	JUL 88	N/A	JUL 88	
Milestone IIC	N/A	N/A	N/A	(Ch-01)
DTE	N/A	N/A	N/A	(Ch-01)

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate	
OTE	N/A	N/A	N/A	(Ch-01)
Milestone III	NOV 89	N/A	N/A	(Ch-01)
Milestone IIIB (Full Production)	JAN 90	N/A	N/A	
IOC (T&E)	JUL 90	N/A	N/A	(Ch-01)
IOC Fleet Training	FEB 93	N/A	N/A	(Ch-01)

b. Previous Change Explanations --

The recent flight test failure has resulted in the following schedule delays:

	From	To
Milestone IIC	JAN 92	OCT 92
Milestone DTE	JAN 92	JUL 92
Milestone OTE	SEP 92	MAR 93
Milestone III	MAR 93	DEC 94
Milestone IOC (T&E)	MAR 94	MAR 95
IOC Fleet Training	NOV 94	NOV 95

c. Current Change Explanations --

(CH-1) Since the SLAT program has been cancelled the following milestones are not applicable.

	From	To
Milestone IIC	OCT 92	N/A
Milestone DTE	JUL 92	N/A
Milestone OTE	MAR 93	N/A
Milestone III	DEC 94	N/A
Milestone IOC (T&E)	MAR 95	N/A
IOC Fleet Training	NOV 95	N/A

d. References --

Development Estimate:
FY 1990-1991 President's Budget.

Approved Program: None.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
Speed (Mach)	2.5			2.5
Altitude/Minimum (ft)	30			<30
Range/Minimum (NM)	55			55
Mission Reliability	.85			.85
Launch and Flight Reliability	.90			.90
Flight Recovery Reliability	.95			.95
Flight Termination Rel.	.97			.97
Maintainability (MTTR) Hrs. (0 LEVEL)	N/A			1.00

b. Previous Change Explanations --

None.

c. Current Change Explanations -- None.

d. References --

Development Estimate:
FY 1990-1991 President's Budget.

Approved Program: None.

11. Total Program Cost and Quantity: **(Current Estimate in Millions of Dollars)**

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	372.4	253.9	253.9
Procurement	0.0	0.0	0.0
Total Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	372.4	253.9	253.9

11a. Total Program Cost and Quantity (Cont'd):

	Development Estimate	Approved Program	Current Estimate
Escalation	-4.6	-5.5	-5.5
Development (RDT&E)	(-4.6)	(-5.5)	(-5.5)
Procurement	(0.0)	(0.0)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	367.8	248.4	248.4
b. Quantity --			
Development (RDT&E)	59	N/A	15
Procurement	0	N/A	N/A
Total	59	N/A	15

c. Foreign Military Sales --
N/A

d. Nuclear Costs --
N/A

e. References --

Development Estimate:
FY 1990-1991 President's Budget.

Approved Program: None.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	248.4	1372.1	248.4
(2) Quantity	15	445	15
(3) Unit Cost	16.560	3.083	16.560

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
c. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (BY89$)	253.9	1054.2	253.9
(2) Unit Cost	16.927	2.369	16.927

d. Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (BY89$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Unit Cost	N/A	N/A	N/A

e. Changes from the Baseline Report - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	13.477	437.14
(2) CPUC (TY$)	0.000	N/A
(3) PAUC Quantity	-430	-96.63
(4) PAUC (BY89$)	14.558	614.52
(5) CPUC (BY89$)	0.000	N/A

f. Changes from the Previous SAR - (JUN 91 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	13.5	441.18
(2) CPUC (TY$)	0.0	N/A
(3) PAUC Quantity	-430	-96.63
(4) PAUC (BY89$)	14.6	627.42
(5) CPUC (BY89$)	0.0	N/A

g. Initial SAR (DEC 88)

(1) Program Acquisition Cost (TY$) --	367.8
(2) Program Acquisition Cost (BY$) --	372.4

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

h. Unit Cost Changes.

(1) PAUC --

Congressional language specifically denied any further funding for the development of the Supersonic Low Altitude Target (SLAT) and only provided funds for the contractual obligation and close out of the contract. This was due to an delays in the flight test program, where the Navy and the contractor did not demonstrate whether identified quality improvements in SLAT were successful. This resulted in a PAUC termination breach.

(2) CPUC -- None.

i. Impact of Performance or Schedule Changes on Unit Cost. - None.

j. Program Management and Control. - None.

k. Cost Control Actions. - None.

l. Contract Information (In Millions of Then-Year Dollars) --

(1) Contractor(s): Martin Marietta
(2) Contract Title: AQM-127A
(3) Contract Number:N00019-84-C-0288
(4) Actual Cost of Work Performed (ACWP) to date: 209.5
(5) Percent contract completed (BCWP/target cost): 0.00
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of 12/31/90	$-68.7/N/A	$-1.0/N/A
Previous SAR	$-69.8/N/A	$+1.0/N/A
Current values	$-68.7/N/A	$-1.0/N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	$+1.1/N/A	$-2.0/N/A

(7) Explanation of Variances. - None.

(8) Impact of Variances on Contract. - None.

(9) Impact of Variances on Unit Costs. - None.

m. Contracts Exceeding Contract Cost Baseline Thresholds. -- None.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	367.8	0.0	0.0	367.8
Previous Changes:				
Economic	+1.9	+20.6	+0.1	+22.6
Quantity	-36.5	+892.9	-	+856.4
Schedule	+46.8	+0.4	-	+47.2
Engineering	+17.3	-	-	+17.3
Estimating	+4.3	-22.5	-	-18.2
Other	-	-	-	-
Support	+8.3	+62.8	+1.8	+72.9
Subtotal	+42.1	+954.2	+1.9	+998.2
Current Changes:				
Economic	-1.7	-20.6	-0.1	-22.4
Quantity	-	-892.9	-	-892.9
Schedule	-	-0.4	-	-0.4
Engineering	-	-	-	-
Estimating	-	+22.5	-	+22.5
Other	-159.8	-	-	-159.8
Support	-	-62.8	-1.8	-64.6
Subtotal	-161.5	-954.2	-1.9	-1117.6
Total Changes	-119.4	-	-	-119.4
Current Estimate	248.4	-	-	248.4

13a. **Cost Variance Analysis (Cont'd)**:

a. Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	372.4	0.0	0.0	372.4
Previous Changes:				
Quantity	-33.2	+630.7	-	+597.5
Schedule	+33.2	-	-	+33.2
Engineering	+23.2	-	-	+23.2
Estimating	-11.2	-18.0	-	-29.2
Other	-	-	-	-
Support	+5.6	+44.6	+1.5	+51.7
Subtotal	+17.6	+657.3	+1.5	+676.4
Current Changes:				
Quantity	-	-630.7	-	-630.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.1	+18.0	-	+19.1
Other	-137.2	-	-	-137.2
Support	-	-44.6	-1.5	-46.1
Subtotal	-136.1	-657.3	-1.5	-794.9
Total Changes	-118.5	-	-	-118.5
Current Estimate	253.9	-	-	253.9

b. Previous Change Explanations --

RDT&E

Economic: Application of revised escalation rates. Correction of errors in previous RDT&E SAR.

Quantity: Lot I target buy cancelled. Correction of errors in previous SAR.

Schedule: Incorporates total program cost. Correction of errors in previous SAR. Revised due to flight test failures resulting in a slip of more than 180 days in planned milestone dates.

Engineering: Guidance & Control design changed. Correction of errors in previous SAR.

Estimating: Navy reprogramming and adjustments due to restructure. Correction of errors in previous SAR.

13b. Cost Variance Analysis (Cont'd):

Incorporates total program cost. Revised estimates due to refinement of prior estimate and change in cost estimating assumptions in terms of cost savings associated with learning curves and non-recurring cost.

Support: Correction of errors in previous SAR. Incorporates total program costs. Support increase reflects actuals.

PROCUREMENT

Economic: Application of revised escalation rates.

Quantity: Addition of 400 SLAT targets.

Schedule: Changes in annual buy rates.

Estimating: Incorporates total program costs. Revised estimates due to refinement of prior current estimate and cost estimating assumptions in terms of break in production, buy rates and non-recurring cost.

Support: Incorporates support/spares for procurement buy. Support reduction due to decrease in cost of spares needed to support current buy rates.

MILCON

Economic: Application of revised escalation rates.

Support: Incorporates total program cost.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Application of revised escalation indices (Economic)	N/A	-2.9
Economic adjustment for negation program change. (Economic)	N/A	1.2
Current and Prior inflation offset (Estimating)	1.1	--
Termination of program. (Other)	-137.2	-159.8
Total Changes	-136.1	-161.5

13c. **Cost Variance Analysis (Cont'd)**:

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Application of revised escalation indices. (Economic)	N/A	-0.1
Economic adjustment for negation program change. (Economic)	N/A	-20.5
Total variance associated with the deletion of all end items and flyway dollars from this appropriation.	-612.9	-870.8
Deletion of 400 targets (Quantity)	-630.7	-892.9
Quantity allocation associated with the deletion of targets. (Schedule)	--	-0.4
Quantity allocation associated with the deletion of targets. (Estimating)	18.0	22.5
Reprogramming action to remove all support costs from this appropriation. (Support)	-44.6	-62.8
Total Changes	-657.3	-954.2
(3) MILCON		
Application of revised escalation indices. (Economic)	N/A	-0.1
Reprogramming action that eliminated this appropriation. (Support)	-1.5	-1.8
Total Changes	-1.5	-1.9

14. **Program Acquisition Unit Cost (PAUC) History**: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
6.23	0.01	15.85	3.12	1.15	0.29	-10.65	0.55	10.32	16.56

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

AQM-127A:	Initial Contract Price Target	Ceiling	Qty
Martin Marietta, Orlando, FL NOOO19-84-C-0288, FPI Award: September 10, 1984 Definitized: June 1, 1986	$103.6	$120.0	15

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$174.2	$192.5	15	$223.3	$262.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-69.8	$1.0
Cumulative Variances To Date (06/13/91)	$-68.7	$-1.0
Net Change	$1.1	$-2.0

Explanation of Change: None.

The program manager anticipates the EAC to reach $262M based on the magnitude of the schedule slip and the corrective actions required by the contractor as a result of the two flight test failures. This slip does not increase government liability under the contract unless delays are directly attributable to government action or inaction, which does not appear to be the case at this time. Currently all required changes are on contract and final funding to meet the installment funding schedule of the contract has been put on contract. The contract is at ceiling and the remaining installment payments has been made to bring the contract ceiling price of $192.5M.

The cumulative Cost Variance (CV) continues to deteriorate on this contract. The contractor notes that the cumulative cost variance is attributable to control actuator system (CAS), digital avionics processor (DAP), and integrated electronics unit (IEU) corrective actions. Also the two flight failures have resulted in increasing unfavorable cost variances due to contractors long term CAS corrective action and higher effort than planned.

The cumulative Schedule Variance (SV) is an unfavorable $733K primarily due to the earned value adjustment in the Propulsion element for the Marquardt overpayment. The Schedule Performance Index (SPI) is still 1.00.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 100.0% (10 yrs/10 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($248.4 / $248.4)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	245.8	2.6	-	-	248.4
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	245.8	2.6	-	-	248.4

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1983				7.5	6.3	6.3	6.3	4.9
1984				5.5	4.8	4.8	4.8	3.8
1985				25.1	22.5	22.5	22.0	3.4
1986				47.0	43.4	43.4	43.2	2.8
1987				48.0	45.6	45.6	45.0	2.7

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1988				39.5	38.8	38.8	38.7	3.0
1989				21.7	22.2	22.2	21.5	4.2
1990				24.4	26.0	26.0	25.5	4.0
1991				32.9	36.2	32.4	27.5	4.2
1992				2.3	2.6			4.0
Subtot	15			253.9	248.4	242.0	234.5	
Grand Total	15			253.9	248.4	242.0	234.5	-

17. **Production Rate Data**:

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1993	40	0	0	0
1994	40	0	0	0
1995	40	0	0	0
1996	40	0	0	0
1997	40	0	0	0
1998	40	0	0	0
1999	40	0	0	0
2000	40	0	0	0
2001	40	0	0	0
2002	40	0	0	0

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	253.9	N/A	0.0
(TY $)	N/A	N/A	248.4	N/A	0.0
PAUC Cost (BY $)	N/A	N/A	16.927	N/A	N/A
(TY $)	N/A	N/A	16.560	N/A	N/A

17c. Production Rate Data (Cont'd):

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date (MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date (MON YY)	N/A	N/A	N/A	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	45/15
Procurement	400/0

e. Approved Design-to-Cost Objective -- N/A.

18. Operating and Support Costs:

a. Assumptions and Ground Rules -- None

b. Costs -- None.

c. Contractor Support Costs -- None.

Operating and support costs are not available and no longer relevant due to cancellation of the program.

N-44 UAV

91-321

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: UAV

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
MAR 24 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. **Designation and Nomenclature (Popular Name):**
Unmanned Aerial Vehicles (UAV)

2. **DoD Component:** Navy

Joint Participants:
Army, Navy, Marine Corps, Air Force

3. **Responsible Office and Telephone Number:**
Program Executive Officer — RADM George Wagner
Cruise Missiles Project and — Assigned: February 8, 1991
Unmanned Aerial Vehicles Joint Proj — AV 222-7409 COMM 703-692-7409
Washington, DC 20361-1014

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 0305141D
PROCUREMENT:
APPN 0300 ICN 0000000 (DCA/DNA)

No Security Objection to Open Publication
92-C-0498
MAR 24 1992
Office of the Chief of Naval Operations Dept. of the Navy

5. **Related Programs:** None.

6. **Mission and Description:**
The total Unmanned Aerial Vehicles-Joint Program encompasses five significant programs; Close Range, Short Range, Medium Range, Maritime, and Endurance. UAVs are a family of powered aerial vehicles which do not carry a human operator and which are designed

[redacted]

6. Mission and Description (Cont'd):

to carry a non-lethal payload. Missions may include: Reconnaissance; surveillance; target acquisition; target spotting; command and control; meteorological data collection, nuclear, biological, and chemical detection, special operations support; and disruption and deception.

This SAR covers three programs; Close Range, Short Range, and Medium Range.

The Close Range (CR), system will provide Reconnaissance, Surveillance, and Target Acquisition (RSTA) capabilities and meteorological data to commanders of lower level tactical units. The system will be highly mobile, easy to operate and maintain with a minimum of manpower and training and capable of launch and recovery in constrained operational environments.

The Short Range (SR) system is the developmental baseline for a common architecture to achieve interoperability within the family of UAVs. The system will provide commanders with near-real-time intelligence, reconnaissance, and battlefield surveillance. SR is intended for employment in environments where immediate feedback is needed, manned aircraft are unavailable, or excessive risk or other conditions render use of manned aircraft less than prudent.

The Medium Range (MR) system is being developed to provide quick response capability to obtain high quality imagery in both low and high threat environments. It is a small profile, high-speed, fully autonomous vehicle that is capable of air and ground launch. The multi-theater role supports warfighting operations under most weather conditions, during either day or night. The air launch platforms are the USN/USMC F/A-18(C/D) and USAF F-16R. The Air Force will also ground launch the MR UAV.

7. Program Highlights:

a. Significant Historical Developments —

In response to congressional direction in FY 1988 to consolidate the management of DOD nonlethal UAV programs, the Under Secretary of Defense (Acquisition) established the UAV Joint Project Office (JPO). An Executive Committee (EXCOM) was established on 7 April 1988 with overall responsibility for DOD UAV programs at the OSD level. In 1991 the EXCOM was disestablished and DOD UAV programs were brought under the Defense Acquisition Board (DAB) procedures and management. The Navy is the Executive Service for the UAV JPO, with full authority, responsibility, and accountability for designing, developing, procuring, and transitioning UAV systems to the Services. The systems must meet the requirements validated by the Joint Requirements Oversight Council (JROC) commensurate with available

7a. Program Highlights (Cont'd):

funding.

The following gives specific highlights for each UAV program:

Close Range: A risk reduction technology demonstration program for the CR system was implemented during FY 1991 and will continue in FY 1992. Six companies are participating in a technology demonstration of a 200 pound class air vehicle. In addition, two companies will demonstrate lightweight Forward Looking Infrared (FLIR) payload devices that would be capable of being carried by a 200 pound air vehicle. These efforts are intended to reduce both technical and schedule risk to the total CR program.

Short Range: Two contracts have been awarded; Israel Aircraft Industries and McDonnell Douglas Missile Systems Company. Systems are being tested at Ft. Huachuca and Pacific Missile Test Center. Downselect for low rate production option is scheduled for fourth quarter FY 92.

Medium Range: The Engineering and Manufacturing Development contract was awarded in June 1989 to Teledyne Ryan Aeronautical (TRA). In June 1991, a modification to the contract redefined the program and directed the contractor to produce metallic vice composite vehicles. The payload is the Advanced Tactical Aerial Reconnaissance System built by Martin Marietta Electronics Systems under the management of the USAF. Other accomplishments include completion of the F/A-18 and F-16 wind tunnel tests, Mid Air Retrieval System demonstration and F/A-18 aircraft fit check. On 20 September 1991 roll out of the first developmental test vehicle occurred at TRA in San Diego. A Memorandum Of Agreement was signed among all participants which provides for all interfacing programs to exchange schedule/program information and to meet quarterly.

b. Significant Developments Since Last Report —
This is the first SAR for the UAV program.

c. Changes Since As Of Date —
An ADM was signed January 3, 1992 designating three programs as ACAT 1D.

8. Threshold Breaches: None.

9. Schedule:

a. Milestones —	Development Estimate	Approved Program	Current Estimate
Close Range			
Milestone 0	JAN 90	N/A	JAN 90
Milestone I/II	SEP 92	N/A	SEP 92
IOT&E			
Start	FEB 96	N/A	FEB 96
Complete	FEB 97	N/A	FEB 97
Milestone III	FEB 97	N/A	FEB 97
Full Rate Production Contract Award	FEB 97	N/A	FEB 97
First Unit Equip (FUE)	JUN 97	N/A	JUN 97
Initial Operating Capability (IOC)	FEB 98	N/A	FEB 98
Short Range			
Milestone 0	JAN 89	N/A	JAN 89
Milestone I	MAY 89	N/A	MAY 89
Milestone II	AUG 89	N/A	AUG 89
Low-Rate Production Award	SEP 92	N/A	SEP 92
Low-Rate Production First Delivery	DEC 93	N/A	DEC 93
IOT&E			
Start	APR 94	N/A	APR 94
Complete	AUG 94	N/A	AUG 94
Milestone IIIB	SEP 92	N/A	SEP 92
Milestone IIIC	SEP 94	N/A	SEP 94
Full Rate Production Contract Award	SEP 94	N/A	SEP 94
First Unit Equipped (FUE)	OCT 94	N/A	OCT 94
Initial Operating Capability	JUN 95	N/A	JUN 95
Medium Range		N/A	
Dem/Val Contract Award	JUN 89	N/A	JUN 89
Milestone II			
Milestone IIA	JUN 89	N/A	JUN 89
Milestone IIB	MAR 93	N/A	MAR 93
Low-Rate Production Award	OCT 95	N/A	OCT 95
Low-Rate Production First Delivery	DEC 96	N/A	DEC 96
IOT&E			
Start	OCT 95	N/A	OCT 95
Complete	APR 96	N/A	APR 96
Milestone III			
MS IIIB - USMC/USAF	OCT 96	N/A	OCT 96
MS IIIC - USN	OCT 97	N/A	OCT 97
Full-Rate Production Contract Award	OCT 97	N/A	OCT 97
Initial Operating Capability			
USMC	JUN 97	N/A	JUN 97
USAF	DEC 97	N/A	DEC 97

9a. **Schedule (Cont'd):**

Milestones (Cont'd) —	Development Estimate	Approved Program	Current Estimate
USN	MAR 98	N/A	MAR 98

b. Previous Change Explanations — None.

c. Current Change Explanations — None.

d. References —

Development Estimate:
DOD UAV Master Plan approved 1 March 1991; JROCM-006-91, UAV Program Fielding Sequence, 25 March 1991; JROCM-009-91, Service Review of UAV System Rqmts, 4 April 1991; JROCM-008-91, UAV Medium Range Program Restructure, June 1991; UAV JPO Charter Signed 16 October 1989. Defense Acquisition Board held 10 December 1991. Acquisition Decision Memorandum (ADM) signed 3 Jan 1992.

Approved Program: None.

10. **Performance Characteristics:**

a. Performance —	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Close Range					
Radius of Action (km)	50	N/A	/ N/A		50
Mission Duration (hrs)	4	N/A	/ N/A		4
Altitude	15000	N/A	/ N/A		15000
Gross Take-off wt (lbs)	100	N/A	/ N/A		100
Short Range					
Mission Duration (hrs)	12	N/A	/ N/A		12
Climb Rate (Ft/min)	1000	N/A	/ N/A		1000
Readiness/Support					
MTBMCF (hrs)	20	N/A	/ N/A		20
MTBOMF (hrs)	13	N/A	/ N/A		13
O-level MTTR (hrs)	.5	N/A	/ N/A		.5
Medium Range					
Radius of Action (Nm) w/302# payload	350	N/A	/ N/A		350
Mission Duration (hrs)	2	N/A	/ N/A		2
Altitude (Ft MSL)	40000	N/A	/ N/A		40000

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Navigation Accuracy (M) (CEP)	25	N/A / N/A		25
Maintainability				
Mission TAT				
Ground Recovery	6	N/A / N/A		6
Water Recovery	24	N/A / N/A		24
Mission Availability	.85	N/A / N/A		.85
Speed(MSL to 18000 ft) (knots)	550	N/A / N/A		550
Greater than 20000 ft Mach	.9	N/A / N/A		.9

MTBMCF - Mean Time Between Mission Critical Failure
MTBOMF - Mean Time Between Operational Mission Failure
MTTR - Mission Time to Repair
MSL - Mean Sea Level
TAT - Turn Around Time
NM - Nautical Miles
CEP - Circular Error Probable

b. Previous Change Explanations — None.

c. Current Change Explanations — None.

d. References —

Development Estimate:
DOD UAV Master Plan approved 1 March 1991; JROCM-006-91, UAV Program Fielding Sequence, 25 March 1991; JROCM-009-91, Service Review of UAV System Rqmts, 4 April 1991; JROCM-008-91, UAV Medium Range Program Restructure, June 1991; UAV JPO Charter Signed 16 October 1989. Defense Acquisition Board held 10 December 1991. Acquisition Decision Memorandum (ADM) signed 3 Jan 1992.

Approved Program: None.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. Cost —			
Development (RDT&E)	1101.3	0.0	1101.3
Procurement	3350.2	0.0	3350.2
Total Flyaway	(1894.0)		(1894.0)
Total Flyaway	(1894.0)		(1894.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(873.7)		(873.7)
Initial Spares	(582.5)		(582.5)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 88 Base-Year $	4451.5	0.0	4451.5
Escalation	2185.2	0.0	2185.2
Development (RDT&E)	(414.0)	(0.0)	(414.0)
Procurement	(1771.2)	(0.0)	(1771.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	6636.7	0.0	6636.7
b. Quantity —			
Development (RDT&E)	29	N/A	29
Procurement	747	N/A	747
Total	776	N/A	776

Quantities:

Short Range - 50 Procurement Systems
Close Range - 172 Procurement Systems; 4 RDT&E Systems
Medium Range - 525 Procurement Air Vehicles; 25 RDT&E Air Vehicles

c. Foreign Military Sales —
none

d. Nuclear Costs —
N/A

e. References —

Development Estimate:
DOD UAV Master Plan approved 1 March 1991; JROCM-009-91, Service Review of UAV System Rqmts, 4 April 1991; JROCM-008-91, UAV Program Restructure, 4 April 1991; UAV JPO Charter Signed 16 October 1989. Acquisition Decision Memorandum (ADM), signed 3 Jan 1992.

11a. Total Program Cost and Quantity (Cont'd):

Approved Program: None.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	6636.7	6636.7	6636.7
(2) Quantity	776	776	776
(3) Unit Cost	8.552	8.552	8.552
b. Current Procurement —	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	138.4	138.4	148.9
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	138.4	138.4	148.9
(2) Quantity	4	4	4
(3) Unit Cost	34.600	34.600	37.225

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1515.3	5121.4	0.0	6636.7
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	1515.3	5121.4	-	6636.7

13a. Cost Variance Analysis (Cont'd):

a. Summary — (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1101.3	3350.2	0.0	4451.5
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	1101.3	3350.2	-	4451.5

b. Previous Change Explanations —

c. Current Change Explanations — None.

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
8.552	—	—	—	—	—	—	—	—	8.552

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E —

MEDIUM RANGE:

Teledyne Ryan Aero, San Diego, CA
N00019-89-C-0173, FPIF
Award: June 30, 1989
Definitized: June 30, 1992

Initial Contract Price		
Target	Ceiling	Qty
$171.2	$186.8	25

Current Contract Price		
Target	Ceiling	Qty
$171.2	$186.9	25

Estimated Price At Completion	
Contractor	Program Manager
$174.4	$186.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (01/31/92)	$-0.8	$-2.5
Net Change	$-0.8	$-2.5

Explanation of Change: None.

The original Medium Range contract was awarded Jun 89 (for $77.7M). The redefined Medium Range program ceiling price modification (186.8M) in Jun 91 to meet emerging requirements.

b. Procurement —

SHORT RANGE:

McDonnell Douglas Missile, St. Louis, MO
N00019-89-C-0347, FFP
Award: September 15, 1989
Definitized: September 15, 1989

Initial Contract Price		
Target	Ceiling	Qty
$61.5	N/A	2

Current Contract Price		
Target	Ceiling	Qty
$61.5	N/A	2

Estimated Price At Completion	
Contractor	Program Manager
$61.5	$61.5

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

SHORT RANGE:
ISRAEL AIRCRAFT INDUSTRY, LTD - MALOT, IS
N00019-89-C-0346, FFP
Award: September 15, 1989
Definitized: September 15, 1989

Initial Contract Price		
Target	Ceiling	Qty
$41.6	N/A	2

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$41.6	N/A	2	$41.6	$41.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

CPR information not required on this FFP contract.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status —

(1) Percent Program Completed: 23.8% (5 yrs/21 yrs)

(2) Percent Program Cost Appropriated: 9.5% ($627.5 / $6636.7)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY88-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2008)	Total
RDT&E	257.7	66.9	129.1	1061.6	1515.3
Procurement	164.5	138.4	148.9	4669.6	5121.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	422.2	205.3	278.0	5731.2	6636.7

c. Annual Summary —

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 0400 RDT&E, Defense Agencies								
1988				45.6	45.6	45.6	45.6	3.0
1989				37.8	40.3	40.3	35.0	4.2
1990				73.3	81.3	81.2	57.7	4.0
1991				78.8	90.5	89.5	45.7	3.9
1992				56.5	66.9	24.1		3.1
1993				105.5	129.1			3.3
1994				112.7	142.5			3.3
1995				80.1	104.6			3.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 0400 RDT&E, Defense Agencies (Cont'd)								
1996				58.9	79.3			3.2
1997				31.1	43.2			3.2
1998				63.9	91.6			3.2
1999				43.9	65.0			3.2
2000				45.6	69.7			3.2
2001				42.9	67.6			3.2
2002				40.3	65.6			3.2
2003				37.9	63.7			3.2
2004				35.7	61.8			3.2
2005				32.8	58.7			3.2
2006				28.6	52.8			3.2
2007				25.9	49.4			3.2
2008				23.5	46.1			3.2
Subtot	29			1101.3	1515.3	280.7	184.0	
Appropriation: 0300 Procurement, Defense Agencies								
1988				45.0	45.0	45.0	45.0	3.0
1989	4		20.0	45.1	50.2	50.2	37.0	4.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 0300 Procurement, Defense Agencies (Cont'd)								
1990				25.1	28.9	28.9	22.7	4.0
1991				33.9	40.4	23.0	10.7	3.9
1992	4		42.2	112.5	138.4			3.1
1993	8		52.7	117.2	148.9			3.3
1994	10		73.6	147.2	193.1			3.3
1995	10		84.9	169.9	230.0			3.3
1996	39		112.7	212.7	297.2			3.2
1997	58		115.8	210.6	303.7			3.2
1998	60		236.9	394.9	587.6			3.2
1999	76		237.6	383.3	588.6			3.2
2000	75		226.1	364.7	577.9			3.2
2001	81		152.3	238.0	389.3			3.2
2002	82		148.0	231.3	390.4			3.2
2003	82		144.6	226.0	393.7			3.2
2004	83		135.4	211.6	380.3			3.2
2005	63		94.7	152.8	283.4			3.2
2006	12		16.5	28.4	54.4			3.2
2007								3.2

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 0300 Procurement, Defense Agencies (Cont'd)								
2008								3.2
Subtot	747		1894.0	3350.2	5121.4	147.1	115.4	
Grand Total	776		1894.0	4451.5	6636.7	427.8	299.4	

Note: Funding constraints may only permit 4 systems in 1993.

17. **Production Rate Data:**

a. Annual Production Rates —

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1988	0	0	0	0
1989	0	0	4	0
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	4	0
1993	0	0	8	0
1994	0	0	10	0
1995	0	0	10	0

17a. Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1996	0	0	39	0
1997	0	0	58	0
1998	0	0	60	0
1999	0	0	76	0
2000	0	0	75	0
2001	0	0	81	0
2002	0	0	82	0
2003	0	0	82	0
2004	0	0	83	0
2005	0	0	63	0
2006	0	0	12	0

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	4451.5	N/A	
(TY $)	N/A	N/A	6636.7	N/A	
PAUC Cost (BY $)	N/A	N/A	5.736	N/A	N/A
(TY $)	N/A	N/A	8.552	N/A	N/A

17c. Production Rate Data (Cont'd):

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. Deliveries (Plan/Actual) —

	To Date
RDT&E	0/0
Procurement	4/4

e. Approved Design-to-Cost Objective — N/A.

18. Operating and Support Costs:

a. Assumptions and Ground Rules — None

b. Costs — None.

c. Contractor Support Costs — None.

AF-7 CMU

91-078

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~~[redacted]~~

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: CMU

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
FEB 13 1992

1. (U) Designation and Nomenclature (Popular Name):
Cheyenne Mountain Upgrade (CMU)

2. (U) DoD Component: USAF

3. (U) Responsible Office and Telephone Number:
ESD/SR
HANSCOM AFB, MA 01731-5000
AV 478-5980 X 5020
COMM (617) 271-5020
COL JAMES E. JACOBY
Assigned: August 1, 1988

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0102310F
PROCUREMENT:
APPN 3080 ICN 833160 (Air Force)

SAF/PAS
92-053 -T

5. (U) Related Programs:
ITW/AA, EMENS, PAVE PAWS, SSNIP, ASAT, SPADOCS, DSP, NNS, OTH-B, SDI, AFAMPE, AINC, JRSC, GWEN, MILSTAR, JSS, ROCC/SOCC, ASPADOC, IDHS,

Classified by: ~~Multiple Sources~~
Declassify on: Originating Agency Determination Required (OADR)
Downgrade Instructions: Not Subject to Automatic Downgrade

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92-019

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CMU, December 31, 1991

5. (U) Related Programs (Cont'd):

COBRA DANE, DSSR, NADS, SEEK IGLOO, FARR.

6. (U) Mission and Description:

The CMU program develops system capabilities to ensure fully capable, timely and reliable day-to-day processing of all tactical warning mission data for atmospheric, ballistic missile and space threats. These capabilities must endure natural or man-made disturbances, jamming, sabotage and other effects to ensure the availability of Integrated Tactical Warning and Attack Assessment (ITW/AA) information in peacetime and through a conflict until physically destroyed. The capacity of the CMU "system of systems" and their interfaces is sufficient to handle both single event, and small and large scale raids. It also provides credible warning data to all U.S. forces and the National Command Authorities (NCA). Transmission of missile warning sensor messages to the Cheyenne Mountain AFB (CMAFB) and the Offutt Processing and Correlation Center (OPCC), and forward fixed users is processed by the Survivable Communications Integration System (SCIS) equipment. Warning messages from air and intelligence sources are transmitted to the CMAFB correlation center directly. Space warning data is provided through Space Defense Operation Center (SPADOC) and Alternate SPADOC at Dahlgren Naval Space Surveillance Center. Messages are processed by the Communications System Segment Replacement (CSSR) and passed to the mission centers. These mission centers (SPADOC, Command Center Processing and Display System Replacement (CCPDS-R) and Granite Sentry) then process the information and generate displays critical to decision makers.

7. (U) Program Highlights:

a. (U) Significant Historical Developments --

The Cheyenne Mountain Upgrade (CMU) Program consolidates six ongoing development programs in support of the Integrated ITW/AA system. They encompass communications, processing and display systems being acquired for CMAFB, CO and OPCC which is a peacetime correlation center at Offutt AFB, NE. All six programs are being acquired to correct deficiencies of the 427M system and to comply with the Commander-in-Chief North American Aerospace Defense/U.S. Commander-in-Chief Space Command (CINCNORAD/USCINCSPACE) overall Integrated ITW/AA system architecture. The consolidation of these programs under the CMU is to satisfy direction contained in the 1989 Appropriation Bill to consolidate the individual programs into a single integrated program and a single line item for each affected appropriation. Granite Sentry and SPADOC 4A system element achieved IOC in 1989. The DAB met in September 1989 and approved a consolidated acquisition and integration approach outlined in the Acquisition Decision Memorandum, dated 25 October 1989, on the CMU program. This approach is delineated in the Acquisition Program

7a. (U) Program Highlights (Cont'd):

Baseline (APB) for CMU, submitted 9 November 1989 and approved by the DAE on 12 Feb 90.

We have made significant progress within the overall program baseline to meet Full Operational Capability in Dec 95. CSSR Technical Control Subsystem (TCS) achieved IOC on 11 Apr 91, SPADOC 4B reached IOC on 30 Jul 91 and CSSR Message Processing and Distribution System (MPDS) achieved IOC on 14 Aug 91. These new systems have greatly increased the capability of the warning system.

Granite Sentry II completed IOT&E with no significant problems and entered Trial Period on schedule in Aug 91. During Trial Period, an operational concern with the control for system switchover during planned and unscheduled maintenance was discovered. The IOC has been delayed and the program remains in Trial Period. The main cause is a lack of System Controller familiarity with Granite Sentry equipment. However, several other factors, including a shortage of system center personnel, and inadequate operational procedures, also impacted our scheduled delivery. Follow-on Granite Sentry capabilities had to be reprioritized by the using command and rephased to meet future milestones prior to CMU FOC. The DAE approved APB (Change 1), 16 Sep 91, deletes Granite Sentry phase terminology and describes the specific functionality to be delivered for minimum number of events needed to define the program.

The SCIS program experienced schedule delays due to several factors. The threat environment has shifted, increasing the ratios of mobile to fixed launch platforms contained in the final system requirements. Additionally, the SCIS hardware vendor, Tolerant, is no longer manufacturing the selected hardware thereby limiting our performance upgrade options. More recently, the contractor experienced significant schedule delays, specifically in software development and system testing. A cure notice was issued in early 1991. After a favorable recovery plan was submitted by the SCIS contractor, a fully coordinated decision was made to upgrade the SCIS architecture to a DEC fault tolerant computer on 6 Jun 91. This system now provides for long term growth and will meet final system requirements.

b. (U) Significant Developments Since Last Report --

CMU has continued to achieve the baseline technical requirements as the program progresses. Overall, we now have an integrated system-of-systems which should be responsive to any likely wartime scenario. Further, the disconnects identified at the 1989 DAB have been resolved. Contractor performance problems have been systematically resolved and quality products are being delivered.

Granite Sentry Missile Warning and NORAD Command Center Functionality IOC occurred on 19 Dec 91. CSSR connectivity with AIR CCOMS and Battle Staff Support Center (BSSC) and expansion of the VDS display is now underway. NORAD has agreed that the above

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7b. (U) Program Highlights (Cont'd):

functionality is the essential content for Granite Sentry and CMU FOC. In addition, NORAD has agreed to realign core requirements in order to stay within CMU FOC. (Granite Sentry is the "design-to-budget" element of CMU.) We are also exploring with AFSPACECOM the opportunity to hire a prime contractor to "normalize" the acquisition strategy as we down-size the Air Force and activate AF Materiel Command.

The SCIS contractor, E-Systems, conducted a System Architecture Review on 7-8 Nov 91 in which the performance assessment met or exceeded requirements in all areas. Further, a demo on the SCIS MILSTAR interface compatibility took place on 21 Nov 91 (ahead of schedule) which was a total success. The contractor is on schedule for Demo I in Jan 92. SCIS has significant workload challenges ahead with definition of the contract, negotiations, demos, design reviews, and site surveys to be accomplished. It appears E-Systems is laying a good foundation (based on receiving 80% fee from the Dec 91 Award Fee Determination) for total recovery of the program. This system now provides for long term growth and meets final system requirements.

On the CSSR program, GTE successfully completed their 90% design review for the CPCC Power Distribution Systems in Dec 91.

SPADOC Block C went on contract in Oct 91. SPADOC/Space Surveillance Center interface tests were conducted on 28 Oct and 9 Nov 91 at the off-site test facility and the transfer of the entire space catalog was successfully completed three times. SPADOC was also accredited for multi-level security, a major technical accomplishment. SPADOC Block C Version I CDR was completed on schedule in Dec 91. Version II PDR is scheduled for Jan 92. This program is solidly on track.

Recent accomplishments demonstrate that CCPDS-R is progressing very well. The Space and Warning System Center (SWSC) received security accreditation on a CCPDS-R Processing and Display Subsystem (PDS) in Nov 91 and the program completed SAC unique subsystem CDR the following month.

The CMU program will satisfy all mission requirements.

c. (U) Changes Since As Of Date —

A SCIS software porting demo was held in Jan 92 which verified SCIS functionality on DEC Hardware.

SPADOC Block C Version II PDR was successfully held in Jan 92.

8. (U) Threshold Breaches:

There are currently schedule breaches for SCIS and a total procurement unit cost breach to the Acquisition Program Baseline (APB) dated 16 Sep 91, for which a program deviation report was submitted with a request to update the CMU APB. There are no Nunn-McCurdy unit cost breaches.

9. (U) **Schedule:**

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Granite Sentry Phase II	MAR 90	N/A	N/A
Granite Sentry (Phase III) (Missile & Space Wrng)	MAR 91	MAR 91	N/A
SPADOC 4B IOC	APR 91	APR 91	JUL 91
CSSR Tech Control & Message Processing	APR 91	N/A	N/A
Granite Sentry (Missile Wrng) IOC	N/A	AUG 91	DEC 91(Ch-1)
Granite Sentry (NCC) IOC	N/A	AUG 91	DEC 91(Ch-1)
Granite Sentry Phase IVA IOC	MAR 92	N/A	N/A
SCIS Installation/Checkout Complete	MAR 92	SEP 92	JUN 95
CCPDS-R Missile Warning (Common Subsystem) IOC	SEP 93	SEP 93	SEP 93
CSSR (Tech Control) IOC	N/A	SEP 93	SEP 93
Granite Sentry -- CSSR Interface	N/A	OCT 93	OCT 93
Granite Sentry Phase IVB	SEP 93	N/A	N/A
Granite Sentry Phase V	MAR 94	N/A	N/A
CSSR P3I	SEP 94	N/A	N/A
CSSR IOC	N/A	SEP 94	SEP 94
SCIS (Additional Media)	DEC 94	SEP 95	N/A (Ch-2)
SCIS IOC	N/A	N/A	NOV 95(Ch-2)
OPOC Missile Warning	DEC 94	N/A	N/A
CCPDS-R (SAC Force Management) IOC	DEC 94	DEC 94	DEC 94
Granite Sentry Phase VI IOC	MAR 95	MAR 95	N/A
Granite Sentry Completion	N/A	JUN 95	NOV 95
SPADOC 4C IOC	SEP 95	SEP 95	AUG 95
OPCC (Air Warning/CCP) IOC	DEC 95	DEC 95	NOV 95
Systems of Systems IOT&E	DEC 95	DEC 95	DEC 95
CMU FOC	N/A	DEC 95	DEC 95
System Turnover/PMRT	SEP 96	SEP 96	SEP 96

b. (U) Previous Change Explanations --

The CSSR schedule was modified for the TCS IOC (April 1991) and the Message Processing and Distribution Subsystem IOC (Aug 91) when Congress cut FY90 funding in May 90.

The SPADOC 4B was delayed to accommodate additional functionality at user request, prior to acceptance. The SPADOC 4C internal milestones were accelerated by 3-6 months, resulting in an IOC 1 month earlier than contracted.

The Granite Sentry Phase II (Missile Warning) delivery was replanned to incorporate portions of the Phase III delivery.

The SCIS schedule was delayed due to problems during software development and systems test. NOTE: The following change is

9b. (U) Schedule (Cont'd):
different from the previous report due to incomplete information available in Dec 90. SCIS schedule was delayed to accommodate contractor schedule slips, a change in threat requirements, and the need to upgrade hardware architecture for supportability.

The OPCC contract schedule returned to normal when funding was restored in FY91.

The Granite Sentry phase(s) terminology has been deleted in favor of delivered functionality (e.g. Phase II provide Missile Warning capability). The program is now defined against specific functionality as stated in the new DAE approved 16 Sep 91 APB. Granite Sentry Ph II, Ph III, Ph IVA, Ph IVB and Ph V have been deleted from the APB and will not be tracked in the current estimate of future SARs. Granite Sentry (Missile & Space Warning) IOC, Granite Sentry-CSSR Interface, and Granite Sentry Completion are the new delivered functionality milestones in accordance with the DAE-approved 16 Sep 91 APB. Granite Sentry (Missile & Space Warning) was delivered in 1991 and is no longer tracked in the current estimate.

CSSR Tech Control and Message Processing, CSSR P3I, and OPCC Msl Warning milestones have been deleted from the DAE approved 16 Sep 91 APB because they are no longer being tracked.

The SPADOC 4B IOC went from Jun 91 to Jul 91 because the Trial Period was extended by one month to ensure system stability after making operational updates to the baseline.

Previous SCIS delay estimated above was based on incomplete information. SCIS Installation/Checkout Complete went from Sep 92 to Jun 95 and SCIS (Additional Media) went from Dec 94 to Sep 95 due to the combination of a changing threat environment, contractor schedule slips and Tolerant hardware limitations. The SCIS program is transitioning from Tolerant to a DEC hardware suite. Although this adds eleven months to the schedule (IOC Nov 95), risk is mitigated by interim connectivity. The using command receives the long term benefits by switching to more capable and logistically supportable equipment. As previously stated, there is no impact to the CMU FOC. The program office, aware of the higher technical risk with SCIS, planned for and has been able to use this additional time to integrate these SCIS delays into the overall CMU schedule without affecting CMU FOC.

The CSSR (Tech Control) IOC description should read "CCSR Operational Date"; and the CSSR IOC description should read "CSSR Installation Complete". These descriptions more accurately reflect the technical effort. The correct milestone descriptions will be incorporated in the APB.

The CMU FOC is a new milestone in the DAE approved 16 Sep 91 APB.

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9c. (U) Schedule (Cont'd):

c. (U) Current Change Explanations --

(Ch-1): Granite Sentry (Missile Wrng) IOC and Granite Sentry (NCC) IOC completed IOT&E with no significant problems and entered Trial Period on schedule in Aug 91. During Trial Period, an operational concern with the control for system switchover during planned and unscheduled maintenance was discovered. The main cause was a lack of System Controller familiarity with Granite Sentry equipment. Granite Sentry Missile Warning and NCC reached IOC on 19 Dec 91. (System Control is a separate existing center in Cheyenne Mountain.)

(Ch-2): The SCIS schedule rephasing contained in this change was planned for in our original DAB baseline (two years of internal schedule reserve were included). This slip, based on the poor contractor performance, was recognized in our baseline planning to include the necessary funding and time to resolve all interface issues. Due to an oversight on our part, this was not reflected in the DAB documentation. The replacement milestone to monitor is SCIS IOC.

d. (U) References --

(U) Development Estimate:
DAE Approved APB dated 12 November 1989, Subject: Acquisition Program Baseline (APB), Cheyenne Mountain Upgrade Programs

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 16 September 1991.

10. (U) Performance Characteristics:

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)	[redacted]			

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10a. (U) Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)	[redacted]			

b. (U) Previous Change Explanations --

Updated to reflect the CMU Systems Operational Requirements Document (SORD) dated 7 Aug 90.
Corrects 31 Dec 90 SAR submission.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
DAE approved APB dated 12 November 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 16 September 1991.

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11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost —			
Development (RDT&E)	1188.1	1168.9	1172.6
Procurement	321.2	316.1	380.9
Flyaway	(321.2)		(321.9)
Total Flyaway	(321.2)		(321.9)
Other Wpn Sys Cost	(0.0)		(9.3)
Total Other Wpn Sys	(0.0)		(9.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(49.7)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	1509.3	1485.0	1553.5
Escalation	71.7	96.0	76.0
Development (RDT&E)	(58.4)	(77.6)	(49.4)
Procurement	(13.3)	(18.4)	(26.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1581.0	1581.0	1629.5
b. (U) Quantity —			
Development (RDT&E)	0	0	0
Procurement	1	1	1
Total	1	1	1

Since CMU consists of a complex mix of subsystems for which a conventional unit of measure is not valid, a nominal quantity of one will be used for unit cost reporting pursuant to 10 USC 2433.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References —

(U) Development Estimate:
DAE approved APB dated 12 November 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 16 September 1991.

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1629.5	1615.7	1629.5
(2) Quantity	1	1	1
(3) Unit Cost	1629.50	1615.70	1629.50
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	20.5	20.5	35.7
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	20.5	20.5	35.7
(2) Quantity	1	1	1
(3) Unit Cost	20.50	20.50	35.70

Since CMU consists of a complex mix of subsystems for which a conventional unit of measure is not valid, a nominal quantity of one will be used for unit cost reporting pursuant to 10 USC 2433.

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13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1246.5	334.5	0.0	1581.0
Previous Changes:				
Economic	+3.6	+2.2	-	+5.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-6.2	+1.0	-	-5.2
Other	-	-	-	-
Support	-	+35.4	-	+35.4
Subtotal	-2.6	+38.6	-	+36.0
Current Changes:				
Economic	-10.8	-4.0	-	-14.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-11.1	-1.2	-	-12.3
Other	-	-	-	-
Support	-	+39.6	-	+39.6
Subtotal	-21.9	+34.4	-	+12.5
Total Changes	-24.5	+73.0	-	+48.5
Current Estimate	1222.0	407.5	-	1629.5

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1188.1	321.2	0.0	1509.3
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-6.3	+1.6	-	-4.7
Other	-	-	-	-
Support	-	+27.7	-	+27.7
Subtotal	-6.3	+29.3	-	+23.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-9.2	-1.0	-	-10.2
Other	-	-	-	-
Support	-	+31.4	-	+31.4
Subtotal	-9.2	+30.4	-	+21.2
Total Changes	-15.5	+59.7	-	+44.2
Current Estimate	1172.6	380.9	-	1553.5

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised economic escalation rates

Estimating: Adjustment for prior and current year escalation. Congressional adjustments to appropriated funding, Air Force reprogramming to support DAB approved program, an addition to out-year funding for the Defense Business Operations Fund (DBOF) and reductions in out-year FFRDC/CETA funding.

PROCUREMENT

Economic: Revised economic escalation rates

Estimating: Adjustment for prior and current year escalation. Air Force reprogramming to support DAB approved

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13b. (U) Cost Variance Analysis (Cont'd):

procurement funding level.
Reprogramming to support SCIS Architecture transition from Tolerant based hardware to DEC based hardware

Support: Additional funding for Initial Spares not included in Development Estimate.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised economic escalation rates (Economic)	N/A	-10.8
Congressional adjustments to FFRDC, CAAS, and Contract Travel; and budget reductions to Air Force Operation (Estimating)	-7.1	-7.7
Reduction to out-years funding for the Defense Business Operations Fund (DBOF) (Estimating)	-6.4	-7.6
Adjustment for prior and current year escalation (Estimating)	4.3	4.2
Total Changes	-9.2	-21.9
(2) PROCUREMENT		
Revised economic escalation rates (Economic)	N/A	-4.0
Reduction to out-years funding for the Defense Business Operations Fund (DBOF) (Estimating)	-2.9	-3.6
Adjustment for prior and current year escalation (Estimating)	1.9	2.4
Additional funding for Initial Spares as stated in APB (Change 2), now in approval cycle. (Support)	22.1	27.4
Additional funding for Interim Contractor Support as we transition to AFMC, will be submitted in APB Change 3 (Support)	9.3	12.2
Total Changes	30.4	34.4

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1581.00	-9.00	--	--	--	-17.50	--	75.00	48.50	1629.50

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) SCIS:

E - Systems, St. Petersburg, FL
F19628-86-C-0131, FPIF
Award: August 21, 1986
Definitized: August 21, 1986

Initial Contract Price		
Target	Ceiling	Qty
$26.9	$30.3	6

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$132.5	$141.3	26	$132.5	$132.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-13.3	$0.0
Cumulative Variances To Date (11/24/91)	$-7.9	$-3.4
Net Change	$5.4	$-3.4

Explanation of Change:

The current contract price increased due to restructuring for the DEC architecture and the addition of future planned engineering changes (already included in the program budget, but not previously placed on contract).

Cost variance is attributable to problems encountered during Software Development and System Test. The estimate at completion is based on final contract actions for design, development, test and delivery of a DEC-based architecture (initiated 9 Sep 91).

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) CCPDS-R:	Initial Contract Price Target	Ceiling	Qty
TRW INC., Redondo Beach, CA F19628-87-C-0047, FPIF Award: June 3, 1987 Definitized: June 3, 1987	$58.9	$64.3	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$182.7	$197.3	24	$185.2	$187.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-1.7	$-1.8
Cumulative Variances To Date (12/31/91)	$-2.5	$-1.1
Net Change	$-0.8	$0.7

Explanation of Change:

Cost and schedule variances are insignificant.

(U) CSSR Blk II:	Initial Contract Price Target	Ceiling	Qty
GTE Government Sys Corp, Needham Heights,, MA F19628-84-C-0063, FPIF Award: June 8, 1984 Definitized: June 8, 1984	$119.8	$136.0	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$141.8	$160.9	1	$125.8	$125.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-1.3	$-0.1
Cumulative Variances To Date (12/27/91)	$-2.3	$-0.2
Net Change	$-1.0	$-0.1

Explanation of Change:

Cost and schedule variances are insignificant.

(U) SPADOC-4C:	Initial Contract Price Target	Ceiling	Qty
Loral Cmd & Control Sys, Colorado Springs, CO F19628-91-C-0169, CPIF Award: October 25, 1991 Definitized: October 25, 1991	$57.1	N/A	1

15. (U) **Contract Information: Cont'd** (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$57.1	N/A	1	$57.1	$57.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (11/22/91)	$0.1	$-0.2
Net Change	$0.1	$-0.2

Explanation of Change:

The name of the contract has been updated. Formerly the contractor's name was Ford Aerospace.

Cost and schedule variances are insignificant. This is the first submission of the CPR: thus all current and cumulative cost and schedule variances are the same reflecting October and November data.

Price and variance data for this contract are for Block C only. The major portion of this contract is Cost Plus Incentive Fee/Award Fee (CPIF/AF). This format does not include any Award Fee.

16. (U) **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 75.0% (15 yrs/20 yrs)

(2) Percent Program Cost Appropriated: 72.3% ($1177.7 / $1629.5)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY78-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	775.5	117.6	149.5	179.4	1222.0
Procurement	264.1	20.5	35.7	87.2	407.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1039.6	138.1	185.2	266.6	1629.5

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1978				4.7	2.6	2.6	2.6	6.9
1979				3.6	2.2	2.2	2.2	8.3
1980				3.7	2.5	2.5	2.5	9.4
1981				3.9	2.9	2.9	2.9	12.0
1982				11.0	8.8	8.8	8.8	9.2
1983				26.3	22.0	22.0	22.0	4.8
1984				63.5	55.3	55.3	55.3	3.9
1985				61.2	55.1	55.1	55.1	3.4

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1986				100.7	92.8	92.8	92.8	2.7
1987				96.3	91.9	91.9	91.9	2.8
1988				112.4	110.8	110.8	110.0	3.0
1989				115.3	118.4	118.4	115.5	4.2
1990				97.9	103.9	103.9	93.6	4.0
1991				96.4	106.3	104.5	60.6	3.9
1992				103.3	117.6	62.4	2.8	3.1
1993				127.1	149.5			3.3
1994				89.9	109.2			3.3
1995				38.0	47.6			3.3
1996				16.9	21.9			3.2
1997				0.5	0.7			3.2
Subtot				1172.6	1222.0	836.1	718.6	

Obligation and expenditure data reflect program office records as of 31 December 1991.

Appropriation: 3080 Other Procurement, Air Force

1982		1.0		1.0	0.8	0.8	0.8	9.2

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16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 3080 Other Procurement, Air Force (Cont'd)								
1983		23.1		23.1	20.1	20.1	20.1	4.8
1984		26.9		26.9	24.1	24.1	24.1	3.9
1985		42.4		42.4	39.2	39.2	39.2	3.4
1986		50.9		50.9	49.1	49.1	49.1	2.7
1987		17.5		17.5	17.5	17.5	17.3	2.8
1988		18.0		18.0	18.7	18.7	8.3	3.0
1989		37.7		37.7	40.5	40.4	21.3	4.2
1990		35.9		39.9	44.2	44.1	32.2	4.0
1991		6.3		8.7	9.9	9.7	4.1	3.9
1992	1	14.5		17.4	20.5	1.4	0.1	3.1
1993		14.3		29.3	35.7			3.3
1994		30.7		47.5	59.7			3.3
1995		2.7		8.2	10.7			3.3
1996				7.5	10.0			3.2
1997				4.9	6.8			3.2
Subtot	1	321.9		380.9	407.5	265.1	216.6	
Grand Total	1	321.9		1553.5	1629.5	1101.2	935.2	

16c. (U) Program Funding Summary (Cont'd):
Since CMU consists of a complex mix of subsystems for which a conventional unit of measure is not valid, a nominal quantity of one will be used for unit cost reporting pursuant to 10 USC 2433. Quantity will always be carried in the current year.

Obligation and expenditure data reflect program office records as of 31 December 1991.

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- None.

b. (U) Cost Variance -- None.

c. (U) Schedule Variance -- None.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

SOURCE: All the information provided in Paragraphs 18a and 18b are from the Cheyenne Mountain Upgrade Independent Cost Estimate (ICE) dated August 1989.

Operations Concept - At Full Operating Capability (FOC), Air Force Space Command (AFSPACECOM) will take over complete day-to-day operating responsibility to perform the mission. Each operational center has five crews to support the 24 hour mission.

Maintenance Concept - AFSPACECOM will have responsibility for maintenance of application software using both organic manpower and contract support. Commercial Off-the-Shelf (COTS) hardware and COTS system software will have a two-level maintenance concept. AFSPACECOM will have responsibility for O and I level COTS hardware maintenance. Air Force Logistics Command (AFLC) will have responsibility for depot level maintenance of COTS hardware and COTS system software with vendor support for repair of COTS hardware.

The following is a comprehensive list of ground rules and assumptions used in the Cheyenne Mountain Upgrade (CMU) program O&S estimate.
a. The estimate was performed in constant FY 89 dollars.
b. Cost for FY 95 was phased in based on the program's IOC
c. CMU operations, computer operations, hardware and software

CMU, December 31, 1991

18a. (U) Operating and Support Costs (Cont'd):
maintenance personnel types and specialties will be drawn from those currently operating and supporting the present Cheyenne Mountain Complex (CMC) systems.
d. Manpower increases during the phase-in period are required to support dual operations between the present system and the upgrade system.
e. Although Canadian Forces are on staff/duty within one or more of the CMU programs, they were not included in the manpower figures because their expenses are paid by the Canadian government.
f. Although the CCPDS-R SAC unique software is being developed using the same contract as the CMU program CCPDS-R software, it was not included in the CMU program O&S estimate. This is because this unique software will be supported and maintained by SAC and is not considered part of the CMU program.
g. Only training required post FOC was included. (Specialty training prior to FOC is included in the CMU acquisition estimate.)
h. Specialized training for Canadian personnel was included in the specialized training cost figures.
i. Only recurring costs for long haul communications were included.
j. Hardware upgrades or replacements due to projected obsolescence and technological breakthroughs are not included in the O&S estimate. Although it is recognized that there will be replacement of hardware in the mountain, presently the CMU program does not include plans for hardware upgrades and replacements in the O&S period and thus these would be viewed as a new program at that point in time.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per CMU overall	Avg Annual Cost Per Antecedent
System Management	10.5	N/A
Operations	30.7	N/A
Support	7.9	N/A
Prime Mission Equip Main	22.8	N/A
Application S/W Maint	7.4	N/A
Acquisition & Training	7.1	N/A
Sustaining Investment	7.0	N/A
Communications	23.2	N/A
Total	116.6	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	---	---	---	132.8	132.8
Total	---	---	---	132.8	132.8

NOTE: Operations and Support data for antecedent system is not available in a format comparable to CMU.

AF-4 AWACS RSIP

91-095

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AWACS RSIP

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
Radar System Improvement Program
(RSIP)

CLEARED
FOR OPEN PUBLICATION
FEB 26 1992 10
DIRECTOR, FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

2. (U) DoD Component: USAF

3. (U) Responsible Office and Telephone Number:

AWACS RSIP PROGRAM OFFICE
ESD/TW
HANSCOM AFB, MA 01731-5000

COL PATRICK CRAIG
Assigned: May 1, 1989
AV 478-6899 COMM (617) 377-6899

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0207417F Project 64411L
PROCUREMENT:
APPN 3010 ICN 11411L (Air Force)

SAF/PAS
92-081 -T

~~Classified by: E-3 SECURITY CLASSIFICATION GUIDE, 15 January 1989~~
~~Declassify on: Originating Agency Determination Required (OADR)~~
~~Downgrade Instructions: Not Subject to Automatic Downgrade~~

(THIS PAGE IS ~~UNCLASSIFIED~~)

OASD(PA) DOCUMENT 92-0321

~~SECRET~~

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5. (U) Related Programs:
E-3 Airborne Warning and Control System (AWACS)

6. (U) Mission and Description:
The purpose of the Radar System Improvement Program (RSIP) modification is to provide the Tactical Air Command (TAC) with new and improved capabilities for the E-3 Airborne Warning and Control System (AWACS) radar. The AWACS RSIP will provide improvements in radar sensitivity/electronic counter-countermeasures (ECCM) performance, radar performance monitoring and control, and reliability/maintainability (R&M) to maintain system effectiveness for the projected operational environment of the 1990's and into the next century.

RSIP is made up of three phases: 1) System Definition/Risk Reduction (Pre-Engineering and Manufacturing Development), 2) Engineering and Manufacturing Development (EMD), and 3) Production/Permanent modification. This program will result in hardware and software changes to the AWACS.

The modifications are primarily to the AWACS Surveillance Radar Functional Group (SRFG) which include:

(1) Replacement of the existing Radar Data Correlator (RDC) and Digital Doppler Processor (DDP) with the Surveillance Radar Computer (SRC).

(2) Modify the existing Radar Control Maintenance Panel (RCMP) with dual CRT displays and a new keyboard and cursor control.

(3) Minor redesigns of the receiver, the Stable Local Oscillator (STALO), the Synchronizer, and the antenna phase control electronics, and replacement of the analog to digital converter.

(4) Replacement of the existing Surveillance Radar Computer Program (SRCP) with a new SRCP.

7. (U) Program Highlights:

a. (U) Significant Historical Developments --

The AFSARC review and approval to start EMD occurred in December 1988: $626M (TY$) approved for total program (RDT&E and Production).

EMD contracts with Boeing and Westinghouse were awarded on 25 September 1989. Two prime contracts are required to accomplish the RSIP effort: one with Westinghouse Electric Corporation for the radar upgrade and one with The Boeing Company for the system integration and testing of the radar in the aircraft. Westinghouse is responsible for Total Radar Set Performance Responsibility (TRSPR) for the design, development, demonstration, and delivery of the E-3 Radar set (B-Kit) that meets specified performance during flight. Boeing has assumed Total System Performance Responsibility (TSPR) for the A-kit design and integration of the new radar on the E-3 by providing system performance which meets Government requirements. The RSIP acquisition schedule is intended to maximize concurrent

7a. (U) Program Highlights (Cont'd):

installation with the Block 30/35 retrofit.

Six (6) Brassboard flight tests on Test System #3 (TS-3) were conducted during February and March 1990 successfully demonstrating the RSIP pulse compression waveform concept.

The System Design Review was held in February 1990 for both the Westinghouse and Boeing contracts.

The RSIP TEMP was approved by OSD on 4 April 1990.

The Software Specification Review was held incrementally in April and May 1990.

The Radar Data Processor (RDP) initial software bench prototype was delivered by subcontractor Control Data Corporation (CDC) to Westinghouse in May 1990.

The radar algorithm simulations were first integrated in Jun of 1990 confirming the viability of the RSIP two-slant signal processing technique.

The Hardware Preliminary Design Review (PDR) was conducted in August 1990.

NATO began observing the monthly US RSIP Program Management Reviews in September 1990 to facilitate their potential future participation in the RSIP EMD effort.

The Radar Control Maintenance Panel (RCMP) Flat Panel Display Terminal (FPDT) subcontractor could not meet technical requirements using Electroluminescent technology. In November 1990, the decision was made to use a monochromatic cathode ray tube display design.

The Software PDR was successfully conducted in December 1990.

b. (U) Significant Developments Since Last Report --

Preliminary Design Review (PDR) on the Radar Control and Maintenance Panel (RCMP) was conducted at Westinghouse on 7 - 8 Jan 1991.

Hardware Critical Design Review (CDR) less RCMP was conducted at Westinghouse on 22 - 29 Jan 1991.

RSIP Brassboard Data Gathering Flight tests were conducted on TS-3 on 23 Jan - 22 Mar 1991.

The "Ad Referendum" case directive for NATO's twelve month interim participation in the RSIP effort was approved on 27 Feb 91 for $18.0M.

The form-fit-function version of the Radar Data Processor (Software Bench) was delivered on 29 Mar 1991 from subcontractor Control Data Corporation (CDC) to Westinghouse.

The NATO RSIP effort was presented at the ESD Program Start Review on 10 Apr 91 and was approved to proceed toward Acquisition Strategy Panel.

Boeing Group A Software and Hardware CDRs were satisfactorily conducted on 10 - 11 Apr and 21 - 23 May 91 respectively.

The RCMP hardware CDR was held on 17 - 19 Jul 91.

RCMP Demonstration #1 on 18 Jul successfully demonstrated the

7b. (U) Program Highlights (Cont'd):

RCMP graphics display executive and its interfaces.

The annual RSIP Test & Evaluation Master Plan (TEMP) review with AFOTEC was held on 12 Aug 91 at Eglin AFB.

The RCMP software CDR was held on 19 - 20 Aug 91.

The Dynamic User-System Interface (USI) demonstration on 22 Aug 91 demonstrated how targets would appear on the plan-position indicator (PPI) and fast fourier transform (FFT) displays.

The RDP hardware bench was accepted by Westinghouse on 30 Aug 91.

Successfully held Software CDR on 23 - 27 Sep 91 and it was a model presentation of the final software design.

The first prototype displays for the RCMP were delivered on 28 Oct 91. This was followed by the first keyboard and trackball for the RCMP on 19 Nov 91.

RDP Kit #1 from subcontractor CDC, was delivered on 13 Dec 91 in time to support the planned delivery of SRC Kit #1 on 31 Jan 92.

Awarded Undefinitized Contract Action (UCA) on 20 Dec 91 to Westinghouse for NATO Phase I effort; total $19.4M.

This system is expected to satisfy its mission requirements.

c. (U) Changes Since As Of Date -- None.

8. (U) Threshold Breaches:
There is a procurement cost breach to the Acquisition Program Baseline (dated 8 Aug 91) and no Nunn-McCurdy unit cost breaches. A PDR and APB change will be submitted as required.

9. (U) Schedule:

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone II AFSARC	DEC 88	DEC 88	DEC 88
FSD Contract Award	SEP 89	N/A	SEP 89
Brassboard Flight Tests	APR 91	APR 91	MAR 91(Ch-1)
System Design Review	FEB 90	FEB 90	FEB 90
Critical Design Review	JAN 91	SEP 91	SEP 91(Ch-2)
Test System-3 (TS-3) IC&O	SEP 92	SEP 92	DEC 92(Ch-3)
Flight Test DT&E			
Start	N/A	JUN 93	JUN 93(Ch-4)
Complete	SEP 93	SEP 93	DEC 93(Ch-5)
Advance Procurement Authorization	JUN 93	JUN 93	N/A
Long Lead Procurement	N/A	N/A	NOV 93

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
IOT&E			
Start	N/A	DEC 93	DEC 93(Ch-6)
Complete	DEC 93	MAR 94	MAR 94(Ch-7)
Physical Configuration Audit	DEC 93	DEC 93	MAY 94(Ch-8)
Production Decision	MAR 94	MAR 94	JUN 94(Ch-9)
Trial Installation	SEP 95	SEP 95	DEC 95(Ch-10)
IOC (4 aircraft)	SEP 96	SEP 96	SEP 96

b. (U) Previous Change Explanations --

The Dec 90 SAR reported a planned CDR completion date of May 91 which was based on holding the SRC CDR in Jan 91 and the RCMP and Software CDRs in May 91 due to delayed completion of software requirements analysis and software documentation and design change to cathode ray tube displays.

The Dec 90 SAR reflected an Air Force decision to await the completion of qualification testing before initializing procurement actions and so Advance Procurement Authorization was dropped in June 93 in favor of Long Lead Procurement in Nov 93.

c. (U) Current Change Explanations --

(Ch-1) RSIP Brassboard Data Gathering Flight tests on TS-3: (changed from Dec 90 SAR Current Estimate of Apr 91 to Mar 91) was conducted on 23 January - 22 March 1991.
(Ch-2) Critical Design Review (CDR) (changed from Dec 90 SAR Current Estimate of May 91 to Sep 91) was conducted incrementally: SRC hardware CDR was held in Jan 91, RCMP CDR held in Jul - Aug 91, and Software CDR held in Sep 91. Change to cathode ray tube display design delayed RCMP CDR. Software CDR delayed to complete software requirements analysis and software documentation.
(Ch-3) TS-3 IC&O changed from Dec90 SAR Current Estimate of Sep 92 to Dec 92 due to delay anticipated because of S/W delay (Reference Ch-2 (CDR)).
(Ch-4) Flight Test DT&E start date was not specified in the Dec 90 SAR and has since been added to the Approved Program requirements and the Dec 91 SAR Current Estimate.
(Ch-5) Flight Test DT&E complete date changed from Dec 90 SAR Current Estimate of Sep 93 to Dec 93 because of delay anticipated due to S/W delay (Reference Chs 2 and 3).
(Ch-6) IOT&E start date was not specified in the Dec 90 SAR and has since been added to the Approved Program requirements and the Dec 91

9c. (U) Schedule (Cont'd):

Current Estimate.

(Ch-7) IOT&E complete date changed from Dec 90 SAR Current Estimate of Dec 93 to Mar 94 because of delay anticipated due to S/W delay (Reference Chs 2 and 3).

(Ch-8) Physical Configuration Audit (PCA) date changed from Dec 90 SAR Current Estimate of Dec 93 to May 94 because of delay anticipated due to S/W delay (Reference Chs 2 and 3).

(Ch-9) Prod Decision changed from Dec 90 SARCurrent Estimate of Mar 94 to Jun 94 because of delay anticipated due to S/W delay (Reference Chs 2 and 3).

(Ch-10) Trial Installation changed from Dec 90 SAR Current Estimate of Sep 95 to Dec 95 because of delay anticipated due to S/W delay (Reference Chs 2 and 3).

d. (U) References --

(U) Development Estimate:
Development Est: FY 91 Amended President's Budget, 29 Jan 90

(U) Approved Program:
DAE Approved Acquisition Program Basline dated 8 August 1991.

10. (U) Performance Characteristics:

a. (U) Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Improve System Sensitivity (dB) 1/	10.6	13.0 / 10.6	N/A	10.6

(b)(1) [redacted]

10a. (U) Performance Characteristics (Cont'd):

		Approved Program		Demon-strated	Current Estimate
(b)(1)	[redacted]				
(SRC/SRCMP)					
Mean Repair Time (hrs) 2/	.26	.26	/ .26	N/A	.26
Fraction of Failures detected (%) 3/	98	98	/ 98	N/A	98

1/ To be verified by analysis of data taken during FSD testing
2/ For RSIP, Mean Repair Time equals MTTR. Time starts when access to equipment is obtained. See ESD Readiness Improvement through Systems Engineering Handbook, Page 1-9, paragraph 6.1.2.e.
3/ Using built-in test equipment only.

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
Development Est: FY 91 Amended President's Budget, 29 Jan 90

(U) Approved Program:
DAE Approved Acquisition Program Basline dated 8 August 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	349.7	367.9	357.9
Procurement	222.1	207.2	227.2
Flyaway	(175.1)		(187.7)
Total Flyaway	(175.1)		(187.7)
Other Weapon Systems	(29.4)		(22.3)
Total Other Wpn Sys	(29.4)		(22.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(17.6)		(17.2)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	571.8	575.1	585.1
Escalation	118.1	77.7	123.5
Development (RDT&E)	(47.0)	(38.6)	(42.2)
Procurement	(71.1)	(39.1)	(81.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	689.9	652.8	708.6
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	34	34	34
Total	34	34	34

c. (U) Foreign Military Sales --
NOTE: RSIP is not a Foreign Military Sales contract but does have NATO funding.

ESD supports NATO involvement in the US E-3 RSIP upgrade program, and PMD 2057(57)/27417F, 26 Aug 91, directs supporting the development of an international cooperative RSIP. ESD expects formal direction and NATO commitment for full funding for a NATO/RSIP cooperative program after approval of the R&D agreement which could occur as soon as the Jan/Feb 92 NAPMA Board of Directors meeting. The NATO/RSIP program has been facilitated by 1) Sentry World meetings in January and March 89 hosted at ESD which provided NATO Airborne Early Warning & Control Program Management Agency (NAPMA) with RSIP documentation and briefings, 2) modifications to the Westinghouse and Boeing EMD contracts to enable NATO observership at RSIP Program Management Reviews and Design Reviews, 3) NATO RSIP Definition Study efforts by Boeing and Westinghouse for investigation and pricing of the NATO RSIP program and 4) on 27 February 1991 NATO approved an "Ad Referendum" proposal for interim participation in the RSIP program. Under this arrangement, NATO has advanced $14.3M (FY91) to RSIP. NATO

11c. (U) Total Program Cost and Quantity (Cont'd):
continues to study the feasibility of several additional radar improvements which they may propose to add to the USAF RSIP core effort. If implemented, these NATO unique requirements will be funded 100% by NATO and will be developed in parallel with USAF RSIP core development efforts.

Preparation for including NATO into the US RSIP program is nearly complete. NATO's participation is expected in three phases. Phase 0, costing $18.0M: An advance payment for future NATO RSIP efforts $14.3M; initial efforts for NATO entry into the BMD effort $3.7M. In Phase 1, the SPO has been directed to structure NATO's participation as changes to the existing RSIP contracts with Westinghouse and Boeing. As a background, on the RSIP program, the USAF has assumed the role of "prime integrator contractor" and has separate contracts with Westinghouse and Boeing. Phase 1, costing approximately $27.4M (WEC $19.4M, Boeing $7.2M, Other $0.8M), consists of one Group A and one Group B hardware kit, long lead for initial test instrumentation, and modifications to non-radar aircraft software. Phase 2, costing approximately $79.0M (WEC $32.4M, Boeing $32.5M, Other $14.1M), consists of integration of the Group A and Group B hardware into a NATO E-3 test aircraft, separate DT&E flight testing, and data reduction/analysis. The WEC Phase I contract award occured on 20 Dec 91 and the Boeing Phase I contract change action is expected in 3QFY92. The SPO expects award of both Westinghouse and Boeing Phase 2 contracts/contract change actions in 4QFY92.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
Development Est: FY 91 Amended President's Budget, 29 Jan 90

(U) Approved Program:
DAE Approved Acquisition Program Basline dated 8 August 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	708.6	694.8	708.6
(2) Quantity	34	34	34
(3) Unit Cost	20.841	20.435	20.841
b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	396.7	293.2	0.0	689.9
Previous Changes:				
Economic	+0.7	+5.4	-	+6.1
Quantity	-	-	-	-
Schedule	-3.0	+6.9	-	+3.9
Engineering	+2.3	-	-	+2.3
Estimating	-0.7	+2.8	-	+2.1
Other	-	-	-	-
Support	-	-9.5	-	-9.5
Subtotal	-0.7	+5.6	-	+4.9
Current Changes:				
Economic	-4.6	-8.2	-	-12.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+8.7	+13.7	-	+22.4
Other	-	-	-	-
Support	-	+4.2	-	+4.2
Subtotal	+4.1	+9.7	-	+13.8
Total Changes	+3.4	+15.3	-	+18.7
Current Estimate	400.1	308.5	-	708.6

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	349.7	222.1	0.0	571.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-2.0	+1.0	-	-1.0
Engineering	+1.4	-	-	+1.4
Estimating	+1.2	+2.0	-	+3.2
Other	-	-	-	-
Support	-	-11.3	-	-11.3
Subtotal	+0.6	-8.3	-	-7.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+7.6	+9.6	-	+17.2
Other	-	-	-	-
Support	-	+3.8	-	+3.8
Subtotal	+7.6	+13.4	-	+21.0
Total Changes	+8.2	+5.1	-	+13.3
Current Estimate	357.9	227.2	-	585.1

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised economic escalation indices.
Schedule: Revised buy and delivery schedule.
Engineering: Depot Activation costs transferred to RDT&E funding (FY 92-93) from Procurement funding (FY93). Depot development descope.
FY 91 Congressional reduction; Must be covered by NATO funding.
Estimating: Current and prior year inflation offset.

PROCUREMENT
Economic: Revised economic escalation indices.
Schedule: Revised production schedule to allow completion of

13b. (U) **Cost Variance Analysis (Cont'd):**

qualification testing.

Estimating: Transfer of Installation costs to Procurement from O&M.

Support: Depot Activation costs (FY 93) transferred to RDT&E funding FY92-93).
Initial Spares funding reduced.
Support estimate updated (Data, Support Equip, Sim/Trainers costs increased).

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	-4.6
Current and prior year inflation offset. (Estimating)	3.6	4.1
Funded an Unfunded Requirement to cover contract termination liability requirements. (Estimating)	3.0	3.3
Revised Program estimate of program requirements. (Estimating)	0.3	0.5
Internal AWACS reallocation between mod projects used to cover contract termination liability. (Estimating)	0.9	1.0
RSIP portion of AWACS Desert Storm assessment (Estimating)	-0.2	-0.2
Total Changes	7.6	4.1
(2) PROCUREMENT		
Revised escalation indices. (Economic)	N/A	-8.2
Revised estimate of Group A/B Kits (Estimating)	5.0	6.8
Correction of categorization in Dec 90 SAR for Group A/B kits (Estimating)	4.6	6.9
Correction of categorization in Dec 90 SAR for other support costs (Support)	-4.6	-6.9
Revised Initial Spares requirement. (Support)	7.8	10.4
Revised funding estimate for modifications to simulator/trainers and data (Support)	0.6	0.7
Total Changes	13.4	9.7

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.000	--	--	--	--	--	--	--	--	0.000

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
20.291	-0.197	-0.001	0.115	0.068	0.721	--	-0.156	0.550	20.841

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) RSIP Group B Kits:	Initial Contract Price		
	Target	Ceiling	Qty
Westinghouse Electric Cor, Baltimore, MD F19628-89-C-0138, FPIF Award: September 25, 1989 Definitized: September 25, 1989	$223.6	$251.8	5

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$223.6	$251.8	5	$241.0	$248.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-4.5	$-5.0
Cumulative Variances To Date (11/22/91)	$-25.2	$-8.1
Net Change	$-20.7	$-3.1

Explanation of Change:

The cumulative unfavorable schedule variance of $8.1M reflects a slip in schedule that is primarily due to the Radar Data Processor (RDP) Operational Software and the RDP Subcontractor effort.
The cumulative cost variance of $25.2M reflects a cost overrun which is primarily attributed to recapturing the RDP Operational Software build schedule, change to the Cathode Ray Tube for the Radar Control

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)
Display Unit, inadequate manning for Systems Engineering and analysis of Brassboard Testing. Neither schedule or cost variance impact the program.

(U) RSIP Group A Kits:	Initial Contract Price Target	Ceiling	Qty
The Boeing Company, Seattle, WA F19628-89-C-0139, FPIF Award: September 25, 1989 Definitized: September 25, 1989	$59.0	$65.0	3

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$59.0	$65.0	3	$59.0	$59.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$1.2	$-0.4
Cumulative Variances To Date (11/28/91)	$-0.2	$-0.4
Net Change	$-1.4	$0.0

Explanation of Change:

There are no significant cost or schedule variances for Boeing's contract.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 40.0% (4 yrs/10 yrs)

(2) Percent Program Cost Appropriated: 41.9% ($297.1 / $708.6)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY89-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	179.4	117.7	72.1	30.9	400.1
Procurement	-	-	-	308.5	308.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	179.4	117.7	72.1	339.4	708.6

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1989				43.0	44.2	44.2	41.7	4.2
1990				60.0	63.7	63.7	46.4	4.0
1991				64.8	71.5	71.3	57.4	3.9
1992				103.4	117.7	42.7		3.1
1993				61.3	72.1			3.3
1994				25.4	30.9			3.3
Subtot				357.9	400.1	221.9	145.5	

Accounting data for Obligated and Expended is as of 31 Dec 91.

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3010 Aircraft Procurement, Air Force								
1994	6	4.0	32.3	47.7	60.9			3.3
1995	7		43.4	55.4	72.9			3.3
1996	9		43.2	49.9	67.8			3.2
1997	2		10.0	11.8	16.5			3.2
1998	10		54.8	62.4	90.4			3.2
Subtot	34	4.0	183.7	227.2	308.5			
Grand Total	34	4.0	183.7	585.1	708.6	221.9	145.5	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1994	6	N/A	6	N/A
1995	7	N/A	7	N/A
1996	9	N/A	9	N/A
1997	2	N/A	2	N/A
1998	10	N/A	10	N/A

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	585.1	N/A	N/A
(TY $)	N/A	N/A	708.6	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	17.209	N/A	N/A
(TY $)	N/A	N/A	20.841	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	JUN 94	N/A	N/A
Duration (in MON)	N/A	N/A	72	N/A	N/A
End Date(MON YY)	N/A	N/A	JUN 00	N/A	N/A

17c. (U) Production Rate Data (Cont'd):
AWACS RSIP is not yet a production program, this modification program is still in development and involves two prime contractors, Boeing and Westinghouse. The kit installations are done at the depot Oklahoma City ALC based on the availablity of the aircraft for modification, not plant capacity.

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules -- None

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- None.

An O&S cost estimate is being accomplished, and we expect to provide this O&S cost in the Dec 92 SAR.

A-18 JSTARS GSM

91-66

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: Army Joint Stars GSM

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
Joint STARS Ground Station Module

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
SFAE-IEW-JS
Ft. Monmouth, NJ 07703-5000
AV 996-5165 COMM 908-544-5165
Col. James L. Mitchell
Assigned: September 13, 1991

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 64770 Project D202
PROCUREMENT:
APPN 2035 ICN BA1080 (Army)
APPN 2035 ICN BA9103 (Army)

5. **Related Programs:**
Joint STARS Aircraft (USAF)
OV-1D Side-Looking Airborne Radar (SLAR) System
Unmanned Aerial Vehicle (UAV) (Imagery)
Bradley Fighting Vehicle System (BFVS)
Electronic Fighting Vehicle System (EFVS)
High Mobility Multipurpose Wheeled Vehicle (HMMWV)
Single Channel Ground and Airborne Radio System (SINCGARS)

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MAR 20 1992
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DEPARTMENT OF DEFENSE

No SECURITY OBJECTION to PUBLIC RELEASE
20 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

*** [redacted] ***

9-0417

6. **Mission and Description:**
The Joint Surveillance Target Attack Radar System (Joint STARS), is a surveillance, battle management and targeting radar system. It is a Joint Army and Air Force Program with the Air Force as the executive service. The Joint STARS radar is an airborne multimode radar system, incorporating an electronically scanned antenna and combining both Moving Target Indicator (MTI) and Synthetic Aperature Radar (SAR) functions. The radar is carried aboard a modified E-8 Aircraft (AN/TSQ-XXX) and broadcasts processed radar data to the Army Ground Station Modules (GSM) through an omnidirectional data link. Joint STARS fills a critical need for an effective capability to detect, delay, disrupt, and destroy first and second echelon mobile targets. Joint STARS is unique because it is a closed loop system for real-time detection, tracking, and attack information of enemy ground moving targets. The Army Corps requires wide area surveillance to understand enemy force buildups and scheme-of-maneuver, in order to apply effective and timely maneuver of forces, battlefield management, and targeting of artillery, rockets and stand-off missles. There is no other system planned to provide this data in real-time. Joint STARS provides commanders at Tactical and Operational Echelons a near real-time, wide area surveillance system to monitor enemy force movements into and through the joint battle area. This allows air and ground commanders to take timely actions to shape the battle and decisively engage the enemy with fire and maneuver.

7. **Program Highlights:**
a. Significant Historical Developments --
In May 82, an OSD/USDRE memorandum directed that a Joint Air Force/Army Program Management Office be established, under Air Force lead, to develop a single multi-mode target acquisition and weapon guidance system. The Joint STARS Program resulted from this directive and was organized from the PAVE MOVER and SOTAS Program Offices. Based on the May 84 agreement by Air Force and Army Chiefs of Staff, the joint program began development of the airborne segment using the E-8A (a Boeing 707-320 class aircraft converted to military use). The Army Ground Station Module (GSM) FSED contract was awarded to Motorola corporation in Aug 84. A Downsized Ground Station Module (DGSM) FSED was awarded Mar 86. In Sep 87, the Army directed the acquisition of nine Limited Procurement Urgent (LPU) Ground Station Modules (GSMs). These LPU variants receive, process and display OV-1 Mohawk SLAR (Side Looking Airborne Radar) radar data. Under the Nunn Iniative Airborne Radar Demonstrations (ARDS) Program, Joint STARS began a NATO Technical data exchange with the United Kingdom and France, and GSMs were deployed to those countries. The DGSM was subsequently stopped while still in the design phase, leaving two GSM at the time (FY87); the Interim GSM (IGSM) and the LPU GSM. Both configurations were mounted on Army standard five-ton trucks, and shared a majority of payload subcomponents. In Dec 1988, the GSM

7a. **Program Highlights (Cont'd):**

program was restructured to capture all user requirements, to synchronize GSM and aircraft fieldings, and to field GSMs in time to support other 'Deep Battle' programs. In order to achieve these objectives, the existing GSM was to be enhanced in a phased effort (IGSM, LPU, Block I, Block II). The Acquisition Decision Memorandum directing implementation of this Block approach was signed in Mar 89 and an FSD contract for the Block I GSM was awarded in Sep 89. Block I improvements entail downsizing the electronic suite, increasing operational capabilities, and enhancing modularity of LRUs (Line Replaceable Units) for standardization and subsequent export to other Intelligence and Electronic Warfare (IEW) systems. Block II improvements involve integrating the Block I mission equipment and functions into an Electronic Fighting Vehicle System (EFVS) (a Bradley FVS variant) in order to meet Nuclear Biological Chemical (NBC) and nuclear hardening requirements of heavy divisions/corps. In Sep 90, Operation Field Demonstration (OFD-1) successfully demonstrated the JSTARS system (Aircraft/GSM) capabilities to NATO and US Forces in Europe. The last 3 LPU GSMs were deployed to USFK in Oct 90.

b. Significant Developments Since Last Report --
The JCS ordered the deployment of the Joint STARS system, aircraft and Ground Station Modules (GSMs) to Operation Dessert Storm in Dec 90. The order came at the request of CINCCENT (Commander-in Chief Central Command) and was based primarily on the success of OFD-1 the prior fall. Six IGSMs were deployed along with both E-SA aircraft. In addition to the IGSMs, 3 LPU GSMs were also deployed with the VII Corp 2nd MI BN. All GSMs performed extremely well. The Joint STARS system proved to be a significant Force Multiplier and was one of Operation Dessert Storm's greatest successes. In Mar 91, ODCSOPS developed a revised distribution plan which aligned GSM fieldings with anticipated future force structure and operational requirements. Based on this new distribution, quantities increased from 90 to 125. The Joint System Operational Requirement Document (JSORD) has been updated in accordance with the Operational & Organizational (O&O) concepts supporting the current distribution plan. The Joint STARS program was briefed to the full Conventional Systems Committee (CSC) in Jun 91. The CSC directed the Air Force/Army to maintain a contingency capability until system IOC in FY97. During the FY92 Congressional Appropriation review process, the GSM budget request was increased by $20M. These funds were directed for developing a less costly, light weight GSM. This increase will accelerate start-up of the EMD Block IIA GSM effort to FY92. The APB will be adjusted to reflect this Congressional action. In Dec 91 the Army submitted an initial proposal for a restructure of the GSM program. This restructure was due primarily to the Congressional language in the FY92 appropriation to develop a light GSM variant, as well as HQDA's

7b. Program Highlights (Cont'd):

directive to reduce future O&S cost by combining intelligence collection/analysis functions into a Common Ground Station. The Block IIA will entail integrating Block I components into the High Mobility Multipurpose Wheeled Vehicle (HMMWV) to support the light forces. The Block III, Common Ground Station, will incorporate other intelligence disciplines (SIGINT, IMINT, etc.) to enhance tactical battlefield intelligence processing and dissemination, as well as providing a single Intelligence and Electronic Warfare (IEW) Ground Station, resulting in the desired O&S savings. This is the initial SAR submission for the JSTARS GSM, which completes the split from the Air Force SAR.

The JSTARS system is expected to meet all mission requirements.

c. Changes Since As Of Date --
None.

8. Threshold Breaches:
There are schedule and procurement cost breaches to the approved Acquisition Program Baseline (APB) dated November 15, 1989. There are no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --

	Development Estimate	Approved Program	Current Estimate	
Interim GSM FSD Award	AUG 84	AUG 84	AUG 84	
Interim CDR	FEB 85	FEB 85	FEB 85	
Interim Force DT&E	FEB 90	AUG 90	N/A	
Joint SLPA/GD/OA:				
Start	OCT 90	SEP 90	SEP 90	
Complete	N/A	SEP 91	N/A	(Ch-1)
Interim Type Classification (LPT)	N/A	JUL 92	JUL 92	
First Unit Equipped	OCT 93	OCT 93	OCT 93	
LPU GSM				
LPU GSM Limited Prod Contr (urgent) Award	SEP 87	SEP 87	SEP 87	
LPU GSM ARDS Eval (UK)	N/A	NOV 88	NOV 88	
LPU GSM FDT&E:				
Start	JUN 89	AUG 89	N/A	
Complete	N/A	N/S	N/A	
LPU First Delivery	N/A	JUL 89	JUL 89	
LPU GSM ARDS Eval (France)	N/A	AUG 89	AUG 89	

9a. **Schedule (Cont'd):**

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
LPU GSM First US Unit Equipped	JUN 90	MAY 90	MAY 90
BLOCK I GSM			
Block I GSM FSD Award	AUG 89	SEP 89	SEP 89
Block I CDR	N/A	JUL 90	NOV 90
Block I PDR	MAR 90	N/A	MAR 90
Block I Tech & User Test:			
Start	N/A	APR 92	APR 92
Complete	N/A	SEP 92	DEC 92(Ch-2)
Block I Milestone III	NOV 92	NOV 92	MAR 93(Ch-3)
Block I Contract Award	DEC 92	DEC 92	MAR 93(Ch-4)
Block I First Prod Delivery	N/A	MAY 94	AUG 94(Ch-5)
Block I First Article Test	N/A	JUN 94	SEP 94(Ch-6)
Block I First Unit Equipped	SEP 94	SEP 94	DEC 94(Ch-7)
BLOCK II GSM			
Block II GSM FSD Award	OCT 92	OCT 92	JAN 93(Ch-8)
Block II CDR	APR 93	APR 93	FEB 94(Ch-9)
Block II FDT&E			
Start	JAN 94	APR 94	N/A (Ch-10)
Complete	N/A	SEP 94	N/A (Ch-11)
Block II Prod IPR	N/A	DEC 94	JAN 96(Ch-12)
Block II Prod Award	MAR 95	MAR 95	FEB 96(Ch-13)
First Prod Delivery	N/A	APR 96	FEB 98(Ch-14)
Block II First Unit Equipped	MAR 97	MAR 97	SEP 98(Ch-15)

b. Previous Change Explanations --

Force DT&E was deleted per MS R202140Z JUL 89. Milestone name changed from Joint IOT&E (Initial Operational Test & Evaluation) to Joint SLPV/GD/OA (System Level Performance Verification/Government Development Test and Evaluation/Operational Assessment) Army FDT&E start and Block I GSM contract award were changed to reflect actuals. First Unit Equip., Block II FDT&E, PDR and CDR were changed to correct program office reporting errors. Approved Acquisition Program Baseline milestones added to SAR reporting.

c. Current Change Explanations --

(Ch-1) The System Level Performance Assessment (SLPA) has been replaced by a phased SLPE (evaluation), completed Sep 91. The GD (Government Development Test and Evaluation) and OA (Operational Assessment) are USAF only milestones, and relate to the E-8 aircraft development contract with Grumman. Since separate SARs are now being submitted for the U.S. Army and U.S. Air Force portion of the Joint

9c. Schedule (Cont'd):
STARS program, this milestone will be deleted in all Army GSM SARs.
(Ch-2) Block I TT/UT completion schedule has been extended from Sep 92 to Dec 92 as a result of delays in receipt of subcontractor material.
(Ch-3) Block I Milestone III has been extended from Nov 92 to Mar 93 as a result of program delays in material receipt and software development.
(Ch-4) Block I Contract Award has been extended from Dec 92 to Mar 93 as a result of program delays in material receipt and software development.
(Ch-5) Block I First Production Delivery has been extended from May 94 to Aug 94 as a result of the delay in the EMD program and subsequent delay in awarding the production contract.
(Ch-6) Block I First Article Test has been extended from Jun 94 to Sep 94 as a result of the delay in the EMD program and subsequent delay in awarding the production contract.
(Ch-7) Block I First Unit Equipped has been extended from Sep 94 to Dec 94 as a result of the delay in the EMD program and subsequent delay in awarding the production contract.
(Ch-8) Based upon the Army's force evolution to lighter, more mobile/deployable units, the Block II GSM effort was delayed to allow acceleration of the Block IIA Light GSM. The Block II FSD Award will be moved from Oct 92 to Jan 93 as a result of Block IIA acceleration and resulting Block II program stretch out.
(Ch-9) The Block II CDR will be moved from Apr 93 to Feb 94 as a result of the Block IIA acceleration and resulting Block II program stretch out.
(Ch-10) The Block II FDT&E start is no longer an applicable milestone per current TEMP and is shown as N/A.
(Ch-11) The Block II FDT&E complete is no longer an applicable milestone per current TEMP and is shown as N/A.
(Ch-12) The Block II Prod IPR will be moved from Dec 94 to Jan 96 as a result of the delay in the Block II EMD program.
(Ch-13) The Block II Prod Award will be moved from Mar 95 to Feb 96 as a result of the delay in the Block II EMD program.
(Ch-14) The Block II First Prod Del will be moved from Apr 96 to Feb 98 as a result of the delay in the Block II EMD program.
(Ch-15) The Block II First Unit Equipped will be moved from Mar 97 to Sep 98 as a result of the delay in the Block II EMD program.

d. References --

Development Estimate:
ADM dated 8 Mar 89, subject "Joint STARS Ground Station Module (GSM) Acquisition Decision Memorandum".

Approved Program:
DAE Approved Acquisition Program Baseline dated 15 November 1989

10. **Performance Characteristics:**

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
INTERIM GSM						
Time Compression/ Integration of Data Display (frames MTI data per second)	5	5	/ 5	5	5	
Target Auto Track/ Prediction (track on tgt file)	16	16	/ 16	16	16	
Interface JSTARS Radar & AN/UPD-7 Radar (bits per second) (k)	50	50	/ 50	50	50	
Workstations	2	2	/ 2	2	2	
Reliability						
Mean Time Between Failure (MTBF)(hrs)	150	150	/ 125	155	175	(CH-1)
Mean Time Between Op Maint Failure (MTBOMF) (hrs)	71	71	/ 71	77	85	(CH-2)
Maintenance						
Mean Time to Repair (MTTR) (min)	30	30	/ 30	13	13	(CH-3)
Mean Time to Repair (MTTR) DS/GS (min)	60	60	/ 60	80	60	
Max Time to Repair Unit (min)	60	60	/ 60	30	30	(CH-4)
Max Time to Repair (DS/GS (hrs)	3.5	3.5	/ 3.5	3.5	3.5	
Interoperability	Rec & Trans to both TACFIRE (19) and ASAS (11)	Rec & Trans to both TACFIRE (19) and ASAS (11)	/ Rec & Trans to both TACFIRE (19) and ASAS (2)	TACFIRE interfac	Rec & Trans to TACFIRE (19) and ASAS (2)	
LPU GSM						
Workstations	2	2	/ 2	2	2	

10a. **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Track Targets	Display time of detection heading, speed, and location	Display time of detection heading, speed, and location / Display target file description heading, speed, & location	display target file description heading speed & location	display target file description heading speed & location
Predict Target Locations	Time of arrival	Time of arrival / Time of arrival	time of arrival	time of arrival
BLOCK I GSM				
Standard IEW Modules	Std HW & SF	Std HW & SW / Std HW & SW	TBD	Std HW & SW
Payload Weight (lbs)	9500	9500 / 10800	TBD	10800
Imagery Storage (hrs on line per 2 hrs video)	8	8 / 8	TBD	8
Simultaneous Multisensor Operations	Data from 2 or more sensors	Data from 2 or more sensors / Data from 2 or more sensors	TBD	data from 2 or more sensors
Interoperabilty	Rec & Trans to both TACFIRE & AFATDS (19) and ASAS (11)	Rec & Trans to both TACFIRE & AFATDS (19) and ASAS (11) / Rec & Trans to both TACFIRE & AFATDS (19) and ASAS (2)	TBD	Rec & Trans to both TACFIRE & AFATDS (19) & ASAS (2)
Two Independent Workstations	Display MTI, FTI, and SAR data	Display MTI, FTI, and SAR data / Display MTI, FTI, and SAR data	TBD	display MTI, FTI & SAR data
Remote Data Display	Data into existing data process facility	Data into existing data process facility / Data into existing data process facility	TBD	data into existing data process facility
Nuclear Survivability	Hardened against EMP	Hardened against EMP / Hardened against EMP	TBD	hardened against EMP

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
BLOCK II GSM					
Nuclear Survivability	Hardened against EMP and TREE thermal radiation and blast	Hardened against EMP and TREE thermal radiation and blast	/ Hardened against EMP and TREE thermal radiation and blast	TBD	hardened against EMP and TREE thermal radiation and blast
NBC Survivability	NBC protected	NBC protected	/ NBC protected	TBD	NBC protected
Commander's Tactical Terminal (CTT)	CTT data interface	CTT data interface	/ CTT data interface	TBD	CTT data interface

b. Previous Change Explanations --

Addition of GSM Approved Acquisition Program Baseline characteristics to SAR reporting.

c. Current Change Explanations --

(Ch-1) IGSM MTBF estimate has been changed from 125 hrs to 175 to reflect demonstrated performance.
(Ch-2) IGSM MTBOMF estimate has been changed from 71 hrs to 85 to reflect demonstrated performance.
(Ch-3) IGSM MTTR (mean) estimate has been changed from 18 min to 13 to reflect demonstrated performance.
(Ch-4) IGSM Max-TTR has been changed from 60 min to 30 to reflect demonstrated performance.

d. References --

Development Estimate:
ADM dated 8 Mar 89, subject "Joint STARS Ground Station Module (GSM) Acquisition Decision Memorandum".

Approved Program:
DAE Approved Acquisition Program Baseline dated 15 November 1989

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	452.4	468.3	493.7
Procurement	680.6	626.6	676.4
Recurring Costs	(563.8)		(573.8)
Nonrecurring Costs	(55.6)		(0.0)
Total Flyaway	(619.4)		(573.8)
Other Weapon Systems	(16.2)		(58.0)
Total Other Wpn Sys	(16.2)		(58.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(45.0)		(44.6)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	1133.0	1094.9	1170.1
Escalation	158.6	238.9	320.9
Development (RDT&E)	(-4.0)	(-3.8)	(13.3)
Procurement	(162.6)	(242.7)	(307.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1291.6	1333.8	1491.0
b. Quantity --			
Development (RDT&E)	15	N/A	21
Procurement	97	97	104
Total	112	97	125

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Development Estimate:
ADM dated 8 Mar 89, subject "Joint STARS Ground Station Module (GSM) Acquisition Decision Memorandum".

Approved Program:
DAE Approved Acquisition Program Baseline dated 15 November 1989

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1491.0	1055.2	1491.0
(2) Quantity	125	90	125
(3) Unit Cost	11.928	11.724	11.928
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	36.2
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	36.2
(2) Quantity	0		5
(3) Unit Cost	N/A	N/A	7.240

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	448.4	843.2	0.0	1291.6
Previous Changes:				
Economic	+9.4	+124.1	-	+133.5
Quantity	-	-192.4	-	-192.4
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.8	-130.6	-	-131.4
Other	-	-	-	-
Support	-	-46.1	-	-46.1
Subtotal	+8.6	-245.0	-	-236.4
Current Changes:				
Economic	-1.0	-2.1	-	-3.1
Quantity	+28.7	+218.4	-	+247.1
Schedule	-	-	-	-
Engineering	+22.3	-	-	+22.3
Estimating	-	+51.2	-	+51.2
Other	-	-	-	-
Support	-	+118.3	-	+118.3
Subtotal	+50.0	+385.8	-	+435.8
Total Changes	+58.6	+140.8	-	+199.4
Current Estimate	507.0	984.0	-	1491.0

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	452.4	680.6	0.0	1133.0
Previous Changes:				
Quantity	-	-99.8	-	-99.8
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.3	-78.5	-	-79.8
Other	-	-	-	-
Support	-	-30.5	-	-30.5
Subtotal	-1.3	-208.8	-	-210.1
Current Changes:				
Quantity	+22.5	+115.2	-	+137.7
Schedule	-	-	-	-
Engineering	+20.1	-	-	+20.1
Estimating	-	+17.5	-	+17.5
Other	-	-	-	-
Support	-	+71.9	-	+71.9
Subtotal	+42.6	+204.6	-	+247.2
Total Changes	+41.3	-4.2	-	+37.1
Current Estimate	493.7	676.4	-	1170.1

b. Previous Change Explanations --

RDT&E
Economic: Revised Escalation Indices.
Estimating: Refinement and rephasing of program estimate.

PROCUREMENT
Economic: Revised Escalation Indices.
Quantity: Quantity reduced from 90 to 74.
Estimating: Refinement of program estimate to accomodate quantity reduction.
Support: Initial spares and support equipment changes.

13c. **Cost Variance Analysis (Cont'd):**

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Escalation Indices. (Economic)	--	-1.0
Increase in prototypes from a total of 17 to 21 in accordance with Congressional/HQDA guidance. (Quantity)	22.5	28.7
Operation Desert Storm lessons learned and recent ROC revisions. (Engineering)	20.1	22.3
Total Changes	42.6	50.0
(2) PROCUREMENT		
Revised Escalation Indicies. (Economic)	--	-2.1
Adjustment for current/prior year inflation offset. (Estimating)	17.5	51.2
Increase in total production from 74 to 104 GSMs (Quantity)	115.2	218.4
Increase in initial spares/support to provide for additional GSMs being procured (Support)	71.9	118.3
Total Changes	204.6	385.8

14. **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

a. Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
30.68	-0.22	-22.59	0.67	2.44	-0.58	--	1.15	-19.13	11.55

14. **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions) (Cont'd)

b. Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
11.53	1.043	-0.761	--	0.178	-0.642	--	0.578	0.396	11.93

15. **Contract Information:** (Then-Year Dollars in Millions)

a. RDT&E --

Block I GSM:	Initial Contract Price Target	Ceiling	Qty
Motorola, Scottsdale, AZ DAAB07-89-C-S014, FPIF Award: September 22, 1989 Definitized: September 22, 1989	$70.0	$80.4	4

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$73.0	$86.6	4	$80.2	$86.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-2.3	$-3.1
Cumulative Variances To Date (11/30/91)	$-14.3	$-4.7
Net Change	$-12.0	$-1.6

Explanation of Change:

Cost Variance: the cost variance is primarily attributable to three areas, unanticipated increase in material costs, underestimated requirement in software lines of code, and adjustments to overhead/G&A rates.
Schedule variance: the negative schedule variance is the result of late delivery of material from subcontractor accounts.

16. **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 47.8% (11 yrs/23 yrs)

(2) Percent Program Cost Appropriated: 29.7% ($443.0 / $1491.0)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY82-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2004)	Total
RDT&E	327.6	68.6	31.2	79.6	507.0
Procurement	46.8	-	36.2	901.0	984.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	374.4	68.6	67.4	980.6	1491.0

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1982				5.1	4.1	4.1	4.1	4.9
1983				43.3	36.5	36.5	35.7	4.9
1984				77.7	67.8	67.8	65.6	3.8
1985				31.9	28.7	28.7	27.8	3.4
1986				45.4	42.1	42.1	39.8	2.8
1987				27.2	25.9	25.9	24.6	2.7
1988				18.9	18.7	18.7	16.5	3.0
1989				22.3	22.9	22.9	22.7	4.2

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)								
1990				35.5	37.8	37.8	34.5	4.0
1991				38.8	43.1	42.6	27.3	3.9
1992				59.9	68.6	3.6	0.2	3.1
1993				26.4	31.2			3.3
1994				22.2	27.1			3.3
1995				10.9	13.8			3.3
1996				6.1	7.9			3.2
1997				3.5	4.7			3.2
1998				10.8	15.0			3.2
1999				7.8	11.1			3.2
Subtot	21			493.7	507.0	330.7	298.8	
Appropriation: 2035 Other Procurement, Army								
1987	3	1.4	14.0	19.4	19.6	19.6	18.5	3.0
1988	6	1.9	20.2	26.0	27.2	27.2	25.9	4.2
1989								4.2
1990								4.0
1991								3.9

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2035 Other Procurement, Army (Cont'd)

1992								3.1
1993	5	2.1	23.8	29.5	36.2			3.3
1994	7	2.4	31.8	43.0	54.5			3.3
1995	9	4.4	42.5	52.0	68.0			3.3
1996	9	1.3	45.2	51.6	69.6			3.2
1997	8	0.3	45.0	49.6	69.1			3.2
1998	10	0.4	57.5	65.0	92.1			3.2
1999	8	1.4	41.2	53.3	79.1			3.2
2000	8	1.1	37.8	47.6	72.8			3.2
2001	8	0.9	49.6	65.1	102.8			3.2
2002	8	0.5	51.5	60.6	98.8			3.2
2003	8	0.5	50.0	59.6	100.3			3.2
2004	7	0.4	44.7	54.1	93.9			3.2
Subtot	104	19.0	554.8	676.4	984.0	46.8	44.4	
Grand Total	125	19.0	554.8	1170.1	1491.0	377.5	343.2	

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1987	0	N/A	3	0
1988	0	N/A	6	0
1989	7	N/A	0	0
1990	9	N/A	0	0
1991	9	N/A	0	0
1992	9	N/A	0	0
1993	9	N/A	5	0
1994	9	N/A	7	0
1995	9	N/A	9	0
1996	9	N/A	9	0
1997	9	N/A	8	0
1998	9	N/A	10	0
1999	9	N/A	8	0
2000	0	N/A	8	0
2001	0	N/A	8	0
2002	0	N/A	8	0
2003	0	N/A	8	0
2004	0	N/A	7	0

Maximum Economic rate in FY97 includes both Block II (7) and Block IIA (12) GSMs.

17b. **Production Rate Data (Cont'd):**

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	1170.1	N/A	N/A
(TY $)	N/A	N/A	1491.0	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	9.361	N/A	N/A
(TY $)	N/A	N/A	11.928	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	SEP 87	N/A	N/A
Duration (in MON)	N/A	N/A	222	N/A	N/A
End Date(MON YY)	N/A	N/A	MAR 06	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	8/8
Procurement	9/9

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules --

O&S costs were based on 125 Ground Station Modules operating for a 20 year cycle after introduction into the field. Sustainment is based on cumulative quantity of fielded systems and appropriate personnel necessary to maintain the system. The source of the O&S data is the January 1992 Joint STARS (Army) Baseline Cost Estimate. There is no antecedent.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per JSTARS	Avg Annual Cost Per (Antecedent)
Personnel	0.3	N/A
Unit Consumption	0.2	N/A
Depot Maintenance	0.1	N/A
Other Sustainment	0.1	N/A
Total	0.7	N/A

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
CLS	1.6	1.2	1.4	10.2	14.4
Total	1.6	1.2	1.4	10.2	14.4

A-3 AFATDS

91-046

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AFATDS

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
Advanced Field Artillery Tactical Data System (AFATDS)

CLEARED
FOR OPEN PUBLICATION
MAR 20 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
SFAE-CC-FS
Ft Monmouth, NJ 07703-5404
AV 995-3090 COMM 908-544-3090
COL Aubrey White
Assigned: February 11, 1990

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 23726 Project D322
PROCUREMENT:
APPN 2035 ICN B28600 (Army)
APPN 2035 ICN B78400 (Army)
APPN 0350 ICN 225 (DCA/DNA) (Shared)
APPN 2035 ICN BA9101 (Army) (Shared)

No SECURITY Objection to PUBLIC RELEASE
20 MAR 1992
DEPUTY CHIEF, OCSINT, HQDA

5. **Related Programs:**
ATCCS Common Hardware/Software

6. **Mission and Description:**
The Advanced Field Artillery Tactical Data System (AFATDS) is a single, integrated battlefield management and decision support system. It will function at Battery through Corps level as one of

Declassified 92-0612

*** [redacted] ***

6. **Mission and Description (Cont'd):**

the five battlefield automation systems of the Army Tactical Command and Control System (ATCCS). AFATDS utilizes evolving commercial computer technology of the ATCCS Common Hardware/Software (CHS) procurement.

AFATDS is designed to overcome the size, vulnerability, high sustainment cost, limited functionality, central processing and training limitations of artillery battalion, division and corps Tactical Fire Direction System (TACFIRE). AFATDS will take advantage of advancing software technology, graphics, decision aids, and embedded training to expand the Fire Support functions. AFATDS will be the Fire Support node of the ATCCS providing advanced software automation assistance to the Fire Support elements and interfacing with all subsystems subordinate to AFATDS and other nodes of ATCCS via the standard communications media available to the force. AFATDS will provide 27 Fire Support functions. These 27 functions are grouped in five Fire Support operational needs (Fire Support Execution, Fire Support Planning, Movement Control, Field Artillery Mission Support and Field Artillery Fire Direction Operations).

Based on the organizational structure to be supported, AFATDS hardware items will be comprised of the following: Fire Support Control Terminals, Fire Support Terminals, Power Converter Groups, Tactical Communications Interface Module (TCIM), Mass Storage Expansion Unit (MSEU), Electronic Printers, Tactical Display Devices, Local Area Network, and installation kits tailored to the Force Structure and available vehicles. This will all be ATCCS Common Hardware. Responsiveness, survivability, and continuity of Fire Support Operations will be enhanced via dispersed processing centers, intelligent remote (work stations) terminals, a distributed data base management system and distributed operations for Fire Support Officers at the Infantry and Armor battalion/brigade levels. AFATDS will interface/inteoperate will all functional control elements of existing and future Army Fire Support Systems, other ATCCS Battlefield Functional Area (BFA) Systems, other services employing Fire Support Joint Interoperability Tactical Command and Control Systems message standards and Allied Forces using NATO Fire Support Standards.

7. **Program Highlights:**

a. Significant Historical Developments --

As improvements to TACFIRE were proposed in the late 1970's and early 1980's, it became clear that the Army needed a new Fire Support (FS) system that would not only automate technical fire direction and tactical fire control, but also expand functional performance to include all available support assets and increase automated support to the areas of fire support command and control, target processing,

7a. Program Highlights (Cont'd):

fire support planning, movement control and decision making.

In 1981, the Department of Defense (DoD) approved the Mission Element Need Statement (MENS) for AFATDS. Approval to proceed into Concept Evaluation without an ASARC I was granted by the Vice Chief of Staff of the Army in March 1984. The contract for Concept Evaluation was awarded May 1984 to Magnavox, Ft Wayne, Indiana. This contract was completed with Concept Evaluation in April 1989. ASARC II / DAB approval to enter Full Scale Development (FSD) was obtained in 4Q89. A sole source FSD contract was awarded to Magnavox in April 1990. The program proceeded with the development of the Version 1 software (Version 3 will meet the objective system requirements) in accordance with MIL-STD 2167A. During 1990, the System Requirements Review (SRR) and System Design Review (SDR) were conducted and these milestones represented the completion of the Requirements Analysis and Definition Phase and the System Design Phase respectively.

b. Significant Developments Since Last Report --
The Advanced Field Artillery Tactical Data System (AFATDS) program made significant progress in the development of Version 1 software since the last report. The program completed the Software Requirements Phase that had begun with the System Design Review (SDR) in November 1990. Subsequently, the Software Specification Review (SSR) was conducted in two parts due to the volume of data to be reviewed and was completed in April 1991, on schedule.

The Preliminary Design Phase of the program began with the completion of the SSR and was completed with a Preliminary Design Review (PDR) conducted for each Computer Software Configuration Item (CSCI) and a system level PDR. The Preliminary Design Phase included a detailed review of the Software Requirements Specifications to insure the traceability of requirements from the system level to the individual CSCIs and Computer Software Components. The PDRs were completed in November.

The completion of the PDRs initiated the Detailed Design Phase which will be completed with the Critical Design Reviews beginning in June 1992.

The training program for AFATDS continued on schedule for the development of training required to support the Force Development Test and Experimentation (FDTE) scheduled for FY93 and the Initial Operational Test and Evaluation (IOTE) scheduled for FY94. The first Training Conference was conducted in April 1991 and since then the training has proceeded on schedule. The contractor and the PM have worked closely with the Field Artillery School to develop a training program that will meet the future needs of AFATDS. In order to

7b. **Program Highlights (Cont'd):**

develop a training device system that will be truly integrated with the AFATDS, the PM awarded a task to the software developer to develop the training device system which will use the same hardware as the fielded system and will build upon the embedded training software which is an integral part of the system. The system will use Computer Aided Instruction and will be used initially to train FDTE/IOTE troops and then will be incorporated into the Field Artillery School's Program of Instruction.

The AFATDS program also began efforts for the initiation of the Version 2 development. The ultimate user representatives of the AFATDS (Field Artillery School and US Marine Corps) defined the operational requirements for Version 2. These were incorporated into the AFATDS System Specification which was included in the Procurement Data Package. Version 2, in accordance with the AFATDS Acquisition Strategy, will be developed by the Version 1 contractor, Magnavox Electronic Systems Company. The Procurement Data Package was provided to the contractor; a proposal will be submitted and evaluated by the Government. Award of Version 2 is anticipated in the summer of 1992.

Calender year 1991 is considered a very successful year for AFATDS. Schedule is being maintained while a significant technical devlopment is on-going. The latest software development tools have been provided to the contractor to mitigate risk and posture him for increased productivity.

The Fire Support Ada Conversion (FSAC) program was officially approved by the AAE in March 1991. The FSAC program will provide an accelerated fielding of ATCCS Common Hardware (CH) using Battery Computer System (BCS) Ada Version 10 software and the Fire Direction System (FDS) Ada Version 10 software. The BCS, MLRS/Lance Missile System and the Fire Direction Data Manager (FDDM) identified a requirement for an interim command and control system until the AFATDS software becomes available. The FSAC program will convert the existing control software to Ada and replace the existing hardware with the Lightweight Computer Unit (LCU). The LCUs will ultimately be utilized as the host for the AFATDS software.

In June 1991, a Memorandum of Agreement between the National Guard, PEO CCS and PM FATDS was signed for the direct procurement of the National Guard BCS Ada rehosted software on LCUs for the National Guard units using Dedicated Procurement Program funds. The National Guard procurement will be managed concurrent with the active BCS Ada rehost program.

A Preliminary Design Review (PDR) for the FSAC program was held

7b. Program Highlights (Cont'd):

in March. The BCS Emulator software was successfully demonstrated at Ft Sill in May and the MLRS-Ada Software Test Description (STD) was delivered to CECOM for the Test Readiness Review (TRR) which took place in June. The Critical Design Review was successfully completed in July and the Final Qualification Test (FQT) was completed in September. The Engineering Change Proposal to support the FSAC Materiel Change Request for the BCS was approved in Sept as well. An Independent System Integration Test (ISIT) with FDDM was completed Dec 91. The FSAC programs are all on schedule and the first IOTE is scheduled for March 1992.

AFATDS is expected to satisfy the mission requirements.

c. Changes Since As Of Date --
The initial hardware order for the National Guard BCS program was made 31 Jan 1992. The order was for 318 units at a cost of $8 Million.

8. Threshold Breaches:
There are currently breaches to the approved Army Acquisition Executive (AAE) Baseline. There is a cost breach of 5% or more for the procurement appropriation and there are schedule breaches of six months or more to several milestones. There are no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --

	Development Estimate	Approved Program	Current Estimate
Concept Evaluation (CE) Contract Award	MAY 84	MAY 84	MAY 84
Common HW/SW (CHS) Contract Award	AUG 88	AUG 88	AUG 88
CHS Initial Prototype (V1) Delivery	NOV 88	NOV 88	NOV 88
Software Formal Qualification Test Complete	JAN 89	JAN 89	JAN 89
User Concept Evaluation:			
Begin	MAR 89	MAR 89	MAR 89
Complete	APR 89	APR 89	APR 89
CHS Initial Ruggerized (V2) Delivery	JUN 89	JUN 89	JUN 89
ASARC II	JUL 89	JUL 89	JUL 89
DAB	SEP 89	SEP 89	SEP 89
Congressional Report	SEP 89	SEP 89	SEP 89
Full Scale Development Contract	APR 90	APR 90	APR 90
Preliminary Design Review (PDR) V1 (Start)	JUN 91	JUN 91	JUN 91

9a. **Schedule (Cont'd):**

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Critical Design Review (CDR) V1 (Start)	MAY 92	MAY 92	MAY 92
Version 2 SW Development Begin	MAY 92	MAY 92	MAY 92
CHS Hardware Order (AFATDS Training Base)	NOV 92	NOV 92	OCT 93(Ch-1)
V3 Acquisition Alternative Selection	DEC 92	DEC 92	DEC 92
System Software Test V1	MAY 93	MAY 93	MAY 93
CHS Hardware Delivery (AFATDS Training Base)	JUN 93	JUN 93	APR 94(Ch-1)
Force Development Test and Experimentation (FDT&E) -- Complete	JUL 93	JUL 93	OCT 93(Ch-2)
First Unit Equipped (FUE) V1	SEP 93	SEP 93	MAR 94(Ch-3)
Preliminary Design Review V2 (Start)	NOV 93	NOV 93	NOV 93
IOTE:			
Begin	JAN 94	JAN 94	FEB 94(Ch-2)
Complete	FEB 94	FEB 94	MAR 94(Ch-2)
ASARC -- Milestone III	APR 94	APR 94	JUN 94(Ch-2)
CDR V2 (Start)	JUN 94	JUN 94	JUN 94
Version 3 SW Development -- Begin	NOV 94	NOV 94	NOV 94
System Software Test V2	JAN 95	JAN 95	JAN 95
Initial Operational Capability (V1)	JAN 95	JAN 95	SEP 95(Ch-4)
FDTE V2	MAR 95	MAR 95	MAR 95
FUE V2	MAY 95	MAY 95	JUL 95(Ch-3)
FOTE V2:			
Begin	MAY 95	MAY 95	MAY 95
Complete	JUL 95	JUL 95	JUL 95
Fielding Total Force -- Start (V2)	SEP 95	SEP 95	SEP 95

The dates reflected in the Current Estimate column represent the updated AFATDS Program Baseline which has been submitted to SARDA with the other PEO CCS ATCCS Battlefield Functional Area (BFA) Program Baselines.

b. Previous Change Explanations --

none

c. Current Change Explanations --

(Ch-1) The CHS Hardware Order was moved from Nov 92 to Oct 93, and the corresponding CHS Hardware Delivery was moved from June 93 to Apr 94. This was due to the elimination of FY93 Other Procurement, Army AFATDS dollars in the FY91 appropriation language.

9c. **Schedule (Cont'd):**
(Ch-2) FDTE Complete was rescheduled from Jul 93 to Oct 93. IOTE Begin moved from Jan 94 to Feb 94. The corresponding milestone for IOTE Complete was moved from Feb 94 to Mar 94. The ASARC Milestone III moved from Apr 94 to Jun 94.

Based on the contract negotiations for AFATDS V1, the FDTE test window was Jun/Jul 93. Subsequent to contract award the Vice Chief of Staff established prescribed test windows for ATCCS testing with III Corps assets at Fort Hood to preclude perturbations to the warfighting mission of III Corps units in FY93. As a result, the current test windows are May/June and Sept/Oct. The AFTADS V1 schedule precludes participations in the May/June 93 test window. As such, the AFATDS V1 FDT&E has been moved to the Sept/Oct 93 test window. The dates for IOTE are still being discussed, the best estimates are shown above. The ASARC is dependent on completion of the IOTE.

(Ch-3) The First Unit Equipped V1 moved from Sep 93 to Mar 94. First Unit Equipped V2 moved from May 95 to Jul 95. FUE for Version 1 was originally scheduled for Sep 93 to coincide with the completion of FDTE (DCSOPS guidance) and FUE Version 2 was originally scheduled for the beginning of FOTE V2. FUE is now scheduled to coincide with the last month of the system testing, i.e., IOTE V1 (3/94) and FOTE V2 (7/95). This rescheduling of FUE is consistent across all BFA's and is IAW PEO CCS guidance.

(Ch-4) The Initial Operational Capability V1 moved from Jan 95 to Sep 95. The old definition of IOC was based on refurbishment of test units which is still planned for Jan 95. The new definition of IOC is based on the first production unit fielded after ASARC (M/S III) which is scheduled for Sep 95.

d. References --

Development Estimate:
AAE Approved Acquisition Program Baseline dated 15 August 1990.

Approved Program:
AAE Approved Acquisition Program Baseline dated 15 August 1990.

10. **Performance Characteristics:**

10a. **Performance Characteristics (Cont'd):**

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
TECHNICAL 1/					
MTBF-Hardware (hrs) 2/					
Fire Support Control Terminal (FSCT)	636	636	/ 212	N/A	636
Fire Support Terminal (FST)	1000	1000	/ 333	N/A	1000
MTTR-System - Unit Level (min)					
FSCT	20	20	/ 30	N/A	20
FST	20	20	/ 30	N/A	20
MIPS (Million Instructions per sec)					
FSCT	12	12	/ 12	N/A	12
FST	12	12	/ 12	N/A	12
Internal Memory (Megabytes)					
FSCT	16	16	/ 16	N/A	16
FST	16	16	/ 16	N/A	16
System Ao-(Wartime) (Operating 24 hrs/day for 108 hours)					
Version 1	.90	.90	/ .80	N/A	.90
Version 2	.90	.90	/ .85	N/A	.90
Version 3	.90	.90	/ .88	N/A	.90
Fire Mission Processing Peak Load (Fire Missions/hr)					
Version 1	247	247	/ 120	N/A	247
Version 2	513	513	/ 420	N/A	513
Version 3	780	780	/ 720	N/A	780
Fire Mission Processing Speed (secs)					
Version 1	14.5	14.5	/ 30.0	N/A	14.5
Version 2	7.0	7.0	/ 8.5	N/A	7.0
Version 3	4.6	4.6	/ 5.0	N/A	4.6
Power Requirements (KW)					
FSCT	1.4	1.4	/ 1.7	N/A	1.4
FST	0.8	0.8	/ 1.0	N/A	.8
Sustainment of Operation During Power Loss (min)	5	5	/ 3	N/A	5
Emergency Purge (min)	2	2	/ 4	N/A	2

10a. **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Set-up/Tear-down (min) 3/	10	10 / 15	N/A	10
Weight in Pounds (Less Radios)				
FSCT	400	400 / 400	N/A	400
FST	243	243 / 243	N/A	243
Operating Temperature (deg F)	0-120	0-120 / 0-110	N/A	0-120

1/ All Hardware related technical papameters are dependent upon ATCCS common hardware components.
2/ Printer MTBF is not included in these figures. Printer is not mission essential.
3/ Set-up/tear-down is for a standard integrated Command Post System without tentage erected.

b. Previous Change Explanations --

none

c. Current Change Explanations --

none

d. References --

Development Estimate:
AAE Approved Acquisition Program Baseline dated 15 August 1990.

Approved Program:
AAE Approved Acquisition Program Baseline dated 15 August 1990.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	390.7	390.7	390.7
Procurement	469.7	469.7	578.8
Total Flyaway	(339.4)		(342.7)
Total Flyaway	(339.4)		(342.7)
Total Flyaway	(87.2)		(193.0)
Total Other Wpn Sys	(87.2)		(193.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(43.1)		(43.1)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	860.4	860.4	969.5
Escalation	191.7	191.7	238.2
Development (RDT&E)	(31.6)	(31.6)	(33.8)
Procurement	(160.1)	(160.1)	(204.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1052.1	1052.1	1207.7
b. Quantity --			
Development (RDT&E)	137	137	137
Procurement	3184	3184	3184
Total	3321	3321	3321

c. Foreign Military Sales -- None.

d. Nuclear Costs --
none

e. References --

Development Estimate:
AAE Approved Acquisition Program Baseline dated 15 August 1990.

Approved Program:
AAE Approved Acquisition Program Baseline dated 15 August 1990.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1207.7	1251.3	1207.7
(2) Quantity	3321	3321	3321
(3) Unit Cost	0.364	0.377	0.364
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	21.1	21.1	12.8
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	21.1	21.1	12.8
(2) Quantity	496	496	182
(3) Unit Cost	0.043	0.043	0.070

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	422.3	629.8	0.0	1052.1
Previous Changes:				
Economic	+3.2	+11.9	-	+15.1
Quantity	-	-	-	-
Schedule	+5.6	+23.6	-	+29.2
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	+154.9	-	+154.9
Subtotal	+8.8	+190.4	-	+199.2
Current Changes:				
Economic	-5.8	-24.2	-	-30.0
Quantity	-	-	-	-
Schedule	-0.6	-7.3	-	-7.9
Engineering	-	-	-	-
Estimating	-0.2	+3.4	-	+3.2
Other	-	-	-	-
Support	-	-8.9	-	-8.9
Subtotal	-6.6	-37.0	-	-43.6
Total Changes	+2.2	+153.4	-	+155.6
Current Estimate	424.5	783.2	-	1207.7

13a. **Cost Variance Analysis (Cont'd):**

a. Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	390.7	469.7	0.0	860.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	+109.1	-	+109.1
Subtotal	-	+109.1	-	+109.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+3.3	-	+3.3
Other	-	-	-	-
Support	-	-3.3	-	-3.3
Subtotal	-	-	-	-
Total Changes	-	+109.1	-	+109.1
Current Estimate	390.7	578.8	-	969.5

b. Previous Change Explanations --

RDT&E
Economic: Revised escalation indices
Schedule: Revised development schedule due to funding profile changes

PROCUREMENT
Economic: Revised escalation rates
Schedule: Revised production schedule due to funding profile changes
Support: Changes due to reprogrammed funding for Total Package Fielding costs

13c. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	--	-5.8
Revised schedule profile due to funding reductions. (Schedule)	--	-0.6
Prior & Current Year Escalation Impact (Estimating)		-0.2
Total Changes	--	-6.6
(2) PROCUREMENT		
Revised escalation indices (Economic)	--	-24.2
Revised schedule due to impact of FSAC/NG programs FY92-95 and AFATDS funding reductions (Schedule)	--	-7.3
Rescheduled nonrecurring requirements plus redefinition of software support as a flyaway cost (Support)	-3.3	-8.9
Revised estimate due to redefinition of software support as a flyaway cost. (Estimating)	3.3	3.4
Total Changes	--	-37.0

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.317	-0.004	--	0.006	--	0.001	--	0.044	0.047	0.364

15. **Contract Information:** (Then-Year Dollars in Millions)

a. RDT&E --

AFATDS:	Initial Contract Price Target	Ceiling	Qty
Magnavox Government, Fort Wayne, IN DAAB07-90-C-E708, CPAF/FP Award: April 27, 1990 Definitized: April 27, 1990	$60.5	$0.0	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$68.2	$0.0	1	$79.4	$79.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.4	$-0.9
Cumulative Variances To Date (12/29/91)	$-0.1	$-1.5
Net Change	$-0.5	$-0.6

Explanation of Change:

The Estimated Price at Completion has increased with the addition of scope of work through contract modifications. The additional scope includes a Training Device System Engineering Change Proposal (ECP), incorporations of USMC DCT messages, EMAPS software implementation, AR380-19 design work, Program Support Environment (PSE) maintenance, PSE upgrades and Interbase DBMS purchases. The Contract Budget Base has not exceeded the Contract Cost Baseline.

The contract shows a schedule variance due to resource shortages and late GFE deliveries. Magnavox has revised the Software Build Plan to ensure the timely delivery of the AFATDS V1 software, and the Schedule Performance Indicator has improved over the past months. The Cost Performance Indicator remains constant over the past months.

16. **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 57.1% (12 yrs/21 yrs)

(2) Percent Program Cost Appropriated: 20.2% ($244.0 / $1207.7)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY81-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2001)	Total
RDT&E	166.0	48.1	41.6	168.8	424.5
Procurement	8.8	21.1	12.8	740.5	783.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	174.8	69.2	54.4	909.3	1207.7

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1981				1.9	1.4	1.4	1.4	
1982				2.2	1.7	1.7	1.7	7.5
1983				4.1	3.3	3.3	3.3	4.8
1984				18.2	15.3	15.3	15.3	3.8
1985				27.3	23.6	23.6	23.6	3.4
1986				18.5	16.5	16.5	16.5	2.8
1987				7.9	7.2	7.2	7.2	2.7
1988				11.7	11.1	11.1	11.1	3.0

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1989				17.3	17.1	13.4	13.4	4.2
1990				28.0	28.7	28.7	28.7	4.0
1991				37.6	40.1	40.0	40.0	3.9
1992				43.7	48.1	6.7	2.1	3.1
1993				36.6	41.6			3.3
1994				40.7	47.8			3.3
1995				32.7	39.7			3.3
1996				20.1	25.1			3.2
1997				13.6	17.5			3.2
1998				15.0	20.0			3.2
1999				13.6	18.7			3.2
Subtot	137			390.7	424.5	168.9	164.3	
Appropriation: 2035 Other Procurement, Army								
1988		8.8		8.8	8.8	8.8	8.8	
1989								
1990								4.0
1991								3.9

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2035 Other Procurement, Army (Cont'd)								
1992	156		5.7	6.0	6.9			3.1
1993	182	4.1	5.6	10.8	12.8			3.3
1994	371	8.7	21.5	49.7	60.5			3.3
1995	198	5.5	24.4	56.4	70.9			3.3
1996	262	2.1	32.3	69.6	90.3			3.2
1997	306	2.1	37.8	70.6	94.6			3.2
1998	364	2.1	45.0	86.8	120.0			3.2
1999	353	2.1	43.6	84.2	120.0			3.2
2000	317	1.3	39.1	70.8	104.2			3.2
2001	335	0.4	41.6	52.7	80.0			3.2
2002								3.2
Subtot	2844	37.2	296.6	566.4	769.0	8.8	8.8	
Army	2981	37.2	296.6	957.1	1193.5	177.7	173.1	
Appropriation: 0350 National Guard & Reserve Equipm, Defense								
1992	340		8.9	12.4	14.2			3.1
Subtot	340		8.9	12.4	14.2			
DoD	340		8.9	12.4	14.2			

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 0350 National Guard & Reserve Equipm, Defense (Cont'd)								
Grand Total	3321	37.2	305.5	969.5	1207.7	177.7	173.1	

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1992	0	N/A	496	N/A
1993	51	N/A	182	N/A
1994	481	N/A	371	N/A
1995	654	N/A	198	N/A
1996	625	N/A	262	N/A
1997	497	N/A	306	N/A
1998	463	N/A	364	N/A
1999	309	N/A	353	N/A
2000	104	N/A	317	N/A
2001	0	N/A	335	N/A

17b. **Production Rate Data (Cont'd)**:

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	969.5	N/A	0.0
(TY $)	N/A	N/A	1207.7	N/A	0.0
PAUC Cost (BY $)	N/A	N/A	0.292	N/A	N/A
(TY $)	N/A	N/A	0.364	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	JAN 92	N/A	N/A
Duration (in MON)	N/A	N/A	116	N/A	N/A
End Date(MON YY)	N/A	N/A	SEP 01	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	137/137
Procurement	0/0

e. Approved Design-to-Cost Objective -- N/A.

The AFATDS will utilize Common Hardware equipment. There is no Design-to-Cost Objective for the program.

18. **Operating and Support Costs**:

a. Assumptions and Ground Rules --

The O&S costs are to operate and maintain the AFATDS system, based on a peacetime operating tempo of 1800 hr/yr. The costs are based on an operating life of 20 years, with a procurement of the CHS hardware after 10 years. The CHS will be contractor maintained above the unit level at Regional Support Centers. Costs are taken from the AFATDS

18a. Operating and Support Costs (Cont'd):
Baseline Cost Estimate, March 1990, and FSAC Baseline Cost Estimate, Jan 1992. Costs are shown per division.

The AFATDS will replace the TACFIRE/LTACFIRE systems and associated Fire Support hardware. FSAC will replace the current BCS system. The costs shown were provided by the Field Artillery School (USAFAS), Ft Sill, and reflect TACFIRE support costs only. Military personnel costs are assumed to be the same as for the AFATDS as crew requirements will be unchanged.

b. Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per DIVISION AFATDS	Avg Annual Cost Per TACFIRE SYSTEM (Antecedent)
Military Personnel	15.6	15.6
Other	4.8	15.3
Total	20.4	30.9

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Eng/Tech Sevices	0.3	---	---	---	0.3
Total	0.3	---	---	---	0.3

N-5 AN/SQY-1

11-114

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AN/SQY-1

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
AN/SQY-1 Surface Ship ASW Combat System

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**
Program Executive Office
Attn: PMO411
Surface Ship ASW Systems
Washington, DC 20362-5104

CAPT T. L. Rice
Assigned: September 14, 1990
AV 286-3030 COMM (703) 746-3030

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604713N (Shared), 0603553N (Shared)

No current MILCON PEs.

5. (U) **Related Programs:**
AN/SQQ-89, AN/UYS-2, and AVP

AS AMENDED
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DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (WHS)
WASHINGTON HEADQUARTERS SERVICES

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~~Downgrade Instructions: OADR~~

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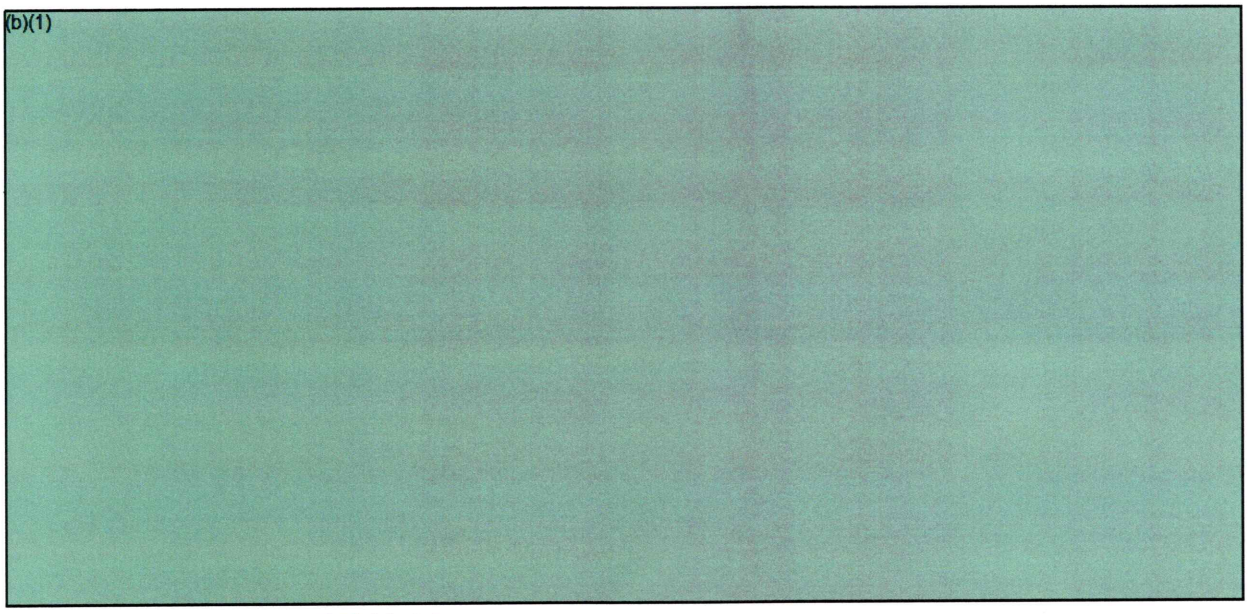


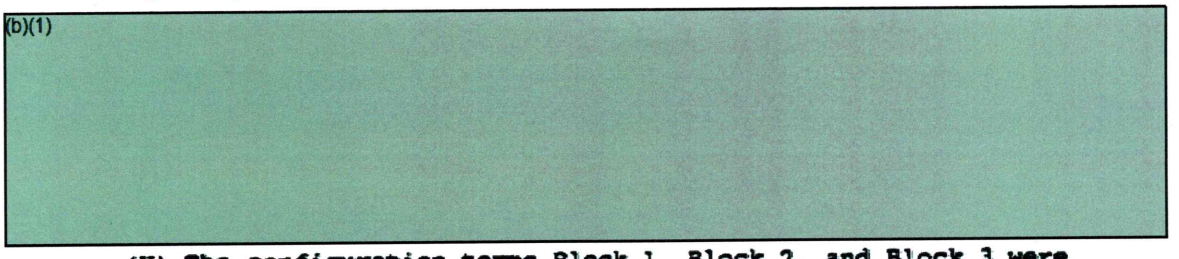
7. (U) Program Highlights:

a. (U) Significant Historical Developments --

(U) Historical Developments:

(U) Design Definition contracts were awarded to the General Electric Company (GE) and Westinghouse Electric Corporation (WEC) teams in FY87. WEC was selected as a competitor to GE based upon a 1986 competition. The Design Definition phase was initiated in February 1988 when funds were made available. Proposals for the Full Scale Engineering Development (FSED) phase were submitted in March 1990. The GE team was eliminated from the competition during the subsequent proposal evaluation.

(b)(1)



(U) The configuration terms Block 1, Block 2, and Block 3 were dropped because multiple configurations were no longer in this development plan.

b. (U) Significant Developments Since Last Report --

Current Developments:

(U) The amended FY 92/93 President Budget terminates the AN/SQY-1 program. The remaining funds in program element 0604713N are for upgrades and high priority performance improvements to the

7b. (U) **Program Highlights (Cont'd):**

AN/SQQ-89 and SAR reporting requirements for these improvements are included in the AN/SQQ-89 SAR. This is the final SAR based on expenditures of 90.1% in accordance with SAR reporting requirements of Title 10, U.S.C., Section 2432.

c. (U) Changes Since As Of Date -- None.

8. (U) **Threshold Breaches:**
Due to program termination all previous milestones are no longer applicable.

9. (U) **Schedule:**

a. (U) Milestones --

	Planning Estimate	Approved Program	Current Estimate
Milestone II Fast Frigate (FFG) Block 1 or 2	SEP 89	N/A	N/A
Milestone II Battle Force Capable (BFC) Blocks 1 & 3	SEP 89	N/A	N/A
Milestone III Fast Frigate (FFG) Block 1 or 2	SEP 93	N/A	N/A
Milestone III Battle Force Capable (BFC) Block 1	SEP 94	N/A	N/A
Milestone III Battle Force Capable (BFC) Block 3 (ALP)	SEP 93	N/A	N/A
Milestone III Battle Force Capable (BFC) Block 3 (AFP)	SEP 94	N/A	N/A

(b)(1)

(b)(1)

c. (U) Current Change Explanations --

(CH-1) Due to termination of the program, schedule milestones no longer apply.

9d. (U) Schedule (Cont'd):

d. (U) References --

(U) Planning Estimate:
31 December 1986 SAR.

(U) Approved Program: None.

10. (U) Performance Characteristics:

a. (U) Performance --

	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

c. (U) Current Change Explanations -- None.

10d. (U) Performance Characteristics (Cont'd):

d. (U) References --

(U) Planning Estimate:
31 December 1986 SAR.

(U) Approved Program: None.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Planning Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	764.8	111.3	111.3
Procurement	0.0	0.0	0.0
Total Sailaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 85 Base-Year $	764.8	111.3	111.3
Escalation	187.9	20.5	20.5
Development (RDT&E)	(187.9)	(20.5)	(20.5)
Procurement	(0.0)	(0.0)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	952.7	131.8	131.8
b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	0	0	N/A
Total	0	0	0

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:
31 December 1986 SAR.

(U) Approved Program: None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	131.8	1330.6	131.8
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) Cost Variance Analysis:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	952.7	0.0	0.0	952.7
Previous Changes:				
Economic	+47.4	-	-	+47.4
Quantity	-	-	-	-
Schedule	+227.1	-	-	+227.1
Engineering	-465.4	-	-	-465.4
Estimating	+568.8	-	-	+568.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+377.9	-	-	+377.9
Current Changes:				
Economic	-45.7	-	-	-45.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-1153.1	-	-	-1153.1
Support	-	-	-	-
Subtotal	-1198.8	-	-	-1198.8
Total Changes	-820.9	-	-	-820.9
Current Estimate	131.8	-	-	131.8

13a. (U) Cost Variance Analysis (Cont'd):

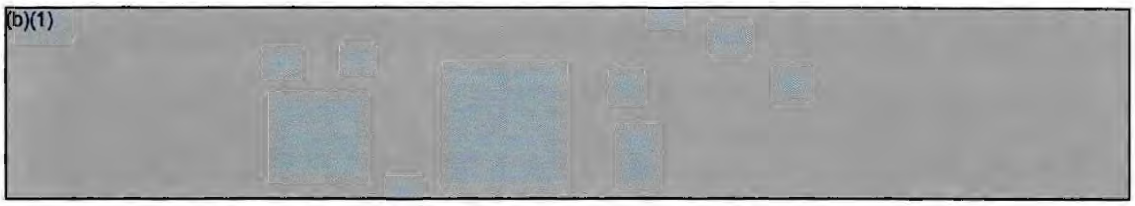
a. (U) Summary -- (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	764.8	0.0	0.0	764.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	+142.6	-	-	+142.6
Engineering	-350.5	-	-	-350.5
Estimating	+393.3	-	-	+393.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+185.4	-	-	+185.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-838.9	-	-	-838.9
Support	-	-	-	-
Subtotal	-838.9	-	-	-838.9
Total Changes	-653.5	-	-	-653.5
Current Estimate	111.3	-	-	111.3

b. (U) Previous Change Explanations --

(b)(1)

(b)(1)



c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation rates. (Economic)	--	-45.7
Termination of the AN/SQY-1 development program at completion of the Demonstration/Validation phase. (Other)	-838.9	-1153.1
Total Changes	-838.9	-1198.8

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Not Applicable.

Not required for RDT&E only SAR.

15. (U) Contract Information: None.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 100.0% (4 yrs/4 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($131.8 / $131.8)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY88-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	131.8	-	-	-	131.8
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	131.8	-	-	-	131.8

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1988				18.1	20.1	20.1	15.7	3.0
1989				32.3	37.5	37.4	36.3	4.2
1990				46.4	56.0	55.8	54.1	4.0
1991				14.5	18.2	16.5	12.6	3.9
Subtot				111.3	131.8	129.8	118.7	
Grand Total				111.3	131.8	129.8	118.7	

17. (U) Production Rate Data:

a. (U) Annual Production Rates -- None.

b. (U) Cost Variance -- None.

c. (U) Schedule Variance -- None.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules -- None

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- None.

91-078 E

A-32 STINGER RMP

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: STINGER-RMP

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
FIM 92C Man-Portable Air Defense Guided Missile System (STINGER-RMP)

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:
AIR-TO-AIR MISSILE PROJECT OFFICE
SFAE-AD-ATA
REDSTONE ARS, AL 35898-5630
COL DONALD H. WATT, JR
Assigned: March 5, 1990
AV 746-6191 COMM (205)876-6191

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 64306A (Sunk)
Project D524
PROCUREMENT:
APPN 2032 ICN C18500 (Army)

Concur in Classification as marked
20 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

Classified by: STINGER SCG DATED 3 JAN 90
Declassify on: OADR
Downgrade Instructions: Not Subject to Automatic Downgrade

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 20 1992
5

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD(PA))
DEPARTMENT OF DEFENSE

OASD(PA) DFOISR 92-T-0613

5. (U) **Related Programs:**
AVENGER (Line of Sight Rear (LOS-R) Pedestal Mounted STINGER (PMS))
AH-64 (Apache)
OH-58C/D (Kiowa/Kiowa Warrior)
AH-1 (Cobra)

6. (U) **Mission and Description:**
The STINGER-RMP (reprogrammable microprocessor) Weapon System is an advanced man-portable, shoulder-fired, air defense system. It provides defense for ground forces against attack by low-flying aircraft and utilizes a passive infrared and ultraviolet homing guidance system which operates independently after aiming and launching by the operator. The system is comprised of the weapon (missile in launcher and reusable gripstock), an Identification Friend or Foe (IFF) unit, trainers, and ancillary equipment. The basic STINGER missile was an infrared seeking system fielded in 1981. The follow-on STINGER-POST (Passive Optical Seeker Technique) system updated the guidance system capability through the use of a dual color (infrared/ultraviolet) seeker. In response to other countermeasure threat advances, the STINGER-POST design was adapted to STINGER-RMP. The guidance functions of the STINGER-RMP are under software control and are reprogrammable via a memory module located in the gripstock, external to the missile. This will allow any future threat changes to be countered by changing the software in the memory module rather than by changing missile hardware. The STINGER systems replace the REDEYE Weapon System in order to counter the threat of the 1980's and 1990's. STINGER-RMP will provide the active army with a light air defense missile for defense of priority assets within the division against hostile aircraft using advanced infrared countermeasures. STINGER-RMP is also deployed on the OH-58C/D and qualified but not deployed on the AH-64 and AH-1 as AIR-TO-AIR STINGER (ATAS). This air-to-air launch capability enhances the survivability of the host aircraft.

7. (U) **Program Highlights:**
a. (U) Significant Historical Developments --
(U) The STINGER program began in 1972 and was completed in 1987. STINGER-POST initial hardware was available in February 1987. This program was completed with the final STINGER-POST missile delivered in September 1987. During the September 1989 reporting cycle, the STINGER SAR was separated into two reports: STINGER BASIC/POST and the STINGER-RMP. The STINGER BASIC/POST SAR was terminated due to completion of the program.

(U) The STINGER-RMP program is an outgrowth of the STINGER-POST Program. The program was initiated in June 1983 to improve performance in an infrared countermeasure environment and to allow change as the threat evolves. The first STINGER-RMP production contract was awarded in August 1985. The Fiscal Year 1987 letter

7a. (U) Program Highlights (Cont'd):

order contract was definitized into a three-year multiyear contract in March 1988. The second year portion of the three-year multiyear contract was signed in April 1988. In September 1987, a second source contract was awarded. Competition began with the FY 89 missile contract awarded in April 1990.

(U) The R&D program was extended from its intended conclusion date of July 1989 when sufficient performance to satisfy the contract had not been achieved. The R&D contract effort continued until May 1990, and included associated test requirements that resulted in test milestone slippages. The OSD Conventional Systems Committee (CSC) met on May 24, 1989 to review STINGER-RMP status pursuant to a decision to release FY 89 funding. The CSC released $225M in FY 89 funds to continue missile procurements for the Army and Marine Corps. The Army completed the approved test requirements in late October 1989. A program status update was held in November 1989 and the remaining FY 89 funds were released. Program revisions were submitted for Army Acquisition Executive (AAE) approval.

(U) On April 29, 1991 the unawarded portion of the FY 90 missile production program (1354 missiles) was awarded to General Dynamics as a modification to contract DAAH01-91-C-0025. This was a result of Raytheon, the second source contractor, not qualifying as scheduled.

b. (U) Significant Developments Since Last Report --
(U) On 3 May 91, the AAE approved reorganization of PEO, Air Defense which converted the STINGER Project Office to the Air-to-Air Missile Project Office.

(U) In August 1991, Raytheon was determined qualified to compete for the FY 91 missile procurement.

(U) DD250 acceptance of Raytheon, the second source, missiles began in December 1991.

(U) General Dynamics was awarded a competitive contract for 4359 of the FY 91 missile quantity on September 5, 1991.

(U) The Air-to-Air Missile Project Office is managing the STINGER retrograde/retrofit program at Red River Army Depot. The effort involves cleaning/refurbishment of missile rounds, gripstocks, containers, and battery coolant units (BCUs) returned from Southwest Asia.

(U) The program acquisition cost increased $16.1M TY / $14.4M BY. The demonstrated system effectiveness increased, as did the demonstrated weapon reliability.

7b. (U) Program Highlights (Cont'd):

(U) The STINGER-RMP is expected to meet mission requirements.

c. (U) Changes Since As Of Date -- None.

8. (U) Threshold Breaches:
There are currently no breaches to the Acquisition Program Baseline (APB) dated 4 Feb 91, and no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Production Estimate	Approved Program	Current Estimate
ASARC III	JUN 83	JUN 83	JUN 88
R&D Contract Award	SEP 84	SEP 84	SEP 84
Initial Production Contract Award	N/A	AUG 85	AUG 85
Development Test/Operational Test (DT/OT) Started	N/A	MAY 86	MAY 86
FY86 Production Contract Award	NOV 86	SEP 86	SEP 86
2nd Source Selection Award	N/A	SEP 87	SEP 87
Production Verification Test (PVT I) Pilot Lot Test Started	N/A	NOV 87	NOV 87
DT/OT Test Completed	N/A	DEC 87	DEC 87
FY87-89 Multiyear Contract Award (36 months)	N/A	MAR 88	MAR 88
PVT I Completed	N/A	APR 88	APR 88
Special Test (SANDIA)	N/A	MAY 88	MAY 88
Eng Development Test (Extension) Start	N/A	JUN 88	JUN 88
Test & Eval Master Plan Approval (Army)	N/A	MAR 89	MAR 89
PVT II Start	N/A	APR 89	APR 89
FY89 2nd Source Option Exercised	N/A	MAY 89	MAY 89
Initial Production Contract Deliveries Started	N/A	JUL 89	JUL 89
FY86 Production Deliveries Start	N/A	AUG 89	AUG 89
PVT II Complete	N/A	OCT 89	OCT 89
First Unit Equiped (FUE) USAREUR	NOV 87	NOV 89	NOV 89
FY89 Competitive Contract Award	N/A	APR 90	APR 90
FY87-89 MYP Deliveries Start	N/A	APR 90	APR 90
Eng Development Test (Extension) Complete	N/A	JUN 90	JUN 90
Performance Assessment	N/A	AUG 90	AUG 90
FUE FORSCOM	N/A	AUG 90	AUG 90
R&D Program Complete	DEC 87	MAY 90	OCT 90

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
FY90 Prime Contract Award	N/A	OCT 90	OCT 90
2nd Source Qualification Decision	N/A	MAR 91	AUG 91
FUE EUSA	N/A	SEP 92	NOV 91
FY90 Deliveries Start	N/A	MAY 92	OCT 92
FUE WESTCOM	N/A	AUG 93	JAN 93
FUE ARNG	N/A	JAN 94	JAN 94

b. (U) Previous Change Explanations --

Initial Production Contract Deliveries Started changed from October 1987 to July 1989 and FY 86 Production Deliveries Start changed from September 1988 to August 1989 both due to software related problems. Performance Assessment changed from March 1989 to October 1990, Eng Development Test (Extension) Complete changed from May 1989 to October 1990, and the R&D Program Complete changed from December 1989 to October 1990 due to extension of engineering development contract and to difficulties with the RMP software and test scheduling problems for tests to be performed with latest software. PVT II Complete changed from May 1989 to October 1989 due to extension of ED contract and expanded test program. The Follow-On Test & Evaluation Start changed from April 1989 to Sep 1990 and the Follow-On Test and Evaluation Complete changed from May 1989 to November 1990 due to increase in test scope and delays in completion of Government tests. The FY 87-89 Multiyear Deliveries Start changed from June 1989 to April 1990 due to software related problems. The 2d Source Pilot Lot Flight Test Start changed from January 1990 to November 1990, the 2d Source Pilot Lot Flight Test complete changed from July 1990 to April 1991, and the 2d Source Government Evaluation Flight Test Start changed from September 1990 to May 1991, 2d Source Government Evaluation Flight Test Complete changed from January 1991 to July 1991 due to program delays experienced because of problems with the test equipment development, proofing, and validation causing a delay in delivery of missiles for pilot lot test. The FY 87 2d Source Deliveries Start changed from February 1991 to May 1991 and the FY 89 2d Source Deliveries Start changed from May 1991 to August 1991 due to delays in completing hardware and pilot lot testing. Milestones for FOTE (Start and Complete), Second Source Pilot Lot Flight Test (Start and Complete), FY 87 2d Source Delivery Start, 2d Source Government Evaluation Flight Test (Start and Complete), and FY 89 2d Source Delivery Start were deleted in accordance with approved APB and Deviation Report since the second source contractor was having difficulties producing and testing STINGER-RMP missiles. The FY 90 Competitive Contract Award changed from April 1990 to September 1990

9b. (U) Schedule (Cont'd):
due to delays in the solicitation associated with the FY 90 Authorization Act restrictive language. FUE (EUSA) changed from October 1990 to March 1993 due to delays in missile acceptance until improvements in contract performance requirements were completed which caused changes in fieldings and because STINGER assets were diverted to support Operation Desert Shield; then rescheduled by DA from March 1993 to November 1991 to allow for simultaneous STINGER-RMP deployment to support AVENGER. The FUE (WESTCOM) changed from August 1993 to January 1993 because current production schedules show an increase in scheduled deliveries allowing for earlier deployment. The FUE (ARNG) changed from January 1994 to July 1992 due to change in sequence for issue and an update in HQDA DCSOPS Operation Desert Shield approved contingencies, and changed back to January 1994 due to prioritization of the Force Structure as directed by HQDA DCSOPS at the end of Operation Desert Storm. ED Test (Extension) Complete changed from September 1990 to June 1990 due to demonstration of flight tests to prove the latest production version of software (Mod IV). FY 89 Competitive Contract Award slipped from February 1990 to April 1990 due to pending DA guidance on the acceptance of hardware according to the FY 90 Authorization Bill. Performance Assessment for the latest gripstock and software was completed ahead of schedule, August 1990 in lieu of October 1990. FUE FORSCOM was completed ahead of schedule (August 1990 versus October 1990) due to Operation Desert Shield. FY 90 Deliveries Start changed from May 1992 to October 1992 since problems experienced under the RMP engineering development program caused the production and delivery schedules to stretch out. FY 90 Competitive Contract Award, renamed in revised APB as FY 90 Prime Contract Award, slipped from September 1990 to October 1990 due to award of the contract to the prime contractor only at this time. The competitive award was delayed due to problems associated with the second source contractor. Second Source Qualification Decision changed from March 1991 to August 1991 as the second source contractor was still in Qualification Testing and was determined qualified to compete for the FY 91 missile procurement at that time.

c. (U) Current Change Explanations -- None.

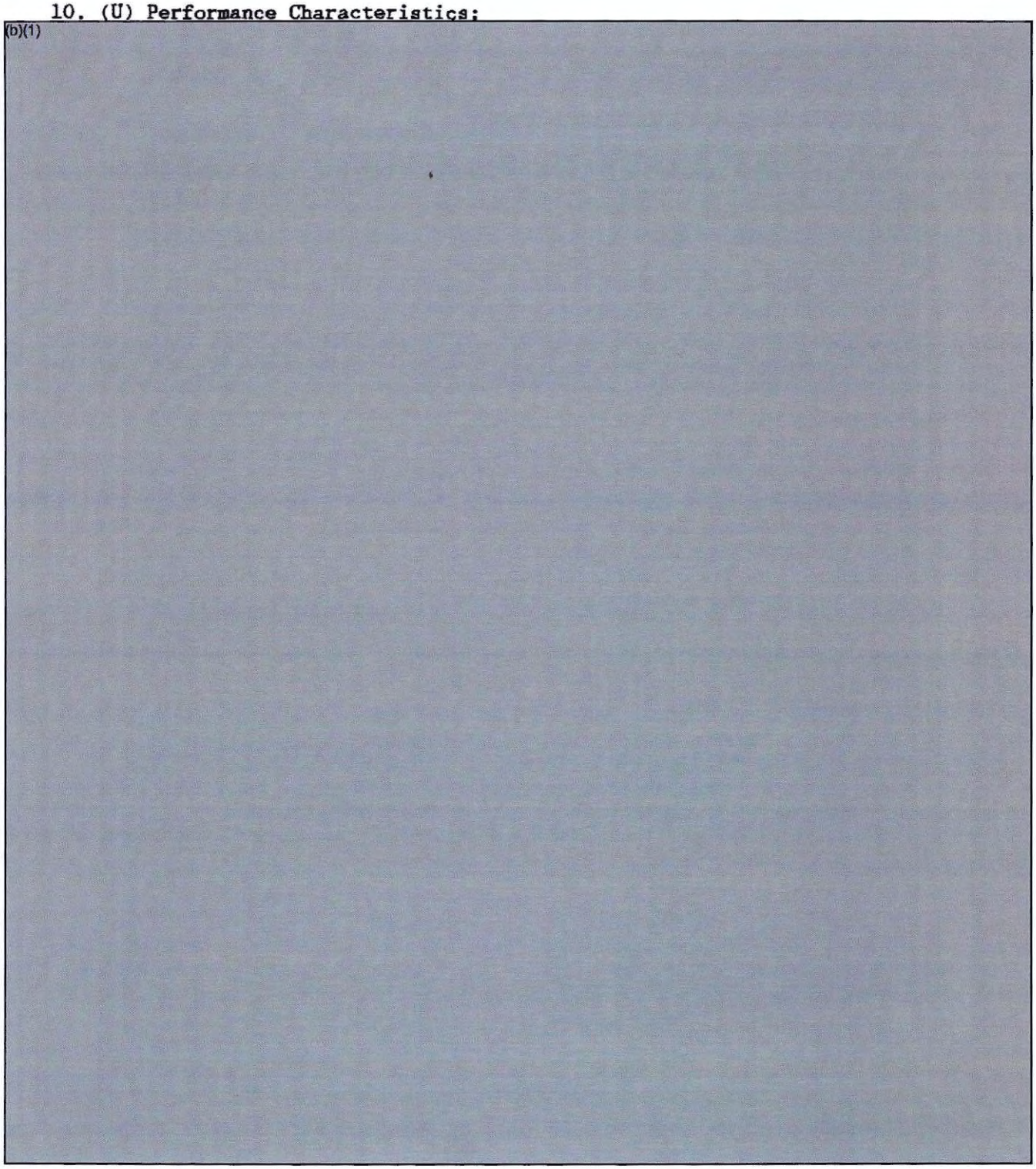
d. (U) References --

(U) Production Estimate:
Approved STINGER-RMP DCP dated June 6, 1983.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 4 February 1991.

10. (U) Performance Characteristics:

(b)(1)



10b. (U) Performance Characteristics (Cont'd):

b. (U) Previous Change Explanations --

System effectiveness changed based on reliability evolution and performance. Weight changed based on improved gripstock. Esi values in previous reports replaced Eso values in December 1988 report. Current Estimate for Weapon Reliability was erroneously reported in a previous SAR as 0.89. Previously demonstrated performance was not representative of current software. Missile performance based on MICOM Performance Estimate and current understanding of infrared countermeasures effects were incorporated in the Eso formula. System effectiveness changed to reflect performance assessment results from flight tests completed in August 1990.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Production Estimate:
Approved STINGER-RMP DCP dated June 6, 1983.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 4 February 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	52.3	46.1	46.1
Procurement	2215.3	1089.7	1104.1
Flyaway	(2095.7)		(1020.4)
Total Flyaway	(2095.7)		(1020.4)
Other Wpn Sys Cost	(119.6)		(83.7)
Total Other Wpn Sys	(119.6)		(83.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 83 Base-Year $	2267.6	1135.8	1150.2
Escalation	693.6	348.6	350.3
Development (RDT&E)	(7.0)	(3.2)	(3.2)
Procurement	(686.6)	(345.4)	(347.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2961.2	1484.4	1500.5

11b. (U) Total Program Cost and Quantity (Cont'd):

b. (U) Quantity --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	6	N/A	9
Procurement	36028	28799	28799
Total	36034	28799	28808

The Army will procure the maximum number of supportable systems consistent with the dollars appropriated.

c. (U) Foreign Military Sales --
(Dollars in Millions)

(U)	Germany	73.8
(U)	Israel	12.9
(U)	Japan	80.0
(U)	Norway	.3
(U)	Switzerland	54.9
(U)	Greece	43.2
(U)	Portugal	1.2
(U)	Denmark	57.9
	Total	$324.2

As of 31 Dec 91, sales are $324.2 for 2249 STINGER-RMP (less reprogrammable module) Missiles, Training/Training Support Equipment, TDP and/or services. Dollar amounts indicated for Germany and Switzerland include foreign military sales (FMS) cases in support of the European STINGER dual production and the Swiss STINGER coproduction programs, respectively.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Production Estimate:
Approved STINGER-RMP DCP dated June 6, 1983.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 4 February 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1500.5	1484.4	1500.5
(2) Quantity	28808	28808	28808
(3) Unit Cost	0.052	0.052	0.052
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	38.2	38.2	9.5
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	38.2	38.2	9.5
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	59.3	2901.9	0.0	2961.2
Previous Changes:				
Economic	-1.2	+19.8	-	+18.6
Quantity	+0.2	-306.3	-	-306.1
Schedule	-	+241.7	-	+241.7
Engineering	+3.7	-	-	+3.7
Estimating	-12.7	-1359.4	-	-1372.1
Other	-	-	-	-
Support	-	-62.6	-	-62.6
Subtotal	-10.0	-1466.8	-	-1476.8
Current Changes:				
Economic	-	-6.3	-	-6.3
Quantity	-	-661.9	-	-661.9
Schedule	-	-139.0	-	-139.0
Engineering	-	-	-	-
Estimating	-	+802.7	-	+802.7
Other	-	-	-	-
Support	-	+20.6	-	+20.6
Subtotal	-	+16.1	-	+16.1
Total Changes	-10.0	-1450.7	-	-1460.7
Current Estimate	49.3	1451.2	-	1500.5

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	52.3	2215.3	0.0	2267.6
Previous Changes:				
Quantity	+0.6	-278.1	-	-277.5
Schedule	-	+148.8	-	+148.8
Engineering	+3.7	-	-	+3.7
Estimating	-10.5	-947.3	-	-957.8
Other	-	-	-	-
Support	-	-49.0	-	-49.0
Subtotal	-6.2	-1125.6	-	-1131.8
Current Changes:				
Quantity	-	-402.2	-	-402.2
Schedule	-	-72.4	-	-72.4
Engineering	-	-	-	-
Estimating	-	+475.9	-	+475.9
Other	-	-	-	-
Support	-	+13.1	-	+13.1
Subtotal	-	+14.4	-	+14.4
Total Changes	-6.2	-1111.2	-	-1117.4
Current Estimate	46.1	1104.1	-	1150.2

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Quantity: Additional 3 Missiles.

Engineering: Addition and deletion of PMS; Safeguard Interlock System.

Estimating: Revision of PMS estimate. Delete STINGER follow-on. Current/prior year inflation offset.

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Additional 8080 missiles for Sgt York and 444 additional peace-time losses due to stretch out of program. Additional Army of Excellence quantities

13b. (U) Cost Variance Analysis (Cont'd):

and deletion of Sgt York missiles. Added 5825 missiles in FY 96 to reach the revised Army Acquisition Objective (AAO). Added 270 missiles to FY 91. Terminated FY92-96 procurement (-30260 missiles) due to Army reevaluation of missile requirements and prioritizations.

Schedule: Moved 1750 missiles from FY 93 to FY 89. Moved 639 missiles from FY 87 to FY 93. Shift of 530 missiles to outyears.

Estimating: Adding additional tooling costs and changing cost estimating methodology and cost savings from actual contracts. Unit cost reduction and revised ECO estimate; addition of estimated warranty risk balance of cost of 8524 missiles added for Sgt York, additional peacetime losses, and the addition of Pedestal Mounted STINGER. Deletion of PMS; quantity change from 6000 per year to 5000 per year. MYP/2nd Source Savings. Correction of prior variances & mis-categorization to reconcile flyaway cost. Revised cost estimating methodology, and revised flyaway definition (to incorporate gripstocks and containers). Current/prior year inflation offset.

Support: Decrease in support costs associated with the reduction of ground support equipment, reduction of 30,260 missiles, and revised flyaway definition (which transfers gripstocks and containers into the flyaway line). Transferred $2.7M Base Year/$4.5M Then Year to STINGER line for support of Total Package Fielding (TPF). Correction of prior variance mis-categorization to reconcile flyaway support costs.

c. (U) Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised inflation indices dated 9 Jan 92. (Economic)		-6.3
Current and prior inflation offset. (Estimating)	4.1	5.9
Additional Battery Coolant Units (BCUs) to support Desert Storm. (Estimating)	2.8	3.9
Revised flyaway estimate incorporating revised FY 90, 91 missile cost and revised test requirements. (Estimating)	-1.3	-2.0
Deletion of 5 Moving Target Simulators (MTS) and 2184 STINGER Launch Simulator (STLS) eject missiles. (Support)	-7.5	-11.3
Desert Storm supplemental for retrograde of missiles deployed to SWA. (Support)	8.0	12.0
Increased Total Package Fielding requirement/refined estimate. (Support)	8.3	13.9
Correction of miscategorization of support element reported as flyaway.		
(Estimating)	-4.3	-6.0
(Support)	4.3	6.0
Correction of prior SAR category allocation associated with the decrease of 30,260 missiles.		
Deletion of prior SAR variance calculated from CE curve. (Quantity)	740.0	1212.9
Variance calculated from baseline quantity curve. (Quantity)	-1142.2	-1874.8
Allocation of schedule variance associated with quantity decrease. (Schedule)	-72.4	-139.0
Allocation of estimating variance associated with quantity decrease. (Estimating)	474.6	800.9
Total Changes	14.4	16.1

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.082	--	-0.013	0.004	--	-0.020	--	-0.001	-0.030	0.052

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) Procurement --

(U) FY87 & FY89-PRODUCTION:	Initial Contract Price		
	Target	Ceiling	Qty
RAYTHEON, BEDFORD, MA DAAH01-87-C-A070, FPI Award: September 26, 1987 Definitized: September 26, 1987	$26.4	$26.4	400

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$87.5	$87.5	1900	$87.5	$87.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-27.6	$-8.4
Cumulative Variances To Date (12/31/91)	$-35.1	$-4.9
Net Change	$-7.5	$3.5

Explanation of Change:

The cost variance is due to process problems in manufacturing, resulting in a large amount of rework. The schedule variance is a result of the large amount of rework. The estimated May 92 completion date is based upon the latest negotiated schedule. Contract price increased $5.6M due to additional amortization of test equipment.

Contract quantity includes all customers.

Note: The government's liability is limited to $87.5M; however, the PM estimates the contractor's cost at completion will be $125.8M.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) RMP FY87-89:PROD/ENG SVC:	Initial Contract Price Target	Ceiling	Qty
GENERAL DYNAMICS, POMONA, CA DAAH01-87-C-0607, FFP/CPA Award: August 26, 1987 Definitized: March 21, 1988	$695.6	N/A	20514

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$738.4	N/A	20514	$738.4	$738.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract Performance Reporting is not required for this FFP/CPAF contract. Contract quantity includes all customers.

(U) RMP FY89-ADD-ON:	Initial Contract Price Target	Ceiling	Qty
GENERAL DYNAMICS, RANCHO CUCAMONGA, CA DAAH01-90-C-0078, FFP Award: March 30, 1990 Definitized: March 30, 1990	$68.5	N/A	2458

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$68.5	N/A	2458	$68.5	$68.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract Performance Reporting is not required for this Firm Fixed Price (FFP) contract. Contract quantity includes all customers.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) RMP FY89-ADD-ON:	Initial Contract Price Target	Ceiling	Qty
RAYTHEON, BEDFORD, MA DAAH01-90-C-0427, FFP Award: April 13, 1990 Definitized: June 25, 1991	$45.1	N/A	1383

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$45.1	N/A	1383	$45.1	$45.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract Performance reporting is not required for this FFP Contract. Contract quantity includes all customers.

Award/Definitized dates were erroneously reported in December 1990 SAR.

(U) RMP FY90-PRODUCTION:	Initial Contract Price Target	Ceiling	Qty
General Dynamics, Rancho Cucamonga, CA DAAH01-91-C-0025, FFP Award: October 5, 1990 Definitized: October 5, 1990	$29.9	N/A	1021

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$71.5	N/A	2375	$71.5	$71.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract performance reporting is not required for this FFP contract. The entire contract quantity (2375) is for the Army.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) RMP FY91-PRODUCTION:	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL DYNAMICS, RANCHO CUCAMONGA, CA DAAH01-91-C-0678, FFP Award: September 5, 1991 Definitized: September 5, 1991	$114.2	N/A	4413

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$134.6	N/A	5490	$134.6	$134.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Contract Performance Reporting is not required for this FFP contract. Contract quantity includes all customers. Contract increased due to exercising of options for 1077 missiles.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 66.7% (10 yrs/15 yrs)

(2) Percent Program Cost Appropriated: 98.5% ($1477.8 / $1500.5)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	49.3	-	-	-	49.3
Procurement	1390.3	38.2	9.5	13.2	1451.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1439.6	38.2	9.5	13.2	1500.5

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY83 Dollars Nonrec	Flyaway FY83 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army								
1983				20.3	20.0	20.0	20.0	4.9
1984								3.8
1985				4.5	5.0	5.0	5.0	3.4
1986				15.5	17.5	17.5	17.3	2.8
1987				3.3	3.8	3.8	3.8	2.7
1988				2.5	3.0	3.0	2.5	3.1
Subtot	9			46.1	49.3	49.3	48.6	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2032 Missile Procurement, Army								
1985	2360		158.9	167.7	198.9	194.8	194.5	2.4
1986	2909		153.4	174.7	212.2	211.2	210.3	3.9
1987	3541		151.4	157.8	199.2	196.9	187.8	3.6
1988	3942		124.4	129.8	169.7	169.7	169.6	4.0
1989	6750		172.2	177.3	241.3	241.3	142.1	4.2
1990	2375		76.9	83.3	116.8	87.5	14.9	4.0
1991	6922		171.9	174.0	252.2	133.1	1.2	3.9
1992			7.4	25.5	38.2	1.0	0.4	3.1
1993			3.9	6.1	9.5			3.3
1994				2.2	3.5			3.3
1995				1.8	3.0			3.3
1996				2.3	3.9			3.2
1997				1.6	2.8			3.2
Subtot	28799		1020.4	1104.1	1451.2	1235.5	920.8	
Grand Total	28808		1020.4	1150.2	1500.5	1284.8	969.4	

Note: Flyaway beyond last year of procurement is for annualized in-house costs to support production.

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1985	0	3933	2360	2360
1986	0	6467	2909	2909
1987	0	6675	3541	3541
1988	0	8113	3942	3942
1989	0	7486	6750	6750
1990	0	3354	2375	2375
1991	0	0	6922	6922
1992	0	0	0	0
1993	0	0	0	0
1994	0	0	0	0
1995	0	0	0	0
1996	0	0	0	0

Annual Production Rates -- Based on a 1-8-5 production schedule. The Annual production rates differ from the annual funded quantities as shown because the funded delivery period for Fiscal Year 1990 is 5 months.

The above production rates reflect fiscal year procurements.

17b. (U) Production Rate Data (Cont'd):

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	2267.6	-1117.4	1150.2	+2.4	1147.8
(TY $)	2961.2	-1460.7	1500.5	+2.1	1498.4
PAUC Cost (BY $)	0.063	-0.023	0.040	0.000	0.040
(TY $)	0.082	-0.030	0.052	0.000	0.052

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	AUG 85	0	AUG 85	N/A	AUG 85
Duration (in MON)	92	9	101	0	101
End Date(MON YY)	APR 93	9	JAN 94	N/A	JAN 94

d. (U) Deliveries (Plan/Actual) --

	To Date 9/9
RDT&E	
Procurement	16102/16302

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The STINGER-RMP Baseline Cost Estimate (BCE), dated July 1989 was the source document for developing the Operating and Support (O&S) Costs. Year 2002 was selected for O&S Cost Analysis as it depicted a typical year for sustainment activities with all 59059 missiles produced and deployed. Numbers of personnel for cost estimating were derived from the organizational structure of the 2nd BTN, 67th ADA, Fort Riley, KS. Attrition rates, training costs and loss rates were obtained from the MOS Training Cost Handbook, OMA MPA Cost Factor Handbook and

18a. (U) Operating and Support Costs (Cont'd):
historical data. An AMC directed value of the 1440 miles per year was utilized in determining Petroleum, Oil and Lubricants (POL) requirements with POL diesel costs estimated at the consumption rate of 10 miles per gallon. STINGER-RMP has no antecedent system.

Note: The latest BCE for Operating and Support (O&S) was developed in accordance with the new streamlining policy per DA. This excluded certain O&S cost elements; therefore, the O&S represents cost from the last full BCE (Qty 59059 in lieu of 28799).

b. (U) Costs -- (FY 1983 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Missile	Avg Annual Cost Per (Antecedent)
Personnel	3.0	N/A
O&S Consumables	0.0	N/A
Direct Depot Maint	0.4	N/A
Sustain Invest	0.0	N/A
Other Direct Costs	0.0	N/A
Indirect Costs	0.0	N/A
Total	3.4	N/A

18c. (U) Operating and Support Costs (Cont'd):

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Depot Maintenance	2.7	1.9	1.2	---	5.8
Cont Log Spt (CLS)	0.3	---	---	---	0.3
Sustaining Eng	0.4	---	---	---	0.4
Other	0.2	---	---	---	0.2
Total	3.6	1.9	1.2	---	6.7

Depot Maintenance: Provide for repair and overhaul of the STINGER system.

Note: Reference Section 18.b
Dollars are in thousands, not millions as indicated.

A-22 LONGBOW HELLFIRE

91-069

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LONGBOW HELLFIRE

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
LONGBOW HELLFIRE

CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 24 1992
S

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
PROJECT MANAGER, AIR-TO-GROUND MSL — COL ROBERT E. HUSTON
SYS PROJ OFC ATTN: SFAE-FS-HD — Assigned: February 1, 1988
RSA, AL 35898-5610 — AV 746-1365 COMM (205) 876-1365

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 64816 Project C27
PROCUREMENT:
APPN 2032 ICN C70300 (Army)

Concur in Classification as marked
24 MAR 1992
SECURITY REVIEW, OSD/WHS, WHSA

5. (U) **Related Programs:**
AH-64 Longbow Apache Helicopter

Classified by: [redacted] Security Classification Guide
Declassify on: Originating Agency's Determination Required (OADR)
Downgrade Instructions: Not Subject to Automatic Downgrade

(THIS PAGE IS [redacted])

OASD(PA) DFOISR 91-T-0675

*** [redacted] ***

6. (U) Mission and Description:
HELLFIRE is an air-to-ground missile system designed to defeat individual hardpoint targets and minimize exposure of the delivery vehicle to enemy fire. The missile configuration has the capability for modular seeker replacements. A version of the missile utilizing a laser seeker, laser HELLFIRE, is presently in production and a version utilizing a radar frequency seeker, Longbow HELLFIRE, is in the beginning stages of full scale development. HELLFIRE does not replace another missile system in the air-to-ground role.

Longbow HELLFIRE will be employed on the AH-64 Apache helicopter and will provide the capability to conduct battle both day and night in adverse weather and with battlefield obscurants present. Longbow also offers a fire and forget capability which complements the semi-active laser HELLFIRE missile. The Longbow HELLFIRE Missile contains a Radar Frequency Seeker which will provide a lock-on before launch (LOBL) or lock-on after launch (LOAL) capability, depending on target range and movement parameters. Longbow will not change the AH-64 mission or role, but will provide for increased mission effectiveness by enhancing lethality and survivability. It is envisioned that Longbow HELLFIRE will be used on the Comanche as a pre-planned product improvement item.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
In 1981, the U.S. Army Aviation Applied Technology Directorate, Fort Eustis, Virginia, conducted competition and awarded parallel competitive technology demonstration contracts to Martin Marietta Corporation (MMC) and Westinghouse Electric Corporation (WEC) for a fire control radar to be integrated and tested on the AH-64 Apache. In late 1981, after a series of study efforts, a [redacted] program was initiated for a millimeter wave radar seeker for the HELLFIRE Modular Missile System which, in conjunction with the fire control radar, yielded a total systems approach for Apache. In 1982, WEC and MMC were again awarded parallel competitive contracts for the firet phase of this program named the Critical Technology Demonstration (CTD). During the three-plus years of the CTD program, both MMC and WEC demonstrated that the technology was in hand for further systems development. As a result of a Government In-Process Review in August 1985, a contract was awarded in November 1985 to MMC and WEC, ae a joint venture (JV), for preliminary design of the tactical Longbow System. This was followed in August 1986 by the award of a Proof of Principle demonstration contract to the JV. An Initial Design Phase contract was awarded to the JV in September 1989. Proof of principal of the Longbow missile was accomplished 11 Apr 90. The Defense Acquisition Board (DAB) granted approval for full scale development (FSD) of the Longbow Missile 5 Dec 90, and a letter contract for FSD of the Longbow missile was awarded 26 Dec 90.

7b. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report --
The letter contract for full-scale development of the missile and launcher was definitized 7 May 91. Interface and development tests of engineering models of missile subassemblies are ongoing. Software detailed design is well in progress. The critical design review is planned for Mar - Jun 92. An In-Process Review with the Army Acquisition Executive was conducted 12 November 1991. There were no technical or contract issues for the missile or launcher. The RDT&E funding line for the Longbow HELLFIRE missile is shared with Longbow Apache.

The Longbow HELLFIRE Modular Missile System is expected to satisfy all mission requirements.

c. (U) Changes Since As Of Date --
Colonel Charles W. Greer replaced Colonel Robert E. Huston as Project Manager effective 3 Feb 92.

8. (U) Threshold Breaches:
There are no breaches to the Acquisition Program Baseline (APB), 6 March 1991. There are no Nunn/McCurdy Unit Cost breaches.

9. (U) Schedule:

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone I In-Process Review	AUG 85	AUG 85	AUG 85
Milestone IB ASARC	JUL 89	JUL 89	JUL 89
Milestone II DAB	DEC 90	DEC 90	DEC 90
FSD Contract Award	DEC 90	DEC 90	DEC 90
Component Qual Test			
Start	MAY 93	MAY 93	MAY 93
Complete	SEP 93	SEP 93	SEP 93
System Qual Test			
Start	MAR 94	MAR 94	MAR 94
Complete	NOV 94	NOV 94	NOV 94
Milestone IIIA (DAB)	MAR 95	MAR 95	MAR 95
Low-Rate Initial Production Contract Award	APR 95	APR 95	MAR 95(Ch-1)
First Production Delivery	SEP 96	SEP 96	JUN 96(Ch-1)
Full-Rate Production Contract Award	DEC 96	DEC 96	NOV 96(Ch-1)

(b)(1)

9b. (U) Schedule (Cont'd):

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

(1) Low-Rate Initial Production (LRIP) Contract Award is changed from Apr 95 to Mar 95, First Production Delivery is changed from Sep 96 to Jun 96, and Full-Rate Production Contract Award is changed from Dec 96 to Nov 96 as a result of definitization of the LRIP options.

d. (U) References --

(U) Development Estimate:
DAE Acquisition Program Baseline dated 8 March 1991.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

10. (U) Performance Characteristics:

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Maximum Range (km)	(b)(1)			

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

None.

10d. (U) **Performance Characteristics (Cont'd):**

d. (U) References --

(U) Development Estimate:
DAE Acquisition Program Baseline dated 8 March 1991.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

11. (U) **Total Program Cost and Quantity:** (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	303.4	303.4	303.0
Procurement	1344.7	1344.7	1368.7
Flyaway	(1323.7)		(1347.7)
Total Flyaway	(1323.7)		(1347.7)
Other Wpn Sys Cost	(3.9)		(3.9)
Total Other Wpn Sys	(3.9)		(3.9)
Peculiar Support	(17.1)		(17.1)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 91 Base-Year $	1648.1	1648.1	1671.7
Escalation	542.2	542.2	496.8
Development (RDT&E)	(28.2)	(28.2)	(24.6)
Procurement	(514.0)	(514.0)	(472.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2190.3	2190.3	2168.5

b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	10896	10896	10896
Total	10896	10896	10896

(1) An LRIP I quantity of 500 and an LRIP II quantity of 618 was planned at Milestone II.

(2) Excludes 67 RDT&E prototypes that are not considered fully configured end items.

c. (U) Foreign Military Sales -- None.

11d. (U) Total Program Cost and Quantity (Cont'd):

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
DAE Acquisition Program Baseline dated 8 March 1991.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2168.5	2190.3	2168.5
(2) Quantity	10896	10896	10896
(3) Unit Cost	0.199	0.201	0.199
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	331.6	1858.7	0.0	2190.3
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-3.4	-51.8	-	-55.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.6	+34.0	-	+33.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-4.0	-17.8	-	-21.8
Total Changes	-4.0	-17.8	-	-21.8
Current Estimate	327.6	1840.9	-	2168.5

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	303.4	1344.7	0.0	1648.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.4	+24.0	-	+23.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.4	+24.0	-	+23.6
Total Changes	-0.4	+24.0	-	+23.6
Current Estimate	303.0	1368.7	-	1671.7

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-3.4
Current & prior inflaction offset. (Estimating)	1.2	1.1
Reduction in hardware requirements for qualification. (Estimating)	-1.6	-1.7
Total Changes	-0.4	-4.0

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices. (Economic)	N/A	-51.8
Change in estimating methodology, contracted for not-to-exceed prices for all-up-rounds. (Estimating)	24.0	34.0
Total Changes	24.0	-17.8

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.201	-0.005	--	--	--	0.003	--	--	-0.002	0.199

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) LONGBOW:	Initial Contract Price Target	Ceiling	Qty
JV MMC/WEC, Orlando, FL DAAH01-91-C-0057, CPIF/AF Award: December 26, 1990 Definitized: May 7, 1991	$265.6	N/A	N/A

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$265.6	N/A	N/A	$265.6	$270.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (10/27/91)	$-1.6	$-2.4
Net Change	$-1.6	$-2.4

Explanation of Change:

The primary contributor to the negative cost and schedule variances is the transceiver. Other much smaller contributors are the inertial measuring system, exciter, software and system engineering design. The Program Manager is actively working with the contractor to

15. (U) **Contract Information**: Cont'd (Then-Year Dollars in Millions) develop corrective action plans to eliminate, offset or minimize the unfavorable balances. The negative schedule variance represents a behind schedule condition of approximately 2 months, which will have minimal program impact. The impact of the variances on price at completion, if the trend is sustained, is shown above. There is no impact of the variances on unit costs.

16. (U) **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 18.2% (2 yrs/11 yrs)

(2) Percent Program Cost Appropriated: 7.5% ($162.5 / $2168.5)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2001)	Total
RDT&E	61.2	101.3	86.0	79.1	327.6
Procurement	-	-	-	1840.9	1840.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	61.2	101.3	86.0	1920.0	2168.5

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1991				59.6	61.2	61.1	47.9	3.9

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1992				95.6	101.3	21.1	0.3	3.1
1993				78.6	86.0			3.3
1994				44.7	50.5			3.3
1995				24.5	28.6			3.3
Subtot				303.0	327.6	82.2	48.2	
Appropriation: 2032 Missile Procurement, Army								
1994		14.6	13.7	28.3	33.0			3.3
1995	500		127.1	128.0	154.3			3.3
1996	618		135.3	136.4	169.6			3.2
1997	572		114.9	115.3	148.0			3.2
1998	1500		202.6	203.6	269.7			3.2
1999	2500		265.8	267.4	365.5			3.2
2000	2700		260.8	267.6	377.5			3.2
2001	2506		212.9	222.1	323.3			3.2
Subtot	10896	14.6	1333.1	1368.7	1840.9			
Grand Total	10896	14.6	1333.1	1671.7	2168.5	82.2	48.2	

16c. (U) **Program Funding Summary (Cont'd)**:
FY 94 funds procure long lead items and initial production facilitization.

17. (U) **Production Rate Data**:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1995	500	0	500	0
1996	618	0	618	0
1997	572	0	572	0
1998	1500	0	1500	0
1999	2500	0	2500	0
2000	2700	0	2700	0
2001	2506	0	2506	0

(1) The funded delivery periods (current estimate) are: FY 95 - 15 mos; FY 96-01 - 12 mos.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	1671.7	N/A	N/A
(TY $)	N/A	N/A	2168.5	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	0.153	N/A	N/A
(TY $)	N/A	N/A	0.199	N/A	N/A

17c. (U) **Production Rate Data (Cont'd)**:

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	JUN 96	N/A	N/A
Duration (in MON)	N/A	N/A	86	N/A	N/A
End Date(MON YY)	N/A	N/A	AUG 03	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 10896 - @ Peak Rate: 225.0/mo			
FY 91 Base-Year $	0.100	0.100	0.000
Then Year $	0.200	0.200	0.000
@ Qty 1690 (1st three years) - @ Peak Rate: 52.0/mo			
FY 91 Base-Year $	0.200	0.200	0.000
Then Year $	0.300	0.300	0.000

18. (U) **Operating and Support Costs**:

a. (U) Assumptions and Ground Rules --

Operation and support costs for Longbow HELLFIRE are further categorized into fielding and sustainment costs. Fielding costs include initial repair parts, transportation and second destination transportation. Under the philosophy of a "certified round" concept, Longbow HELLFIRE sustainment costs should be minimum. The sustainment phase cost are for FY 96 through FY 20, Baseline Cost Estimate, dated Mar 90. The following efforts are considered applicable:

- o Replenishment spares for support equipment.

- o Annual overhaul of Longbow HELLFIRE equipment - ten percent of missiles in storage will be checked annually. Of the items checked,

18a. (U) Operating and Support Costs (Cont'd):
those that fail will be shipped to the depot for overhaul and return. Costs are based on predicted failure rate and average cost to repair.

- o Transportation costs associated with annual overhaul.
- o Modification and material
- o System Project Management
- o Surveillance Program.

There is no antecedent system.

b. (U) Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Missile	Avg Annual Cost Per Antecedent
Fielding	0.1	N/A
Sustainment	0.1	N/A
Total	0.2	N/A

c. (U) Contractor Support Costs -- None.

91-056

A-13 CSSCS

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: CSSCS

AS OF DATE: December 31, 1991

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SECURITY Objection
RELEASE
20 MAR 1992
Grace Bromwell
DCSINT, HQDA

1. **Designation and Nomenclature (Popular Name):**
   Combat Service Support Control System (CSSCS)

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
   PM CSSCS
   ATTN: SFAE-CC-CSS
   BLDG 1908
   FT BELVOIR, VA 22060-5375

   COL JAMES R. STEVERSON
   Assigned: July 30, 1990
   AV 345-7470 COMM (703) 355-7470

CLEARED
FOR OPEN PUBLICATION
MAR 20 1992 5
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD - A)
DEPARTMENT OF DEFENSE

4. **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 63805 (Shared) Project D091
   PROCUREMENT:
   APPN 2035 ICN W34600 (Army)
   APPN 2035 ICN BA9106 (Army) (Shared) PEO CCS SPARES

5. **Related Programs:**
CSSCS is an integral part of the Army Tactical Command and Control System. Other inter-related programs are: Maneuver Control System (MCS), All-Source Analysis System (ASAS), Advanced Field Artillery Tactical Data System (AFATDS), Forward Area Air Defense Command and Control (FAADC2) System and ATCCS Common Hardware and Software.

*** [redacted] ***

6. Mission and Description:
The Combat Service Support Control System (CSSCS) is one of the five Battlefield Functional Area (BFA) systems which comprise the Army Tactical Command and Control System (ATCCS). The CSSCS will support Fire Support, Air Defense, Maneuver Control, and Intelligence-Electronic Warfare BFA's in the Active Army, Army Reserve and National Guard components. The CSSCS will provide critical logistical, medical, and personnel information to force and theater level commanders in a timely, integrated and accurate fashion. This automated processing of critical data from the Combat Service Support (CSS) Standard Army Management Information Systems (STAMIS) and from subordinate organizational headquarters will be analyzed and integrated into informational reports for evaluating current and projected sustainment capabilities. The CSSCS will correct the deficiencies of the current manual CSS Command and Control (C2) system that severely hampers the ability of the CSS commanders to provide and sustain adequate support for the Air-Land battle.

The CSSCS also provides CSS Commanders and their Staffs automated C2 capabilities. Automated capabilities include: CSS planning, decision support, critical resource tracking, access to the ATCCS common battlefield picture, briefing support, preparation and dissemination of orders and information exchange with other ATCCS BFA systems.

The CSSCS will be comprised of ATCCS common hardware, Common ATCCS Support Software (CASS), CSSCS-unique software and any CSSCS-unique hardware identified during development. This hardware and software, housed in the Standard Integrated Command Post System (SICPS) family of shelters, will enable CSS commanders and staffs to receive, analyze, process, and disseminate essential and critical C2 information and thus to more effectively manage resources in support of Air-Land battle operations.

7. Program Highlights:

a. Significant Historical Developments --
PEO CCS chartered the CSSCS Project Management Office on 22 February 1988 to support decisions on the employment of resources and to communicate these decisions to support elements. During FY 1989, the Under Secretary of the Army decided that CSSCS would be managed as a Major Defense Acquisition Program. CSSCS was approved for Engineering and Manufacturing Development by the Army Systems Acquisition Review Council in December 1990. On 1 February 1991, the Version 3&4 software development contract was awarded to TRW.

CSSCS is expected to satisfy mission requirements.

b. Significant Developments Since Last Report --
The CSSCS Version 3, Build 0 software was completed and turned over for technical testing in November 1991 on schedule.

7c. **Program Highlights (Cont'd):**

c. Changes Since As Of Date --
The CSSCS Version 3, Build 1 Critical Design Walkthrough (CDW) and Embedded Training Software Specification Review (SSR) were held at TRW during 4-8 Nov 91. The CSSCS Version 3, Build 0 software was turned over for testing by TRW in November 1991 on schedule.

8. **Threshold Breaches:**
There are no breaches to the approved Acquisition Program Baseline (APB) dated October 31, 1991 and no Nunn-McCurdy unit cost breaches.

9. **Schedule:**

a. Milestones --

	Development Estimate	Approved Program	Current Estimate
ROC Approved	JUL 88	JUL 88	JUL 88
Solicitation Issued	JUN 90	JUN 90	JUN 90
ROC Revised	SEP 90	SEP 90	SEP 90
Milestone I/II (ASARC)	DEC 90	DEC 90	DEC 90
Dev Contract Award (V 3&4)	FEB 91	FEB 91	FEB 91
SDR Version 3	MAY 91	MAY 91	MAY 91
SSR Version 3	SEP 91	SEP 91	NOV 91
PDR Version 3	DEC 91	DEC 91	MAR 92(Ch-1)
CDR Version 3	MAR 92	MAR 92	JUN 92(Ch-1)
Begin Version 4 Prototyping	JUL 92	JUL 92	JUL 92
Tech Test Version 3			
Start	NOV 92	NOV 92	AUG 92
Complete	JAN 93	JAN 93	JAN 93
Begin Version 4	MAR 93	MAR 93	MAR 93
IOT&E Version 3			
Start	FEB 93	FEB 93	MAY 93(Ch-1)
Complete	APR 93	APR 93	JUN 93(Ch-1)
Milestone III (ASARC)	AUG 93	AUG 93	AUG 93
OSD C3I Committee Review	SEP 93	SEP 93	SEP 93
Begin Version 3 Fielding	APR 94	APR 94	APR 94
First Unit Equipped	APR 93	APR 93	JUN 93(Ch-1)
IOC Version 3	APR 94	APR 94	APR 94
PDR Version 4	SEP 93	SEP 93	SEP 93
CDR Version 4	DEC 93	DEC 93	DEC 93
Dev Contract Award Version 5	MAR 95	MAR 95	MAR 95
Tech Test Version 4			
Start	MAY 95	MAY 95	MAY 95
Complete	JUN 95	JUN 95	JUN 95
FOT&E Version 4			

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Start	AUG 95	AUG 95	AUG 95
Complete	OCT 95	OCT 95	OCT 95
Begin Fielding Version 4	NOV 95	NOV 95	NOV 95
PDR Version 5	JUL 96	JUL 96	JUL 96
CDR Version 5	DEC 96	DEC 96	DEC 96
Tech Test Version 5			
Start	JUN 97	JUN 97	JUN 97
Complete	JUL 97	JUL 97	JUL 97
FOT&E Version 5			
Start	AUG 97	AUG 97	AUG 97
Complete	OCT 97	OCT 97	OCT 97
Begin Fielding Version 5	NOV 97	NOV 97	NOV 97
Complete Fielding CSSCS	SEP 01	SEP 01	SEP 01

b. Previous Change Explanations --

None.

c. Current Change Explanations --

(CH1) Changes from the last SAR to the current SAR were created by the establishment of a May 1993 ATCCS test window. The schedule was realigned to coincide with the new test window.

The Version 3 PDR (to Mar 92 from Dec 91) and CDR (to Jun 92 from Mar 92) results from the cumulative effect of the build 2 realignment as well as an internal adjustment of the Version 3 build dates to meet external test and experiment activities.
The IOT&E date (to May 93 and Jun 93 from Feb 93 and Apr 93) was changed to coincide with the established ATCCS test window.
The FUE date (to Jun 93 from Apr 93) was realigned to coincide with the IOT&E date.

d. References --

Development Estimate:
Army Acquisition Executive Memorandum, ASARC II, dated 26 Dec 90, Subject: ASARC Acquisition Decision Memorandum (Combat Service Support Control System) and AAE Approved Acquisition Program Baseline dated 31 Oct 91.

Approved Program:
AAE approved Acquisition Program Baseline dated 31 Oct 1991.

CSSCS, December 31, 1991

10. **Performance Characteristics:**

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Operational Temp (degF)	0-+120	0-+120	/ +40-+95	TBD	+40-+95 (CH-1)
Relative Humidity (%)	10-80	10-80	/ 10-80	TBD	10 - 80
Portability (no. person carry)	2	1	/ 2	TBD	2
Equipment Set-up/Tear-down (hrs)	<=.5	<=.5	/ <=.5	TBD	<=.5
Mean Time Between Op Msn Failure (hrs)					
ACCS Hardware	220	220	/ 220	TBD	220
ACCS CHS & CSSCS Software (HW&SW)	210	210	/ 210	TBD	210
Automatic Msg Handling					
User Responsiveness					
Disp 24 Lines (sec)	1.0	.7	/ 5.0	TBD	1.0
Scroll (lines/sec)	20	28	/ 20	TBD	20
Error Feedback (sec)	1.0	.7	/ 1.0	TBD	1.0
User Help Req (sec)	3.0	2.1	/ 3.0	TBD	3.0
Auto-message handling					
Speed-in (sec)	10/500	7/500	/ 10/500	TBD	10/500
Speed-out (sec)	10/1000	7/1000	/ 10/1000	TBD	10/1000
Msg Trans and Receipt					
24 hr USMTF Trans	334	477	/ 334	TBD	334
24 hr Recpt&Process					
(million char)	6.9	9.86	/ 6.9	TBD	6.9
(STAMIS msgs)	4400	6286	/ 4400	TBD	4400
Capable of Update (every x hrs)	3	2	/ 3	TBD	3
Process All Info Rec (within x hrs)	3	2	/ 3	TBD	3
On-Line Query Resp Time (sec/min)	5/180	5/7	/ 2/3	TBD	5-180sec
Local Data File Update Response Time (sec/min) (sec)	5/180	5/7	/ 5/15	TBD	5-180sec

* USMTF is the abbreviation for United States Message Text Format.

10b. **Performance Characteristics (Cont'd):**

b. Previous Change Explanations --

None.

c. Current Change Explanations --

CH(1) Operational temperature current estimate changed from 0-+120 degrees F to =40-+95 degrees to correct estimate error in previous SAR.

d. References --

Development Estimate:
Army Acquisition Executive Memorandum, ASARC II, dated 26 Dec 90, Subject: ASARC Acquisition Decision Memorandum (Combat Service Support Control System) and AAE Approved Acquisition Program Baseline dated 31 Oct 91.

Approved Program:
AAE approved Acquisition Program Baseline dated 31 Oct 1991.

11. **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	114.5	114.5	114.3
Procurement	131.6	131.6	131.6
Flyaway	(122.2)		(122.2)
Total Flyaway	(122.2)		(122.2)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(9.4)		(9.4)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 91 Base-Year $	246.1	246.1	245.9
Escalation	44.6	44.6	42.7
Development (RDT&E)	(11.5)	(11.5)	(10.6)
Procurement	(33.1)	(33.1)	(32.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	290.7	290.7	288.6

11b. Total Program Cost and Quantity (Cont'd):

b. Quantity --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	84	0	84
Procurement	1031	1031	1031
Total	1115	1031	1115

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Development Estimate:
Army Acquisition Executive Memorandum, ASARC II, dated 26 Dec 90, Subject: ASARC Acquisition Decision Memorandum (Combat Service Support Control System) and AAE Approved Acquisition Program Baseline dated 31 Oct 91.

Approved Program:
AAE approved Acquisition Program Baseline dated 31 Oct 1991.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(SEP 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	288.6	290.7	288.6
(2) Quantity	1115	1115	1115
(3) Unit Cost	0.259	0.261	0.259
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	126.0	164.7	0.0	290.7
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-2.8	-0.9	-	-3.7
Quantity	-	-	-	-
Schedule	-	+0.3	-	+0.3
Engineering	-	-	-	-
Estimating	+1.7	-0.4	-	+1.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1.1	-1.0	-	-2.1
Total Changes	-1.1	-1.0	-	-2.1
Current Estimate	124.9	163.7	-	288.6

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	114.5	131.6	0.0	246.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+0.1	-	+0.1
Engineering	-	-	-	-
Estimating	-0.2	-0.1	-	-0.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.2	-	-	-0.2
Total Changes	-0.2	-	-	-0.2
Current Estimate	114.3	131.6	-	245.9

b. Previous Change Explanations -- None.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Escalation Indices (Economic)		-2.8
Revised Estimate (Estimating)	-0.2	1.7
Total Changes	-0.2	-1.1

13c. **Cost Variance Analysis (Cont'd):**

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised Escalation Indices (Economic)		-0.9
Change in Procurement Schedule (Schedule)	0.1	0.3
Revised Estimate (Estimating)	-0.1	-0.4
Total Changes	--	-1.0

14. **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.261	-0.003	--	--	--	0.001	--	--	-0.002	0.259

15. **Contract Information:** (Then-Year Dollars in Millions)

a. RDT&E --

CSSCS VERSIONS 3 & 4:	Initial Contract Price Target	Ceiling	Qty
TRW, INC, CARSON, CA DAAB07-91-C-N501, CPAF Award: February 1, 1991 Definitized: February 1, 1991	$48.3	N/A	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$49.0	N/A	0	$49.5	$49.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-0.1	$0.0
Cumulative Variances To Date (12/20/91)	$-0.1	$-0.2
Net Change	$0.0	$-0.2

Explanation of Change:

The contract schedule variance resulted due to additional effort required to complete Critical Design Walkthrough #1 and a two week delay in turnover of Version 3 Build 0 software for testing.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 40.0% (6 yrs/15 yrs)

(2) Percent Program Cost Appropriated: 14.8% ($42.6 / $288.6)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY87-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2001)	Total
RDT&E	20.8	21.8	17.7	64.6	124.9
Procurement	-	-	-	163.7	163.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	20.8	21.8	17.7	228.3	288.6

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1987			1.1	1.1	1.0	1.0	1.0	2.7
1988			1.7	1.7	1.5	1.5	1.5	3.0
1989			5.2	5.2	4.8	4.8	4.8	4.2
1990			4.6	4.6	4.4	4.4	4.1	4.0
1991			9.0	9.0	9.1	9.1	8.8	3.9

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1992			21.0	21.0	21.8	2.6	1.2	3.1
1993			16.2	16.2	17.7			3.3
1994			16.0	16.0	17.7			3.3
1995			17.6	17.6	19.1			3.3
1996								3.2
1997								3.2
1998			21.9	21.9	27.8			3.2
1999								3.2
Subtot	84		114.3	114.3	124.9	23.4	21.4	
Appropriation: 2035 Other Procurement, Army								
1994	121		15.2	15.2	16.6			3.3
1995	184		20.4	20.4	23.2			3.3
1996	191		21.1	21.1	24.9			3.2
1997	173		13.1	13.1	16.6			3.2
1998	122		24.0	24.0	30.0			3.2
1999	109		15.2	15.2	20.0			3.2
2000	82		13.3	13.3	18.1			3.2

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2035 Other Procurement, Army (Cont'd)								
2001	49		9.3	9.3	14.3			3.2
Subtot	1031		131.6	131.6	163.7			
Grand Total	1115		245.9	245.9	288.6	23.4	21.4	

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year) Development Decision	Production Decision	Current Estimate	Maximum Economic
1994	125	0	121	N/A
1995	169	0	184	N/A
1996	180	0	191	N/A
1997	106	0	173	N/A
1998	71	0	122	N/A
1999	62	0	109	N/A
2000	65	0	82	N/A
2001	60	0	49	N/A
2002	57	0	0	N/A

17a. Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
2003	57	0	0	N/A
2004	53	0	0	N/A
2005	61	0	0	N/A
2006	53	0	0	N/A
2007	69	0	0	N/A
2008	83	0	0	N/A

* Development Estimate reflects planned procurement buy rates at the Milestone II decision point.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	245.9	N/A	N/A
(TY $)	N/A	N/A	288.6	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	0.221	N/A	N/A
(TY $)	N/A	N/A	0.259	N/A	N/A

17c. **Production Rate Data (Cont'd):**

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	OCT 94	N/A	N/A
Duration (in MON)	N/A	N/A	83	N/A	N/A
End Date(MON YY)	N/A	N/A	SEP 01	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	17/17
Procurement	0/0

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules --

The concept of operation is for CSSCS to be fielded in both active and reserve units. The total manhours of operation per year for active duty units per device is 1690 hours, and 234 hours for reserve units. There are no new personnel costs involved as CSSCS will be operated by personnel currently assigned to those organizations receiving these devices. The present maintenance concept for the CHS hardware is contractor logistics support for the operational life of the equipment, not to exceed ten years. Contractor will establish Regional Support Centers (RSC), which will provide all repairs above the unit level. Unit level maintenance consists of preventive maintenance, replacement of Line Replaceable Units (LRU), and replacement of expendable items (cables, batteries, fuses, and filters). Internal repair of LRU's requiring removal of covers will not be performed by U.S. Army personnel. Units will exchange unserviceable LRU's for serviceable LRU's through assigned Intermediate Direct Support (IDS) facilities. The IDS will perform fault verification and ship unserviceable LRU's to the nearest RSC for repair. There is no antecedent equipment for the CSSCS. It will replace current manual and non-standard automated processes. PM CSSCS will not be provided funding for O&S costs. All O&S costs will be funded at the unit level after delivery.

The Average Annual Cost is for the entire CSSCS system and is based

18a. Operating and Support Costs (Cont'd):
on sustainment from FY 94-21 (28 years). Source: Army Cost Position, August 1991.

b. Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per CSSCS System	Avg Annual Cost Per (Antecedent)
Personnel	0.3	N/A
O&S Consumables	0.6	N/A
Direct Depot Maintenance	0.5	N/A
Sustaining Investment	19.1	N/A
Other Costs	1.5	N/A
Total	22.0	N/A

c. Contractor Support Costs -- None.

A-9 BAT

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: BAT

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
   BAT

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:
   BAT PROGRAM MANAGER — COL DAVID JONES
   PROGRAM EXECUTIVE OFFICE — Assigned: October 2, 1989
   FIRE SUPPORT - ATTN: SFAE-FS-XB — AV 788-0307 COMM 205-842-0307
   REDSTONE ARS, AL 35898-7998

4. (U) Program Elements/Procurement Line Items:

   RDT&E:
   PE 63754A Project D600
   PE 64754A (Shared) Project D636
   PE 64768A Project D641
   PROCUREMENT:
   APPN 2032 ICN CA6100 (Army)

AS AMENDED
CLEARED
FOR OPEN PUBLICATION
MAR 24 1992 21
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

Classified By: BAT SECURITY CLASSIFICATION GUIDE, SSD 7 JUN 91
Declassify on: OADR
Downgrade Instructions:

Concur in Classification
as marked
23 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

(THIS PAGE IS [redacted])

*** [redacted] ***

93-T-0669

5. (U) **Related Programs**:
MULTIPLE LAUNCH ROCKET SYSTEM (MLRS), ARMY TACTICAL MISSILE SYSTEM (ATACMS), AND TRI-SERVICE STANDOFF ATTACK MISSILE (TSSAM).

6. (U) **Mission and Description**:

The BAT Program is an antiarmor top attack submunition with acoustic/infrared seekers working in tandem designed for the destruction of second echelon forces of operating armored vehicles. This submunition is capable of being delivered by a variety of missiles. The BAT Program does not replace another system.

7. (U) **Program Highlights**:
a. (U) Significant Historical Developments --

The program was approved for execution on 5 June 1984. Phase I of the Proof of Principle began in August 1984 and a contract was awarded to Northrop Corporation as the prime contractor for this effort. Phase II of Proof of Principle was completed in April 1989. An extended Proof of Principle Phase was approved in May 1989 to address specific technical issues. Milestone II, Engineering and Manufacturing Development (EMD), was approved by the Defense Acquisition Executive (DAE) who signed the Acquisition Decision Memorandum (ADM) 15 May 1991. Engineering and Manufacturing Development contract was awarded 5 June 1991 to Northrop Corporation.

b. (U) Significant Developments Since Last Report --

Internal Design Review was accomplished 9-13 Dec 91 to assure sufficient progression to support the Critical Design Review beginning Jan 92. Integration design activity was initiated November 1991 via contract award to LTV for analysis and demonstration of the dispense of simulated BAT Submunition from Army TACMS.

The BAT program is expected to satisfy the mission requirement.

c. (U) Changes Since As Of Date --
None.

8. (U) **Threshold Breaches**:
There are no breaches to the approved Acquisition Program Baseline (APB), dated February 18, 1992. There are no Nunn-McCurdy unit cost breaches.

9. (U) **Schedule**:

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone 0	JUN 84	N/A	JUN 84
Milestone I	FEB 85	N/A	FEB 85
Milestone II	MAY 91	MAY 91	MAY 91
Preliminary Design Review	MAY 91	MAY 91	MAY 91
EMD/FSD Contract Award	JUN 91	JUN 91	JUN 91
Critical Design Review Complete	MAR 92	MAR 92	MAY 92(Ch-1)
Prototype Production			
Start	DEC 92	DEC 92	DEC 92
Complete	SEP 94	SEP 94	SEP 94
Design Verification Test			
Start	JAN 93	JAN 93	JAN 93
Complete	NOV 93	NOV 93	NOV 93
First Prototype Unit Delivery	OCT 93	OCT 93	OCT 93
Contractor Development Test			
Start	NOV 93	NOV 93	NOV 93
Complete	SEP 94	SEP 94	SEP 94
Long Lead Program Review	DEC 93	DEC 93	DEC 93
Long Lead Contract Award for LRIP	JAN 94	JAN 94	JAN 94
LRIP Program Review	NOV 94	NOV 94	NOV 94
EMD/LRIP I Contract Award	NOV 94	NOV 94	NOV 94
(b)(1) [redacted]			

NOTE: BAT IOT&E will be conducted with receiving system.

b. (U) Previous Change Explanations --

None.

c. (U) Current Change Explanations --

(Ch-1) Changed Critical Design Review Current Estimate from Mar 92 to May 92 due to delay of subcontractors/vendors receiving finalized system requirements.

d. (U) References --

(U) Development Estimate:

Acquisition Decision Memorandum (ADM), dated 15 May 1991, approval to

9d. (U) **Schedule (Cont'd)**:
enter Engineering and Manufacturing Development (EMD).

(U) Approved Program:
AAE approved Acquisition Program Baseline dated February 18, 1992.

10. (U) **Performance Characteristics**:

a. (U) Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Weight (lbs)	44	44 / 44		44
Length (stowed) (ins)	36	36 / 36		36
Diameter (stowed) (ins)	5.5	5.5 / 5.5		5.5

(b)(1)

[redacted]

b. (U) Previous Change Explanations --

None.

c. (U) Current Change Explanations --

(Ch-1) Changed to correct the current estimate from the previous SAR to match the development estimate.

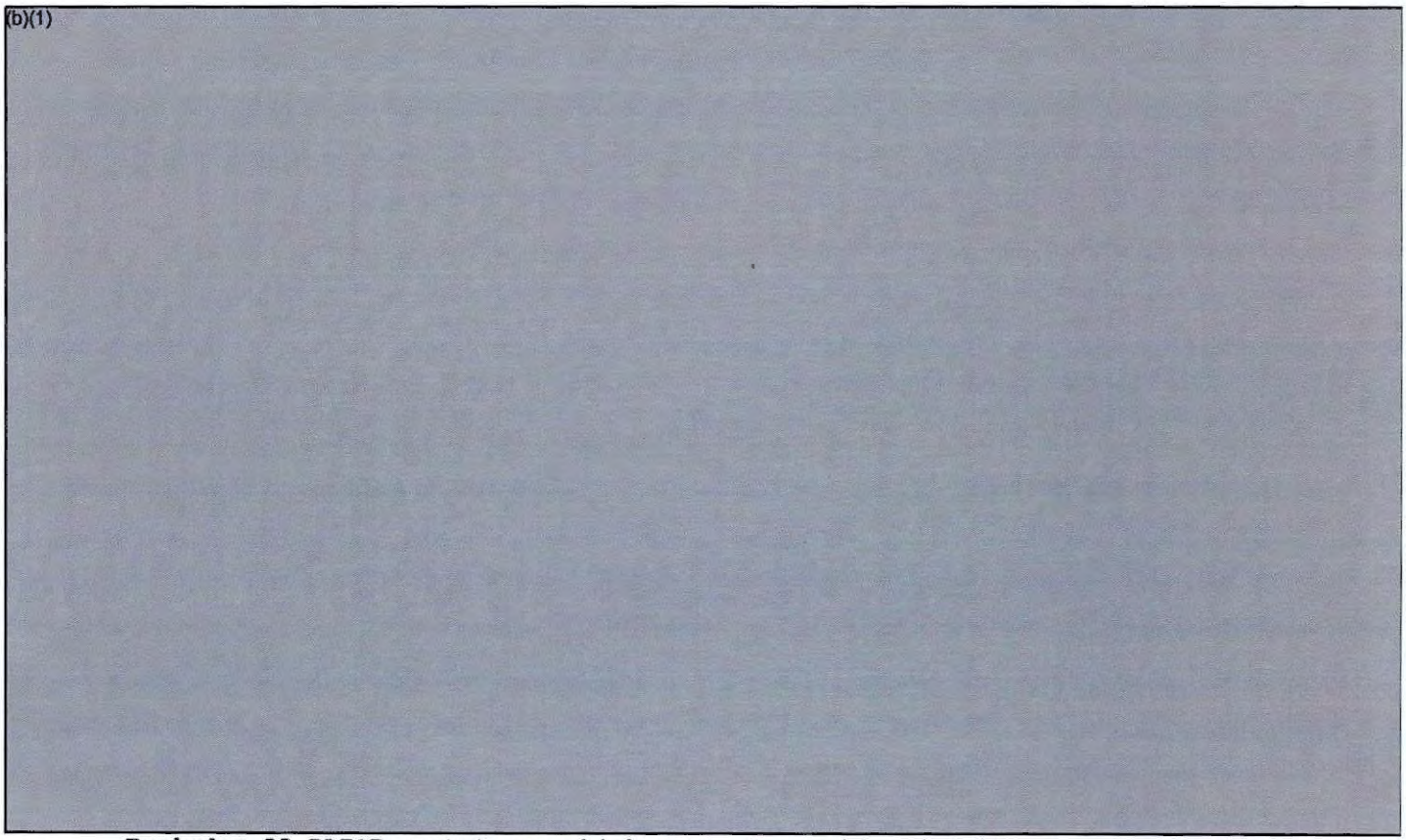
d. (U) References --

(U) Development Estimate:
Acquisition Decision Memorandum (ADM), dated 15 May 1991, approval to enter Engineering and Manufacturing Development (EMD).

(U) Approved Program:
AAE approved Acquisition Program Baseline dated February 18, 1992.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

(b)(1)



Excludes 33 RDT&E prototypes which are not considered fully configured end items.

c. (U) Foreign Military Sales --
None.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
Acquisition Decision Memorandum (ADM), dated 15 May 1991, approval to enter Engineering and Manufacturing Development (EMD).

(U) Approved Program:
AAE approved Acquisition Program Baseline dated February 18, 1992.

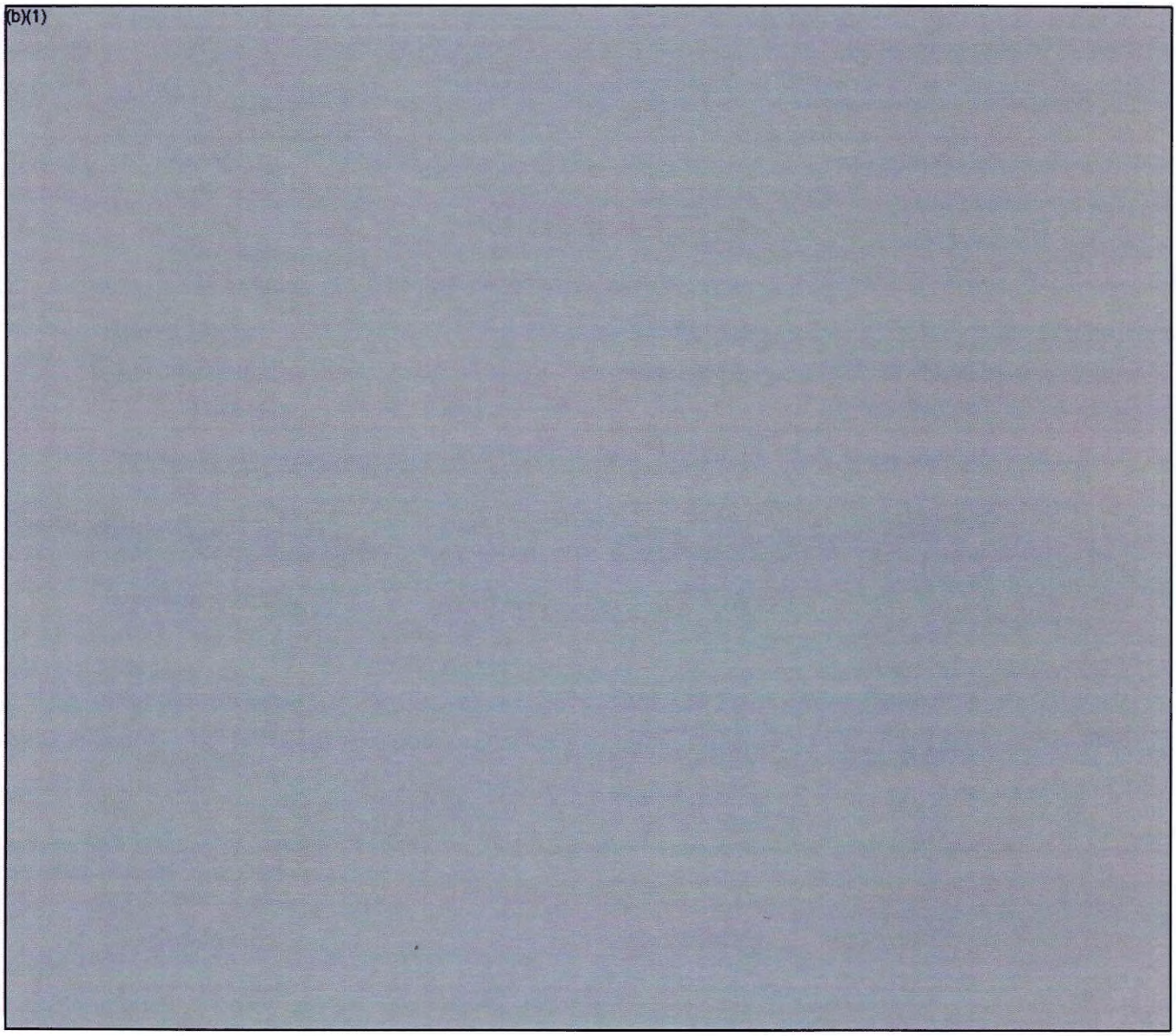
BAT, December 31, 1991

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current	Current Year	Budget Year
(b)(1)	[redacted]		

BAT, December 31, 1991

(b)(1)



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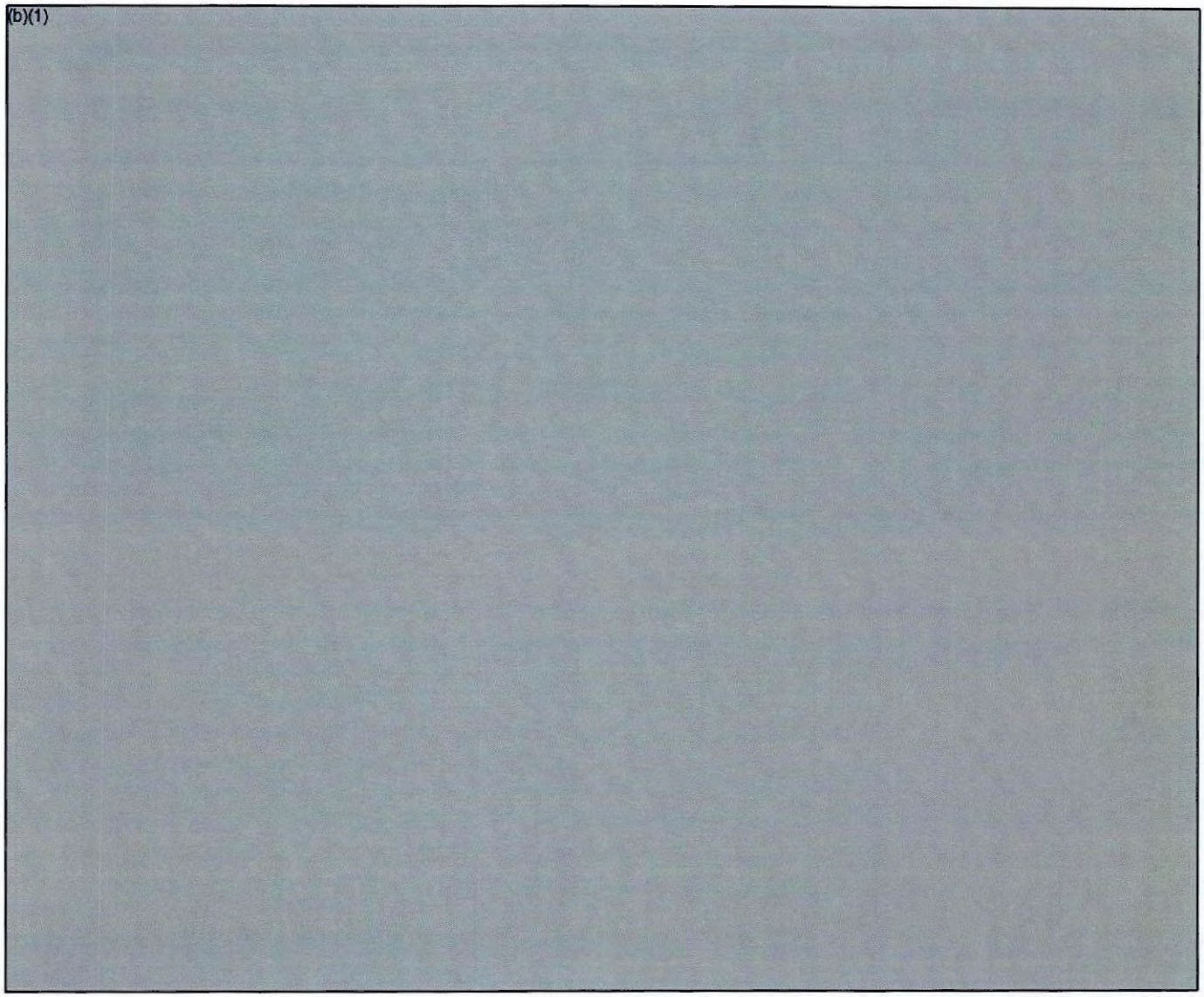
BAT, December 31, 1991

(b)(1)



b. (U) Previous Change Explanations --

c. (U) Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year

[redacted]

13c. (U) **Cost Variance Analysis (Cont'd):**

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)		-5.2
Current and prior inflation offset. (Estimating)	0.4	0.5
Rephased development effort for FY1992-96. (Schedule)	N/A	3.6
Total Changes	0.4	-1.1
(2) PROCUREMENT		
Revised escalation indices. (Economic)	N/A	-67.7
Revised schedule of submunition procurement from FY1995-96 to FY2003-06. (Schedule)	-0.3	32.4
Revised estimate to efficiently utilize FY1994-97 Budget. (Estimating)	-8.1	-12.9
Change in projected engineering data costs. (Support)	-6.6	-8.0
Total Changes	-15.0	-56.2

14. (U) **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

(b)(1)

[redacted]

a.(U) RDT&E --

(U) EMD:	Initial Contract Price Target	Ceiling	Qty
Northrop Corporation, Hawthorne, CA DAAH01-91-C-A017, CPIF/AF Award: June 5, 1991 Definitized: June 5, 1991	$383.9	N/A	0

15. (U) **Contract Information**: **Cont'd** (Then-Year Dollars in Millions)

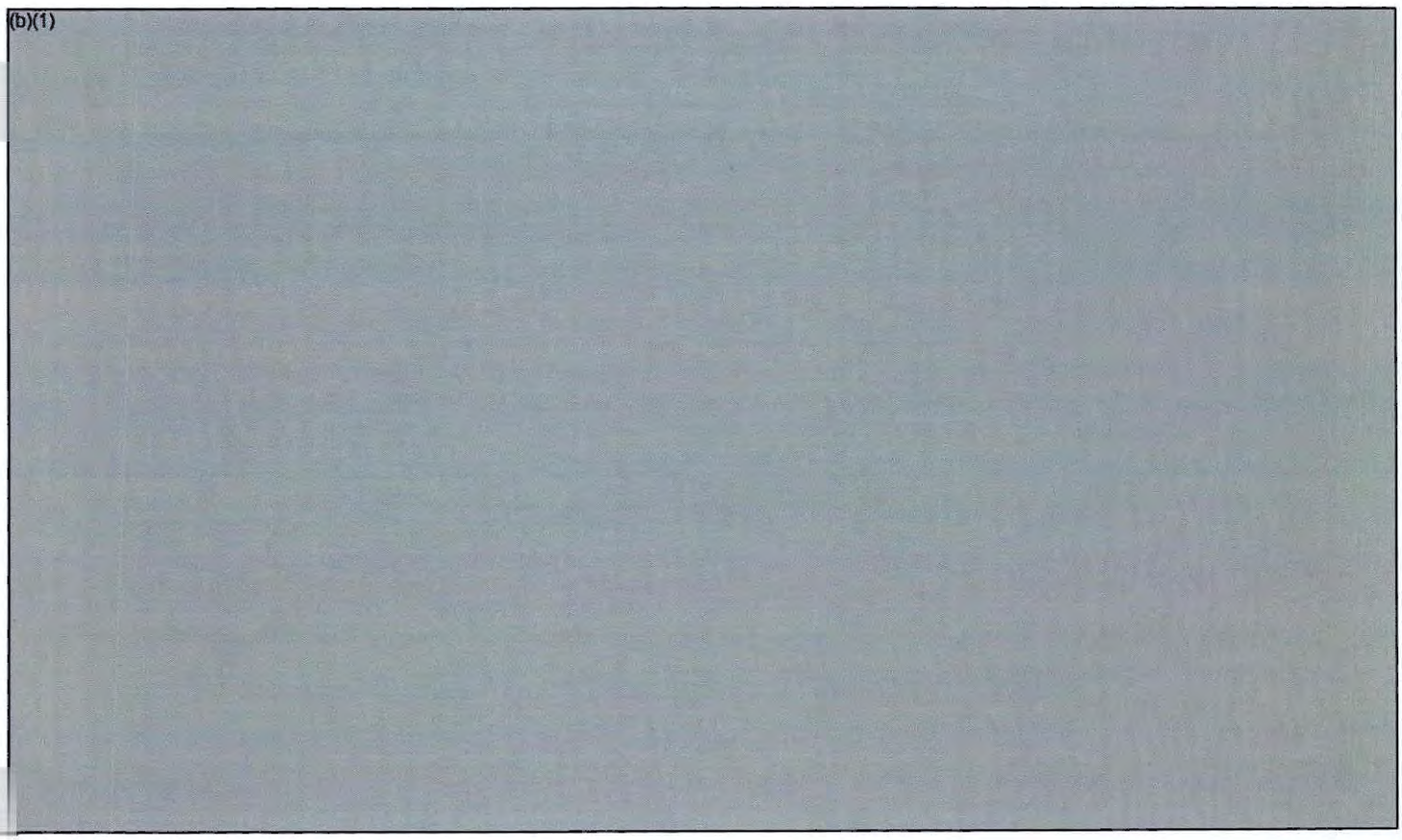
Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$383.9	N/A	0	$383.9	$383.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.1	$-1.8
Cumulative Variances To Date (11/30/91)	$-2.2	$-5.6
Net Change	$-2.3	$-3.8

Explanation of Change:

Essentially all the variance in the direct costs and a majority of the schedule variance to date is attributed to subcontract activities at Raytheon and Systron Donner. Variances at Raytheon are due to delays in design releases from the prime and overhead rate adjustment. Variances at Systron Donner are due to higher than planned G&A rate and greater complexity of the ASIC development upgrade than expected. Work-around plans are implemented to mitigate schedule variance. PM's EAC remains at contract price of $383.9M.

(b)(1)



BAT, December 31, 1991

16c. (U) Program Funding Summary (Cont'd):

c. (U) Annual Summary --

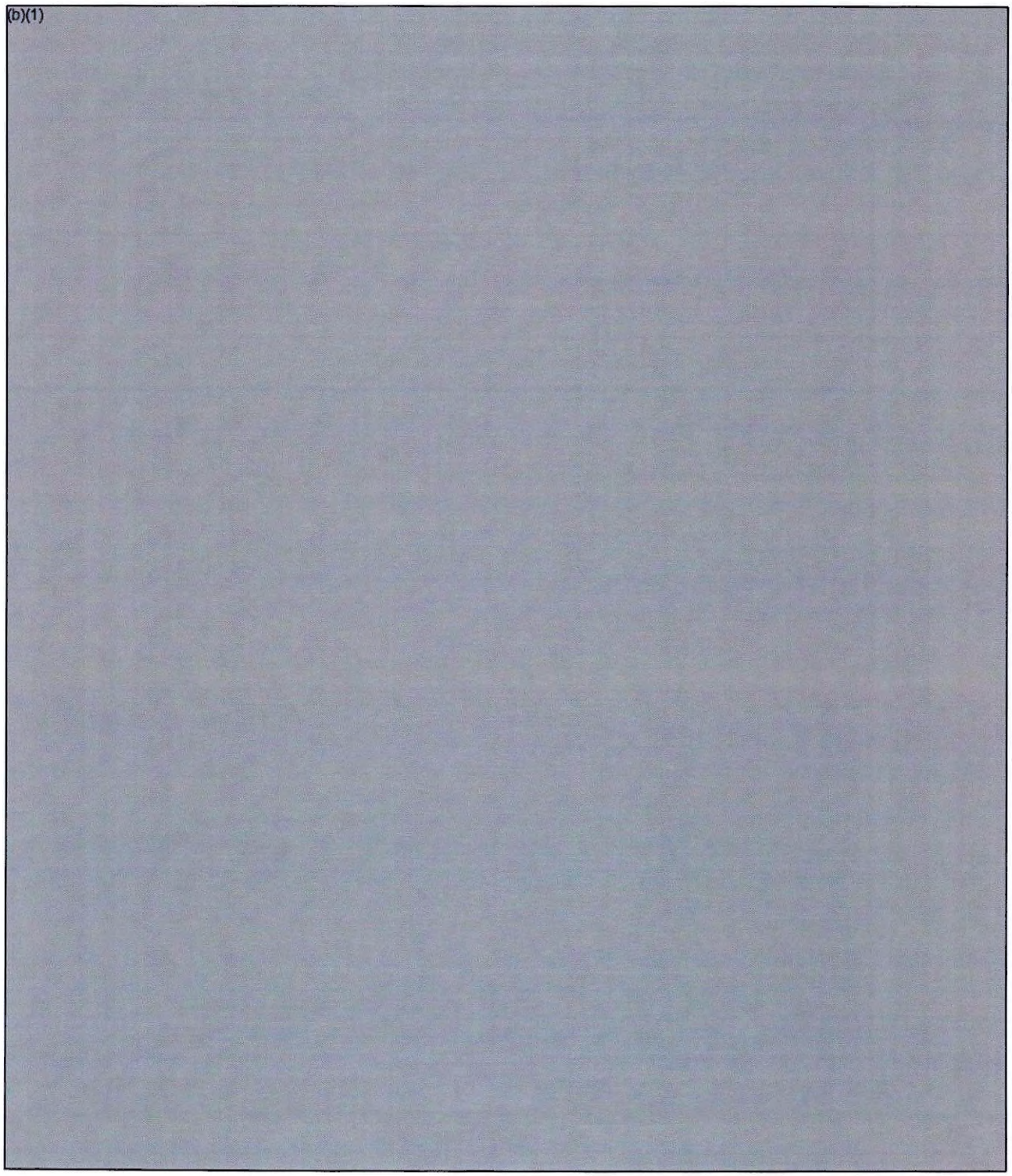
Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1984				5.2	4.2	4.2	4.2	3.4
1985				18.3	15.2	15.2	15.2	2.8
1986				37.5	32.2	32.2	32.2	2.7
1987				34.1	30.0	30.0	30.0	3.0
1988				45.9	41.9	41.9	41.9	4.0
1989				46.3	44.0	44.0	44.0	3.9
1990				40.7	40.1	40.1	39.8	4.0
1991				70.0	71.9	71.7	62.9	3.9
1992				109.2	115.7	27.2	0.6	3.1
1993				111.0	121.5			3.3
1994				104.2	117.8			3.3
1995				50.6	59.1			3.3
1996				12.2	14.7			3.2
1997								3.2
1998				17.3	22.2			3.2
Subtot				702.5	730.5	306.5	270.8	

16c. (U) **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)	
		Nonrec	Rec		Program	Obligated	Expended		
Appropriation: 2032 Missile Procurement, Army									
(b)(1)									
1994		12.1		32.8	38.3			3.3	(C)
1995		15.1	71.3	98.3	118.5			3.3	(C)
1996		31.2	192.5	215.0	267.4			3.2	(C)
1997		8.6	148.5	151.5	194.5			3.2	(C)
1998			148.5	142.9	189.3			3.2	(C)
1999			129.7	128.1	175.1			3.2	(C)
2000			123.3	122.3	172.5			3.2	(C)
2001			119.5	119.7	174.3			3.2	(C)
2002			116.7	116.9	175.7			3.2	(C)
2003			114.5	114.7	177.9			3.2	(C)
2004			112.6	112.8	180.5			3.2	(C)
2005			110.9	110.8	183.0			3.2	(C)
2006			90.2	89.1	151.8			3.2	(C)
Subtc		67.0	1478.2	1554.9	2198.8				(C)
Gran Tota		67.0	1478.2	2257.4	2929.3	306.5	270.8		(C)

17. (U) **Production Rate Data:**

(b)(1)



17c. (U) Production Rate Data (Cont'd):

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	JAN 97	N/A	N/A
Duration (in MON)	N/A	N/A	139	N/A	N/A
End Date(MON YY)	N/A	N/A	AUG 08	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

None.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The BAT Submunition will be furnished to the delivery vehicle contractor as GFE. The submunition is considered a certified round; therefore, O&S cost will be minimal. It will consist of stockpile reliability test for recertification, minimal depot maintenance, military personnel for Explosive Ordnance Disposal (EOD) and system project management. O&S requirements for BAT will solidify after the results of planned accelerated aging tests and flight tests in FY94. There is no antecedent.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per BAT	Avg Annual Cost Per (Antecedent)
DEP MAINTENANCE (27 YRS)	0.2	N/A
MILPERS (12 YRS)	0.2	N/A
SYS PROJ MGT (16 YRS)	0.3	N/A
STKPILE REL TST (16 YRS)	1.4	N/A
Total	2.1	N/A

c. (U) Contractor Support Costs -- None.

N-20 F/A-18 E/F

91-13

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: F/A-18 E/F

AS OF DATE: December 31, 1991

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FOR OPEN PUBLICATION
MAR 23 1992 9
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD—PA) DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name):
   F/A-18 Naval Strike Fighter (HORNET)

2. DoD Component: Navy

3. Responsible Office and Telephone Number:

F/A-18 Program Office	CAPT CRAIG STEIDLE
Tactical Aircraft Program	Assigned: June 11, 1990
Washington, DC 20361-1265	AV 222-7954 COMM (703) 692-7954

4. Program Elements/Procurement Line Items:

   RDT&E:
   PE 0204136N

No Security Objection to Open Publication
(AS AMENDED)
92-C0466
MAR 20 1992
Office of the Chief of
Naval Operations Dept. of the Navy

5. Related Programs:
F/A-18 C/D

6. Mission and Description:

The F/A-18 E/F will be the second major model upgrade since F/A-18 aircraft program inception. The F/A-18 E (single seat) and the F/A-18 F (two seat) will be a high performance twin engine, mid-wing, multi-mission tactical aircraft designed to replace F/A-18 C (single seat), F/A-18 D (two seat), and F-14 aircraft as they reach the end of service life and retire. The F/A-18 E/F will be designed primarily to meet current Navy and Marine Corps fighter escort and

*** [redacted] ***

OASD(PA) DPOISR 92-T-0621

6. Mission and Description (Cont'd):

interdiction mission requirements and to maintain additional F/A-18 fleet air defense and close air support roles. Enhancements will include the increased range and improved carrier suitability required for the F/A-18 to continue it's key strike fighter role against the advanced threat of the late 1990's and beyond.

7. Program Highlights:

a. Significant Historical Developments --

In July 1987, the Secretary Of Defense issued a memorandum to the Secretaries of the Navy and the Air Force directing them to begin studying advanced versions of the F/A-18 and F-16 aircraft. In response, the Assistant Chief of Naval Operations for Air Warfare initiated an upgrade study to evaluate various F/A-18 alternatives for the year 2000 and beyond. The trade studies for the Hornet 2000 evaluated seven configuration options for operational performance, costs and technical feasibility. The results of these studies, refined by risk reduction work during FY-91, have been incorporated into the recommended configuration for the F/A-18 E/F.

The F/A-18 E/F program is scheduled for a Milestone IV/II Defense Acqusition Board (DAB) review in March 1992. The primary objective of the Milestone IV/II review will be to determine if the major upgrade to the F/A-18 is warranted, and to establish an approved acquisition strategy and baseline. Engineering and Manufacturing Development (E&MD) is scheduled to begin in March/April 1992 following DAB approval of the program.

b. Significant Developments Since Last Report -- None.

c. Changes Since As Of Date -- None.

8. Threshold Breaches: None.

9. Schedule:

a. Milestones --

	Planning Estimate	Approved Program	Current Estimate
Milestone IV/II	MAR 92	N/A	MAR 92
First Engine to Test	APR 93	N/A	APR 93
Preliminary Design Review (Airframe)	APR 93	N/A	APR 93
Critical Design Review (Airframe)	JAN 94	N/A	JAN 94
Production Readiness Review (Airframe)	APR 95	N/A	APR 95
Preliminary Flight Qualification (Engine)	SEP 94	N/A	SEP 94

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate
First Flight	OCT 95	N/A	OCT 95
Long Lead Release for LRIP	DEC 95	N/A	DEC 95
Limited Production Qualification (Engine)	OCT 96	N/A	OCT 96
LRIP Contract Award	JAN 97	N/A	JAN 97
Full Production Qualification (Engine)	OCT 97	N/A	OCT 97
LRIP First Delivery	DEC 98	N/A	DEC 98
Milestone III	DEC 99	N/A	DEC 99
Full Rate Production Contract Award	DEC 99	N/A	DEC 99

b. Previous Change Explanations -- None.

c. Current Change Explanations -- None.

d. References --

Planning Estimate:
DRAFT: Acquisition Program Baseline (APB), dated January 1992.

Approved Program: None.

10. Performance Characteristics:

a. Performance --	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Deck Spot Factor (F/A-18A/B/C/D =1.2)	<1.5	N/A		<1.5
Fighter Escort Radius (internal fuel) (Nm)	410	N/A		410
Interdiction Mission Radius (Nm)				
2 external tanks (retained)	390	N/A		390
3 external tanks (retained)	430	N/A		430
Combat Ceiling (max thrust)(ft)	>50K	N/A		>50K
Carrier Suitability (Tropical Day Conditions)				

10a. Performance Characteristics (Cont'd):

	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Launch: Catapult WOD (C-13 Catapult:TCGW) (kts)	<30	N/A		<30
Recovery: WOD (MK-7 MOD 3) (kts)	<15	N/A		<15
Approach Speed (kts)	<150	N/A		<150
Recovery Payload (lbs)	9000	N/A		9,000
Usable Load Factor (Subsonic; Nz) (lg)	+7.5	N/A		+7.5
Specific Excess Power (Max Thrust, .9M,(lg) 10kft) (fps)	>600	N/A		>600
Acceleration (.8M to 1.2M at 35kft) (sec)	<70	N/A		<70

1/ "Fighter Escort Radius" and "Interdiction Mission Radius" as defined by the current F/A-18 Specification Mission Definition.

2/ "Launch" based on (2) AIM 9 + (5) Mark 83 + (2) External Tanks, NAVFLIR, FLIR and AMMO.

3/ "Usable Load Factor" and "Specific Excess Power" based on (2) AIM 7 + (2) AIM 9 + AMMO at 60% Internal Fuel.

b. Previous Change Explanations -- None.

c. Current Change Explanations -- None.

d. References --

Planning Estimate:
Operational Requirements Document dated December 19, 1991.

Approved Program: None.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost --	Planning Estimate	Approved Program	Current Estimate
Development (RDT&E)	1334.0	0.0	1738.6
Procurement	0.0	N/A	0.0
Total Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 75 Base-Year $	1334.0	0.0	1738.6
Escalation	2640.4	0.0	3371.3
Development (RDT&E)	(2640.4)	(0.0)	(3371.3)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	3974.4	0.0	5109.9
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	0	N/A	N/A
Total	0	0	0

There are 10 non-fully configured end items; 7 flight test articles and 3 ground test articles.

c. Foreign Military Sales -- None.

d. Nuclear Costs --
N/A

e. References --

Planning Estimate:
FY 1993 Amended President's Budget, dated February 1991.

Approved Program: None.

12. Program Acquisition/Current Procurement Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	3974.4	0.0	0.0	3974.4
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-84.3	-	-	-84.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1219.8	-	-	+1219.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1135.5	-	-	+1135.5
Total Changes	+1135.5	-	-	+1135.5
Current Estimate	5109.9	-	-	5109.9

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1975 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1334.0	0.0	0.0	1334.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+404.6	-	-	+404.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+404.6	-	-	+404.6
Total Changes	+404.6	-	-	+404.6
Current Estimate	1738.6	-	-	1738.6

b. Previous Change Explanations -- None.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)		-84.3
Refinement of the F/A-18 E/F program. (Estimating)	404.6	1219.8
Total Changes	404.6	1135.5

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

15. Contract Information: None.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 25.0% (2 yrs/8 yrs)

(2) Percent Program Cost Appropriated: 7.0% ($359.1 / $5109.9)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	8.0	351.1	1079.9	3670.9	5109.9
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	8.0	351.1	1079.9	3670.9	5109.9

F/A-18 E/F E&MD is anticipated to begin following DAB approval in March 1992.

16c. Program Funding Summary (Cont'd):

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY75 Dollars Nonrec	Flyaway FY75 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1991				3.0	8.0			3.9
1992				129.6	351.1			3.1
1993				385.9	1079.9			3.3
1994				441.3	1275.5			3.3
1995				328.3	979.8			3.3
1996				266.5	820.9			3.2
1997				88.5	281.4			3.2
1998				95.5	313.3			3.2
Subtot				1738.6	5109.9			
Grand Total				1738.6	5109.9			

17. Production Rate Data:

a. Not applicable for Pre-Milestone II programs.

b. Not applicable for Pre-Milestone II programs.

c. Not applicable for Pre-Milestone II programs.

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. Not applicable for Pre-Milestone II programs.

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

A-14 FAAD C²I

91-058

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)

PROGRAM: FAAD C2I

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
   Forward Area Air Defense Command, Control, and Intelligence

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
   AIR DEFENSE COMMAND AND CONTROL SYST COL DAVID R. TAYLOR
   ATTN: SFAE-CC-AD Assigned: April 18, 1988
   REDSTONE ARS, AL 35898-5600 AV 788-3441 COMM (205) 895-3441

FAAD C2

Air Defense Command and Control
Systems Project Office
Program Executive Office
Command and Control Systems
Redstone Arsenal, AL 35898-5600

LTC RAYMOND D. ZEGLEY
Product Manager
Assigned: 21 Jun 91
AV 788-3517
COMM (205) 895-3517

CLEARED AS AMENDED
FOR OPEN PUBLICATION

MAR 24 1992 21

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

Concur in Classification as marked

23 MAR 1992

SECURITY REVIEW, ODCSINT, HQDA

~~Classified by: Multiple Sources~~
~~Declassify on: OADR~~
~~Downgrade Instructions:~~

(THIS PAGE IS [redacted])

*** [redacted] ***

OASD(PA) DFOISR [redacted]

3. (U) **Responsible Office and Telephone Number:**

GBS

FAAD Sensors Product Office Program Executive Office, Air Defense Redstone Arsenal, AL 35898-5600	LTC MICHAEL I. HOWELL Product Manager Assigned: 17 Sep 90 AV 788-1673 COMM (205) 722-1673

NCTR

Non Cooperative Target Recognition (NCTR) Project Manager RADAR/CI Program Executive Office Intelligence, Electronic Warfare Fort Monmouth, NJ 07703-5000	COL Peter P. Belch Assigned: 5 Jul 89 AV 996-5324 COMM (908) 544-5324

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
- PE 63740 Project D593, D464
- PE 64741 Project D126, D421
- PE 64820 Project E10
- PE 64709 (Shared) Project 355 (Shared), 530 (Shared)
- PE 63709 (Shared) Project 356 (Shared)
- PE 63706 (Shared) Project 243
- PE 64817 (Shared) Project 495 (Shared), 356 (Shared)

PROCUREMENT:
- APPN 2035 ICN AD5050 (Army)
- APPN 2035 ICN WK5053 (Army)
- APPN 2035 ICN AD5051 (Army) (Shared) NCTR-4, Model 1
- APPN 2035 ICN AD5053 (Army)
- APPN 2035 ICN AD5054 (Army)
- APPN 2035 ICN BA9106 (Army)
- APPN 2035 ICN MX1010 (Army) (Shared)
- APPN 2035 ICN BA9620 (Army) (Shared)

5. (U) **Related Programs:**
Combined Arms, Line of Sight-Forward-Heavy, AVENGER, Line of Sight-Rear, Non-Line of Sight (NLOS), Enhanced Position Location Reporting System (EPLRS), Joint Tactical Information Distribution System (JTIDS), Common Hardware/Software (CHS), Standard Integrated Command Post System (SICPS), High-to-Medium Air Defense Command and Control (HIMAD C2), SINCGARS, and Light and Special Divisions Interim Sensor (LSDIS).

6. (U) **Mission and Description:**
(U) The Forward Area Air Defense Command, Control, and Intelligence (FAAD C2I) Program integrates weapons, sensors, communications, and

6. (U) Mission and Description (Cont'd):

command, control and intelligence (C2I) architecture to counter the entire spectrum of the air threat to the forward area through the 90's. The acquisition strategy relies heavily on non-developmental items (NDI) and preplanned product improvements (P3I) to rapidly overcome our current air defense command, control, and intelligence deficiencies and to keep pace with the advancing threat.

(U) As the air defense node of the Army Tactical Command and Control System (ATCCS), the FAAD C2I System provides critical air defense information to support the command and control decision process at various levels of command. The FAAD C2 System ties weapons together by a C2I network and integrates Forward Area Air Defense Syatems (FAADS) into the Army Command and Control System (ACCS) architecture. The C2I initiative incorporates a family of sensors and identification equipment (ground and aerial, active and passive) with automated data processing and distribution capability. The mission will be accomplished through collection, digital processing and dissemination of target information, air threat warning, and the Battalion Tactical Operations Center (BNTOC). The FAAD C2 System will also provide target data processing and display capabilities at the Air Battle Management Operations Center (ABMOC), the Army Airspace Command and Control (A2C2), Sensor/Command and Control (C2), battery, platoon, and fire unit levels.

(U) The FAAD C2I System also provides track information to the Combined Arms Initiative (armor, infantry, and aviation). The FAAD C2I Program, using a systems approach, will integrate these relatively independent systems together to allow engagement of the enemy air threat at maximum weapons ranges in the forward area. The components will work together to maximize total force effectiveness across the divisional areas.

FAAD C2 SYSTEM

(U) The FAAD C2 Program includes only the command and control (C2) software development and the effort required to integrate this software with: (1) ATCCS Common Hardware/Software (CHS) processors, displays, and associated peripherals; (2) Army Data Distribution System (ADDS) (and/or SINCGARS); (3) FAAD sensors and LSDIS; (4) FAAD weapon systems; and (5) combined arms interface.

GBS SYSTEM

(U) The mission of the FAAD GBS is to provide continuous, volume acquisition and tracking of friendly and hostile aircraft over the

6. (U) **Mission and Description (Cont'd):**

division area of influence. GBS provides cueing data to the AVENGER Pedestal Mounted STINGER (PMS) and Man Portable Air Defense Systems (MANPADS) under Armor while preventing fratricide through its identification capabilities. FAAD GBS performs this mission by providing its air picture data to the FAAD C2I System, or in Continuity of Operations (CONOPS), directly to supported fire units. FAAD GBS is an essential component of the Army's FAAD System of Systems - It puts the "I" into FAAD C2I to allow pro-active air defense by providing near real time air picture and targeting data to the other FAAD Systems.

(U) The FAAD GBS system consists of a radar based sensor with Integrated Identification Friend or FOE (IFF) and Non-Cooperative Target Recognition (NCTR) identification devices, prime mover/power, communications equipment, an operator's remote control unit and FAAD C2 interfaces. The GBS target set includes both fixed and rotary wing aircraft with growth to Cruise Missiles and Unmanned Aerial Vehicles (UAVs). GBS target information includes track location, classification, and identification. Highly mobile and reliable, FAAD GBS's Electronic Countermeasures (ECM) and Anti-Radiation Missile (ARM) resistant performance will support both heavy and light forces in contingency and mature theaters. FAAD GBS meets today's and tomorrow's Army needs to support light and heavy forces throughout the spectrum of battlefield intensities and contingencies.

NCTR SYSTEM

(U) NCTR includes a combination of programs which provide positive identification of both fixed and rotary winged aircraft.

(U) The ability of weapons systems to detect and engage targets at longer ranges has advanced further than the capability to positively identify them. Hence, new weapons cannot be used at maximum range or high levels of fratricide may occur. The NCTR program embraces design and development of signal processing equipments and system interfaces to provide multiple technology devices to resolve this battlefield deficiency.

7. (U) **Program Highlights:**

a. (U) Significant Historical Developments --

FAAD C2I

(U) The Short Range Air Defense Command and Control (SHORAD C2) program was presented to the Army Systems Acquisition Review Council (ASARC) (MDR II) on March 26, 1985. On September 3, 1985, the ASARC program was approved by the Vice Chief of Staff of the Army (VCSA). On January 3 and 4, 1986, an ASARC level review directed that SHORAD

7a. (U) Program Highlights (Cont'd):

C2 become a subsystem of the FAAD system and that SHORAD C2 be redesignated FAAD C2I. On July 29, 1986, the JRMB approved the concept for execution of the overall FAAD program as a system of systems and approved the following segments of FAAD C2I:

(U) (1) Full scale development (beginning with a Build I demonstration) of the FAAD C2I system software.

(U) (2) A ground based sensor NDI acquisition strategy to procure four test articles to support other FAAD developmental and operational testing, and 13 low rate initial production (LRIP) units to be used for operational test and evaluation, production verification, and initial training.

FAAD C2 SYSTEM

(U) In November 1988, the Deputy Secretary of Defense concurred with the chief of Staff of the Army request to restructure the FAAD C2I program to field a FAAD C2 capability. This authorized a change to the FAAD C2I Build I full scale development program to allow for a fieldable system rather than a demonstration system. Build II of the program, which was to be the full scale development effort bringing the entire FAAD C2I System up to an Initial Operational Capability, was also changed. Some elements of Build I were deferred and some elements from Build II were added to Build I to make Build I a fieldable system to the heavy divisions. A March 1989 Secretary of Defense Decision Memorandum (SDDM) approved the restructure of the FAAD C2 program to field an initial capability to perform limited air defense engagements and essential force control interfaces within the divisions. The May 90 Army Acquisition Executive Acquisition Decision Memorandum approved early development of a tailored FAAD C2 for fielding to light and special divisions.

(U) This restructure was due to the changing threat environment and budget reductions. The restructured program will provide early development of a tailored FAAD C2 for fielding to light and special divisions changing milestone "Command, Control and Intelligence/Fire Unit Technical Test (Light Division) (C2I/FU Tech Test (LT)" from Sep 90 to Jun 91 and milestone "First Unit Equipped (Light Division) (FUE LT)" from Jun 91 to Sep 93.

GBS SYSTEM

(U) An automated command and control system to include a dedicated sensor continues to be a critical shortfall of Short Range Air Defense (SHORAD). In 1979, the Project Manager for Air Defense Command and Control Systems (PM ADCCS) was chartered to develop an

7a. (U) Program Highlights (Cont'd):

automated SHORAD C2 System. An in-house concept definition (requirements, architectures, strategies, and alternatives) was completed, validated, and taken to the Army System Acquisition Review Council (ASARC) on March 26, 1985. The ASARC Program, approved by the Vice Chief of Staff of the Army on September 3, 1985, called for fielding four division sets by FY 91 including a Non-Developmental Item (NDI) GBS and use of Army Command and Control System (ACCS) common hardware and software. Subsequently, an ASARC level review, on January 4, 1986, directed that SHORAD C2 become a subsystem of the FAAD System and be renamed FAAD C2I. On January 6, 1986, the Secretary of Defense approved FAADS as a System of Systems to include FAAD C2 and GBS. A Joint Requirements and Management Board (JRMB), a forerunner of the Defense Acquisition Board (DAB), approved full scale engineering development of the FAAD C2 system software on July 29, 1986, and authorized the NDI procurement of four GBS test articles in FY 88 and thirteen low rate initial production (LRIP) sensors in FY 88 and FY 89.

(U) The Milestone II/IIIA Acquisition Decision Memorandum (ADM) of August 1986 approved the GBS NDI acquisition strategy and LRIP. The first buy of sensors are planned to be RDT&E funded pre-production sensors to complete Government technical and operational testing in the RDT&E phase. After completion of technical testing, the pre-production sensors will be refurbished to fully configured units. In FY 94, an LRIP In-Process Review (IPR) will be conducted following successful completion of the pre-production phase exit criteria and an operational assessment. In FY 95, a full scale production (FSP) IPR will be conducted following successful completion of all remaining Technical Tests and Initial Operational Test and Evaluation (IOT&E).

(U) A request for proposal (RFP), DAAH01-87-R-A997, was issued April 19, 1988 for FAAD GBS. The acquisition strategy was to consider sensor systems in industry ready for production and conduct an evaluation consisting of proposal analysis and field tests to select the winner. Only one proposal was received. A Candidate Evaluation Test (CET) was conducted from August 1988 to May 1989. The candidate was unable to meet product specification on all requirements and the solicitation was terminated.

(U) The U.S. Army Air Defense Artillery School reassessed the minimum GBS operational requirements and an update to the FAAD GBS market survey was performed. The market survey update indicated that there were at least eight sensors in industry capable of meeting the revised performance specification requirements.

(U) A draft GBS RFP was released to industry on November 22, 1989,

7a. (U) Program Highlights (Cont'd):

and the amended GBS Required Operational Capability (ROC), which tiers operational requirements, was approved by Department of Army on November 29, 1989. At approximately the same time, the GBS FY 91 funds were zeroed; however, FY 91 was funded with Foreign Comparative Test (FCT) funding and FY 90 RDT&E carryover.

(U) Industry comments to the draft RFP were incorporated into the revised solicitation (DAAH01-90-0303) released to industry on June 11, 1990. The competitive procurement reflected the "best value" NDI concept was designed to obtain the sensor which would meet or exceed program thresholds and most closely meet the goals shown in the GBS Acquisition Program Baseline (APB), which was later approved on March 8, 1991.

(U) Seven proposals were received from industry on September 25, 1990. In October, Firm Fixed Price (FFP) contracts of $250K were awarded to each of the seven competitors for operator training and range support during the Source Selection Evaluation Test (SSET). SSET pilot testing began on November 30, 1990. SSET was completed March 12, 1991. SSET data reduction, authentication, and analysis were completed in May 1991. The results, including operational trials, were formally presented to the Source Selection Evaluation Board (SSEB), and Source Selection Acquisition Council (SSAC) in June 1991. A reassessment of SSEB activities and progress was conducted July 31, 1991. Model contracts were completed, following incorporation of contractor comments. Source selection process complexity magnified by seven proposals, induced delays. Negotiations were started September 16, 1991.

(U) Four of the seven contractor proposals that met the FAAD GBS requirements are based upon radars in service with, or produced by allied nations. International Cooperation is not a program requirement, however, agreements could be established if in the best interest of the Army. The seven candidates evaluated provide industry's confirmation of the operational need and acquisition approach. The FAAD GBS acquisition strategy combines the best features of an event (exit criteria) based milestone schedule, and a streamlined acquisition approach with a fully integrated test program.

(U) The GBS quantities have varied. The December 1989 SAR reflected a GBS program buy of 130 production systems. In December 1989, HQ DA directed that consideration be given to fielding two heavy divisions at Fort Hood and to fielding in accordance with the Air Defense Modernization Plan, August 24, 1989. In addition, the GBS ROC, November 28, 1989, required the GBS to be fielded to the Armored Cavalry Regiments, Heavy Separate Brigades, and Echelons Above Corps.

7a. (U) Program Highlights (Cont'd):

As a result, a decision was made in FY 90 to increase the force structure from 130 to 143 tactical sensors (plus 4 maintenance training systems). In FY 91, the Total Army Analysis (TAA) 98 was approved by HQDA ODSOPS, to again increase the force structure from 143 to 159 sensors (plus training systems and four additional fully configured, tactical GBS, constructed from refurbished pre-production prototypes), a quantity increase which was incorporated in the December 1990 SAR.

NCTR SYSTEM

(U) The Army NCTR Program evolved through a collaborative effort between several Army laboratories, the Navy, the Air Force, and the user community. Army management of the NCTR program transitioned from the PEO, Air Defense, to the PEO, Intelligence and Electronic Warfare in FY 90.

(U) In SARs prior to Sept 91, the Masked Target Sensor (MTS) was reported jointly with the NCTR devices in combined SAR displays. MTS is no longer funded, and development has stopped. For this reason, the 30 Sep 91 SAR reflected NCTR only and a one-time adjustment of the cost figures was made to delete MTS sunk costs from the NCTR figures. The cost figures were also adjusted to delete the NCTR-4, Model 1 program from SAR reporting since it is not part of the FAADS.

(U) The NCTR devices will be incorporated into FAADS' radar and missile systems and provide passive target identification to their hosts. The NCTR devices are known as NCTR-1 Model 1, NCTR-1 Model 2, NCTR-2, NCTR-3, NCTR-4 Model 1 and NCTR-4 Model 2. Model 1 of the NCTR-4 is intended to be integrated into the HAWK air defense system which is not part of FAADS. Thus there are five different NCTR devices intended to be integrated individually and in combination into the FAADS AVENGER, ADATS, NLOS (or equivalent,) and the Ground Based Sensor System. NCTR-3 and NCTR-4, Model 2 are currently unfunded programs. Future SAR submissions will reflect DA decisions and deliberations that alter the postures of NCTR-3 and NCTR-4, Model 2.

(U) Currently, all three active NCTR programs are under contract. NCTR-1 has been under contract to Magnavox Corp since March 1991; NCTR-2 has been under competitive contract with General Dynamics, Lockheed-Sanders, and Hazeltine since Aug 1990. NCTR-4, Model 1 has been under contract with Scope, Inc. since March 1990.

(U) Significant reductions in funding for the NCTR programs in Dec 1990 caused schedule stretchouts and milestone threshold breaches.

7b. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report --
FAAD C2 System

(U) Current estimate is based on an acquisition strategy approved by the September 1991 OSD C3I Committee Review of the Army Tactical Command and Control Systems (ATCCS). This acquisition strategy reflects the overall ATCCS approach which deletes technology insertion for computer re-buys and replaces software versions 6 and 7 with a low level funding wedge for all Pre-Planned Product Improvements.

GBS System

(U) Evaluation of proposals from the seven competitors has been concluded. Best and final offers (BAFO) were solicited on November 22, 1991. Final evaluations, based on proposals, test results and BAFOs were briefed to the source selection advisory council and source selection authority on December 20, 1991.

NCTR System

(U) The NCTR program has been reduced by DA to reflect the newly defined force structure. This provides for buying "Force Package 1" only. Force Package 1 covers equipment requirements for troops deployed OCONUS, rapid deployment forces in CONUS, and also for the training base.

(U) In the NCTR-2 program, milestone slippage greater than six months has been caused by complications in NCTR-2 data collection and reduction, plus severe funding reductions.

(U) The FAAD C2I program is expected to satisfy mission requirements.

c. (U) Changes Since As Of Date --
FAAD C2

(U) None.

GBS SYSTEM

(U) Effective January 1, 1992, the GBS program transitioned from PEO, Air Defense to PEO, Intelligence and Electronic Warfare. The transition was in accordance with a letter signed by the Assistant Secretary of the Army (Research, Development and Acquisition) dated September 19, 1991.

7c. (U) **Program Highlights (Cont'd):**

(U) On 27 February 1992, Hughes Aircraft Company of Fullerton, CA, was awarded the FAAD GBS "best value" contract. Hughes Aircraft was awarded a $26.3M increment of a $61.7M firm fixed price contract option for 6 pre-production units (148 production units). Total value of the contract, if all options are exercised, would be $452.4M. The first 6 pre-production units are scheduled to be delivered in August 1993. They will undergo technical and operational testing and be fielded to the ICD at Ft. Hood, TX, in late 1994. Low-rate initial production of 8 sensors will begin in 1994, followed by full-scale production of 140 sensors in 1995.

NCTR

None.

8. (U) **Threshold Breaches:**
(U) There are schedule breaches to the NCTR APB, 8 Mar 91 caused by very significant funding reductions in Dec 90 to fund higher priority Army efforts. There are no Nunn-McCurdy unit cost breaches.

9. (U) **Schedule:**
FAAD C2

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Required Op Capability (ROC) Approved	N/A	OCT 85	OCT 85
Milestone II DAB	AUG 86	JUL 86	JUL 86
Contract Award (Build I)	SEP 86	SEP 86	SEP 86
Contract Award (Built II)	JUN 88	N/A	N/A
Contract Award (GBS LRIP)	JUN 88	N/A	N/A
Common Hardware/Software Proto Delivery	N/A	NOV 88	NOV 88
EPLRS Eng Dev Model Delivery	N/A	DEC 88	DEC 88
Begin Technical Test (Build I)	JUN 89	N/A	N/A
Complete Tech Test (Build I)	JUN 90	N/A	N/A
Common Hardware/Software Delivery (Test System)	N/A	JUN 90	JUN 90
JTIDS Eng Dev Model Delivery (qty 8)			
Start	N/A	MAR 89	MAR 89
Complete	N/A	JUN 90	JUN 90
Proto SICPS			
Rigid Wall Delivery	N/A	JUL 90	JUL 90
Soft Top Delivery	N/A	MAR 91	MAR 91
Contract Mod (Restructure/Version 3)	N/A	JAN 91	JAN 91

9a. (U) Schedule (Cont'd):
FAAD C2

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
LSDIS Production Delivery	N/A	DEC 91	DEC 91
C2I/Fire Unit Tech Test (Light Div)			
Start	SEP 90	SEP 92	OCT 92
Complete	JUN 91	OCT 92	NOV 92
Early User Eval (Light Div)			
Start	N/A	DEC 92	DEC 92
Complete	N/A	MAR 93	MAR 93
Complete SINCGARS Delivery (Light Div)	N/A	JAN 93	JAN 93
Complete JTIDS 2M Delivery (Light Div)	N/A	JAN 93	JAN 93
Complete Common Hardware/Software Delivery (First Unit Equipped Suite)	N/A	JAN 93	JAN 93
IOT&E "A" (Light Div)			
Start	N/A	APR 93	APR 93
Complete	N/A	MAY 93	MAY 93
Milestone III (Light Div)	N/A	AUG 93	AUG 93
First Unit Equipped (Light Div)	JUN 91	SEP 93	SEP 93
Contract Award (Version 4)	N/A	JUL 94	JUL 94(Ch-1)
Early User Eval (Heavy Div)			
Start	N/A	JAN 97	N/A
Complete	N/A	APR 97	N/A
IOT&E "B" (Heavy Div)			
Start	N/A	MAY 97	MAY 97(Ch-1)
Complete	N/A	JUN 97	JUN 97(Ch-1)
Milestone III (Heavy Div)	N/A	AUG 97	AUG 97(Ch-1)
First Unit Equipped (Heavy Div)	N/A	OCT 97	OCT 97(Ch-1)

(b)(1)

[redacted]

b. (U) Previous Change Explanations --

(U) The FSD C2 Build II contract slipped from June 1988 to January 1989 because the GFE was not available and because of budget reductions. This caused a corresponding slip to the FAAD C2 program. ASARC/JRMB changed from August 86 to July 86 to reflect accurate date. Schedule slippage of approximately 7 months due to funding constraints. The start of the IOT&E changed from July 92 to February 94, completion of IOT&E changed from March 93 to January 95, and FUE (CONUS) changed from June 93 to December 93 because of budget

9b. (U) Schedule (Cont'd):

FAAD C2

reductions. This program was restructured May 1990 by the AAE because of the changing threat environment and budget reductions. The restructured program will provide early development of a tailored FAAD C2 for fielding to light and special divisions impacting milestones "C2I/FU Tech Test (LT)" and "FUE LT". The sensor LEWDD name was changed to LSDIS. C2I FU Tech Test was changed from Sep 92 to Oct 92 due to non-availability of LSDIS.
Contract award of Version 4 changed from July 94 to July 92 due to limited heavy division capability being provided earlier. EUE Heavy Divison was changed to Test, Analyze, and Fix. IOT&E Heavy Division was changed from May 97 - June 97 to February 95 - March 95 due to limited heavy division capability being provided earlier. CDR Heavy Division - May 93 was added due to limited heavy division capability being provided earlier. IOC Light Division - September 94 was added by DA direction. Test, Analyze, and Fix - October 94 - January 95 was changed due to limited heavy division capability being provided earlier. IOC Heavy Division - November 96 was added due to limited heavy division capability being provided earlier.

c. (U) Current Change Explanations --

(CH-1) Schedule dates were changed back to the original dates.

(CH-2) Milestones were erroneously added to the Sep 90 SAR.

d. (U) References --

(U) Development Estimate:

SDDM, August 14, 1986.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

GROUND BASED SENSOR

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Milestone IIIA	JUL 86	JUL 86	JUL 86
Request for Proposal Issued	N/A	JUN 90	MAY 90
Proposal Received	N/A	N/A	SEP 90
Candidate Evaluation Test Contract Awards	AUG 88	SEP 90	SEP 90

9a. (U) Schedule (Cont'd):
GROUND BASED SENSOR

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Candidate Test and Proposal Eval			
Start	N/A	SEP 90	OCT 90
Complete	MAR 89	JUN 91	DEC 91(Ch-1)
Contract Award (Pre-Production)	MAY 89	OCT 91	MAR 92(Ch-1)
Pre-Prod Deliveries Start	APR 91	JUL 93	AUG 93
Tech Test			
Start	MAY 91	JUL 93	SEP 93
Complete	OCT 91	JAN 94	MAR 94
RAM Test			
Start	N/A	JUL 93	SEP 93
Complete	N/A	SEP 94	SEP 94
LRIP Option DAB Review	N/A	JAN 94	JAN 94
LRIP Option Contract Award	JUN 88	FEB 94	FEB 94
IOTE			
Start	NOV 91	JUN 94	JUL 94
Complete	DEC 91	SEP 94	SEP 94
First Unit Equipped (Pre-Prod)	JUN 93	NOV 94	NOV 94(Ch-2)
Full Rate Production DAB Review	JAN 92	DEC 94	JAN 95
Full Rate Production Contract Award	FEB 92	FEB 95	FEB 95
LRIP Deliveries Start	JAN 92	FEB 96	MAR 96
Prod Qual Test			
Start	N/A	FEB 96	MAR 96
Complete	N/A	APR 96	JUL 96
Full Rate Production Deliveries Start	MAY 93	FEB 97	FEB 97

(b)(1)

b. (U) Previous Change Explanations --

(U) The sole candidate responding to the original GBS solicitation failed to meet minimum operational requirements. The solicitation was cancelled and the PM was directed to re-solicit. A "best value" resolicitation was released. It provided seven candidates which complicated and added evaluation time to the source selection process. In 1990 an LRIP buy in FY94 was inserted into the program. These changes, plus budget constraints and the loss of funding (both RDT&E and Procurement), have contributed to the milestone delays.

c. (U) Current Change Explanations --

(CH-1) Candidate Test and Proposal Evaluation Complete changed from Nov 91 to Dec 91 and Contract Award (Pre-Prod) changed from

9c. (U) Schedule (Cont'd):

GROUND BASED SENSOR

Nov 91 to Feb 92 due to source selection process complexity (multiplied by consideration of seven candidatees).

(CH-2) First Unit Equipped (Pre-Prod) changed from Feb 95 to Nov 94 to match negotiated milestone.

d. (U) References --

(U) Development Estimate:

(U) ROC, July 10, 1986

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

NCTR

a. (U) Milestones --

	Planning Estimate	Approved Program	Current Estimate
NCTR-1/Mod 1 (ADATS/AVENGER)			
Milestone II	N/A	JUN 87	JUN 87
Contract Award (FSD)	JUL 90	DEC 90	MAR 91
Prelim Design Review	N/A	APR 91	AUG 91
Critical Design Review	N/A	JAN 92	FEB 92(Ch-1)
Development Test			
Start	MAR 93	DEC 92	JUN 93(Ch-2)
Complete	JUN 93	MAR 93	AUG 93(Ch-2)
Fire Unit Integration			
Start	N/A	MAR 93	FEB 93(Ch-2)
Complete	N/A	AUG 93	JUN 93(Ch-2)
Pre-Prod Qual/Op Assess Test			
Start	JUN 93	AUG 93	AUG 93(Ch-2)
Complete	SEP 93	DEC 93	OCT 93(Ch-2)
Milestone IIIA	NOV 93	APR 94	APR 94(Ch-3)
LRIP Contract Award	FEB 94	JUN 94	MAR 94(Ch-4)
LRIP Deliveries Start	SEP 95	FEB 96	MAR 95(Ch-2)
Fire Unit Integration			
Start	N/A	FEB 96	APR 95(Ch-2)
Complete	N/A	MAY 96	AUG 95(Ch-2)
First Article Test/Limited Op Test			
Start	N/A	MAY 96	MAR 95
Complete	N/A	SEP 96	SEP 95
Milestone IIIB	N/A	NOV 96	JAN 96

9a. (U) Schedule (Cont'd):
NCTR

(U) Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate
Full Scale Prod Contract Award	APR 96	JAN 97	MAR 96
First Unit Equipped	SEP 96	JAN 97	MAY 96
NCTR-1/Mod 2 (Ground Based Sensors)			
Milestone II	N/A	JUN 87	JUN 87
Contract Award (FSD)	N/A	FEB 92	APR 92(Ch-5)
Prelim Design Review	N/A	MAY 92	NOV 92(Ch-5)
Critical Design Review	N/A	DEC 92	JUL 93(Ch-5)
Development Test			
Start	N/A	FEB 94	MAY 94(Ch-5)
Complete	N/A	APR 94	AUG 94(Ch-5)
Fire Unit Integration			
Start	N/A	APR 94	JUN 94(Ch-5)
Complete	N/A	SEP 94	SEP 94
Pre-Prod Qual/Op Assess Test			
Start		OCT 94	SEP 94(Ch-4)
Complete		JAN 95	DEC 94(Ch-4)
Milestone IIIA	N/A	APR 95	MAR 95(Ch-4)
LRIP Contract Award	N/A	JUN 95	MAR 95(Ch-4)
LRIP Deliveries Start	N/A	JAN 97	MAR 96(Ch-4)
Fire Unit Integration			
Start	N/A	JAN 97	JUL 96(Ch-4)
Complete	N/A	APR 97	SEP 96(Ch-4)
First Article Test/Limited Op Test			
Start	N/A	APR 97	MAR 96(Ch-4)
Complete	N/A	AUG 97	NOV 96(Ch-4)
Milestone IIIB	N/A	SEP 97	FEB 97(Ch-4)
Full Scale Prod Contract Award	N/A	NOV 97	MAR 97(Ch-4)
First Unit Equipped	N/A	NOV 97	AUG 97(Ch-4)
NCTR-2 (ADATS/AVENGER)			
Milestone II	N/A	JUN 87	JUN 87
Contract Award (FDS) (3Competitors)	APR 90	JUN 90	AUG 90
Technical Test			
Start	N/A	MAY 91	JUL 91
Complete	N/A	JUN 91	SEP 91(Ch-6)
Down Select to One Contractor	N/A	AUG 91	MAR 92(Ch-7)
FSD Contract Option 1 Award	N/A	AUG 91	JUN 92(Ch-7)
Preliminary Design Review	N/A	NOV 91	APR 94(Ch-7)
Critical Design Review	N/A	FEB 92	OCT 94(Ch-7)
Development Test			
Start	NOV 92	SEP 92	JAN 95(Ch-2)

9a. (U) Schedule (Cont'd):
NCTR

(U) Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate
Complete	NOV 93	DEC 92	MAY 95 (Ch-2)
Fire Unit Integration			
Start	N/A	SEP 92	DEC 95 (Ch-2)
Complete	N/A	DEC 92	MAR 96 (Ch-2)
Pre-Prod Qual/Op Assess Test			
Start	FEB 93	DEC 92	JUL 95
Complete	MAY 93	MAR 93	SEP 95 (Ch-6)
Milestone IIIA	JUL 93	JUL 93	JAN 96 (Ch-8)
LRIP Contract Award	OCT 93	NOV 93	JAN 96 (Ch-2)
LRIP Deliveries Start	APR 95	AUG 95	DEC 96 (Ch-2)
Fire Unit Integration			
Start	N/A	AUG 95	JAN 97 (Ch-2)
Complete	N/A	NOV 95	MAY 97 (Ch-2)
First Article Test/Limited Op Test			
Start	N/A	NOV 95	JAN 97 (Ch-2)
Complete	N/A	MAR 96	APR 97 (Ch-2)
Milestone IIIB	N/A	JUN 96	DEC 97
Full Scale Production Contract Award	NOV 95	JUL 96	FEB 98 (Ch-2)
First Unit Equipped	NOV 95	JUL 96	FEB 98
NCTR-4 (Ground Based Sensor)			
Milestone II	N/A	JUN 87	TBD (Ch-3)
Contract Award (FSD)	AUG 88	NOV 91	TBD (Ch-3)
Preliminary Design Review	N/A	MAR 92	TBD (Ch-3)
Critical Design Review	N/A	OCT 92	TBD (Ch-3)
Development Test			
Start	MAY 90	JAN 94	TBD (Ch-3)
Complete	AUG 90	APR 94	TBD (Ch-3)
Ground Based Sensor Integration			
Start	N/A	MAY 94	TBD (Ch-3)
Complete	N/A	JUL 94	TBD (Ch-3)
Pre-Prod Qual/Op Assess Test			
Start	N/A	JUN 94	TBD (Ch-3)
Complete	N/A	OCT 94	TBD (Ch-3)
Milestone IIIA	JAN 91	FEB 95	TBD (Ch-3)
LRIP Contract Award	N/A	APR 95	TBD (Ch-3)
LRIP Deliveries Start	FEB 93	OCT 96	TBD (Ch-3)
Ground Based Sensor Integration			
Start	FEB 92	OCT 96	TBD (Ch-3)
Complete	MAY 92	JAN 97	TBD (Ch-3)
First Article Test/Limited Op Test			

9a. (U) Schedule (Cont'd):
NCTR

(U) Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate	
Start	N/A	JAN 97	TBD	(Ch-3)
Complete	N/A	MAY 97	TBD	(Ch-3)
Milestone IIIB	N/A	SEP 97	TBD	(Ch-3)
Full Scale Production Contract Award	N/A	NOV 97	TBD	(Ch-3)
First Unit Equipped	MAY 93	NOV 97	TBD	(Ch-3)
MTS (Masked Target Sensor)		~~N/A~~	~~N/A~~	
Start Advanced Development	DEC 87	N/A	N/A	
Complete Advanced Development	DEC 90	N/A	N/A	

(U) Milestone IIIB has been changed to Milestone III. This applies to all the NCTR programs reported in this SAR.

b. (U) Previous Change Explanations --

(U) In previous SARs, eighty-three milestones were reported as being either slipped, deleted, or advanced to an earlier date. Slipped milestones were caused by delays in contract award, increased prototype lead time, delayed test start dates, requirements changes, risk reduction tasks being added, a new requirement for a MARB and extended testing, and unavailability of the host platform. Deleted milestones were caused by replacement with equivalent milestones which reflected refined testing plans. Milestones advanced to an earlier date were caused by parallel work, earlier availability of a host platform, earlier test starts, and schedule advancements to mesh with GBS schedules.

c. (U) Current Change Explanations --

(U) (Ch-1) The Critical Design Review for NCTR-1, Model 1 has been slipped from Jan 92 to Feb 92 due to design changes necessitated from "lessons learned" in Desert Storm. The listing of this milestone as occurring in Jun 92 in earlier SARs was a typographical error.

(U) (CH-2) Replanning to stay within austere funding and to procure force package 1 only.

(U) (CH-3) The date in the 30 Sep 91 SAR was a data transcription error.

(U) (CH-4) Program progress has facilitated an earlier schedule.

9c. (U) Schedule (Cont'd):

NCTR

(U) (CH-5) A several-month slip in many of the milestones for NCTR-1, Model 2 has occurred because our option for Model 2 was contingent on GBS contract award and was scheduled to be exercised approximately two months after that award. We do not anticipate exercising the option before April based on a February award for GBS.

(U) (CH-6) Delays in data reduction.

(U) (CH-7) A six-month slip in many of the milestones for NCTR-2 has occurred because of complications in NCTR-2 data collection and reduction.

(U) (CH-8) Program stretched due to drastic funding reductions.

d. (U) References --

(U) Planning Estimate:

(U) NCTR-1 Development Specification FAAD, Electronic Support Measures (ESM) NCTR System dated October 1990.

(U) NCTR-2 Development specification FAADS, Non-Imaging Sensor, NCTR System dated May 89.

(U) Approved Program:

DAE Approved Acquisition Program Baseline dated 8 March 1991.

10. (U) Performance Characteristics:

FAAD C2

a. (U) Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate	
LIGHT DIVISION:					
Operational Availability (Ao) Range (w/o Environ Control Unit/veh)	N/A	.60-.70 / .60-.70	N/A	.60-.70	(CH-1)
MTBOMF (hrs)					
Air Defense Sensor (Single) Light Early Warn Detec Device	125	2400 / 2400	N/A	N/A	(CH-2)
JTIDS	N/A	393 / 393	N/A	207	
SINCGARS	N/A	987 / 987	N/A	987	
Generator Common HW/SW	425	366 / 366	N/A	366	

10a. (U) Performance Characteristics (Cont'd):
FAAD C2

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Trans Computer Unit	N/A	1824	/ 1824	N/A	1824
Enhanced Hand-held Term Unit	N/A	2810	/ 2810	N/A	2810
Tgt (non-maneuvering) positional accuracy reported to a Fire Unit (FU) with range of air def sensor inputs (Path = Sensor(x)--> C**2(y)-->FU(z)) (m) w/1 sigma	N/A	1172-2517 (x,y)	/ 1172-2517 (x,y)	N/A	1172-2517 (x,y)
Range of air def sensor inputs (Path = Sensor(x)--> C**2(y)-->FU(z)) (m) w/1 sigma	N/A	300-1300 (x,y)	/ 300-1300 (x,y)	N/A	300-1300 (x,y)
Initial track rpt delivery time to fire unit (sec)					
Overall	N/A	12.0	/ 12.0	N/A	12.0
JTIDS	N/A	1.3	/ 1.3	N/A	1.3
SINCGARS	~~N/A~~				
Transmit Key On	N/A	.5	/ .5	N/A	.5
Transmit Release	N/A	.2	/ .2	N/A	.2
Common HW/SW	N/A	.7	/ .7	N/A	.7
Battle Mgt Info delivery speed to wpn syst (sec)					
Air Def Warning	N/A	30	/ 30	N/A	30
Wpns Control Order	N/A	30	/ 30	N/A	30
Common HW/SW	N/A	.9	/ .9	N/A	.9
SINCGARS					
Transmit Key On	N/A	.5	/ .5	N/A	.5
Transmit Release	N/A	.2	/ .2	N/A	.2
Subsystem march order and emplacement 85% of time, non-remoted equip (less EPLRS and JTIDS mast antenna) (min)					

10a. (U) Performance Characteristics (Cont'd):
FAAD C2

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Soft-top/Pallet	30	30 / 30	N/A	30
HEAVY DIVISION:				
Operational Availability (Ao) Range (w/o Environ Control Unit/veh)	N/A	.80-.88 / .80-.88	N/A	.84
MTBOMF (hrs)				
Air Defense Sensor (Single) Ground Based Sensor	125	125 / 125	N/A	125
JTIDS*	N/A	393 / 393	N/A	393
SINCGARS*	N/A	987 / 987	N/A	987
EPLRS* User Unit	N/A	547 / 547	N/A	547
Generator	425	366 / 366	N/A	366
Common HW/SW				
Trans Computer Unit	N/A	5475 / 5475	N/A	5475
Enhanced Hand-held Term Unit	N/A	8431 / 8431	N/A	8431
Target (non-maneuvering) positional accuracy reported to a Fire Unit (FU) with range of air def sensor inputs (Path=Sensor (x)--> C**2(y)-->FU (z)) (m) w/1 sigma)	N/A	204-449 (x,y) 257-4000 (z) / 204-449 (x,y) 257-4000 (z)	N/A	204-499 (x,y) 257-4000 (z)
Range of air def sensor inputs (m) w/1 sigma	N/A	100-424 (x,y) 210-4000 (z) / 100-424 (x,y) 210-4000 (z)	N/A	100-424 (x,y) 210-4000 (z)
Initial track rpt delivery time to fire unit (sec)				
Overall	N/A	6.0 / 6.0	N/A	6.0
JTIDS	N/A	1.3 / 1.3	N/A	1.3
EPLRS	N/A	.3 / .3	N/A	.3
Common HW/SW	N/A	.7 / .7	N/A	.7
Battle Mgt Info delivery speed to wpn syst (sec)				

10a. (U) **Performance Characteristics (Cont'd):**
FAAD C2

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Air Def Warning	N/A	30	/ 30	N/A	30
Wpns Control Order	N/A	30	/ 30	N/A	30
Sensor Mgt	N/A	30	/ 30	N/A	30
Movement Order	N/A	64	/ 64	N/A	64
Common HW/SW	N/A	.9	/ .9	N/A	.9
EPLRS	N/A	1.0	/ 1.0	N/A	1.0
Correct target ID provided to FU (prob)	N/A	.90-.99	/ .90-.99	N/A	.90 -.99
Subsystem march order and emplacement 85% of time, non-remoted equip (less EPLRS and JTIDS mast antenna) (min)					
Sheltered Cmd Post	N/A	30	/ 30	N/A	30
RAM - FAAD C2		~~N/A~~	~~/ N/A~~		
ABMOC or AME C2 subsystems MTBOMF	184	N/A	/ N/A	N/A	N/A
System Req Ao	.84	N/A	/ N/A	N/A	.84
Manpower Threshold	626	N/A	/ N/A	N/A	N/A
MTTR (subsystem)	.5 hrs	N/A	/ N/A	N/A	N/A
(sensor)	~~2.0~~ 0.5 hrs	N/A	/ N/A	N/A	N/A
ABMOC/C2 Node, 90% of time, will be capable of:		~~N/A~~	~~/ N/A~~		
Target Correlation rpts true position	w/i 1km	N/A	/ N/A	N/A	N/A
Target info to fire unit after report entry	w/i 12 sec	N/A	/ N/A	N/A	N/A
Selection & simultaneous display of air track, grnd situation, wpns & special pts of interest	90%	N/A	/ N/A	N/A	N/A
FAAD C2I subsystems, 90% of time, will be capable of Air Battle Mgt Order (ABMO) dissemination to fire unit of:		~~N/A~~	~~/ N/A~~		

10a. (U) Performance Characteristics (Cont'd):
FAAD C2

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Air Defense Warning	w/i 90 sec	N/A	/ N/A	N/A	N/A
Weapons Control	w/i 90 sec	N/A	/ N/A	N/A	N/A
State of Alert	w/i 90 sec	N/A	/ N/A	N/A	N/A
Manual Acknowledgement of ASMO from time of receipt	w/i 90 sec	N/A	/ N/A	N/A	N/A
FAAD C2I Ground Based Sensor w/FAAD C2I subsystem will be capable of fully initialized march order and emplacement 85% of time	w/i 30 min	N/A	/ N/A	N/A	N/A
MTBOMF (HRS) Air Defense Sensor (Single) Light & Special Div Interim Sensor (LSDIS)	N/A	N/A	/ N/A	N/A	1715

* Denotes non-APB characteristics.

(U) MTTR (sensor) is erroneously entered in the CARS Approved Baseline diskette as 2.0 hrs. The correct performance characteristic is 0.2 hrs.

(U) Performance characteristics are identified to other PMs.

ACRONYMS:

EPLRS - Enhanced Position Location Reporting System
JTIDS - Joint Tactical Information Distribution System
LEWDD - Light Early Warning Detection Device
MTBOMF - Mean Time Between Operational Mission Failure
SICPS - Standard Integrated Command Post Shelter
SINCGARS - Single Channel Ground Airborne Radio System

10b. (U) Performance Characteristics (Cont'd):
FAAD C2

b. (U) Previous Change Explanations --

(U) Sensor MTBOMF was revised based on identification of Heavy & Light Division requirements. The generator MTBOMF estimate was revised based on tests and contractual information. ABMOC or AME C2 is no longer applicable since RAM requirements for Light Forces fielding were not established by the combat developer; Heavy Force fielding RAM requirements are being revised.

(U) The .84 for Ao (Heavy Division) is a user generated goal. The ROC Ao for FAAD C2 indicates percent of the time the system must be operational to accomplish its mission and be successful. Overall FAAD C2 Ao was derived from the subcomponent RAM by calculating total subcomponent operational time and dividing by the total time.

(U) The 207 hours for JTIDS is MTBF. The MTBOMF is 666 hours.

c. (U) Current Change Explanations --

(CH-1) The Ao (Light Division) reflects the approved Performance Characteristic.

(CH-2) The name for Air Defense Sensor (Single) Light Early Warning Detection Device (LEWDD) was changed to Light & Special Division Interim Sensor (LSDIS).

d. (U) References --

(U) Development Estimate:

SDDM, August 14, 1986.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

GROUND BASED SENSOR

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

10a. (U) Performance Characteristics (Cont'd):
GROUND BASED SENSOR

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
(b)(1) [redacted]					
size)					
Interface Requirement	N/A	FAAD C**2I	/ FAAD C**2I	N/A	FAAD C**2I
Identification Friend or Foe	N/A	Mark XV	/ Mark XII	N/A	Mark XII
March Order (mins)	<=10	<=10	/ Best Value 1/	N/A	N/A
Emplacement (mins)	<=10	<=30	/ Best Value 1/	N/A	N/A
Reliability (MTBF hrs)	208	>=208	/ Best Value 1/	N/A	N/A
Maintainability (MTTR hrs)	2	<=2	/ Best Value 1/	N/A	N/A

ACRONYMS:

ECM - Electronic Counter Measure
MTBF - Mean Time Between Failure
RAM - Reliability And Maintainability
HMMWV - High Mobility Multipurpose Wheeled Vehicle
MTTR - Mean Time to Repair

1/ Contractors are permitted to propose that performance which he feels his sensor can meet. The "best value" sensor will be selected as measured against all objectives in the program. Once the contract is signed, the baseline thresholds will be updated to reflect the minimum values which the winning contrator agrees to warrant.

10b. (U) **Performance Characteristics (Cont'd)**:
GROUND BASED SENSOR

b. (U) Previous Change Explanations --

(U) Performance characteristics were changed to reflect the revised GBS ROC approved November 29, 1989, and to incorporate the "best value" acquisition concept.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
(U) ROC, July 10, 1986

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

NCTR

a. (U) Performance --	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate	
Weight (lbs)					
NCTR-1 Model 1	100	50 / 100	N/A	100	
NCTR-1 Model 2	100	300 / 500	N/A	500	
NCTR-2	30	30 / 50	N/A	30	
NCTR-4	80	100 / 100	N/A	TBD	(CH-1)
RAM Mean Time Between Failure (hrs)					
NCTR-1	N/A	>=900 / >=900	N/A	>=900	
NCTR-2	N/A	>=900 / 900	N/A	900	
NCTR-4	N/A	>=600 / >=600	N/A	TBD	(CH-1)
Mean Time to Repair (Organic) (mins)					
NTCR-1	N/A	<=30 / <=30	N/A	<=30	
NTCR-2	N/A	<=30 / <=30	N/A	<=30	
Mean Time to Repair (Dir Spt/Gen Spt) (hrs)					
NTCR-1	N/A	1 / 1	N/A	1	
[illegible]					

(b)(1) [redacted]

10a. (U) Performance Characteristics (Cont'd):

NCTR

	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
NCTR-1 (detect and ID radio freq emitters)				

(b)(1)

[redacted]

10a. (U) Performance Characteristics (Cont'd):
NCTR

PE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)			

ACRONYMS:

NCTR-1 = Non Cooperative Target Recognition 1 is an electronic support measures device that mounts on the weapon platform for FAADS LOS-F-H (ADATS), FAADS LOS-R (Avenger), and the Ground Based Sensor.

NCTR-2 = Non Cooperative Target Recognition 2 is a non-imaging sensor that mounts on the weapon platform for FAADS LOS-F-H

10a. (U) Performance Characteristics (Cont'd):
NCTR
(ADATS) and FAADS LOS-R (Avenger).

NCTR-3 = Non Cooperative Target Recognition 3 is a non-imaging infrared sensor that mounts on the weapon platform for FAADS LOS-F-H (ADATS) and FAADS LOS-R (Avenger) NOTE: This system has been tested but range and accuracy performance were not acceptable -- retained in tech base.

NCTR-4 = Non Cooperative Target Recognition 4 is an electronic sensor that mounts on the Ground Based Sensor.

b. (U) Previous Change Explanations --

(U) Performance characteristics requirements in older SARs lacked specificity. When actual needs were clarified, the requirements were accordingly updated in the SARs which followed. Also, Phase I NCTR-2 test results became available. An improved performance change was incorporated based on a contractor's actual design. One deletion covered a requirement for HAWK, which is not part of FAADS.

c. (U) Current Change Explanations --

(CH-1) Parameter in 30 Sep 91 SAR was a data transcription error.

(CH-2) New ROC value. Change was requested by user.

(CH-3) Phase I test results indicate this estimate to be the most likely for the detection range.

(CH-4) Model 1 of NCTR-4 is intended to be integrated into the HAWK air defense system which is not part of FAADS.

(CH-5) Coverage for NCTR-1 now displayed as Model 1 and Model 2 separately.

d. (U) References --

(U) Planning Estimate:
(U) NCTR-1 Development Specification FAAD, Electronic Support Measures (ESM) NCTR System dated October 1990.

(U) NCTR-2 Development specification FAADS, Non-Imaging Sensor, NCTR System dated May 89.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)
FAAD C2

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	474.3	821.8	557.7
Procurement	331.1	251.1	84.3
Flyaway	(180.7)		(70.2)
Total Flyaway	(180.7)		(70.2)
Other Weapon Systems	(140.6)		(14.1)
Total Other Wpn Sys	(140.6)		(14.1)
Peculiar Support	(9.8)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 87 Base-Year $	805.4	1072.9	642.0
Escalation	88.6	415.0	139.9
Development (RDT&E)	(27.0)	(200.2)	(97.3)
Procurement	(61.6)	(214.8)	(42.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	894.0	1487.9	781.9

(U) PM SICPS controlled costs for Standard Integrated Command Post System (SICPS) which is Government Furnished Equipment (GFE) for the FAAD C2 program are included in FAAD C2 current estimate.

b. (U) Quantity --			
Development (RDT&E)	0	N/A	2
Procurement	0	35	33
Total	0	35	35

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:

SDDM, August 14, 1986.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

11a. (U) Total Program Cost and Quantity (Cont'd):
GROUND BASED SENSOR

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	31.8	127.3	116.9
Procurement	452.3	488.4	482.8
Total Flyaway	(303.5)		(326.4)
Total Flyaway	(303.5)		(326.4)
Other Weapon Systems Cost	(114.9)		(118.9)
Total Other Wpn Sys	(114.9)		(118.9)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(33.9)		(37.5)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 87 Base-Year $	484.1	615.7	599.7
Escalation	84.0	300.0	271.7
Development (RDT&E)	(3.3)	(27.1)	(22.5)
Procurement	(80.7)	(272.9)	(249.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	568.1	915.7	871.4
b. (U) Quantity --			
Development (RDT&E)	0	N/A	6
Procurement	0	159	159
Total	0	159	165

(U) The total quantity is 165 units since there will be 159 production units and all six development prototypes will be fully configured end items. Four of the six development prototypes will be fielded. Two will be used to support development and testing of P3I modifications.

(U) The Milestone II/IIIA Acquisition Decision Memorandum (ADM) of August 14, 1987 approved acquisition of 4 pre-production and 13 LRIP sensors. Acquisition Plan dated September 5, 1990 approved 8 pre-production and 12 LRIP sensors. Negotiated quantities (February 1992) are for 6 RDTE pre-production with a Production Option for 8 LRIP sensors.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

11e. (U) Total Program Cost and Quantity (Cont'd):
GROUND BASED SENSOR

e. (U) References --

(U) Development Estimate:

(U) ROC, July 10, 1986

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

NCTR

a. (U) Cost --	Planning Estimate	Approved Program	Current Estimate
Development (RDT&E)	221.2	164.9	114.7
Procurement	129.9	433.0	204.8
Other Weapon Systems Cost	(129.9)		(0.0)
Total Flyaway			(204.8)
Total Flyaway	(129.9)		(204.8)
Other Weapon Systems Cost	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 87 Base-Year $	351.1	597.9	319.5
Escalation	50.5	231.6	133.6
Development (RDT&E)	(17.1)	(30.2)	(24.3)
Procurement	(33.4)	(201.4)	(109.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	401.6	829.5	453.1

(U) Current estimate funding information for the NCTR breakdown is as follows:

Then-Year Dollars (in Million):

Total RDT&E	139.0
NCTR-1	(92.6)
NCTR-2	(46.1)
NCTR-4, Model 2	TBD
Total Procurement:	314.1
NCTR-1	(266.3)
NCTR-2	(47.8)
NCTR-4, Model 2	TBD

11a. (U) Total Program Cost and Quantity (Cont'd):

Base Year (FY87) Dollars (in Millions):

Total RDT&E (FY87)	Objective	Threshold
NCTR-1	75.5	86.8
NCTR-2	39.2	45.1
NCTR-4, Model 2	TBD	TBD
Total Procurement:		
NCTR-1	174.0	182.6
NCTR-2	30.8	32.4
NCTR-4, Model 2	TBD	TBD

Average Unit Procurement Cost (FY87$):			Total Proc. Quantities
NCTR-1, Model 1	0.133	0.140	669
NCTR-1, Model 2	0.865	0.908	98
NCTR-2	0.173	0.182	178
NCTR-4, Model 2	TBD	TBD	TBD

b. (U) Quantity --

Development (RDT&E)	0	N/A	0
Procurement	0	N/A	1
Total	0	N/A	1

(U) The above chart requires clarification, as follows:

(U) There are four programs involved. Each is required in a quantity unique to its own application. The R&D quantities currently required by contract or available as unexercised options are:

	FY91	FY93	FY95	TOTAL
NCTR-1, Model 1		10		10
NCTR-1, Model 2			6	6
NCTR-2	6			6

(U) The production quantities of NCTR devices reflect DA defined Force Package 1, as follows. Note: The NCTR "quantity" is defined as a nominal quantity of "1".

NCTR-1, Model 1	669 ea
NCTR-1, Model 2	98 ea
NCTR-2	178 ea
NCTR-4, Model 2	TBD

c. (U) Foreign Military Sales -- None.

11d. (U) Total Program Cost and Quantity (Cont'd):
NCTR

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:

(U) NCTR-1 Development Specification FAAD, Electronic Support Measures (ESM) NCTR System dated October 1990.

(U) NCTR-2 Development specification FAADS, Non-Imaging Sensor, NCTR System dated May 89.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

FAAD C2

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	781.9	1520.6	781.9
(2) Quantity	35	35	35
(3) Unit Cost	22.340	43.446	22.340
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

GROUND BASED SENSOR

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	871.4	898.6	871.4
(2) Quantity	165	165	165
(3) Unit Cost	5.281	5.446	5.281

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):**

GROUND BASED SENSOR

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

NCTR

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	453.1	846.8	453.1
(2) Quantity	1	1	1
(3) Unit Cost	453.10	846.80	453.10
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

(U) Cost Parameters: There are three programs involved. Total dollars divided by total quantity yields a non-informative number.

13. (U) **Cost Variance Analysis:**
Summary - All end items

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Estimate	774.7	1089.0	0.0	1863.7
Previous Changes:				
Economic	+4.2	+225.8	-	+230.0
Quantity	-	+134.0	-	+134.0
Schedule	-2.7	+34.7	-	+32.0
Engineering	-	-	-	-
Estimating	+530.7	+205.0	-	+735.7
Other	-	-	-	-
Support	-	+67.1	-	+67.1
Subtotal	+532.2	+666.6	-	+1198.8
Current Changes:				
Economic	-28.5	-194.4	-	-222.9
Quantity	-	-211.2	-	-211.2
Schedule	+7.4	+39.0	-	+46.4
Engineering	-	-7.7	-	-7.7
Estimating	-352.4	-37.6	-	-390.0
Other	-	-	-	-
Support	-	-170.7	-	-170.7
Subtotal	-373.5	-582.6	-	-956.1
Total Changes	+158.7	+84.0	-	+242.7
Current Estimate	933.4	1173.0	-	2106.4

13a. (U) **Cost Variance Analysis (Cont'd):**

Summary - All end items

a. (U) Summary -- (FY 1987 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Estimate	727.3	913.3	0.0	1640.6
Previous Changes:				
Quantity	-	+120.6	-	+120.6
Schedule	-0.1	+31.2	-	+31.1
Engineering	-	-	-	-
Estimating	+145.8	+24.7	-	+170.5
Other	-	-	-	-
Support	-	-13.6	-	-13.6
Subtotal	+145.7	+162.9	-	+308.6
Current Changes:				
Quantity	-	-176.4	-	-176.4
Schedule	-	-12.2	-	-12.2
Engineering	-	-3.7	-	-3.7
Estimating	-83.7	+3.1	-	-80.6
Other	-	-	-	-
Support	-	-115.1	-	-115.1
Subtotal	-83.7	-304.3	-	-388.0
Total Changes	+62.0	-141.4	-	-79.4
Current Estimate	789.3	771.9	-	1561.2

13a. (U) Cost Variance Analysis (Cont'd):
FAAD C2

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	501.3	392.7	0.0	894.0
Previous Changes:				
Economic	-1.7	+36.1	-	+34.4
Quantity	-	-	-	-
Schedule	-2.2	-	-	-2.2
Engineering	-	-	-	-
Estimating	+527.1	+20.4	-	+547.5
Other	-	-	-	-
Support	-	+46.9	-	+46.9
Subtotal	+523.2	+103.4	-	+626.6
Current Changes:				
Economic	-19.3	-19.8	-	-39.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-350.2	-145.8	-	-496.0
Other	-	-	-	-
Support	-	-203.6	-	-203.6
Subtotal	-369.5	-369.2	-	-738.7
Total Changes	+153.7	-265.8	-	-112.1
Current Estimate	655.0	126.9	-	781.9

13a. (U) Cost Variance Analysis (Cont'd):
FAAD C2

a. (U) Summary -- (FY 1987 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	474.3	331.1	0.0	805.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-2.1	-	-	-2.1
Engineering	-	-	-	-
Estimating	+169.0	-29.5	-	+139.5
Other	-	-	-	-
Support	-	-24.5	-	-24.5
Subtotal	+166.9	-54.0	-	+112.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-83.5	-81.0	-	-164.5
Other	-	-	-	-
Support	-	-111.8	-	-111.8
Subtotal	-83.5	-192.8	-	-276.3
Total Changes	+83.4	-246.8	-	-163.4
Current Estimate	557.7	84.3	-	642.0

b. (U) Previous Change Explanations --

RDT&E
Economic: (U) Revised escalation indices.
Schedule: (U) Revised schedule.
Estimating: (U) Appropriation change from OPA to RDTE for Initial Operation Test and Evaluation (IOT&E) (Heavy Division), plus additional GFE required (+99.2 base year and +127.6 then year).

(U) Budget reduction in FY90.

(U) Program funding changes (+17.5) and the projected program requirements for P3I (119.3)

13b. (U) Cost Variance Analysis (Cont'd):
FAAD C2

through the year 2006.

(U) Funding changes resulted from budget reductions in FY 91-93 totaling $-168M; program restructure increased in FY 94-97 by $36.5M; and cost estimated for evolutionary software in FY 98-06 were $295.4M.

PROCUREMENT

Economic: (U) Revised escalation indices.

Estimating: (U) Budget reduction in FY92.

(U) Appropriation change from OPA to RDTE for Initial Operation of Test and Evaluation (IOT&E) Heavy Division (-68.3 base year and -75.0 then year).

(U) Resource decrements (FY88 and FY90 deletion); delayed deployment two years.

(U) Program funding changes (-100.0) and projected program requirements FY95-06 (+188.4).

(U) Funding reductions and a program restructure reduced the funding in FY 92-01 by $-166.7M. The requirement for technology insertion was a net then-year increase of $+176.5M.

Support: Mistake in previous SAR.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	--	-19.3
Current & prior inflation offset. (Estimating)	1.0	0.8
Correction to previous annual SAR. (Estimating)	129.4	--
Revised estimate to reflect President's budget. (Estimating)	--	-0.8
Revised estimate due to deletion of: - Tech. insertion for computer re-buy - Software version 6 & 7. (Estimating)	-213.9	-350.2
Total Changes	-83.5	-369.5

13c. (U) Cost Variance Analysis (Cont'd):
FAAD C2

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices. (Economic)	--	-19.8
Correct previous annual SAR (Estimating)	-9.6	--
Revised estimate due to President's Budget. (Estimating)	--	0.1
Revised estimate due to deletion of: - Tech. insertion for computer re-buys (Estimating)	-183.2	-349.5
Correct previous annual SAR to reconcile Flyaway and Support. (Estimating)	111.8	203.6
Correct previous annual SAR to reconcile Flyaway and Support. (Support)	-111.8	-203.6
Total Changes	-192.8	-369.2

13a. (U) Cost Variance Analysis (Cont'd):
GROUND BASED SENSOR

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	35.1	533.0	0.0	568.1
Previous Changes:				
Economic	+9.2	+178.5	-	+187.7
Quantity	-	+134.0	-	+134.0
Schedule	+37.2	+34.7	-	+71.9
Engineering	-	-	-	-
Estimating	+59.6	-142.9	-	-83.3
Other	-	-	-	-
Support	-	+20.2	-	+20.2
Subtotal	+106.0	+224.5	-	+330.5
Current Changes:				
Economic	-9.0	-156.8	-	-165.8
Quantity	-	-47.0	-	-47.0
Schedule	+7.4	+13.6	-	+21.0
Engineering	-	-	-	-
Estimating	-0.1	+131.8	-	+131.7
Other	-	-	-	-
Support	-	+32.9	-	+32.9
Subtotal	-1.7	-25.5	-	-27.2
Total Changes	+104.3	+199.0	-	+303.3
Current Estimate	139.4	732.0	-	871.4

13a. (U) Cost Variance Analysis (Cont'd):
GROUND BASED SENSOR

a. (U) Summary -- (FY 1987 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	31.8	452.3	0.0	484.1
Previous Changes:				
Quantity	-	+120.6	-	+120.6
Schedule	+34.2	+31.2	-	+65.4
Engineering	-	-	-	-
Estimating	+51.0	-128.9	-	-77.9
Other	-	-	-	-
Support	-	+10.9	-	+10.9
Subtotal	+85.2	+33.8	-	+119.0
Current Changes:				
Quantity	-	-67.7	-	-67.7
Schedule	-	-31.3	-	-31.3
Engineering	-	-	-	-
Estimating	-0.1	+99.0	-	+98.9
Other	-	-	-	-
Support	-	-3.3	-	-3.3
Subtotal	-0.1	-3.3	-	-3.4
Total Changes	+85.1	+30.5	-	+115.6
Current Estimate	116.9	482.8	-	599.7

b. (U) Previous Change Explanations --

RDT&E

Economic: (U) Revised escalation indices; adjustments for changes that were miscategorized.

Schedule: (U) For the GBS Program, schedules were adjusted as a result of loss of FY 91 RDT&E funding, and consequent use of FY 90 RDT&E carryover and Foreign Comparative Testing (FCT) funding.

Estimating: (U) Adjustments were made for: budget reductions; actual contract proposals and definitized testing requirements; adjustments for changes that were miscategorized; and adjustments for funds that were reprogrammed to other efforts.

13b. (U) Cost Variance Analysis (Cont'd):
GROUND BASED SENSOR

PROCUREMENT

Economic: (U) Revised escalation indices; adjustments for changes that were miscategorized.

Quantity: (U) Increased force structure and revised fielding plans.

Schedule: (U) Procurement schedules were adjusted in order to: follow the funded RDT&E prototype test program with proper transition to LRIP and FSP; and procure the maximum number of GBS systems consistent with available procurement funding, using the PM's best estimate of the realistic costs that will be encountered in the planned NDI, "best value" competitive procurement.

Estimating: (U) Revisions were due to additional data; withdrawal of funds due to non-award of original contract.

Support: (U) Support costs and initial spares were adjusted to accomodate quantity increase and program schedule change.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	-1.6
Correct Dec 90 SAR: miscategorizations resulting from an overstated Economic change (Economic)	N/A	-7.4
Same as above (Schedule)	N/A	7.4
Current and prior inflation offset (Estimating)	-0.1	0.6
Revised estimate to reflect budget decrement (Estimating)	N/A	-0.7
Total Changes	-0.1	-1.7

13c. (U) Cost Variance Analysis (Cont'd):
GROUND BASED SENSOR

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-21.9
Correct Dec 90 SAR: miscategorizations resulting from overstated Econ change which required realignment of BY $ (Economic)	N/A	-134.9
Same as above (Quantity)	-67.7	-47.0
Same as above (Schedule)	-31.3	13.6
Same as above (Estimating)	99.0	131.8
Same as above (Support)	--	36.6
Support costs were decreased proportionately to align with budget constraints (Support)	-3.3	-3.7
Total Changes	-3.3	-25.5

13a. (U) Cost Variance Analysis (Cont'd):
NCTR

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	238.3	163.3	0.0	401.6
Previous Changes:				
Economic	-3.3	+11.2	-	+7.9
Quantity	-	-	-	-
Schedule	-37.7	-	-	-37.7
Engineering	-	-	-	-
Estimating	-56.0	+327.5	-	+271.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-97.0	+338.7	-	+241.7
Current Changes:				
Economic	-0.2	-17.8	-	-18.0
Quantity	-	-164.2	-	-164.2
Schedule	-	+25.4	-	+25.4
Engineering	-	-7.7	-	-7.7
Estimating	-2.1	-23.6	-	-25.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-2.3	-187.9	-	-190.2
Total Changes	-99.3	+150.8	-	+51.5
Current Estimate	139.0	314.1	-	453.1

13a. (U) Cost Variance Analysis (Cont'd):
NCTR

a. (U) Summary -- (FY 1987 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	221.2	129.9	0.0	351.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-32.2	-	-	-32.2
Engineering	-	-	-	-
Estimating	-74.2	+183.1	-	+108.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-106.4	+183.1	-	+76.7
Current Changes:				
Quantity	-	-108.7	-	-108.7
Schedule	-	+19.1	-	+19.1
Engineering	-	-3.7	-	-3.7
Estimating	-0.1	-14.9	-	-15.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.1	-108.2	-	-108.3
Total Changes	-106.5	+74.9	-	-31.6
Current Estimate	114.7	204.8	-	319.5

b. (U) Previous Change Explanations --

RDT&E
Economic: (U) Revised escalation indices.
Estimating: Refinement of engineering estimates for NCTR; Deletion of MTS from SAR; Deletion of NCTR-4, Model 1; Cost status of NCTR-4, Model 2 changed to "TBD".

PROCUREMENT
Economic: (U) Revised escalation indices.
Estimating: (U) Refinement of estimate; Deletion of NCTR-4, Model 1; Cost status of NCTR-4, Model 2 changed to "TBD".

13c. (U) **Cost Variance Analysis (Cont'd)**:
NCTR

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	N/A	-0.2
Refinement of estimate (Estimating)	-0.1	-2.1
Prior & current inflation offset (Estimating)	--	--
Total Changes	-0.1	-2.3
(2) PROCUREMENT		
Revised escalation indices (Economic)	N/A	-17.8
Replanning to buy Force Package 1 only, plus curtailment of NCTR-2 production. (Quantity)	-108.7	-164.2
Revised production buildup. (Schedule)	19.1	25.4
Redesign due to "lessons learned" from Desert Storm. (Engineering)	-3.7	-7.7
Refinement of estimate (Estimating)	-14.9	-23.6
Prior & current inflation offset (Estimating)	--	--
Total Changes	-108.2	-187.9

14. (U) **Program Acquisition Unit Cost (PAUC) History**: (Then-Year Dollars in Millions)

FAAD C2
(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
N/A	--	--	--	--	--	--	--	--	22.340

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions) (Cont'd)

GROUND BASED SENSOR

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
N/A	--	--	--	--	--	--	--	--	5.281

NCTR

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
N/A	--	--	--	--	--	--	--	--	453.100

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) FAAD C2I SYS INTEGRATION:	Initial Contract Price Target	Ceiling	Qty
TRW DEFENSE SYS GROUP, REDONDO BEACH, CA DAAH01-86-C-A065, CPIF Award: September 1, 1986 Definitized: N/A	$58.1	N/A	N/A

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$172.6	N/A	N/A	$177.7	$172.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-11.2	$-3.9
Cumulative Variances To Date (12/28/91)	$-10.4	$-4.6
Net Change	$0.8	$-0.7

Explanation of Change:

(U) Contract information is December 1991 data reported by the contractor in the January 1992 Cost Performance Report. The cost variance is positive. There is a slight negative schedule variance. Approximately $152K is attributed to delays in completing dry runs

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) due to test bed software and hardware build problems. Other small variances are associated with FQT procedure preparation and a slight behind schedule performance in System Engineering and Management.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 52.0% (13 yrs/25 yrs)

(2) Percent Program Cost Appropriated: 26.4% ($556.9 / $2106.4)

b. (U) Appropriation Summary -- FAAD C2

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY80-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2004)	Total
RDT&E	357.4	31.8	40.5	225.3	655.0
Procurement	-	-	-	126.9	126.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	357.4	31.8	40.5	352.2	781.9

b. (U) Appropriation Summary -- GROUND BASED SENSOR

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY88-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2001)	Total
RDT&E	55.7	39.9	18.7	25.1	139.4
Procurement	-	-	-	732.0	732.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	55.7	39.9	18.7	757.1	871.4

16b. (U) Program Funding Summary (Cont'd):
NCTR

b. (U) Appropriation Summary -- NCTR

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY87-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2001)	Total
RDT&E	50.5	21.1	20.1	47.3	139.0
Procurement	0.5	-	-	313.6	314.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	51.0	21.1	20.1	360.9	453.1

c. (U) Annual Summary -- FAAD C2

Fiscal Year	Qty	Flyaway FY87 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2040 Research Development Test + Eval, Army								
1980				4.1	3.0	3.0	2.9	5.9
1981				12.3	10.0	10.0	9.7	6.1
1982				15.2	13.2	13.1	12.8	7.6
1983				1.1	1.0	1.0	1.0	4.9
1984				33.3	31.2	31.2	30.7	3.8
1985				18.7	18.1	18.1	15.5	3.4
1986				20.2	20.1	20.1	19.3	2.8
1987				36.4	37.2	37.2	33.2	2.7

16c. (U) Program Funding Summary (Cont'd):
FAAD C2

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Flyaway FY87 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1988				52.1	55.2	55.2	50.6	3.0
1989				60.2	66.3	66.0	52.0	4.2
1990				40.5	46.3	46.3	45.1	4.0
1991				46.9	55.8	54.2	38.0	3.9
1992				25.9	31.8	0.8	0.2	3.1
1993				31.9	40.5			3.3
1994				35.1	46.0			3.3
1995				35.5	48.0			3.3
1996				20.1	28.1			3.2
1997				22.1	31.8			3.2
1998				14.3	21.2			3.2
1999				13.9	21.3			3.2
2000				8.5	13.5			3.2
2001				9.4	15.4			3.2
Subtot	2			557.7	655.0	356.2	311.0	

16c. (U) Program Funding Summary (Cont'd):
FAAD C2

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Flyaway FY87 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2035 Other Procurement, Army								
1994	3		8.6	11.9	16.2			3.3
1995	8		10.8	17.5	24.6			3.3
1996	6		14.0	14.0	20.3			3.2
1997			2.7	2.7	4.0			3.2
1998	4		9.7	11.0	16.9			3.2
1999	5		9.1	10.9	17.3			3.2
2000	3		7.9	7.2	11.8			3.2
2001	3		6.0	5.1	8.7			3.2
2002	1		1.4	1.5	2.7			3.2
2003				1.6	2.8			3.2
2004				0.9	1.6			3.2
Subtot	33		70.2	84.3	126.9			
Grand Total	35		70.2	642.0	781.9	356.2	311.0	

(U) PM SICPS controlled costs for Standard Integrated Command Post System (SICPS) which is GFE for the FAAD C2 program are included in the FAAD C2 current estimate.

16c. (U) Program Funding Summary (Cont'd):
GROUND BASED SENSOR

c. (U) Annual Summary -- GROUND BASED SENSOR

Fiscal Year	Qty	Flyaway FY87 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1988				17.1	18.1	18.1	18.1	3.0
1989				19.3	21.2	20.4	19.6	4.2
1990				14.3	16.4	16.4	13.4	4.0
1991								3.9
1992				32.5	39.9	1.3	0.4	3.1
1993				14.7	18.7			3.3
1994				12.1	15.8			3.3
1995				6.9	9.3			3.3
Subtot	6			116.9	139.4	56.2	51.5	

(U) FY91 was funded with $11.3M (then-year) Foreign Comparative Test (FCT) Funding and $9.1M (then-year) carry over from FY90 RDT&E.

Fiscal Year	Qty	Flyaway FY87 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2035 Other Procurement, Army								
1994	6	0.2	16.3	31.0	42.1			3.3
1995	17	13.5	29.0	63.9	89.7			3.3
1996	27	0.5	55.7	65.7	95.1			3.2
1997	27	0.5	53.8	66.2	98.9			3.2

16c. (U) Program Funding Summary (Cont'd):
GROUND BASED SENSOR

Fiscal Year	Qty	Flyaway FY87 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2035 Other Procurement, Army (Cont'd)								
1998	42	0.7	79.0	105.5	162.8			3.2
1999	40	0.7	73.8	99.6	158.5			3.2
2000			1.4	26.2	43.0			3.2
2001			1.3	24.7	41.9			3.2
Subtot	159	16.1	310.3	482.8	732.0			
Grand Total	165	16.1	310.3	599.7	871.4	56.2	51.5	

c. (U) Annual Summary -- NCTR

Fiscal Year	Qty	Flyaway FY87 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1987				4.4	4.5	4.5	4.5	2.7
1988				13.9	14.7	14.7	14.7	3.0
1989				15.7	17.3	17.3	17.3	4.2
1990				5.1	5.8	5.8	4.3	4.0
1991				6.9	8.2	7.7	3.2	3.9

16c. (U) Program Funding Summary (Cont'd):
NCTR

Fiscal Year	Qty	Flyaway FY87 Dollars Nonrec	Flyaway FY87 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1992				17.2	21.1	3.2	0.2	3.1
1993				15.8	20.1			3.3
1994				24.5	32.1			3.3
1995				11.2	15.2			3.3
Subtot				114.7	139.0	53.2	44.2	
Appropriation: 2035 Other Procurement, Army								
1990				0.4	0.5			4.0
1991								3.9
1992								3.1
1993								3.3
1994				9.9	13.4			3.3
1995				13.3	18.6			3.3
1996				19.3	27.9			3.2
1997				19.2	28.6			3.2
1998				66.1	101.7			3.2
1999				52.8	83.8			3.2
2000				13.4	21.9			3.2

16c. (U) Program Funding Summary (Cont'd):
NCTR

Fiscal Year	Qty	Flyaway FY87 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2035 Other Procurement, Army (Cont'd)								
2001	1			10.4	17.7			3.2
Subtot	1			204.8	314.1			
Grand Total	1			319.5	453.1	53.2	44.2	

(U) The FY90 through FY 97 totals do not include the funding for NCTR-4, Model 1 production quantities, whereas the President's Budget does. The NCTR-1 and NCTR-4 share the same AD5051 procurement line.

17. (U) **Production Rate Data:**
FAAD C2

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1994	0	0	3	N/A
1995	0	0	8	N/A
1996	0	0	6	N/A
1997	0	0	0	N/A
1998	0	0	4	N/A
1999	0	0	5	N/A
2000	0	0	3	N/A
2001	0	0	3	N/A
2002	0	0	1	N/A

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	642.0	N/A	N/A
(TY $)	N/A	N/A	781.9	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	18.343	N/A	N/A
(TY $)	N/A	N/A	22.340	N/A	N/A

17c. (U) **Production Rate Data (Cont'd)**:
FAAD C2

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

GROUND BASED SENSOR

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1994	0	N/A	6	N/A
1995	0	N/A	17	N/A
1996	0	N/A	27	N/A
1997	0	N/A	27	N/A
1998	0	N/A	42	N/A
1999	0	N/A	40	N/A

17b. (U) Production Rate Data (Cont'd):
GROUND BASED SENSOR

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	599.7	N/A	N/A
(TY $)	N/A	N/A	871.4	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	3.635	N/A	N/A
(TY $)	N/A	N/A	5.281	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

17a. (U) Production Rate Data (Cont'd):
NCTR

a. (U) Annual Production Rates -- None.

b. (U) Cost Variance -- None.

c. (U) Schedule Variance -- None.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:
FAAD C2

a. (U) Assumptions and Ground Rules --

(U) 35 FAAD C2 units will be fielded and sustained for 20 years from date of fielding. There is no antecedent.

b. (U) Costs -- (FY 1987 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per FAAD C2	Avg Annual Cost Per (Antecedent)
Total O&S Consumable	2.6	N/A
Total	2.6	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	---	---	1.2	103.2	104.4
Total	---	---	1.2	103.2	104.4

18a. (U) Operating and Support Costs (Cont'd):
GROUND BASED SENSOR

a. (U) Assumptions and Ground Rules --

(U) Operational availability of the peace time tactical systems is targeted as 8.0 hours per day, 7 days per week (training system 8.0 hours per day 5 days per week). Fielding costs include costs for field training services, transportation and initial repair parts. Sustainment costs include personnel costs and costs for labor and materials needed for system maintenance and overhaul. Also included are repair of component parts, installation of modifications, provision of replenishment spares and repair parts, and replenishment training. There is no antecedent system. Cost estimate developed Jan 92.

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	---	---	---	3.2	3.2
Industrial Fund	---	---	---	2.6	2.6
Total	---	---	---	5.8	5.8

(U) The estimated average annual O&S cost per GBS sensor per year is $0.383M. No O&S cost element breakouts were identified at Milestone II.

NCTR

a. (U) Assumptions and Ground Rules -- None

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- None.

AF-1 ACM

91-0902

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: ACM (AGM-129)

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
AGM-129/Advanced Cruise Missile (ACM)

2. (U) DoD Component: USAF

3. (U) Responsible Office and Telephone Number:
Aeronautical Systems Division ASD/VC COL CLAUDE M. BOLTON, JR.
Advanced Cruise Missile (ACM) Assigned: August 1, 1989
Program Office AV 785-7885 COMM (513) 255-7885
WPAFB, OH 45433-6503

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0603001F
PROCUREMENT:
APPN 3010 ICN AGM129A (Air Force)
APPN 3020 ICN AGM129A (Air Force)
MILCON:
PE 0101120F

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FOR OPEN PUBLICATION
AS AMENDED
MAR 3 1992

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

Classified By: ACM SCG, dtd 31 May 1991
Declassify on: OADR
Downgrade Instructions: Not Subject to Automatic Downgrade

SAF/PAS
92-162 -T

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OASD(PA) DFOISR 91-T-0347

5. (U) Related Programs:

(U) F112 Engine, B-52 ACM Integration (PE11113F), B-1 Integration (PE11126F), Common Strategic Rotary Launcher (PE63258F).

(b)(1)

[redacted]

7. (U) Program Highlights:

(b)(1)

[redacted]

(U) This program began in October 1982 as a special access program. The initial full scale development (FSD) contract was competitively awarded to General Dynamics/Convair (GD/C) in April 1983. Sole source contracts were awarded to Williams International for the F112 engine, Boeing-Wichita for the B-52 integration and missile launcher (CSRL), and Boeing-Seattle and Rockwell International for B-1B integration. A concurrent FSD/pilot production contract (10 missiles) and a low rate production contract (100 missiles) were awarded to GD/C in September 1985 and July 1986 respectively.

(U) Early flight tests results were mixed. After several successful flights at the beginning, the program experienced several failures in a row, prompting a Congressional restriction requiring six successful

7a. (U) Program Highlights (Cont'd):

flight tests before the FY87 production contract could be awarded. Since the flight test failures were attributed to missile production quality, the program initiated a second source qualification program. In November 1987, a Technology Transfer and Qualification contract was awarded to McDonnell Douglas Missile Systems Company (MDMSC) for fourteen qualification missiles, built to GD/C drawings. As a result of flight test failures, and to reduce concurrency, Congress zeroed the FY89 production buy. The required successful flights were performed during 1989 and the FY87 production contract (150 missiles) was definitized in [redacted] 1989. The FY88 contract option (100 missiles) was exer[redacted]nuary 1990. Missile procurement quantity changed t[redacted]e FY92/93 President's Budget. Two MDMSC qualification flig[redacted]ccessfully completed on 3 August 1990 and 14 September 1990. The Qualification Review Milestone (MS II) was met in April 1990. DAB III-B was held in Jul 1991. The acquisition strategy of a yearly competitive split for FY92 and out was changed to a competitive split in FY92 and a buy out of the baseline missiles for FY93 and out. A variant version of the missile was to be sole source to GD/C.

(b)(1) [redacted]

(U) The Ogden Air Logistics Center missile depot was activated in December 1989. Depot training activities are underway.

(U) DT&E/IOT&E is complete. FOT&E was initiated by HQ SAC in November 1990. Seven (7) FOT&E flights have occurred with one failure.

b. (U) Significant Developments Since Last Report --

(U) The Variant program was terminated in the FY92/93 President's Budget.

(U) The eighth FOT&E flight was successfully accomplished in December 1991.

7b. (U) Program Highlights (Cont'd):

(U) The ACM is expected to satisfy mission requirements.

c. (U) Changes Since As Of Date --

(U) The ACM production program was cancelled by the President for FY93-95.

(b)(1) [redacted]

(U) PAUC has increased by 19.0% as a result of the Presidental cancellation of the program for FY93 and out in his January 1992 State of the Union address. This reduced the total quantity by 360 missiles. The details of this unit cost breach will be reported in the March 1992 SAR.

9. (U) Schedule:

a. (U) Milestones --

	Production Estimate	Approved Program	Current Estimate
FSD Contract Award/Start	APR 83	APR 83	APR 83
Preliminary Design Review (PDR)	SEP 84	SEP 84	SEP 84
Critical Desig.. Review (CDR)	MAR 85	MAR 85	MAR 85
First Free Flight	JUL 85	JUL 85	JUL 85
Pilot Production Decision (Lot I PP)	JUL 85	JUL 85	JUL 85
Low Rate Initial Production Decision	JUL 86	JUL 86	JUL 86
Physical Configuration Audit (PCA)	FEB 88	FEB 88	FEB 88
Dual Source Qualification Option Exercise	N/A	MAY 88	MAY 88
Limited Nuclear Surety Inspection (LNSI)	SEP 88	AUG 88	SEP 88
Dual Source Milestone I - Mfg Validation	N/A	APR 89	APR 89
Dual Source Milestone II - Full Qualification	N/A	APR 90	APR 90

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
ACM/B-52 DT&E/IOT&E Completion	N/A	MAY 90	JUL 90
Full Rate Production Decision (Lot V)	SEP 88	JUN 90	JUL 91
Dual Source Milestone III - Final Qual Del	N/A	AUG 90	FEB 91
(b)(1) [redacted]			
Quantity Competition Contract Award	N/A	DEC 91	MAY 92(Ch-1)
Program Management Responsibility Transfer	N/A	SEP 95	MAR 96

(b)(1) [redacted]

(U) The beyond low rate production decision could not be made until six (6) successful flight tests had been conducted. As of December 31, 1988, only three (3) of the six (6) required flights had been completed. Program restructure due to fiscal adjustments and reduction of concurrency delayed Full Rate Decision to Lot V, from August 1989 to August 1990. It was delayed again until March 1991 to resolve acquisition strategy, producibility, and reliability issues and the completion of the Operational Test Beyond Low-Rate Initial Production Report. The full production decision (DABIII-B) was delayed again from Mar 1991 to Jul 1991. The FY92 competition contract award slipped from Dec 1991 to May 1992 due to the decision to delay FY92 RFP release until FY90/91 negotiation issues are resolved.

(U) The final FCA was changed from June 1989 to September 1990, four (4) months after completion of B-52 flight testing, to allow for analysis of complete performance data rather than allow a number of open items. The audit, therefore, can be on demonstrated DT&E/IOT&E performance, not future events or incomplete tasks. FCA then slipped to November 1990 to incorporate design changes to the bladder.

(b)(1) [redacted]

(b)(1)

c. (U) Current Change Explanations --

(Ch-1) (U) The contract award date for the Quantity Competition Contract has slipped from Mar to May as a result of the delay in completion of the FY90/91 negotiations.

d. (U) References --

(U) Production Estimate:

(1) (U) PMD3006(7), June 27, 1985 (S/SAR)
(2) (U) PMD3006(8), November 10, 1987 (S/SAR)
(3) (U) DEPSECDEF Memo: Low Rate Initial Production, (LRIP) July 21, 1986 (S)
(4) (U) SECDEF Briefing, November 9, 1987, (S/SAR)
(5) (U) PMD3006(10), ACM Procurement Direction, April, 1987 (S)
(6) (U) PMD3006(11), Undated (S)

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 15 November 1989.

10. (U) Performance Characteristics:

a. (U) Performance --

(b)(1)

	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate

10a. (U) Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Missile Carriage - External		1/		(3)	
B-1 (each) 2/	12	10	/ 10	N/A	10
B-52 (each) 5/	12	12	/ 12	12	12
Internal					
(b)(1) [redacted]					

(U) Notes:

1. (U) Demonstration has not been accomplished since requirement includes low altitude at end of cruise and hot day conditions (MIL STD 210A).

2. (U) Reliability estimate is at projected maturity of 60 flights.

3. (U) Radar Cross Section is not included as one of the characteristics and the footnote pertaining to it is listed after Missile Carriage. Neither of these fields can be edited by the user. Additionally, two of the [redacted] performance characteristics are listed as [redacted].

(U) ACRONYMS:
CSRL - Common Strategic Rotary Launcher

FOOTNOTES:

1/ (U) See Top [redacted] Annex on file ASD/VCE

2/ (U) B-1B implementation is not currently planned. All B-1B integration and flight test activities have been deferred.

3/ (U) Operational Availability is defined as the probability that the air vehicle is in an operable and commitable state when required to perform its mission at any random point in time.

(b)(1) [redacted]

(b)(1)

5/ (U) B-52H Aircraft will be capable of carrying up to 12 variants externally per aircraft (6 per pylon) and mixed with baseline missiles.

(b)(1)

c. (U) Current Change Explanations --

(U) None

d. (U) References --

(U) Production Estimate:

(1) (U) PMD3006(7), June 27, 1985 (S/SAR)
(2) (U) PMD3006(8), November 10, 1987 (S/SAR)
(3) (U) DEPSECDEF Memo: Low Rate Initial Production, (LRIP) July 21, 1986 (S)
(4) (U) SECDEF Briefing, November 9, 1987, (S/SAR)
(5) (U) PMD3006(10), ACM Procurement Direction, April, 1987 (S)
(6) (U) PMD3006(11), Undated (S)

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 15 November 1989.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	1349.1	1417.4	1474.5
Procurement	3798.8	3685.6	2453.1
Missile Flyaway	(3157.9)		(2122.4)
A/C Integration	(112.8)		(109.8)
Total Flyaway	(3270.7)		(2232.2)
Other Wpn Sys Cost	(464.8)		(65.2)
Total Other Wpn Sys	(464.8)		(65.2)
Peculiar Support	(0.0)		(91.0)
Initial Spares	(63.3)		(64.7)
Construction (MILCON)	49.6	30.1	16.4
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 83 Base-Year $	5197.5	5133.1	3944.0
Escalation	1467.9	1532.3	1018.2
Development (RDT&E)	(143.3)	(164.7)	(195.6)
Procurement	(1308.0)	(1360.7)	(819.4)
Construction (MILCON)	(16.6)	(6.9)	(3.2)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	6665.4	6665.4	4962.2
b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	1461	1461	640
Total	1461	1461	640

(U) Excluded are twenty-five (25) R&D units that are not considered fully configured.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --
$979.9 Million

e. (U) References --

(U) Production Estimate:
(1) (U) PMD3006(7), June 27, 1985 (S/SAR)
(2) (U) PMD3006(8), November 10, 1987 (S/SAR)
(3) (U) DEPSECDEF Memo: Low Rate Initial Production, (LRIP) July 21, 1986 (S)
(4) (U) SECDEF Briefing, November 9, 1987, (S/SAR)
(5) (U) PMD3006(10), ACM Procurement Direction, April, 1987 (S)
(6) (U) PMD3006(11), Undated (S)

11e. (U) Total Program Cost and Quantity (Cont'd):

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 15 November 1989.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	4962.2	6513.0	4962.2
(2) Quantity	640	1000	640
(3) Unit Cost	7.753	6.513	7.753
b. (U) Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	516.0	516.0	0.0
Less CY Adv Proc	68.1	68.1	0.0
Plus PY Adv Proc	88.3	88.3	0.0
Net Total	536.2	536.2	0.0
(2) Quantity	120	120	0
(3) Unit Cost	4.468	4.468	N/A

Note: The data presented above shows a 19.0% Nunn-McCurdy unit cost breach as the result of the Presidential cancellation of the program for FY93 and out in his January 1992 State of the Union address. The details of this breach will be reported in the March 1992 SAR.

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	1492.4	5106.8	66.2	6665.4
Previous Changes:				
Economic	+5.1	+258.6	-0.4	+263.3
Quantity	-	-1071.0	-	-1071.0
Schedule	-	+265.9	-	+265.9
Engineering	+62.5	+38.8	-	+101.3
Estimating	+138.2	+499.7	-42.3	+595.6
Other	-	-	-	-
Support	+57.0	-364.5	-	-307.5
Subtotal	+262.8	-372.5	-42.7	-152.4
Current Changes:				
Economic	-5.3	-63.9	-	-69.2
Quantity	-	-971.1	-	-971.1
Schedule	-	-123.8	-	-123.8
Engineering	-77.4	-18.3	-	-95.7
Estimating	+22.8	-248.1	-3.9	-229.2
Other	-	-	-	-
Support	-25.2	-36.6	-	-61.8
Subtotal	-85.1	-1461.8	-3.9	-1550.8
Total Changes	+177.7	-1834.3	-46.6	-1703.2
Current Estimate	1670.1	3272.5	19.6	4962.2

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1983 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	1349.1	3798.8	49.6	5197.5
Previous Changes:				
Quantity	-	-676.2	-	-676.2
Schedule	-	+41.6	-	+41.6
Engineering	+47.4	+27.3	-	+74.7
Estimating	+96.2	+418.3	-29.9	+484.6
Other	-	-	-	-
Support	+39.2	-290.7	-	-251.5
Subtotal	+182.8	-479.7	-29.9	-326.8
Current Changes:				
Quantity	-	-602.9	-	-602.9
Schedule	-	-78.5	-	-78.5
Engineering	-55.8	-11.3	-	-67.1
Estimating	+16.4	-156.8	-	-140.4
Other	-	-	-3.3	-3.3
Support	-18.0	-16.5	-	-34.5
Subtotal	-57.4	-866.0	-3.3	-926.7
Total Changes	+125.4	-1345.7	-33.2	-1253.5
Current Estimate	1474.5	2453.1	16.4	3944.0

b. (U) Previous Change Explanations --

RDT&E

Economic: (U) Revised economic escalation indices.

Engineering: (U) Addition and restructure of Variant missile program.

Estimating: (U) Reflection of fiscal adjustments and revised Variant estimate to incorporate proposal evaluation and fact-finding.

Support: (U) Addition of Depot Repair Capability for Circuit Card Assemblies.

PROCUREMENT

Economic: (U) Revised economic escalation indices and correction of error in December 1989 SAR.

13b. (U) Cost Variance Analysis (Cont'd):

Quantity: (U) Reduction of missile quantity from 1461 to 1000.

Schedule: (U) Program rephasing, reduction in missile quantity from 1461 to 1000, and reduction in fiscal year buy profile quantities.

Engineering: (U) Addition and restructure of Variant missile program, reduction in Aircraft Integration requirements, and reduction in engineering applicable to quantity reduction.

Estimating: (U) Reflection of fiscal adjustments, effects of competition and prior year inflation adjustments and removal of Common Support Equipment funds. Reduction applicable to quantity reduction, reconfigured guidance sets and loss of Blanket Purchasing Agreement, addition of MDMSC Variant production qualification and Defense Business Operating Fund, and change in procurement strategy.

Support: (U) Reevaluation of support requirements and transfer of Variant cost from Other System Costs to Flyaway. Reduction in support requirements based on reduced quantity and correction of error in Dec 89 SAR.

MILCON

Economic: (U) Revised economic escalation indices.

Estimating: (U) Revised estimate of Main Operating Base (MOB) requirements and revision to prior year inflation indices.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised inflation indices dated Jan 92 (Economic)	--	-5.3
Cancellation of variant version of the missile (Engineering)	-55.8	-77.4
Adjustment for current and prior year escalation (Estimating)	2.7	3.4
Revised estimate of program requirements (Estimating)	13.7	19.4
Revised estimate for depot repair capability (Support)	-18.0	-25.2
Total Changes	-57.4	-85.1

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised inflation indices dated Jan 92 (Economic)	---	-63.9
Reduction in missile quantity from 1000 to 640	-839.8	-1353.3
Reduction of 360 missiles (Quantity)	-602.9	-971.1
Engineering change applicable to 360 missile reduction (Engineering)	-11.3	-18.3
Estimating change applicable to 360 missile reduction (Estimating)	-147.1	-237.4
Schedule change applicable to 360 missile reduction (Schedule)	-78.5	-126.6
Deletion of estimate for MDMSC variant qualification (Estimating)	-50.7	-75.0
Revised estimate for AF assessment (Estimating)	-13.4	-21.5
Revised estimate of competition savings (Estimating)	21.7	31.7
Adjustment for current and prior year escalation (Estimating)	15.6	23.1
Adjustment for current and prior year escalation (Support)	0.7	1.1
Revised estimate based on increase in System Engineering Program Management (SEPM) (Estimating)	17.1	33.8
Reduced support requirements based on quantity reduction (Support)	-17.2	-37.7
Total Changes	-866.0	-1461.8
(3) MILCON		
Revised estimate of requirement (Estimating)	-3.3	-3.9
Total Changes	-3.3	-3.9

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
4.562	0.303	2.661	0.222	0.009	0.573	--	-0.577	3.191	7.753

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) AGM-129B VARIANT PHASE 2:	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL DYNAMICS, SAN DIEGO, CA F33657-90-C-0104, FPIF Award: January 1, 1991 Definitized: N/A	$135.9	$0.0	5

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$135.9	N/A	5	$136.4	$134.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$1.1	$-3.7
Cumulative Variances To Date (10/27/91)	$0.1	$-5.0
Net Change	$-1.0	$-1.3

Explanation of Change:

(U) Fabrication of the 1st test vehicle was approximately 3 weeks behind schedule. There is no longer an impact to this since the program has been cancelled.

NOTE: (U) This is the final submission for the variant program. The variant program was cancelled in the FY92 Appropriation Bill. The contract was undefinitized at the time of cancellation. The data provided is from the October CPR.

b.(U) Procurement --

(U) AGM-129 LOT III (FY87):	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL DYNAMICS, SAN DIEGO, CA F33657-88-C-0103, FPIF Award: March 31, 1986 Definitized: September 22, 1989	$537.2	$613.1	150

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$568.0	$630.9	150	$616.1	$630.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-34.9	$-25.7
Cumulative Variances To Date (11/11/91)	$-35.5	$-34.4
Net Change	$-0.6	$-8.7

Explanation of Change:

(U) The unfavorable cost variance is the result of missile quality investigation and resolution. The unfavorable schedule variance is due to a slow down caused by bladder, wing deployment actuation and environmental seal problems.

NOTE: (U) Contract Target Price increased by $6.8 and Ceiling Price by $3.8 to incorporate ECPs for guidance modificiation, RCS calibration change and additional award fee.

(U) AGM 129 LOT IV (FY88):	Initial Contract Price		
	Target	Ceiling	Qty
GENERAL DYNAMICS, SAN DIEGO, CA F33657-88-C-0103, FPIF Award: March 31, 1986 Definitized: January 30, 1990	$231.7	$261.9	100

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$244.3	$274.3	100	$273.7	$297.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-2.1	$-61.7
Cumulative Variances To Date (11/11/91)	$-5.6	$-13.7
Net Change	$-3.5	$48.0

Explanation of Change:

(U) The unfavorable cost variance increase is the result of Class II design changes and issuance of a guidance set used for HQA. The improvement of the schedule variance is the result of a new contract schedule that slips deliveries to the right.

NOTE: (U) Contract Target Price increased by $2.5 and Ceiling Price by $2.8 to incorporate ECPs for guidance modification, umbilical cavity seal and fuel flow meter proposal prep.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 84.6% (11 yrs/13 yrs)

(2) Percent Program Cost Appropriated: 97.9% ($4859.2 / $4962.2)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY82-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94)	Total
RDT&E	1538.5	28.6	82.3	20.7	1670.1
Procurement	2756.5	516.0	-	-	3272.5
MILCON	19.6	-	-	-	19.6
O&M	-	-	-	-	-
Total	4314.6	544.6	82.3	20.7	4962.2

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1982				3.4	3.3	3.3	3.3	9.2
1983				140.7	143.4	143.4	143.4	4.9
1984				457.4	484.4	484.4	484.1	3.8
1985				231.3	253.3	253.3	253.2	3.4
1986				158.8	178.0	178.0	178.0	2.8

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1987				119.6	138.7	138.7	138.7	2.7
1988				122.9	147.4	147.4	147.4	3.0
1989				77.1	96.3	96.1	69.1	4.2
1990				32.5	41.9	40.6	25.4	4.0
1991				38.6	51.8	48.3	24.6	3.9
1992				20.6	28.6	3.5	0.3	3.1
1993				57.6	82.3			3.3
1994				14.0	20.7			3.3
Subtot				1474.5	1670.1	1537.0	1467.5	
Appropriation: 3010 Aircraft Procurement, Air Force								
1984								
1985		51.2		51.2	60.0	60.0	58.7	3.4
1986		58.6		58.6	71.2	71.2	70.2	2.8
Subtot		109.8		109.8	131.2	131.2	128.9	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3020 Missile Procurement, Air Force								
1984				34.6	39.6	39.6	39.6	8.0
1985	10	0.4	52.4	128.3	151.0	151.0	151.0	3.4
1986	100	19.7	388.2	448.8	552.5	552.5	551.8	2.8
1987	150	36.3	441.3	587.1	752.1	736.3	682.0	2.7
1988	100	75.1	207.8	271.5	361.4	361.4	215.1	3.0
1989								4.2
1990	75	6.3	270.8	221.3	314.5	277.1	128.0	4.0
1991	85	11.8	272.0	310.2	454.2	281.8	60.1	3.9
1992	120	12.2	328.1	341.5	516.0			3.1
1993								3.3
1994								3.3
1995								3.3
1996								3.2
1997								3.2
1998								3.2
Subtot	640	161.8	1960.6	2343.3	3141.3	2399.7	1827.6	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY83 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3300 Military Construction, Air Force								
1987				16.4	19.6	19.6	16.2	2.7
Subtot				16.4	19.6	19.6	16.2	
Grand Total	640	271.6	1960.6	3944.0	4962.2	4087.5	3440.2	

(U) Obligations and expenditures reflect Program Office records as of 31 December 1991.

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1985	0	10	10	36
1986	0	100	100	120
1987	0	150	150	180
1988	0	100	100	304
1989	0	150	0	0
1990	0	150	75	0
1991	0	200	85	0
1992	0	300	120	0

17a. (U) Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1993	0	301	0	0
1994	0	0	0	0
1995	0	0	0	0

(U) The funded delivery period is 18 months for FY85, 34 months for FY86, 16 months for FY87, 9 months for FY88, 13 months for FY90, 13 months for FY91.

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	5197.5	-1253.5	3944.0	+722.0	3222.0
(TY $)	6665.4	-1703.2	4962.2	+1071.2	3891.0
PAUC Cost (BY $)	3.557	2.606	6.163	+1.128	5.034
(TY $)	4.562	3.191	7.753	+1.674	6.080

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	NOV 84	0	NOV 84	N/A	NOV 84
Duration (in MON)	122	-6	116	44	72
End Date(MON YY)	JAN 95	-6	JUL 94	N/A	NOV 90

17d. (U) Production Rate Data (Cont'd):

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	25/25
Procurement	217/128

e. (U) Approved Design-to-Cost Objective -- N/A.

(U) Note -- The ACM does not have a Design-To-Cost Objective.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

(U) The ACM is designed as a "wooden round" requiring minimal scheduled maintenance. The operational environment consists primarily of a 90-day period of flight alert followed by a 270-day "ready storage" at the Weapon Storage Area. While on flight alert, periodic Built in Tests (BIT) are conducted to insure missile war readiness. In addition, Loaded Launcher Pylon Tests are scheduled at 24-month intervals to verify both missile and pylon integrity. This test is conducted using the Electronic System Test Set (ESTS) and is more effective than aircraft software BIT tests. Scheduled missile maintenance is required only at the 5-year point, when the engine requires depot recertification and the pyrotechnic devices reach their certified life. Active efforts are underway to extend these intervals. The only other scheduled maintenance is a 48-month warhead recertification which is a DoE requirement. Personnel costs are direct costs to support primary consumption, contractor support, operational test launch support, operational software support and maintenance training software support. Base consumables and contractor support are based on expected maintenance actions and the number of Main Operating Bases (MOBs). Operational and maintenance training software support is estimated by comparison to similar operational systems. Depot cost is a summary cost to include Interim Contractor Support (ICS), unscheduled and scheduled depot maintenance manhours and the air vehicle and component surveillance programs. Unscheduled maintenance manhours were estimated from demonstrated BIT failure rates, Optimum Repair Level Analysis data, and depot planning factors from AFLC Pamphlet 173-10. ICS includes both pipeline and condemnation spares for support maintenance requirements, air vehicle modification, depot software support and technical data updates. Other direct costs include second destination transportation, system management support, contractor sustaining support and material management. Indirect costs are indirect personnel costs at SAC operating facilities. This system does not replace another system in the inventory; no antecedant system costs are shown below. The O&S cost estimate was accomplished in July 1990.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1983 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per AGM-129	Avg Annual Cost Per
Unit Mission Personnel	217.5	N/A
Unit Level Consumption	35.1	N/A
Depot Maintenance	332.3	N/A
Sustaining Investment	145.9	N/A
Install Support Personne	30.7	N/A
Indir Support Personnel	48.0	N/A
Depot Nonmaintenance	391.8	N/A
Acquisition & Training	25.1	N/A
FOT&E Support	84.8	N/A
Total	1311.2	N/A

c. (U) Contractor Support Costs -- None.

(U) These Operating and Support (O&S) Costs are reported at the total program level and were calculated using the approved O&S estimate done to support the DABIII-B decision. The estimate was done for 1461 missiles, and was adjusted for the current quantity of 1000 missiles. SAC has not developed a new deployment schedule for the reduced quantity, therefore, no data is available to calculate cost per SAC wing as displayed in the December 1989 SAR. There is no known antecedent to the AGM-129.

A-1 ADATS (FAADS LOS-F-H)

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LOS-F-H

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
FORWARD AREA AIR DEFENSE SYSTEM (FAADS) LINE-OF-SIGHT FORWARD HEAVY

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**

PROJECT MANAGER
ATTN:SFAE-AD-LO
REDSTONE ARSENAL
HUNTSVILLE, AL 35898-5792

COL JAMES A. PATTERSON
Assigned: December 1, 1990
AV 788-4449 COMM (205)895-4449

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 23801A Project D683
PE 63757A Project D463
PROCUREMENT:
APPN 2032 ICN CJ8001 (Army)
APPN 2032 ICN H01700 (Army)

CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 2 3 1992 5
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (GAD-PSR)
DEPARTMENT OF DEFENSE

~~Classified by: LOS-F-H Security Classification Guide, dtd 15 June 1991~~
~~Declassify on: Originating Agency Determination Required (OADR)~~
~~Downgrade Instructions: (Not Subject to Automatic Downgrade)~~

~~(THIS PAGE IS [redacted])~~

Concur in Classification as marked
2 3 MAR 1992
SECURITY REVIEW, DOCSINT, HQDA

[redacted]

(PA) DFOISR 92-0628

5. (U) Related Programs:
Line-of-Sight Rear; Non-Line of Sight; and Forward Area Air Defense Command, Control, and Intelligence (C2I).

6. (U) Mission and Description:
The Line of Sight-Forward-Heavy (LOS-F-H) component of the Forward Area Air Defense System (FAADS) consists of an armored, tracked vehicle (XM1069, a derivative of the M3A2 Bradley) that integrates a missile system; communications equipment; and detection, identification, and tracking sensors. To field an effective air defense capability as soon as possible, the Army selected a Non-Developmental Item (NDI) acquisition strategy to overcome current air defense deficiencies, with concurrent pre-planned product improvements (P3I) to keep pace with the advancing threat. The Martin Marietta Air Defense Anti-Tank System (ADATS) was selected on 30 November 1987 after a rigorous NDI Candidate Evaluation for the LOS-F-H role. The system to be initially deployed meets or exceeds initial system Required Operational Capability (ROC) requirements aimed at meeting the early to mid-nineties air threat. An active P3I program is planned to meet late nineties threat. The initial P3I will focus on inclusion of an integrated weapons display, improved mission processor, commander's viewer, and integration of FAADS C3I. The LOS-F-H will be located in forward battle areas, maneuver with the combined arms team, and be used to protect tanks and infantry fighting vehicles from enemy helicopters and fixed-wing aircraft. The system will use radar and optics to detect, acquire, and identify targets and is line-of-sight in the sense that it can only fire at targets within its field of view. The system will operate autonomously or using FAADS C3I data, in day or night, in obscurants, in adverse weather, and in battlefield environments where electronic or physical countermeasures are prevalent. The system is integrated into the overall FAAD architecture to improve low-altitude counter-air operations. The system is manned by a crew of three: a driver, a commander, and a gunner. The commander uses the frequency agile radar to search for targets. Target detections are handed off to the gunner, who tracks the target, automatically or manually, using the FLIR or TV sensors. When track is established and the target is identified, the gunner launches one of eight on-board missiles, which is guided to the target via a receiver on the tail fins of the missile using a CO2 laser. The missile's high speed and maneuverability severely limit threat reaction time. Its dual-purpose impact/proximity fuze and highly lethal warhead minimize the threat's chances of survival.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
On July 29, 1986, the Defense Acquisition Board (DAB) approved the concept for the execution of the overall Forward Area Air Defense (FAAD) program as a system of systems. An In-Process Review (IPR)

7a. (U) Program Highlights (Cont'd):

(Milestone II DAB) held in November 1986, reviewed the LOS-F-H program. At this review, the Office of the Secretary of Defense (OSD), approved release of a Request For Proposal (RFP) for the LOS-F-H system. The Army was directed to ensure that testing included provisions for comparing candidates of varying maturities and that the program be moved forward as quickly as possible. Following a successful seven month Candidate Evaluation Phase, Martin Marietta Missile Systems (MMMS) was chosen as the prime contractor; announcement was made on November 30, 1987. A firm-fixed price contract covering the RDTE funded Operational Assessment (OA) Test Phase option was signed on February 10, 1988. Congressional direction in FY89 required revision of the negotiated OA test program. The revised test program (addition of live fire testing and user changes to the operation test program) was approved by the DAB review on August 4, 1988. This revised program included provisions for a program decision after completion of the Initial Operational Test and Evaluation (IOT&E); and a Milestone IIIB full scale production decision following the completion of live fire testing. First Unit Equipped (FUE) was scheduled for September 1990 in the the original contract baseline. FUE subsequently slipped to July 1992, then to June 1993.

The LOS-F-H program continued in the OA Test Phase. Technical testing on the engineering prototype and initial pre-production systems has been successfully completed with the exception of signature testing. European environment testing has been completed. Test results show that even in worst-case visibility, the system can properly decode the CO2 laser energy and guide the missile to its target. Force Development Test and Experimentation (FDT&E) II began in October 1989 and was completed in December 1989.

IOT&E missile firings and Force-on-Force exercise were completed in May 1990. The system met or exceeded all of its performance requirements except operational availability. Operational availability problems experienced during IOT&E made it necessary for the Project Office to revise the program schedule. Live Fire Test A was completed in June 1990.

A restructured program was approved by the Acquisition Review Council (ASARC) and the Defense Acquisition Board (DAB). The restructured program added a Reliability, Availability, and Maintainability (RAM) Maturation Phase and deferred production until the required reliability values were demonstrated. Reliability growth progress was to be measured at three established Exit Points.

The revised Program Baseline, which reflected the restructured program was approved by the Acquisition Decision Memorandum (ADM)

7a. (U) Program Highlights (Cont'd):

dated November 20, 1990. The restructured program placed the FUE in June 1996.

b. (U) Significant Developments Since Last Report --
The RAM Maturation Phase approved by the Nov 90 DAB, contained three In-Process Review (IPR) Exit Points at which specified system reliability growth was to be demonstrated. The Exit Point A IPR was held in August 1991. A Mean Time Between Hardware Mission Failure (MTBHMF) of 75.9 hours (versus a requirement of 30 hours) was demonstrated during the Exit Point A test. Exit Point B testing, which required a MTBHMF value of 54 hours, was conducted from September through November 1991 and resulted in a MTBMHF of 92.2 hours. The Exit Point B DA-level IPR, held on 13 November 1991, concluded that all Exit Point B requirements have been met. Testing was to continue in order to demonstrate the Exit Point C MTBHMF requirement of 85 hours with a higher confidence. A Logistics Demonstration on two fire units began in December 1991 at Redstone Arsenal, Alabama.

The Alternative Vehicle Source (AVS) program was a cost driven initiative to create an alternative source for the LOS-F-H XM 1069 chassis. Ultimately a fully approved AVS program would have had Red River Army Depot (RRAD) converting over 300 early production Bradley Fighting Vehicle chassis to the XM 1069 chassis as an affordable alternative to "from the ground up" fabrication of new XM 1069 chassis.

Completion of tests changed the estimated performance characteristics to the demonstrated values for engagement ranges, probability of single shot killa, and mean time between mission hardware failure.

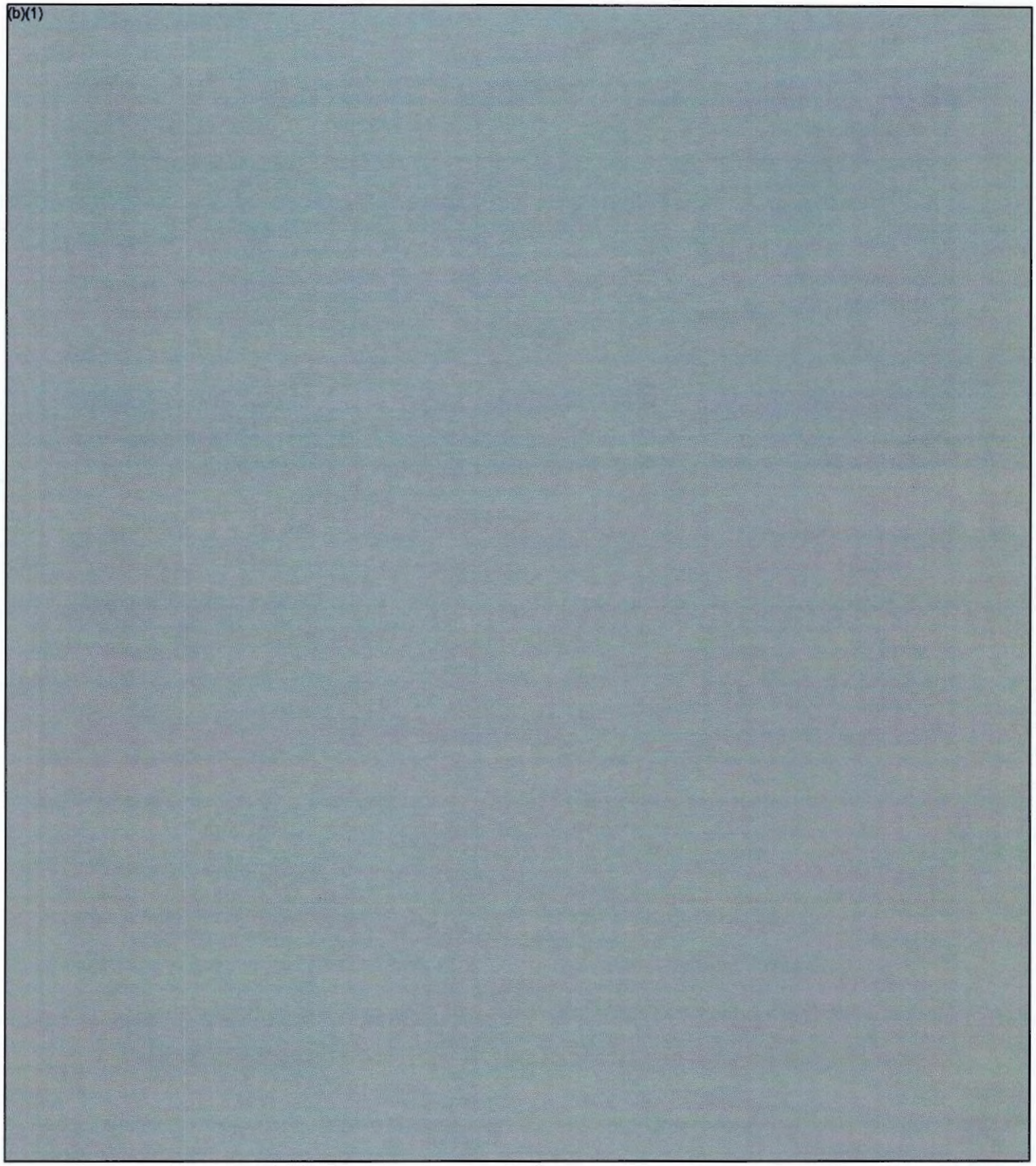
Development and future production dollars were terminated on 28 January 1992. It is expected that this will be the final SAR.

c. (U) Changes Since As Of Date --
Program was terminated, 28 January 92. Plans for completion of Exit Point C have been terminated as well as all other program activities as of 1 February 92. Program Office will officially close on or before 30 September 92.

8. (U) Threshold Breaches:
There are currently no breaches to the Acquisition Program Baseline (APB) dated November 20, 1990. There is a Nunn-McCurdy program acquisition unit cost breach as a result of program termination 28 January 92.

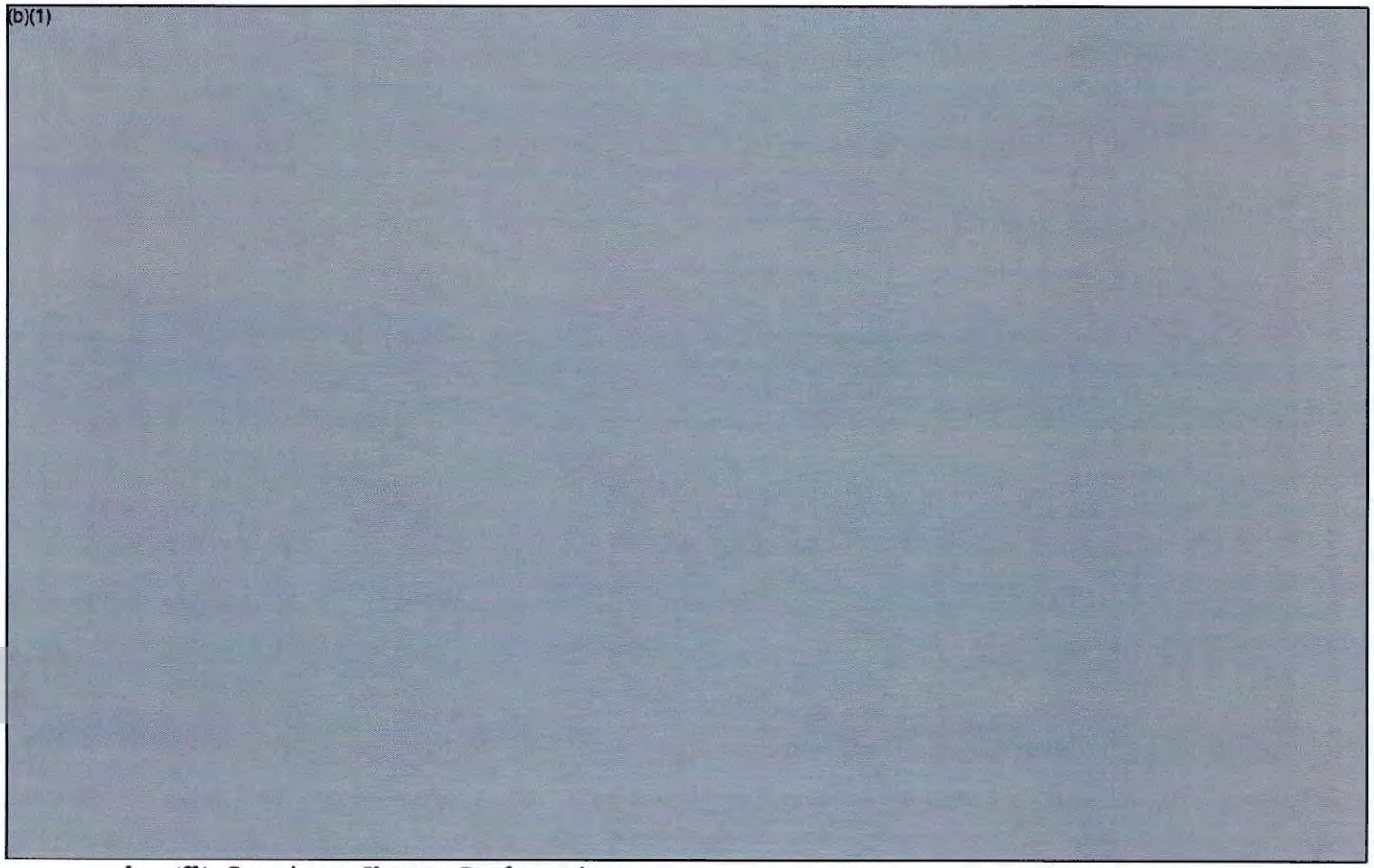
LOS-F-H, December 31, 1991

(b)(1)



9a. (U) Schedule (Cont'd):

(b)(1)



b. (U) Previous Change Explanations --

The LOS-F-H had undergone funding reductions and a revised test program. The LOS-F-H Test program/schedule had been revised to reflect user concern over the adequacy of the time allocated to unit level/combined arms training and test instrumentation/checkout at the test ranges. Recurrent budget reductions perturbated contract award schedules and slipped the FY89 Production Option award from July 1989 to August 1989. All requirements of Technical Test B have been successfully completed. Technical Test B Complete changed from July 1989 to February 1990. All requirements of Technical Test C have been completed with the exception of two missile firings.

The two remaining Technical Test C Complete firings were rescheduled to June 1990. Technical Test C Begin and Complete changed from July 1989 to October 1989 and from October 1989 to July 1989, respectively. The designation of some critical production line assets as potential spare parts for IOT&E impacted delivery of first

9b. (U) Schedule (Cont'd):
production fire units. PVT Begin slipped from Jun 1991 to July 1991.

Reduced funding caused First Unit Equipped (FUE) to slip from May 1993 to June 1993 due to lower production rates in early lots, thereby reducing fire unit quantities available for FUE. Milestones were added to align with the revised DAE Baseline as reported in the 31 December 89 SAR. The award of the FY89 Procurement Option was slipped from August 1898 to January 1990 due to Congressional reductions of the FY90 program and the necessity to restructure the Advance Procurement contract action.

Both IOT&E Begin and Technical Test D Begin missile firings were slipped from January 1990 to February 1990, due to the delay in the prerequisite Technical Test B missile firings caused by range conditions. Single Milestone III was converted to Program Review and Milestone III B to permit completion of live fire testing prior to full scale production decision. Program Review was scheduled for completion June 1990, and Milestone IIIB was scheduled for completion in March 1991. Award FY90 Production Option was converted to Award FY90 Production Option (LRIP) and Award FY90 Advance Production Option - LLI and forecast subsequent to Program Review.

The Tech Tests C and D, Live Fire A and B, FY90 Production Option Award, DAB Program Review, FY90 Advance Production Option (LLI), Milestone IIIB, FY91 and FY92 Production Award, PVT and FUE milestones were changed to incorporate a RAM Maturation Phase and align with the new program as directed by the Nov 90 DAB.

Milestones concerning the ASARC RAM Approval; Exit Points A, B, & C; RAM Follow-on Evalution-Start & Complete; Initial Operational Capability (IOC); Transition to Organic Logistics Direct Support and for Depot Maintenance; FY93 Full Rate Production Award were added to align with latest baseline which incorporated a RAM Maturation Phase.

c. (U) Current Change Explanations --

CH-1 - Due to program termination, 28 January 92, scheduled milestones will not occur.

CH-2 - Correction of problems with preproduction fire units delayed start of tests. DA Red Team recommended using production firs units which necessitated a slight restructuring of the test schedule.

d. (U) References --

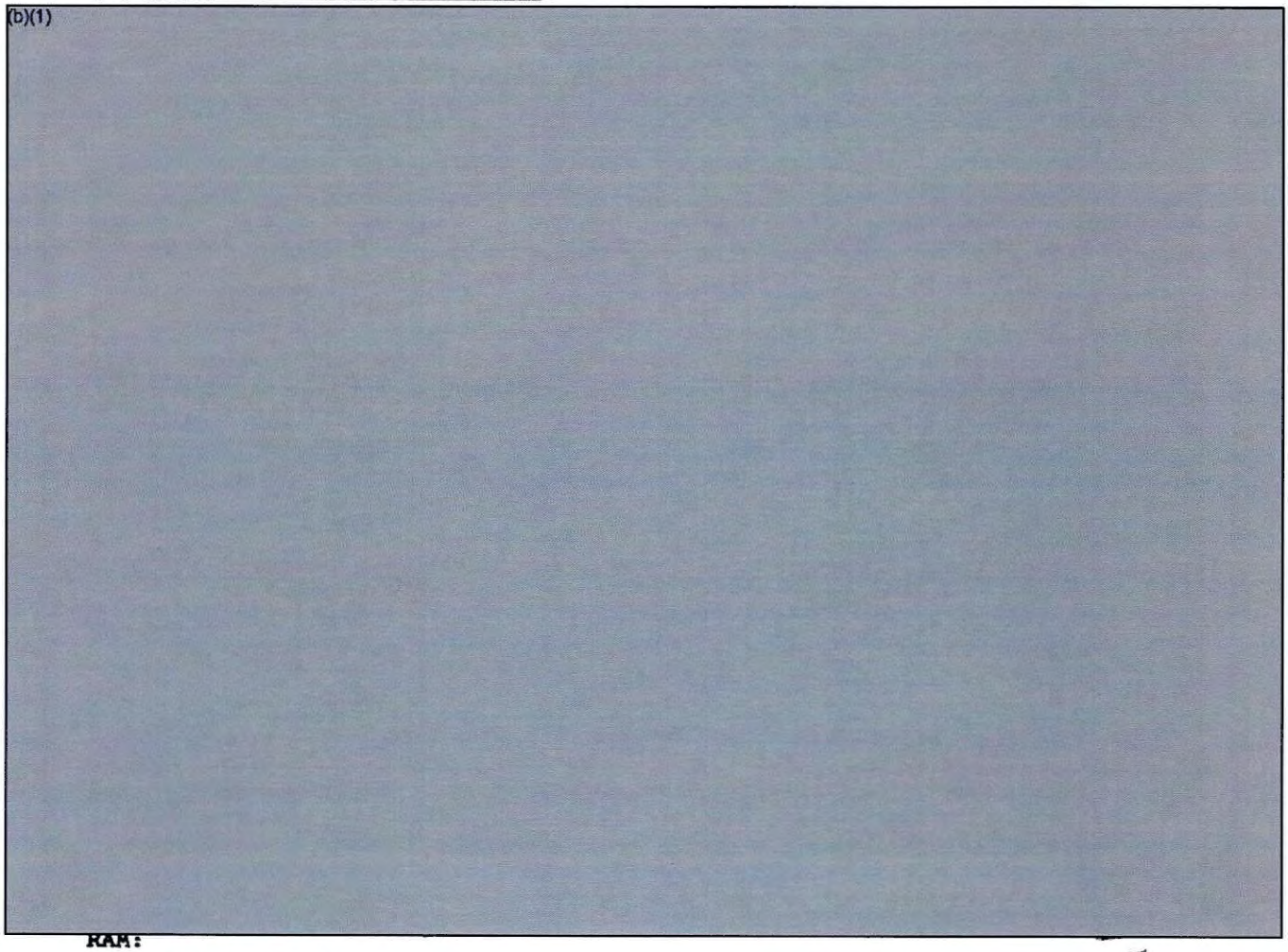
(U) Development Estimate:
DAE Acquisition Program Baseline dated March 2, 1989.

9d. (U) Schedule (Cont'd):

(U) Approved Program: None.

10. (U) Performance Characteristics:

(b)(1)



RAM:

MTBHMF (wpn subsys) (hrs)						
Exit Point A	N/A	N/S	/ 30	75.9	75.9	(CH-2)
Exit Point B	N/A	N/S	/ 54	92.2	92.2	(CH-3)
Exit Point C	N/A	117	/ 85		85	
MTBOMF (wpn sys) (hrs)	92	92	/ 92	53.39	92	
MTBOMF (fire unit) (hrs)	44	60	/ 44	37.57	44.0	

10a. (U) **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
MTTR (fire unit) (hrs)	1	1 / 1.5	0.62	1.5
MTBUHMA (wpn sys) (hrs)	34	34 / 34	6.1	34
MTBHUMA (fire unit) (hrs)	79	79 / 79	15.5	79
Msl Reliability (%)	80	80 / 80	83	80

(b)(1)

[redacted]

Notes:

* 8.0 km demonstrated against a target board

** Number of ready missiles is based on demonstration of a full complement of missiles reloaded during trials in operational test.

*** Probability of detection determined against all targets in operational test.

**** No differentiation made between maneuvering and non-maneuvering for rotary wing since tests were not designed to discriminate maneuvering and non-maneuvering.

* ACRONYMS:

PSSKA - Probability of Single Shot Kill (type A)
MTBHMF - Mean Time Between Hardware Mission Failure
MTBOMF - Mean Time Between Operational Mission Failure
MTTR - Mean Time to Repair
MTBHUMA - Mean Time Between Hardware Unscheduled Maintenance Action
FDTE - Force Development Test and Experimentation

10b. (U) Performance Characteristics (Cont'd):

b. (U) Previous Change Explanations --

MTBOMF (fire Unit) Approved Program Goal/Threshold values were transposed in the DAE Baseline dated March 2, 1989. Development Estimate and Current Estimate were changed from 60 to 44 to align with that baseline value.

Exit Point A, B, and C were added to align with the DAB approved APB Baseline, dated Nov 90.

MTTR (Fire Unit) was changed from 1 to 1.5 to align with the threshold value in the latest APB Baseline, dated Nov 90.

c. (U) Current Change Explanations --

CH-1 - Data was based on OTEA Report OER-OT-1390A. The current estimate was updated to demonstrated performance values. No differentiation between maneuvering and non-maneuvering targets.

CH-2 - The minimum criteria set for Exit Point A was 30. Exit Point A testing demonstrated a value of 75.91.

CH-3 - The minimum criteria set for Exit Point B was 54. Exit Point B testing demonetrated a value of 92.2.

d. (U) References --

(U) Development Estimate:
DAE Baseline dated March 2, 1989.

(U) Approved Program: None.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	277.9	437.0	437.0
Procurement	4773.4	134.5	134.5
Flyaway	(4179.4)		(126.5)
Total Flyaway	(4179.4)		(126.5)
Other Weapon Systems	(131.5)		(7.9)
Total Other Wpn Sys	(131.5)		(7.9)
Peculiar Support	(61.7)		(0.1)
Initial Spares	(400.8)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	5051.3	571.5	571.5
Escalation	974.4	30.9	30.9
Development (RDT&E)	(3.7)	(22.3)	(22.3)
Procurement	(970.7)	(8.6)	(8.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	6025.7	602.4	602.4
b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	562	4	4
Total	562	4	4

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
DAE Acquisition Program Baseline (APB) dated 2 March 1989.

(U) Approved Program: None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	602.4	6426.0	602.4
(2) Quantity	4	378	4
(3) Unit Cost	150.60	17.00	150.60
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

For unit cost purposes, a fire unit with missiles is considered to be the LOS-F-H unit of measure.

The quantity excludes 4 R&D units that are not considered fully-configured end items.

The ADATS program was terminated as of the end of FY92. This creates a technical PAUC breach exceeding 25 percent. The current estimate deletes all future dollars and the associated quantities of 374 fire units (FUs), leaving a balance of 4 sunk procurement fire units to be divided into the total sunk dollars for both RDTE and Procurement appropriations.

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
c. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (BY89$)	571.5	4389.8	571.5
(2) Unit Cost	142.88	11.61	142.88
d. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (BY89$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Unit Cost	N/A	N/A	N/A

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

e. (U) Changes from the Baseline Report - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	133.600	785.88
(2) CPUC (TY$)	0.000	N/A
(3) PAUC Quantity	-374	-98.94
(4) PAUC (BY89$)	131.262	1130.30
(5) CPUC (BY89$)	0.000	N/A

f. (U) Changes from the Previous SAR - (DEC 90 SAR)

	Changes in $ or Qty	Percent Change
(1) PAUC (TY$)	133.6	785.88
(2) CPUC (TY$)	0.0	N/A
(3) PAUC Quantity	-374	-98.94
(4) PAUC (BY89$)	131.3	1134.34
(5) CPUC (BY89$)	0.0	N/A

g. (U) Initial SAR (DEC 86)

(1) Program Acquisition Cost (TY$) -- 0.0
(2) Program Acquisition Cost (BY$) -- 0.0

h. (U) Unit Cost Changes.

(1) (U) PAUC --

The Program Acquisition Unit Cost increased by 786% as a result of the termination of the program and the deletion of all procurement dollars and the associated quantities of 374 fire units.

(2) (U) CPUC --

N/A

i. (U) Impact of Performance or Schedule Changes on Unit Cost. - None.

j. (U) Program Management and Control. - None.

k. (U) Cost Control Actions. - None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

1. (U) Contract Information (In Millions of Then-Year Dollars) --

(U) (1) Contractor(s): MARTIN MARIETTA
(2) Contract Title: FIRE UNITS (RDTE)
(3) Contract Number:DAAH01-87-C-A049
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): 0.00
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of 12/31/91	N/A	N/A
Previous SAR	N/A	N/A
Current values	N/A	N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	N/A	N/A

(7) (U) Explanation of Variances. - None.

(8) (U) Impact of Variances on Contract. - None.

(9) (U) Impact of Variances on Unit Costs. - None.

(U) (1) Contractor(s): MARTIN MARIETTA
(2) Contract Title: FIRE UNITS (PROC)
(3) Contract Number:DAAH01-87-C-A049
(4) Actual Cost of Work Performed (ACWP) to date: N/A
(5) Percent contract completed (BCWP/target cost): 0.00
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of 12/31/91	N/A	N/A
Previous SAR	N/A	N/A
Current values	N/A	N/A
Change from the baseline SAR	N/A	N/A
Change from the previous SAR	N/A	N/A

(7) (U) Explanation of Variances. - None.

(8) (U) Impact of Variances on Contract. - None.

(9) (U) Impact of Variances on Unit Costs. - None.

m. (U) Contracts Exceeding Contract Cost Baseline Thresholds. -- None.

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	281.6	5744.1	0.0	6025.7
Previous Changes:				
Economic	+5.9	+732.8	-	+738.7
Quantity	-	-1603.7	-	-1603.7
Schedule	+272.7	+823.7	-	+1096.4
Engineering	-	-	-	-
Estimating	+11.8	+3.6	-	+15.4
Other	-	-	-	-
Support	-	+153.5	-	+153.5
Subtotal	+290.4	+109.9	-	+400.3
Current Changes:				
Economic	-5.7	-730.3	-	-736.0
Quantity	-	-4278.1	-	-4278.1
Schedule	-	+112.9	-	+112.9
Engineering	-113.2	-	-	-113.2
Estimating	+6.2	+1.1	-	+7.3
Other	-	-	-	-
Support	-	-816.5	-	-816.5
Subtotal	-112.7	-5710.9	-	-5823.6
Total Changes	+177.7	-5601.0	-	-5423.3
Current Estimate	459.3	143.1	-	602.4

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	277.9	4773.4	0.0	5051.3
Previous Changes:				
Quantity	+223.0	-917.5	-	-694.5
Schedule	-	+40.3	-	+40.3
Engineering	-	-	-	-
Estimating	+13.2	-35.3	-	-22.1
Other	-	-	-	-
Support	-	+14.8	-	+14.8
Subtotal	+236.2	-897.7	-	-661.5
Current Changes:				
Quantity	-	-2669.2	-	-2669.2
Schedule	-	-3801.8	-	-3801.8
Engineering	-82.7	-	-	-82.7
Estimating	+5.6	+3330.6	-	+3336.2
Other	-	-	-	-
Support	-	-600.8	-	-600.8
Subtotal	-77.1	-3741.2	-	-3818.3
Total Changes	+159.1	-4638.9	-	-4479.8
Current Estimate	437.0	134.5	-	571.5

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices.

Schedule: Additional funds received to extend IOT&E test program required by Operational Test and Evaluation. Operational availability problems experienced during IOT&E required a program restructure to include adding a RAM Maturation Phase. Incorporated P3I requirements.

Estimating: Revised estimate to include additional live fire test to meet congressional language. Revised P3I requirements.

13b. (U) Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic: Revised escalation indices.

Quantity: AAO Fire Unit quantitiy reduced from 562 to 378.

Schedule: Near term funding reduction resulted in program stretch out and increased cost.

Production schedule delayed due to added RAM Maturation Phase and lowered production rate.

Estimating: Incorporated Manpower Estimating Report, target procurements changed from live to drone, revised trainer schedule, Op/site Activation, changes in PVT support, application of decreasing factors in Engineering Change Orders.

Support: Revised initial spares requirement.

A Program Restructure caused a change in support costs (-14.9 BY and +72.1TY). Revised funding policy resulted in transfer from OMA to Procurement Total Package Fielding (+44.3 BY and +75.6 TY).

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices. (Economic)	--	-5.7
P3I program eliminated due to program termination at the end of FY92. (Engineering)	-82.7	-113.2
Current and Prior Inflation Offset (Estimating)	2.0	2.3
Reprogramming Action for live fire testing. (Estimating)	3.6	3.9
Total Changes	-77.1	-112.7

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices. (Economic)		-730.3
Change from 378 fire units to 4 due to program termination. (Quantity)	-2669.2	-4278.1
Change in schedule due to program termination. (Schedule)	-3801.8	112.9
Current & Prior Inflation Offset (Estimating)	0.2	0.2
Support change due to program termination. (Support)	-600.8	-816.5
Allocation due to quantity/schedule change. (Estimating)	3330.4	0.9
Total Changes	-3741.2	-5710.9

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
10.7	--	--	--	--	--	--	--	--	10.7

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
10.7	0.7	25.3	302.3	-28.3	5.7	--	-165.8	139.9	150.6

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) FIRE UNITS (RDTE):	Initial Contract Price		
	Target	Ceiling	Qty
MARTIN MARIETTA, ORLANDO, FL DAAH01-87-C-A049, FFP Award: February 10, 1988 Definitized: February 10, 1988	$100.4	N/A	4

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$259.7	N/A	4	$259.7	$259.7

CPR information is not a requirement on this FFP contract.

Cost Performance Data is not required for this FFP contract. Contract target price represents RDTE funds issued as of 5 Nov 90.

b.(U) Procurement --

(U) FIRE UNITS (PROC):	Initial Contract Price		
	Target	Ceiling	Qty
MARTIN MARIETTA, ORLANDO, FL DAAH01-87-C-A049, FFP Award: June 29, 1990 Definitized: June 29, 1990	$27.2	N/A	5

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$115.4	N/A	4	$115.4	$115.4

CPR information is not a requirement on this FFP contract.

No cost performance data is required for this FFP contract. Initial Procurement contract Price represents Advance Procurement only. The Current Contract Target Price includes additional mods and procurement options that have been exercised since the Initial Contract Target Price was established. Contract target price represents PROCUREMENT funds issued as of 5 Nov 90. This contract effort was completed on 29 Feb. 1992.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 100.0% (7 yrs/7 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($602.4 / $602.4)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY86-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	352.0	107.3	-	-	459.3
Procurement	143.1	-	-	-	143.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	495.1	107.3	-	-	602.4

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1986				35.7	33.1	32.7	32.4	3.0
1987				24.0	22.8	22.6	22.0	4.2
1988				100.0	98.7	98.5	97.5	4.0
1989				47.4	48.6	48.6	45.7	4.4
1990				50.7	54.0	54.0	53.2	4.1
1991				85.5	94.8	94.5	74.8	3.9
1992				93.7	107.3	6.4	0.6	3.1
Subtot				437.0	459.3	357.3	326.2	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2032 Missile Procurement, Army								
1988			25.1	32.5	33.9	33.5	33.2	3.0
1989	4		101.4	102.0	109.2	103.1	87.8	4.2
Subtot	4		126.5	134.5	143.1	136.6	121.0	
Grand Total	4		126.5	571.5	602.4	493.9	447.2	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1989	4	N/A	4	N/A
1990	18	N/A	0	N/A
1991	28	N/A	0	N/A
1992	43	N/A	0	N/A
1993	45	N/A	0	N/A
1994	42	N/A	0	N/A
1995	0	0	0	N/A
1996	0	0	0	N/A

17a. (U) **Production Rate Data (Cont'd)**:

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1997	0	0	0	N/A
1998	0	0	0	N/A
1999	0	0	0	N/A
2000	0	0	0	N/A
2001	0	0	0	N/A
2002	0	0	0	N/A

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	571.5	N/A	N/A
(TY $)	N/A	N/A	602.4	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	142.875	N/A	N/A
(TY $)	N/A	N/A	150.600	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	MAR 89	N/A	N/A
Duration (in MON)	N/A	N/A	28	N/A	N/A
End Date(MON YY)	N/A	N/A	JUL 91	N/A	N/A

17d. (U) **Production Rate Data (Cont'd)**:

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	4/4
Procurement	4/4

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) **Operating and Support Costs**:

a. (U) Assumptions and Ground Rules -- None

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- None.

N-21 FOS

91-136 S1

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: FIXED DIST SYS (FDS)

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
Fixed Distributed System (FDS)

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**
FDS Program Manager — Mr. R. L. Hobart
Space/Naval Warfare Systems Command — Assigned: October 16, 1991
Department of the Navy — AV 332-0041 COMM (703) 602-0041
Washington, DC 20363-5100

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604784N Project X1312
PE 0603784N Project X1312
PE 0204311N (Shared) FY87 and Prior
Project X0766 (Shared)
PROCUREMENT:
APPN 1810 ICN 0204311N (Navy) (Shared) FY92 and Beyond

No Security Objection to Open Publication
(AS AMENDED)
MAR 24 1992
Office of the Chief of
Naval Operations Dept. of the Navy

Classified by: OPNAVINST S5460.5A
Declassify on: OADR
Downgrade Instructions: Not Subject to Automatic Downgrade

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OASD(PA) DFOISR 92 0697

6. (U) Program Elements/Procurement Line Items (Cont'd):

MILCON:
PE 0204311N (Shared)

(b)(1) [redacted]

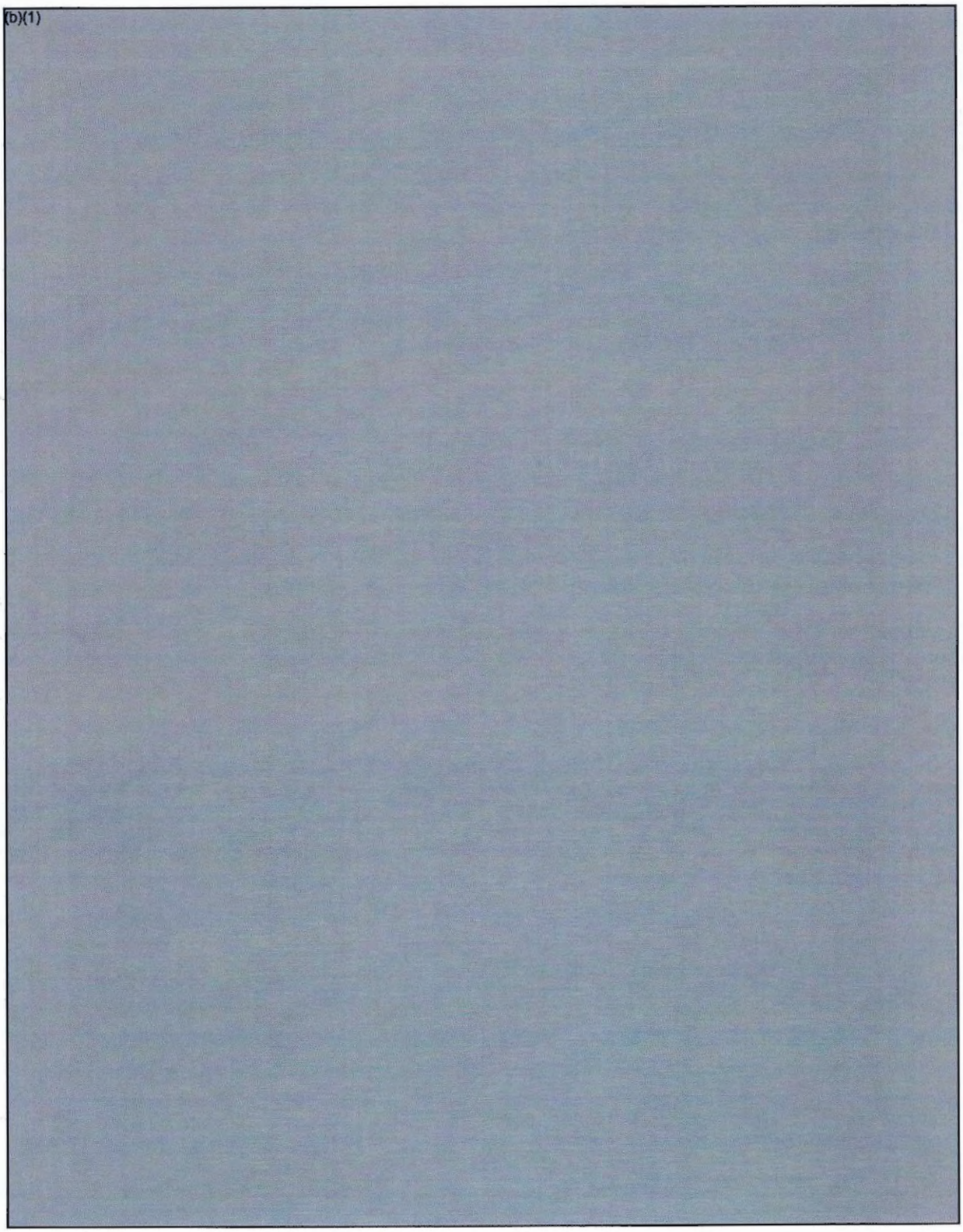
6. (U) Mission and Description:

(U) As a result of the changing world situation, the FDS program is in the process of being restructured to respond to this new world order. The Secretary of Defense (SECDEF) guidance on the development and production has impacted the acquisition strategy of the FDS program. With the deletion of all production systems, the FDS program is being restructured to provide for the development of and preparation for the production of deployable systems to respond to rapidly changing world events. Because of the very recent SECDEF guidance on production, the funding and quantity data that represents the current Program Baseline in this report does not reflect this new acquisition strategy. A revised Program Baseline is being prepared at the time that this report is issued and will be submitted to SECDEF for approval in FY92. This new strategy should be reflected in the December, 1992 Selected Acquisition Report.

(b)(1) [redacted]

FIXED DIST SYS (FDS), December 31, 1991

(b)(1)



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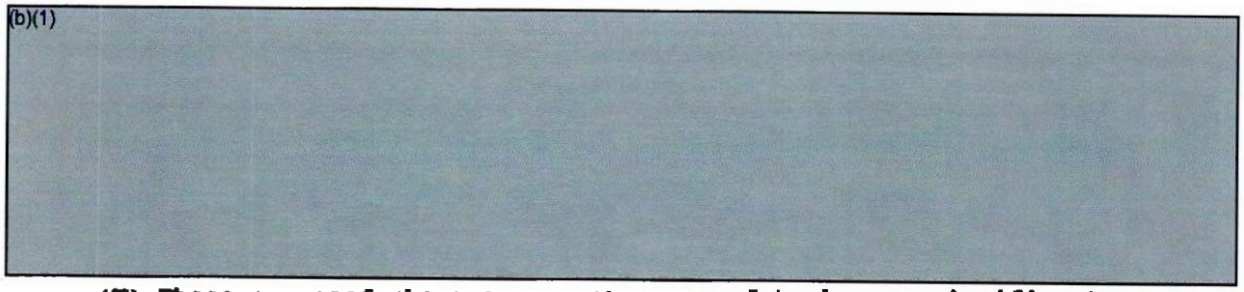


(U) These proposed changes are not expected to have a significant impact on the development program technical characteristics, cost or schedule. These changes remain proposed and under consideration. When approved and authorized, the program baseline will be updated accordingly.

(U) Underwater Segment. -- A follow-on FDS underwater hardware development contract was awarded to AT&T Technologies on a Cost Plus Award Fee (CPAF) basis on 23 February 1989. An Underwater Segment (UWS) Engineering and Manufacturing Development (E&MD) contract was awarded to AT&T Technologies on a Cost Plus Incentive Fee (CPIF) basis on 15 January 1990. The underwater segment successfully completed a Preliminary Design Review (PDR) in January 1989.

(U) Shore Segment. -- Two competitive design contracts for the Shore Signal and Information Processing System (SSIPS) were awarded, one to GE and the other to IBM, in September 1989 on a Firm Fixed Price (FFP) basis.

b. (U) Significant Developments Since Last Report --
A revised Program Baseline has been delivered to the Office of the Secretary of Defense (OSD) for approval as a result of the FY92/93 President's Budget. Due to cancellation of the FDS production, the program has been reduced from seven systems (six production and one RDT&E) to one RDT&E system, thus all non-recurring costs associated with development are levied against this single system.

(U) Underwater Segment. -- A majority of the configuration items for the Underwater Segment have completed their Critical Design Review (CDR). A Subsequent Application Review (SAR) was conducted at AT&T in August 1991.

(U) Shore Segment. -- Selection of a E&MD contractor has been completed. A Program Review was successfully conducted in November 1991 as required by the Milestone II Acquisition Decision Memorandum (ADM). The hardware CDR was completed in December 1991.

(U) This system will satisfy mission requirements.

7c. (U) **Program Highlights (Cont'd):**

(b)(1)

[redacted]

8. (U) **Threshold Breaches:**
Due to the cancellation of the FDS production, a Nunn-McCurdy Program Acquisition Unit Cost Breach of 104.6% was realized. In accordance with provisions of 10 U.S.C 2433, Unit Cost Breach information is provided in section 12(a-m) of this SAR. The Acquisition Program Breaches indicated in section 9 for deployment of the fields are as a result of FY90 and FY91 funding reductions. These program baseline changes have been submitted in a revised program baseline submitted to OSD for approval.

9. (U) **Schedule:**

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone I (DNSARC)	MAY 86	MAY 86	MAY 86
Milestone II (DAB)	SEP 89	SEP 89	SEP 89
SSIPS Design Contracts Award	SEP 89	DEC 89	DEC 89
UNS FSD Contract Award	JAN 90	DEC 89	DEC 89
CBIC-V Yield Demo	N/A	JUN 90	JUN 90
Program Review	JAN 91	NOV 91	NOV 91(Ch-1)
Integration Facility BOD	N/A	NOV 91	NOV 91
SSIPS FSD Contract Award	DEC 91	FEB 92	FEB 92(Ch-2)
DT IIB (Underwater Pre Prod Test)	N/A	DEC 91	DEC 91

(b)(1)

[redacted]

[redacted]

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
OT IIE (Opeval)	N/A	DEC 95	DEC 95
Milestone IIIB	JUN 96	JUN 96	JUN 96
Milestone IV/VA	JUN 98	N/A	DEL (Ch-4)
Milestone VB	MAR 04	N/A	DEL (Ch-4)

b. (U) Previous Change Explanations --

None.

c. (U) Current Change Explanations --

(CH-1) The change from September 1991 to November 1991 for the Program Review was required to allow OSD to complete cost analysis to support the Program Review.

(CH-2) The change from December 1991 to February 1992 for the SSIPS FSD contract award is required because the procuring activity was awaiting authority to sign this contract as described in section 7(b) above.

(CH-3) The changes for Achieve Production Rate, Milestone III A and DT II D/OT II A are as a result of the recommended Program Baseline Change that is currently being reviewed by OSD.

(CH-4) This change is due to SECDEF Guidance issued 29 January 1992 cancelling all production quantities for FDS.

d. (U) References --

(U) Development Estimate:
DCP dated May 15, 1989, Subj: "Fixed Distributed System (FDS)"

(U) Approved Program:
DAB approved Acquisition Program Baseline dated January 28, 1992.

10. (U) Performance Characteristics:

10a. (U) Performance Characteristics (Cont'd):

a. (U) Performance --	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

ACRONYMS:

10a. (U) Performance Characteristics (Cont'd):

AOU - Area of Uncertainty
CBIC - Complimentary Bi-polar Integrated Circuit
MTBMCF - Mean Time Between Mission Critical Failure
MTBMA - Mean Time Between Maintenance Actions
MTTR - Mean Time To Repair
Pd - Probability of Detection
Pfa - Probability of False Alarm
SSIPS - Shore Signal Information Processing Segment
UWS - Underwater System

b. (U) Previous Change Explanations --

None.

c. (U) Current Change Explanations --

None.

d. (U) References --

(U) Development Estimate:
DCP dated May 15, 1989, Subj: "Fixed Distributed System (FDS)"

(U) Approved Program:
DAE approved Acquisition Program Baseline dated January 28, 1992.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

(b)(1)

(b)(1) [redacted]

O&MN is not included in the Program Acquisition Cost for this program. O&MN is strictly for Operations and Maintenance of FDS systems.

(b)(1) [redacted]

O&MN is not included in the Program Acquisition Cost for this program. O&MN is strictly for Operations and Maintenance of FDS systems.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
DCP dated May 15, 1989, Subj: "Fixed Distributed System (FDS)"

(U) Approved Program:
DAE approved Acquisition Program Baseline dated January 28, 1992.

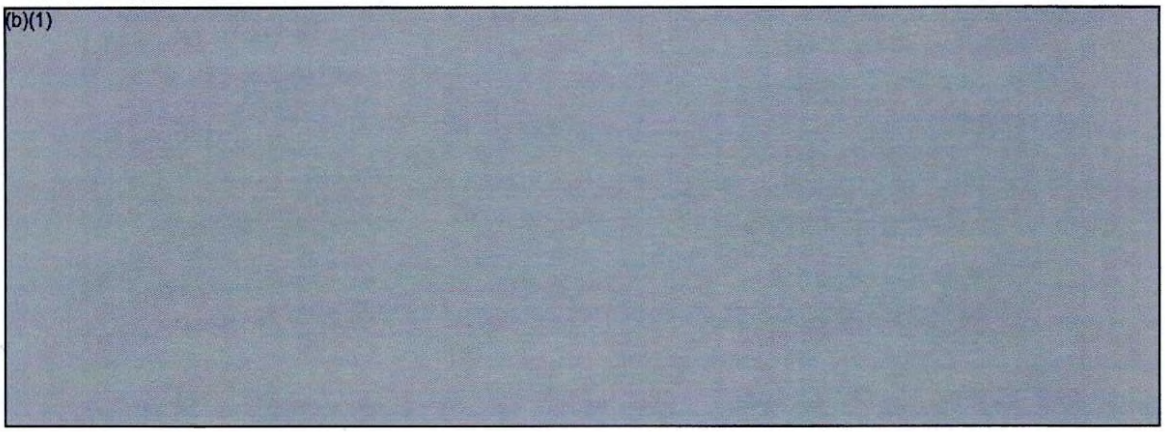
FIXED DIST SYS (FDS), December 31, 1991

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
(b)(1)	[redacted]		

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

(b)(1)



SECDEF Guidance issued on 29 January 1992 cancelled all production quantities for FDS. The unit cost breach that has resulted is only due to the cancellation of production not due to any increases in any contract costs.

h. (U) Unit Cost Changes.

(1) (U) PAUC --

See footnote for sections 12c-g

(2) (U) CPUC --

Not applicable

i. (U) Impact of Performance or Schedule Changes on Unit Cost.

There is no performance or schedule impact to the Engineering & Manufacturing Development phase of FDS.

j. (U) Program Management and Control.

Program Management and control is unchanged. SPAWAR (PMW184) is the Principal Development Agency (PDA) reporting through the PEO (SPAWAR) to the SAE (ASN(RDA)).

k. (U) Cost Control Actions.

There are no cost control actions requiring change at this time

12. (U) Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

1. (U) Contract Information (In Millions of Then-Year Dollars) —

(U) (1) Contractor(s): AT&T Technologies Inc.
(2) Contract Title: FDS UWS (ULSS)
(3) Contract Number:N00039-89-C-0083
(4) Actual Cost of Work Performed (ACWP) to date: 81.0
(5) Percent contract completed (BCWP/target cost): 86.90
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of 03/31/91	$-1.6/-2.20%	$-5.6/-6.47%
Previous SAR	$-1.6/-2.20%	$-5.6/-6.47%
Current values	$+0.4/+0.01%	$-4.2/-4.90%
Change from the baseline SAR	$+2.0/+2.21%	$+1.4/+1.57%
Change from the previous SAR	$+2.0/+2.21%	$+1.4/+1.57%

(7) (U) Explanation of Variances. -

See section 15(a).

(8) (U) Impact of Variances on Contract. -

See section 15(a).

(9) (U) Impact of Variances on Unit Costs. -

None

(U) (1) Contractor(s): AT&T, Technologies Inc.
(2) Contract Title: FDS UWS FSED
(3) Contract Number:N00039-90-C-0077
(4) Actual Cost of Work Performed (ACWP) to date: 156.6
(5) Percent contract completed (BCWP/target cost): 38.70
(6) Variances:

	Cost Variance ($/%)	Schedule Variance ($/%)
SAR Values as of 03/31/91	$-1.5/+1.34%	$-17.9/-18.43%
Previous SAR	$-1.5/+1.34%	$-17.9/-18.43%
Current values	$-13.3/-9.28%	$-28.0/-16.36%
Change from the baseline SAR	$-11.8/-10.62%	$-10.1/+2.07%
Change from the previous SAR	$-11.8/-10.62%	$-10.1/+2.07%

(7) (U) Explanation of Variances. -

See section 15(a).

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):**

(8) (U) Impact of Variances on Contract. -

See section 15(a).

(9) (U) Impact of Variances on Unit Costs. -

None

m. (U) Contracts Exceeding Contract Cost Baseline Thresholds. -- None.

13. (U) **Cost Variance Analysis:**

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1604.1	6135.1	108.1	7847.3
Previous Changes:				
Economic	+13.2	+100.1	+0.8	+114.1
Quantity	-	-2410.2	-	-2410.2
Schedule	-	-127.0	-	-127.0
Engineering	-	-	-	-
Estimating	-89.7	-195.3	-56.7	-341.7
Other	-	-	-	-
Support	-	+322.2	-	+322.2
Subtotal	-76.5	-2310.2	-55.9	-2442.6
Current Changes:				
Economic	-22.9	-124.4	-1.5	-148.8
Quantity	-	-2416.9	-	-2416.9
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+23.0	-343.0	-0.5	-320.5
Other	-	-	-	-
Support	-	-940.6	-	-940.6
Subtotal	+0.1	-3824.9	-2.0	-3826.8
Total Changes	-76.4	-6135.1	-57.9	-6269.4
Current Estimate	1527.7	-	50.2	1577.9

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1300.0	3814.8	75.7	5190.5
Previous Changes:				
Quantity	-	-1494.0	-	-1494.0
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-50.7	-160.2	-35.5	-246.4
Other	-	-	-	-
Support	-	+112.2	-	+112.2
Subtotal	-50.7	-1542.0	-35.5	-1628.2
Current Changes:				
Quantity	-	-1553.3	-	-1553.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+12.0	-183.8	-0.3	-172.1
Other	-	-	-	-
Support	-	-535.7	-	-535.7
Subtotal	+12.0	-2272.8	-0.3	-2261.1
Total Changes	-38.7	-3814.8	-35.8	-3889.3
Current Estimate	1261.3	-	39.9	1301.2

As directed by SECDEF Guidance on 29 January 1992, the production program for FDS has been cancelled. The amended President's Budget in accordance with this guidance is now reflected in this report.

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Estimating: Realized program efficiencies and cost savings. Revised estimate due to changes in the President's Budget.

PROCUREMENT
Economic: Revised escalation indices. Economic adjustment for negative PCR.

13b. (U) Cost Variance Analysis (Cont'd):

Quantity: FDS planned production reduced from eleven to six systems.

Schedule: Change associated with reduction in planned production quantity.

Estimating: Realized saving in first year Underwater Hardware costs.

Support: Initial spares decreased as a result of a reduction in planned production quantity. Other Systems Costs and Peculiar Support increased as a result of a mistake made in allocating costs in the Development Estimate.

MILCON

Economic: Revised escalation indices. Economic adjustment for negative PCR.

Estimating: Elimination of a second Integration Facility.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised January 1992 economic escalation rates. (Economic)	N/A	-22.9
Cost growth due to UWS E&MD contract efforts. (Estimating)	12.0	23.0
Total Changes	12.0	0.1
(2) PROCUREMENT		
Revised January 1992 economic escalation rates. (Economic)	N/A	-124.4
Revised due to SECDEF Guidance received 29 Jan 92, now reflected in amended President's Budget (Quantity)	-1553.3	-2416.9
Revision of production system estimates to reflect cost savings in SSIPS effort and downsizing of production systems. (Estimating)	-183.8	-343.0
Revision on production system estimates to reflect cost savings in SSIPS effort and downsizing of production systems. (Support)	-535.7	-940.6
Total Changes	-2272.8	-3824.9

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(3) MILCON		
Revised January 1992 economic escalation rates. (Economic)	N/A	-1.5
Revision in size of facilities. (Estimating)	-0.3	-0.5
Total Changes	-0.3	-2.0

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(b)(1) [redacted]

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) FDS UWS (ULSS):	Initial Contract Price Target	Ceiling	Qty
AT&T Technologies Inc., Greensboro, NC N00039-89-C-0083, CPFF Award: February 23, 1989 Definitized: February 23, 1989	$99.9	N/A	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$99.9	N/A	0	$93.5	$101.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$-4.7
Cumulative Variances To Date (12/31/91)	$0.4	$-4.2
Net Change	$0.4	$0.5

Explanation of Change:

See text below.

(U) All work for CLIN 0001 has been completed. Effort on CLIN 0003 - Long Lead Material (LLM) is 81% complete and CLIN 0004 -

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) Special Tool/Special Test Equipment (ST/STE) is 80% complete. The consolidation of contract N00039-89-C-0083 CLIN 0003 into contract N00039-90-C-0077 CLIN 0001 is expected to be contractually executed in February 1992.

(U) The schedule variance in this contract is due solely to the planned lower production rate and schedule push-out. The remaining efforts on this contract are CLINs 0003 - LLM and 0004 - ST/STE. With a lower planned production rate for the EDM, the requirement for ST/STE is less, allowing us to defer procurement of some hardware until we can learn from actual manufacturing experience. The schedule variance in long lead material reflects the deferred requirements of the push-out schedule.

(U) The cost variance has changed slightly from 0.0 to -0.4. Significant effort under this contract ceased on 31 March 1990 except for CLINs 0003 and 0004. No new milestones have been established as the contract is nearing completion.

(U) FDS UNS FSED:	Initial Contract Price Target	Ceiling	Qty
AT&T, Technologies Inc., Greensboro, NC N00039-90-C-0077, CPIF Award: January 15, 1990 Definitized: January 15, 1990	$320.5	N/A	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$369.8	N/A	1	$401.4	$437.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-8.3	$-8.4
Cumulative Variances To Date (12/31/91)	$-13.3	$-28.0
Net Change	$-5.0	$-19.6

Explanation of Change:

See text below.

(U) There is currently a schedule variance of -28.0. The schedule variance is due to more effort than planned on various aspects of the repeater design including test and evaluation and assembly difficulties. A redesign effort on several aspects of the multiplexer/repeater and sensor cluster has been initiated. Present schedules indicate that this redesign effort will not impact IOC.

(U) There is currently a -13.3 cost variance. Major cost variance items include: cluster development (which reflects problems

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) with the hydrophone and physical design rework of the multiplexer), terminations and molds (which reflect problems with the cable to cable junctions termination splices), in-situ sea test (weather delays), and the demultiplexer.

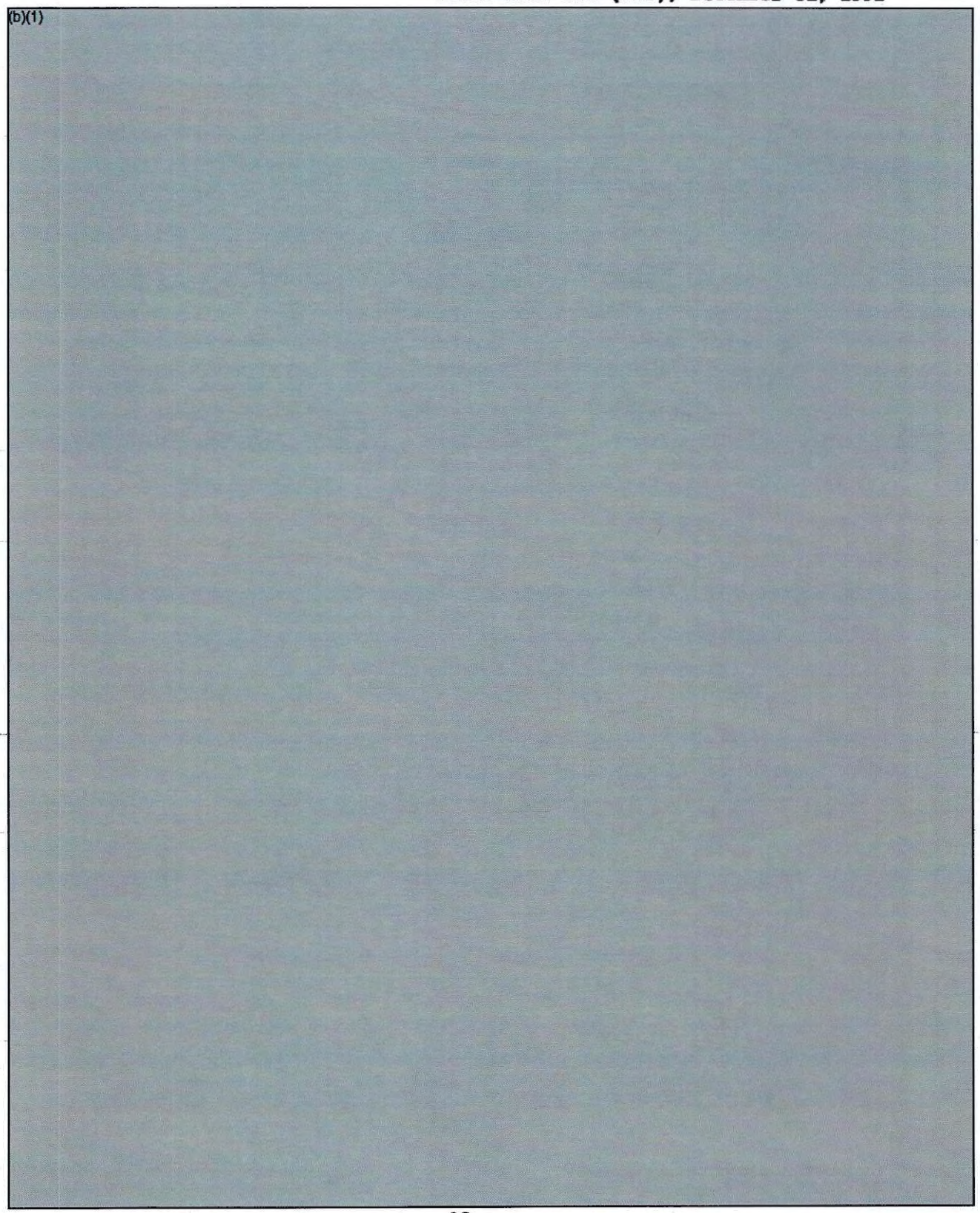
(U) The cost variance is the direct result of additional need for staff and overtime for unanticipated work such as fixture designs for test and evaluation (T&E) articles, building T&E articles, testing associated with Cable to Cable Junction (CCJ) CDR and other configuration item CDR postponement. Also increased drafting, fixture fabrications, test articles and unplanned work for additional tooling design add to the cost variance.

(b)(1)



FIXED DIST SYS (FDS), December 31, 1991

(b)(1)



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FIXED DIST SYS (FDS), December 31, 1991

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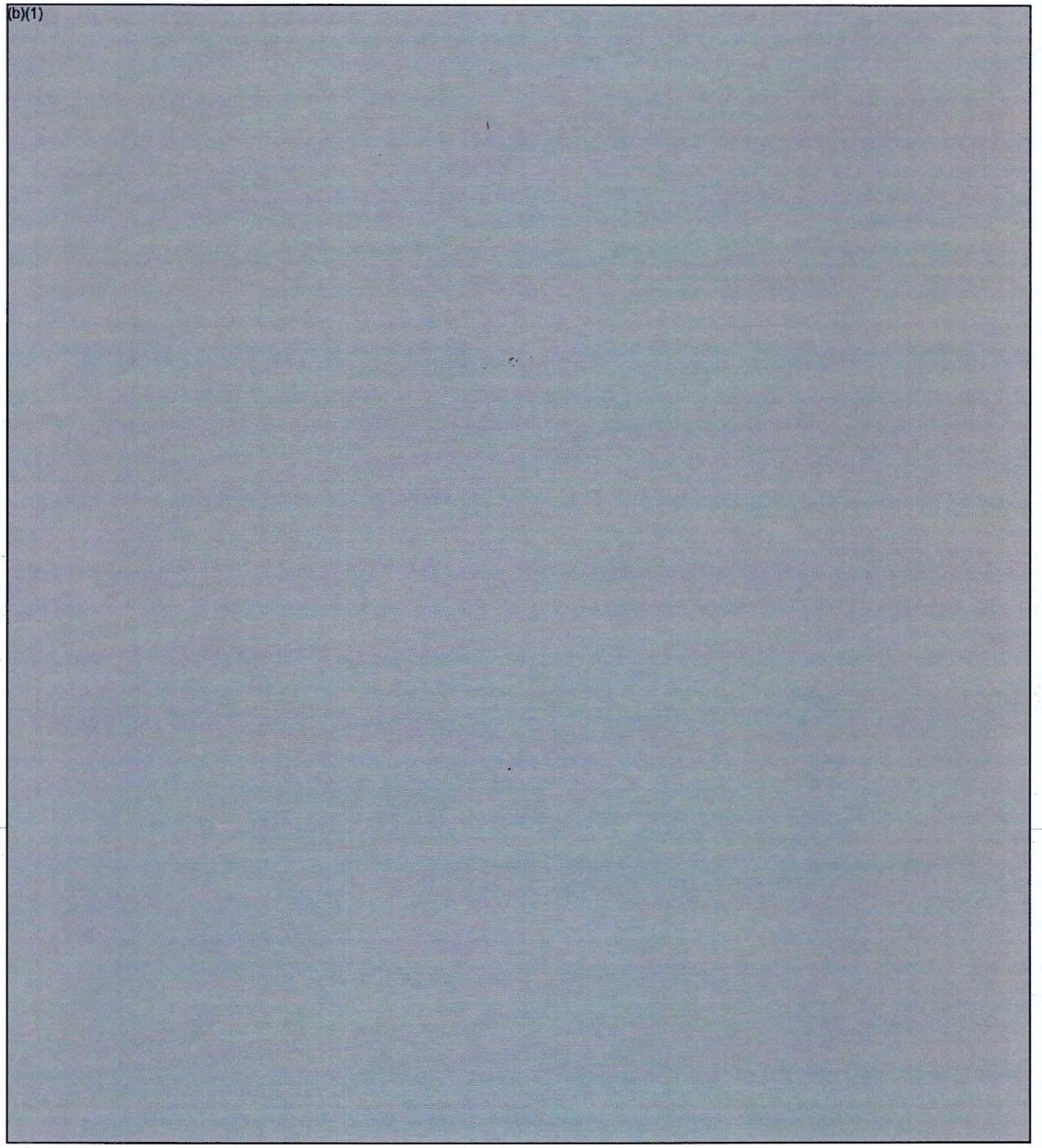

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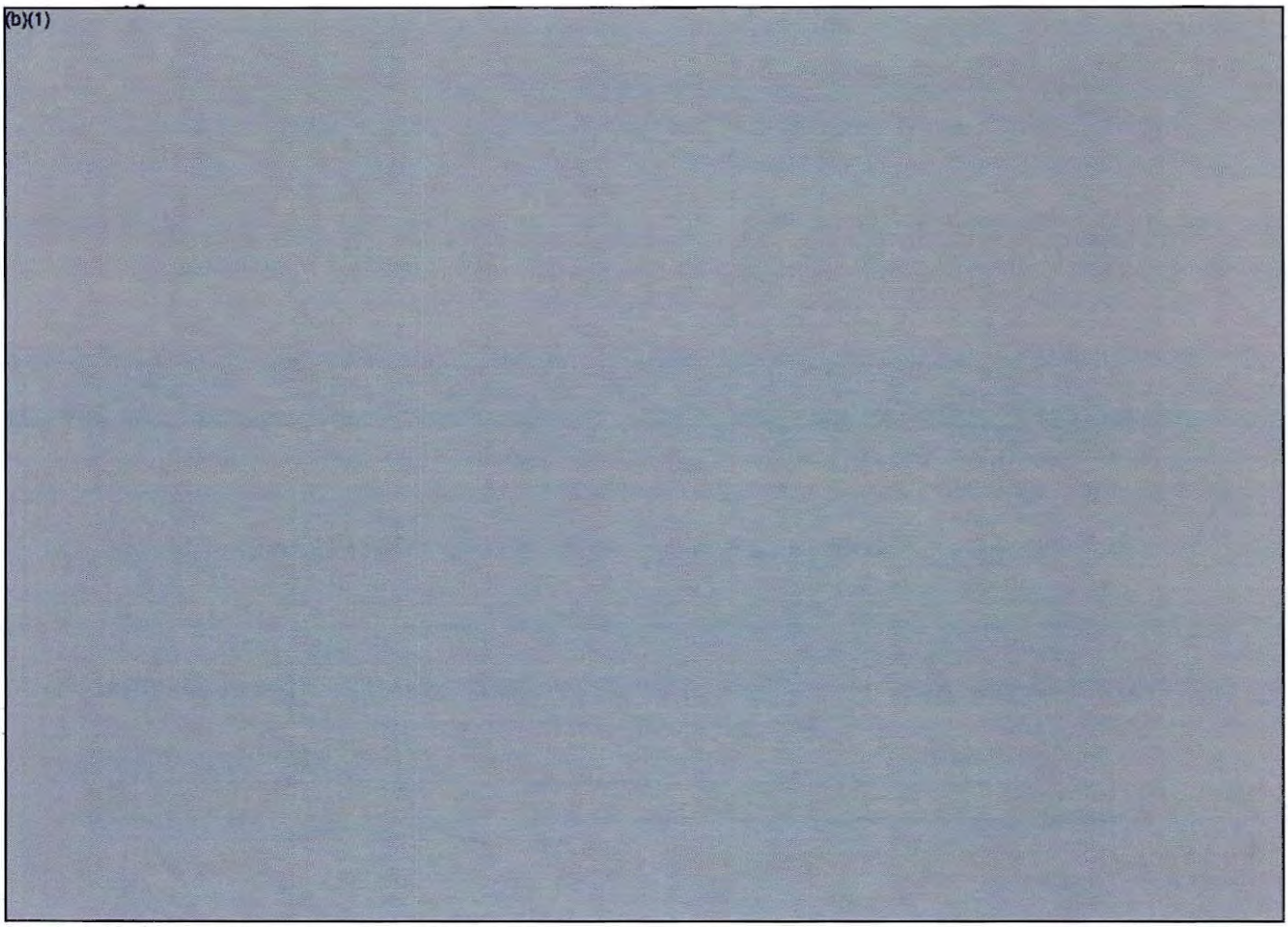
17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1995	1	0	0	0
1996	1	0	0	N/A
1997	1	0	0	N/A
1998	1	0	0	N/A
1999	1	0	0	N/A
2000	1	0	0	N/A
2001	1	0	0	N/A
2002	1	0	0	N/A
2003	1	0	0	N/A
2004	1	0	0	N/A
2005	1	0	0	N/A
2006	0	0	0	N/A

(U) Production Rate Data is not applicable because less than 6 units per year are produced.

(b)(1)



d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	1/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 0 - @ Peak Rate: 0/mo			
FY 88 Base-Year $	337.3	337.3	337.3
Then Year $	474.6	474.6	474.6
@ Qty 0 (1st three years) - @ Peak Rate: 0/mo			
FY 88 Base-Year $	337.3	337.3	337.3
Then Year $	473.8	473.8	473.8

Develop Estimate	Current Estimate	Lasted Approved Threshold

17e. (U) **Production Rate Data (Cont'd):**

(1) @ Qty 0 - @ Peak Rate:	1 MFS per year		
FY88 Base Year $	337.3	337.3	337.3
Then-Year $ (Avg unit)	474.6	474.6	474.6
(2) @ Qty 8 - @ Peak Rate:	1 MFT per year		
FY88 Base Year $	186.7	186.7	186.7
Then Year $ (Avg unit)	300.6	300.6	300.6

18. A **Operating and Support Costs:**

(b)(1)

(U) **Technical Assumptions:**

(U) The detailed design of underwater electronic components will incorporate proven technology of SOSUS, SOSUS LUSC and TAT-8 systems to the maximum extent possible.

(U) The AT&T/Simplex deep water and armor cable design will incorporate proven technology and production processes of SOSUS List 1, 2, and 3 and TAT-8 cable to the maximum extent possible.

(U) Reliability, maintainability and availability goals established for the program will be met.

(U) The AT&T high reliability specifications will be applied fully to electro-optic components of the underwater segment.

(U) The E-Systems Concept 1 architecture, which includes both Navy standard and commercial non-developmental hardware, is appropriate for estimating SSIPS O&S costs.

(U) Program Assumptions:

(U) The FDS will have an operational life of 24 years.

(b)(1)

(U) **Operating Assumptions:**

(U) The FDS shore segment will be housed in an existing Navy Facility (NAVFAC).

(U) The FDS shore facility operates continuously, 24 hours per day, 7 days per week.

(U) Operating personnel will be distributed into five section watches enabling implementation of a four section watch bill with sufficient personnel available to account for non-watch time.

(U) Manning for maintenance of processing suites and subsystems

(b)(1) [redacted]

(U) The introduction of FDS into the Integrated Undersea Surveillance System (IUSS) will require an additional manning of 84 enlisted operators and 6 enlisted maintenance personnel at the FDS site.

(U) Possible offsets in personnel requirements due to the incorporation of FDS advances in processing automation into other IUSS systems is not included in the baseline O&S costs estimate.

(U) Possible reduction of FDS operating personnel requirements due to possible system augmentations such as increased levels of automation are not considered in the baseline analysis.

(U) Maintenance of underwater segment electro-optic equipment will be through the AT&T Technologies sea/shore engineering contract.

(U) Cable Repair and underwater segment equipment maintenance will be undertaken using Military Sealift Command (MSC) ships.

(U) FDS-1 and subsequent FDS deployed notional systems will require 30 days load and underway days each for Neptune and Zeus class ships each year to support underwater segment maintenance requirements.

(U) SSIPS equipment organizational maintenance will be performed by enlisted personnel augmented by Contractor Engineering Technical Services (CETS) at the FDS sites.

(U) Depot maintenance of SSIPS equipment will be performed at Navy Depots where they exist for military NDI or at the Contractor's facilities for commercial NDI.

(U) Cost Assumptions:

(U) OSD indices dated January 1992 are appropriate for estimating escalated and outlayed costs for the FDS program.

(U) O&M,N costs for lease of MSC ships and funding of contract support for standard riders are applicable to an assessment of FDS operating and support costs.

(U) Estimates are in constant FY88 dollars.

(U) FDS hardware will have no residual value after the end of scheduled operations.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1988 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per platform	Avg Annual Cost Per platform
Personnel	2.7	N/A
O&S Consumables	1.3	N/A
Direct Depot Maintenance	0.6	N/A
Sustaining Investment	10.1	N/A
Other Direct Costs	4.1	N/A
Indirect Costs	3.7	N/A
	0.0	N/A
Total	22.5	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O&M	---	6.4	6.3	1773.3	1786.0
Industrial Fund	---	---	---	---	---
Total	---	6.4	6.3	1773.3	1786.0

Note: RDT&E Funding should be included in the 18.c. table as follows:

	FY1990 &Prior	FY1991	FY1992	Bal to Complete	Total
RDT&E	19.6	6.1	6.5	31.1	63.3
O&MN	0.0	0.0	6.4	1779.6	1786.0
Total	19.6	6.1	12.9	1810.7	1849.3

A-24 MCS

91-071

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)

PROGRAM: MCS

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
MAR 20 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. **Designation and Nomenclature (Popular Name):**
MANEUVER CONTROL SYSTEM (MCS)

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
PM-OPTADS, US ARMY COMMUNICATIONS ELECTRONICS COMMAND, SFAE-CC-MVR
FORT MONMOUTH, NJ 07703-5405
COL CARL L. LAMBETH
Assigned: May 25, 1991
AV 992-4041 COMM 908-532-4041

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 23740 SHARED PROJECT 484

PROCUREMENT:
APPN 2035 ICN BA9320 (Army)
APPN 2035 ICN BA9101 (Army) SHARED

O & M:
PE NONE

SECURITY Objection
TO PUBLIC RELEASE
20 MAR 1992

5. **Related Programs:**
ARMY TACTICAL COMMAND AND CONTROL SYSTEMS (ATCCS) - COMMON HARDWARE SOFTWARE (CHS)

OASD(PA) DPCISR 92-T-0539

*** [redacted] ***

MCS, December 31, 1991

6. **Mission and Description:**
The Maneuver Control System (MCS) is one of the five Battlefield Functional Areas (BFA) of the Army Tactical Command and Control Systems (ATCCS). MCS is a network of computer equipment which serves the Commander and Staff Corps, Division, Brigade, and Maneuver Battalion. The system provides automated assistance in the coordination of plans, dissemination of orders and guidance, and the monitoring and supervision of operations. MCS is the force level commander's information system and integrates the maneuver functions with the automated or manual Command and Control (C2) systems of the other four functional areas. (The other four functional areas are: Fire Support, Air Defense, Intelligence/Electronic Warfare, and Combat Service Support). MCS versions of software will extend automated command and control capabilities down to battalion/squadron, company/troop, squad/weapon system and platoon level through the subordinate systems to MCS.

The Maneuver Control System (MCS) is a collection of computer equipment which supports operation planning and control at one of the five nodal points (Maneuver Control) of the Army's Command and Control System (ACCS). We will not develop, modify or field any more Tactical Computer Terminal (TCT) nomenclature AN/UYQ-30 and 30A, we are in the process of replacing those few that were fielded. MCS currently consists of the Non-Development Items (NDI) such as the Tactical Computer Processor (TCP) nomenclatured AN/UYQ-43(V)1. It is a microprocessor based portable system which provides automated assistance to the maneuver commanders. The Analyst Console (AC) nomenclatured AN/UYQ-43(V)2, is a microprocessor based intelligent terminal, connected to the TCP via Local Area Network, which provides multiple workstations within a nodal configuration. The MCS takes advantage of commercial state-of-the-art technology by more readily fielding the commercial hardware NDI.

The NDI equipment (TCP/AC) will be replaced by Common Hardware (CH). CH is composed of the Transportable Computer Unit (TCU) and the Light weight Computer Unit (LCU), which will exceed the capability and the processing of the TCP/AC. These devices are to be fielded to all US Army Tactical Units. They are smaller and lighter and provide ease of transportability to all ATCCS users.

7. **Program Highlights:**
a. Significant Historical Developments --
In July of 1982 the MCS Operational and Organizational Plan (O&O) and the Required Operational Capability (ROC) was approved for the MCS Non-Development Item (NDI) which includes the Tactical Computer Processor (TCP) and the Analyst Console (AC). The MCS program was expanded in 1982, by awarding a MCS System Engineering/Integration and Software Contract which was let to Ford Aerospace and Communication Corporation (FACC). By 1986, the sofware had evolved

7a. Program Highlights (Cont'd):

to Version 9, written in Ada, which was fielded with the production Tactical Computer Termininals (TCT) in Europe, and ported to the Tactical Computer Prococessor (TCP). In June 1986 PM OPTADS awarded a procurement contract for the Non-Development Item (NDI) equipment to Ford Aerospace and Communications Corporations (FACC). Changes to the ROC were made 24 June 1987; Annex A: 7 August 1989. Total System Test Validation (TSTV) supervised and Operational Test & Evaluation Agency (OTEA) participated in the division revalidation of NDI at Ft. Hood (3QFY90) for Materiel Release decision to begin fielding in Europe. In 1987 the second software effort was awarded to LORAL C2 System, the second five year evolutionary development effort was awarded to FACC and the System Engineering and Integration Contract (SE&I) was awarded to TRW. Under these efforts, software Version 10 was completed, and fielded in 1989. Version 11, now under development is expected to be delivered by 2QFY93. These versions validated the use of ATCCS CHS architecture, established interface with other ATCCS BFAs and the MCS subsystems, and provided initial division level and MCS functional application software on the ATCCS hardware. Continuation of Version 11 and later versions of software will provide an automated interface with the Maneuver Battlefield Functional Area which includes Armor, Infantry, Aviation, Signal Engineer, Military Police and Chemcial units with the other four Functional Areas of Fire Support, Intelligence/Electronic Warfare, Combat Service Support and Air Defense and the automated Command and Control Systems at Echelons Above Corps (EAC) to include joint and allied systems. In FY 91 OPTADS continued Software Segment 11 (Force Level Control System (FLCS)) and continued fielding of NDI. PM-OPTADS will complete porting of software to support the transition to ATCCS CHS and conduct operational testing using CHS in preparation for a production decision.

b. Significant Developments Since Last Report --
Initial submission

c. Changes Since As Of Date --
NONE

8. Threshold Breaches:
There are schedule breaches to the approved Acquisition Program Baseline (APB) dated October 1989. A revised APB is in process. There are no Nunn-McCurdy unit cost breaches.

9. **Schedule:**

a. Milestones --	Development Estimate	Approved Program	Current Estimate
AN/UYQ-30/30A			
Milestone III ASARC	MAY 83	MAY 83	MAY 83
Initial Prod Contract Award	JUN 83	JUN 83	JUN 83
First Prod Del Initial Contr	FEB 85	FEB 85	FEB 85
Follow-on Prod Contr Award	AUG 86	AUG 86	AUG 86
FUE/IOC	SEP 86	SEP 86	SEP 86
User Follow-on Test & Eval I	APR 87	APR 87	APR 87
First Prod Deliv Follow Contr	NOV 87	NOV 87	NOV 87
AN/UYQ-43 (V)1 & (V) 2			
IPR Approval	JUN 86	JUN 86	JUN 86
Initial Production Contract Award	JUN 87	JUN 87	JUN 87
First Article Test			
Start	MAY 88	MAY 88	MAY 88
Complete	SEP 88	SEP 88	SEP 88
Production Contract Option Award	SEP 88	SEP 88	SEP 88
First Prod Deliv Initial Contr	FEB 89	FEB 89	FEB 89
FUE\IOC	APR 89	APR 89	APR 89
First Prod Deliv Prod Option	JUN 89	JUN 89	JUN 89
Field Validation	AUG 89	AUG 89	AUG 89
Common Hardware/Software			
First CHS Prototype Delivery (BuildI)	DEC 88	DEC 88	DEC 88
CHS Software Verification Test	MAY 91	MAY 91	N/A
FUE/IOC 1/	NOV 91	NOV 91	N/A
Follow-on Test & Evaluation	JAN 92	JAN 92	N/A
Milestone III ASARC	MAY 92	MAY 92	SEP 93(Ch-1)
First MCS Prod Buy of CHS	JUN 92	JUN 92	DEC 93(Ch-1)
First Production Deliveries	OCT 92	OCT 92	APR 94(Ch-1)
Software Releases			
Version 9	SEP 86	SEP 86	SEP 86
Version 10	OCT 88	OCT 88	OCT 88
Version 11 (30/30A & 43 (V) 1&2)	NOV 90	NOV 90	NOV 90
Version 11 (CHS)	SEP 91	SEP 91	FEB 93(Ch-1)
DA IPR	N/A	N/A	DEC 92
MCS -IOT&E INCL V11&CHS	N/A	N/A	MAY 93
First Unit Equip (FUE)	N/A	N/A	JUN 93
C3I Review	N/A	N/A	OCT 93
Initial Oper Cap (IOC)	N/A	N/A	DEC 94

1. CHS SW Verification Test, FUE/IOC - The Verification/Testing concept has changed from separate Hardware and Software to a systems testing, which consist of Common Hardware and V11 Software. Because of this testing concept (combining software and hardware) the separate verification and Common Hardware FUE entries are no longer applicable.

9a. **Schedule (Cont'd):**

2. FOT&E - Previously, the initial test performed in Europe for the V10 software hosted on the TCT equipment was considered equivalent to an IOT&E, therefore, in the 89 APB the next schedule test was an FOT&E. That test is now considered inappropriate for the current program strategy.

3. IOT&E - IOT&E is required prior to the production decision for the CH equipment and V11 software, therefore, the May 93 date is reflected as a current estimate.

4. SOFTWARE VERSION 11 - The major factors in the slippage of V11 software are as follows: In FY-91 a congressional funding reduction ($8.6) led to a scope reduction of work efforts by the software development contractor. There were technical difficulties in development of the system and communications software using commercial off the shelf (COTS) software. There was also a fire at the software contractors facility, which caused disruption and slippage in schedule. There have been subsequent briefings to the Management Review Panel (MRP) (25 Nov 92 and 11 Feb 92) on the MCS software development status by PM OPTADS. The MRP is not recommending approval of the MCS APB until further schedule and technical assessment of the contractors effort meet the software deliveries for the Early User Test and Evaluation in Sept 92 and the Initial Operation Test and Evaluation in May 93.

b. Previous Change Explanations -- None.

c. Current Change Explanations --

(Ch-1) These schedule dates changed from the SAR baseline due to a recent program restructure and a revised APB is in process.

d. References --

Development Estimate:
AAE Approved Acquisition Program Baseline dated 16 October 1989.

Approved Program:
AAE Approved Acquisition Program Baseline dated 16 October 1989.

10. **Performance Characteristics:**

a. Performance --	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
100% Memory Retention during power fluc/loss (at least xx mins)				
AN/UYQ-30/30A	5	5 / 5		5
AN/UYQ-43 (V)1&(V)2	5	5 / 5		5
Common Hardware/Software	5	5 / 5		5
Purge Memory (within xx mins)				
AN/UYQ-30/30A	3	3 / 3		3
AN/UYQ-43 (V)1&(V)2	3	3 / 3		3
Common Hardware/Software	3	3 / 3		3
Mean Time to Repair (hr) Organizational				
AN/UYQ-30/30A	.5	.5 / .5		.5
AN/UYQ-43 (V)1&(V)2	.5	.5 / .5		.5
Common Hardware/Software	.5	.5 / .5		.5
Direct Support				
AN/UYQ-30/30A	2.0	2.0 / 2.0		2.0
Reliability (hrs)				
AN/UYQ-30/30A TCT	433	433 / 433		433
AN/UYQ-30/30A TCT'	310	310 / 310		310
Operational Avail (Ao) 1/				
AN/UYQ-30/30A TCT	.88	.88 / .88		.88
AN/UYQ-30/30A YCT'	.84	.84 / .84		.84
AN/UYQ-43 (V)1&(V)2	.76	.76 / .76		.76
Common Hardware/Software	.88	.88 / .76		.88

1/ User has not established a required Ao for the MCS system. Requirements document contains Ao's for individual devices.

b. Previous Change Explanations --

Initial Submission

10c. **Performance Characteristics (Cont'd):**

c. Current Change Explanations --

Initial Submission

d. References --

Development Estimate:
AAE Aproved Acquisition Program Baseline dated 16 October 1989.

Approved Program:
AAE Approved Acquisition Program Baseline dated 16 October 1989.

11. **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	215.2	215.2	231.0
Procurement	545.5	545.5	443.1
Flyaway	(451.3)		(304.3)
Total Flyaway	(451.3)		(304.3)
SUPPORT FIELDING COSTS			(98.6)
Total Other Wpn Sys	(0.0)		(98.6)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(94.2)		(40.2)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 80 Base-Year $	760.7	760.7	674.1
Escalation	511.4	511.4	464.7
Development (RDT&E)	(123.1)	(123.1)	(136.0)
Procurement	(388.3)	(388.3)	(328.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1272.1	1272.1	1138.8
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	6365	6365	5667
Total	6365	6365	5667

c. Foreign Military Sales -- None.

d. Nuclear Costs --
NONE

11e. **Total Program Cost and Quantity (Cont'd):**

e. References --

Development Estimate:
AAE Aproved Acquisition Program Baseline dated 16 October 1989.

Approved Program:
AAE Approved Acquisition Program Baseline dated 16 October 1989.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1138.8	1138.8	1138.8
(2) Quantity	5667	5667	5667
(3) Unit Cost	0.201	0.201	0.201
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	8.0	8.0	42.3
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	8.0	8.0	42.3
(2) Quantity	0	0	470
(3) Unit Cost	N/A	N/A	0.090

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	338.3	933.8	0.0	1272.1
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-2.0	+28.2	-	+26.2
Quantity	-	-122.8	-	-122.8
Schedule	-	+16.5	-	+16.5
Engineering	-	+14.3	-	+14.3
Estimating	+30.7	-177.8	-	-147.1
Other	-	-	-	-
Support	-	+79.6	-	+79.6
Subtotal	+28.7	-162.0	-	-133.3
Total Changes	+28.7	-162.0	-	-133.3
Current Estimate	367.0	771.8	-	1138.8

13a. **Cost Variance Analysis (Cont'd)**:

a. Summary -- (FY 1980 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	215.2	545.5	0.0	760.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-58.7	-	-58.7
Schedule	-	-0.1	-	-0.1
Engineering	-	+8.2	-	+8.2
Estimating	+15.8	-96.4	-	-80.6
Other	-	-	-	-
Support	-	+44.6	-	+44.6
Subtotal	+15.8	-102.4	-	-86.6
Total Changes	+15.8	-102.4	-	-86.6
Current Estimate	231.0	443.1	-	674.1

b. Previous Change Explanations -- None.

c. Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year

13c. **Cost Variance Analysis (Cont'd):**

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Escalation Indices (Economic)	--	-2.0
Current & Prior Inflation Offset (Estimating)	3.6	4.9
Revised estimate associated with reprogramming of R&D funding from FY-90 Through FY-2000. (Estimating)	12.2	25.8
Total Changes	15.8	28.7
(2) PROCUREMENT		
Revised Esclation indicies. (Economic)	N/A	45.6
Economic adjustment for negative program change. (Economic)	N/A	-17.4
Reduction in Active Army Force Structure from 6365 to 5667. (Quantity)	-58.7	-122.8
One Year Production Delay Due to a Slip of the IOT&E Test from May 92 to May 93. (Schedule)	-0.1	16.5
Engineering Upgrades of NDI equipment to a 375 Processor and 8MB RAM increase. (Engineering)	8.2	14.3
A Revised Estimate of Hardware Costs Based on Actual Contract data. (Estimating)	-83.7	-167.3
Reconcile differences between flyaway and support. (Estimating)	-12.7	-10.5
(Support)	12.7	10.5
Transition of OMA Support $'s to OPA Support $'s. (Support)	31.9	69.1
Total Changes	-102.4	-162.0

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.200	0.005	0.002	0.003	0.003	-0.026	--	0.014	0.001	0.201

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

Systems Eng/Integration:	Initial Contract Price Target	Ceiling	Qty
TRW, INC, Redondo Beach, CA DAAB07-87-C-E012, CPFF Award: July 24, 1987 Definitized: July 24, 1987	$3.8	$4.1	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$164.3	$164.3	0	$164.5	$164.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (11/29/91)	$-0.5	$0.0
Net Change	$-0.5	$0.0

Explanation of Change:

The cumulative negative cost variance (.3M) was caused by the communications software activity requiring additional months and greater manpower to complete. Software was delivered on time to the schedules revised in April 91. The balance (.2M) was the result of projects not associated with MCS.

LORAL:	Initial Contract Price Target	Ceiling	Qty
LORAL Command/Control Sys, Colorado Springs, CO DAAB07-88-C-E212, CPFF Award: October 29, 1987 Definitized: October 29, 1987	$3.6	$3.8	0

15. **Contract Information**: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$39.5	$42.2	0	$55.0	$54.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (11/22/91)	$0.4	$-0.5
Net Change	$0.4	$-0.5

Explanation of Change:

The positive cost variance (+.4M) was due primarily to the contractors inability to fill vacant positions, approximately 40 man months. The negative schedule variance (-.5M) is driven by the Prime Mission Software Task, specifically unacceptable results of code and unit testing of Version 11 software and software integration.

16. **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 61.9% (13 yrs/21 yrs)

(2) Percent Program Cost Appropriated: 53.2% ($606.1 / $1138.8)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY80-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2000)	Total
RDT&E	188.5	36.4	28.5	113.6	367.0
Procurement	373.2	8.0	42.3	348.3	771.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	561.7	44.4	70.8	461.9	1138.8

Appropriation: 2035 Other Procurement, Army includes spare dollars.

16c. **Program Funding Summary (Cont'd):**

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY80 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1980				8.6	9.0	9.0	9.0	10.6
1981				13.2	15.2	15.2	15.2	10.6
1982				13.6	16.6	16.6	16.6	7.6
1983				15.6	19.9	19.9	19.9	4.9
1984				12.5	16.5	16.5	16.5	3.8
1985				23.3	31.8	31.8	31.8	3.4
1986				8.5	11.9	11.9	11.9	2.8
1987				8.7	12.6	12.6	12.6	2.7
1988				9.3	14.0	14.0	14.0	3.0
1989				7.6	11.9	11.9	11.9	4.0
1990				7.0	11.3	11.3	11.3	4.0
1991				10.6	17.8	17.8	17.8	3.9
1992				20.9	36.4			3.1
1993				15.9	28.5			3.3
1994				12.0	22.3			3.3
1995				9.0	17.3			3.3
1996				7.8	15.5			3.2

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY80 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)								
1997								3.2
1998				9.1	19.2			3.2
1999				8.9	19.3			3.2
2000				8.9	20.0			3.2
Subtot				231.0	367.0	188.5	188.5	
Appropriation: 2035 Other Procurement, Army								
1983	34	1.9	17.6	20.6	27.7	27.7	27.7	4.9
1984	31	0.2	20.4	21.5	29.5	29.5	29.5	3.8
1985	38	0.2	19.6	21.4	30.4	30.4	30.4	3.4
1986	103	0.4	37.6	45.1	66.0	66.0	66.0	2.8
1987	705	0.1	38.9	46.6	70.6	70.6	70.6	2.7
1988	887	1.1	52.3	72.1	114.3	114.3	114.3	3.0
1989			5.8	5.8	9.6	9.6	9.6	4.0
1990			11.3	11.3	19.1	19.1	19.1	4.0
1991			3.4	3.4	6.0	5.1	5.1	3.9
1992			1.7	4.4	8.0			3.1
1993	470		10.8	22.7	42.3			3.3

MCS, December 31, 1991

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY80 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2035 Other Procurement, Army (Cont'd)

1994	795		20.6	32.9	63.3			3.3
1995	832		17.8	32.3	64.2			3.3
1996	535		13.3	30.1	61.7			3.2
1997	469		12.2	29.0	61.3			3.2
1998	571		12.2	23.2	50.6			3.2
1999	197		4.4	12.8	28.9			3.2
2000			0.5	7.9	18.3			3.2
Subtot	5667	3.9	300.4	443.1	771.8	372.3	372.3	
Grand Total	5667	3.9	300.4	674.1	1138.8	560.8	560.8	

The recurring costs from FY89 through FY92 were for component upgrades and software development through FY90.

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1983	0	0	34	N/A
1984	0	0	31	N/A
1985	0	0	38	N/A
1986	0	0	103	N/A
1987	0	0	705	N/A
1988	0	0	887	N/A
1989	0	0	0	N/A
1990	0	0	0	N/A
1991	0	0	0	N/A
1992	451	0	0	N/A
1993	560	0	470	N/A
1994	587	0	795	N/A
1995	632	0	832	N/A
1996	375	0	535	N/A
1997	575	0	469	N/A
1998	570	0	571	N/A
1999	119	0	197	N/A

17b. **Production Rate Data (Cont'd):**

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	674.1	N/A	N/A
(TY $)	N/A	N/A	1138.8	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	0.119	N/A	N/A
(TY $)	N/A	N/A	0.201	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	JUN 83	N/A	N/A
Duration (in MON)	N/A	N/A	219	N/A	N/A
End Date(MON YY)	N/A	N/A	SEP 01	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	10/10
Procurement	1798/1798

e. Approved Design-to-Cost Objective -- N/A.

The MCS program will utilize common hardware equipment. There is no Design-to-Cost Objective for this program.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules --

The major assumptions and ground rules used to estimate operating and support costs are as follows: There is no antecedent system for MCS. All MCS operating costs are estimated based upon peacetime useage rates. The operating tempo for MCS is 2,280 hours for Active Units and 496 hours for Reserves. Costs are based on a operating life of 20

18a. **Operating and Support Costs (Cont'd):**

years. Common Hardware (CH) equipment life is 10 years, therefore CH equipment will be reprocured and replaced after 10 years. MCS has no dedicated crew. The CH equipment will be fielded to the Active Force, while NDI will be removed from the field, refurbished and fielded to the Reserves. The sustaining investment consists primarily of replenishment repair parts (vehicles, SICPS generators) & replenishment spares (all equipment). The depot costs includes costs for the maintenance labor & material (for NDI) only. There will be depot maintenance labor for the end item vehicles for the TCU and LCU equipment. There will be field maintenance labor costs for the TCP and AC, also the cumulative warranty maintenance cost for CH equipment. POL is needed for all the vehicles and generators to support the CH equipment. Other direct costs includes, military pay and allowances, system specific support, trainee/trainer, and system project management costs. The Modifications/Kit costs are alterations to system through modification work orders or ECP's after fielding. Other sustainment includes costs associated with the CHS rebuy, Center for Software Engineering, Regional Support Costs, Life Cycle Support, consumables, and Common ATCCS costs.

b. Costs -- (FY 1980 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per MCS	Avg Annual Cost Per (ANTECEDENT)
REPL REPAIR PARTS	1.9	N/A
POL	0.2	N/A
DEPOT MAINT L&M	0.1	N/A
FLD MAINT LABOR TCP	0.7	N/A
SYS SPEC REPL TRGN	0.0	N/A
MPA	2.6	N/A
MOD KITS	0.4	N/A
OTHER	1.3	N/A
Total	7.2	N/A

18c. Operating and Support Costs (Cont'd):

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
O & M	7.4	---	---	---	7.4
INDUSTRIAL FUNDS	---	---	---	---	---
Total	7.4	---	---	---	7.4

NOTE: 18b: SOURCE OF O&S DATA: BCE EXCURSION 20 JAN 92 - Annual O&S costs per unit were inputed in millions of dollars. These costs really represent thousands of dollars:
REPLEN REPAIR PARTS = $1,980.00, POL = $200.00, DEPOT MAINT LABOR & MAT = $140.00, FLD MAINT LABOR FOR TCP = $700.00, SYSTEM SPECIFIC REPL TRGN (insignificant $ amt), MPA = $2,600.00, MOD KITS = $350.00, OTHER STAINT (INCLUDES
CSE,RSC/LCSS,CONSUMABLES,
COMMON ATCCS COSTS & REBUY = $1,320.00

TOTAL $7,200

A-30 SADARM

91-072

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: SADARM

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 16 1992
5
APPROPRIATE PUBLIC RELEASE AND SECURITY REVIEW CONTROLS IN ACCORDANCE WITH DEPARTMENT OF DEFENSE

1. (U) Designation and Nomenclature (Popular Name):
Sense and Destroy Armor (SADARM)

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:

OFFICE OF THE PROJECT MANAGER FOR
SENSE & DESTROY ARMOR (SADARM)
ATTN: SFAR-AR-SD
PICATINNY ARSEN, NJ 07806-5000

COL. RICHARD C. WILLIAMS
Assigned: July 2, 1989
AV 880-2573 COMM 201-724-2573

The Sense and Destroy Armor (SADARM) system includes:
(1) Projectile, 155mm, XM898 and (2) Rocket, Multiple Launch Rocket System, XM29

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 64802 Project D369
PE 64814 Project D644

Concur in Classification as marked
17 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

Classified by: SADARM SCG DTD 20 OCTOBER 1990
Declassify on: OADR
Downgrade Instructions: Regraded unclassified when separated from enclosures/pages.

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[redacted]

OASD(PA) DIRSEC 91-T-0586

SADARM, December 31, 1991

4. (U) **Program Elements/Procurement Line Items (Cont'd):**

PROCUREMENT:
APPN 2032 ICN C67900 (Army)
APPN 2034 ICN E66300 (Army)

5. (U) **Related Programs:**
M270 Launcher; M109 Howitzer; M198 Howitzer; M109A6.

6. (U) **Mission and Description:**
The SADARM smart munitions will provide an enhanced counterfire capability for the Multiple Launch Rocket System (MLRS) and 155mm Howitzer delivery systems with both systems capable of attacking targets well beyond the Forward Line of Troops (FLOT) in a fire and forget mode. This indirect fire mission can be accomplished under inclement weather, degraded battlefield conditions and Nuclear, Biological, Chemical (NBC) environments, both day and night. The SADARM munitions are designed for use against self-propelled howitzers, lightly armored personnel carriers and other stationary armored threat vehicles encountered in counterfire, close support, Suppression of Enemy Air Defense (SEAD) and interdiction. The SADARM Munitions Need and Planned Operational Environment description is contained in the SADARM Required Operational Capability (ROC) document dated 11 March 1986 and as revised 18 June 1987. The system is comprised of the following major components: multi-mode sensor with infra-red , and active and passive millimeter wave; lethal mechanism with explosively-formed penetrator; parachutes which control deceleration, spin and descent velocity; fuzing, safe and arm device; and appropriate carrier hardware.

7. (U) **Program Highlights:**
a. (U) Significant Historical Developments --
Aerojet and Alliant were selected in Sept 1986 to competitively complete Full Scale Development (FSD) of the submunitions and carriers for the 155mm and 8 inch projectiles and MLRS submunitions. In Dec 1986, LTV was selected as the MLRS Rocket integration contractor. The requirement for the 8 inch SADARM was deleted when the Army developed plans to retire the 8 inch howitzer from the inventory. In July 1989, both FSD contractors scored hits with live 8 inch hardware in the Congressional Demonstration Test.

The final MLRS Rocket Phase I Orientation and Stabilization Test flights were successfully completed, demonstrating rocket performance, and submunition dispensing and stabilization. The 155mm subsystem tests successfully demonstrated lethality, carrier performance, and sensor capabilities in various environments and against countermeasures.

The Program Restructure, approved by the Defense Acquisition

7a. (U) **Program Highlights (Cont'd)**:

Executive in March 1990 to reduce test schedule risk, was implemented. The Army Acquisition Objectives (AAO) for the MLRS SADARM and the 155mm SADARM were reduced by 60% and 38% respectively, causing a Program Acquisition Unit Cost (PAUC) breach in excess of 25%. On May 3, 1991, the Under Secretary of Defense for Acquisition recertified the program to Congress. The elimination of the basic MLRS production after FY91 required the development of a new, much smaller production facility for the MLRS SADARM carrier, or the utilization of offshore production on existing facilities.

b. (U) Significant Developments Since Last Report --
A new acquisition strategy for the completion of Engineering & Manufacturing Development (EMD) (formerly FSD) was implemented due to budget reductions. The Aerojet design was chosen for EMD completion after an extensive design select effort which included having both contractors firing 155mm SADARM Projectiles and scoring direct hits. Aerojet and Alliant are now working together in a Prime/Sub arrangement. Technical Tests for the 155mm SADARM have begun on the system level. Ballistic similitude has been demonstrated and the firing tables have been completed. Captive Flight testing of the sensor subsystem has been conducted with over 112,000 target encounters in both winter and summer, and foilage and desert environments. To date, effectiveness exceeds requirements in clean target scenarios and is very robust against countermeasures.

There are no significant changes to program schedule, cost or technical requirements.

The SADARM munitions are expected to satisfy the mission requirement.

c. (U) Changes Since As Of Date --
None.

8. (U) **Threshold Breaches**:
There are no cost or schedule breaches to the 6 September 1991 Acquisition Program Baseline (APB), or Nunn-McCurdy Unit Cost Breaches.

9. (U) **Schedule**:
155mm SADARM Projectile

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate

SADARM, December 31, 1991

9a. (U) Schedule (Cont'd):
155mm SADARM Projectile

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Generic SADARM Submunition Development Approved by Army Materiel Cmd	NOV 84	NOV 84	NOV 84
DA Approval-48 Month Acq.Plan	N/A	N/A	N/A (Ch-1)
Congressional Direction for FSD/Prod	DEC 85	DEC 85	DEC 85
DA Approval SADARM (155mm & MLRS) ROC	MAR 86	MAR 86	MAR 86
DA In-Process Review for Submunition FSD	SEP 86	SEP 86	SEP 86
Competitive Submunition FSD Contract Award	SEP 86	SEP 86	SEP 86
Milestone II (ASARC)	NOV 87	NOV 87	NOV 87
Milestone II (DAB)	MAR 88	MAR 88	MAR 88
Congressional Demonstration			
Start	JAN 89	JAN 89	JAN 89
Complete	APR 89	APR 89	JUL 89
Army Decision: keep 2 submun sizes	N/A	NOV 90	NOV 90
155mm SADARM Tech Tests			
Start	MAY 90	AUG 91	JUL 91(Ch-2)
Complete	JUL 91	NOV 92	NOV 92
155mm SADARM IOT&E			
Start	JUL 91	JUL 93	JUL 93
Complete	DEC 91	OCT 93	OCT 93
Submunition Design Select	JAN 92	N/A	N/A
Type Classification	JAN 92	N/A	N/A
Milestone III (ASARC)	JAN 92	N/A	N/A
Milestone IIIA-155mm SADARM	N/A	APR 93	MAR 93(Ch-3)
155mm SADARM LRIP Contract Award	N/A	APR 93	APR 93
Milestone III (DAB) - 155mm and MLRS	APR 92	JUN 94	JUN 94
155mm SADARM Full Scale Production Award	MAY 92	JUN 94	JUN 94
IOC/First Unit Equipped-155mm SADARM	JUL 93	JUL 94	JUL 94

b. (U) Previous Change Explanations --

The Congressional Demonstration End was rescheduled from APR 89 to JUL 89 because of a longer than expected test, fix, and retest process.

The remaining development program was restructured to reduce excessive test schedule risk.

9c. (U) Schedule (Cont'd):
155mm SADARM Projectile

c. (U) Current Change Explanations --

(Ch-1) The DA Approval-48 Month Acq. Plan was changed from APR 86 to N/A to indicate that it was deleted from the APB dated Sept. 6, 1991.

(Ch-2) The 155mm Tech Test Start was changed from Aug 91 to Jul 91 to indicate the actual date of accomplishment.

(Ch-3) The PM estimates that he can accelerate completion of Milestone IIIA-155mm SADARM from Apr 93 to Mar 93.

d. (U) References --

(U) Development Estimate:
DAE Approved Baseline, 24 July 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated September 6, 1991.

MLRS SADARM Rocket

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
DA Approval SADARM (155mm & MLRS) ROC	MAR 86	MAR 86	MAR 86
MLRS SADARM Initial Integration Contract Award	DEC 86	DEC 86	DEC 86
Milestone II (DAB) - 155mm & MLRS	MAR 88	MAR 88	MAR 88
MLRS SADARM FSD Contract Award	SEP 88	SEP 88	SEP 88
MLRS SADARM Tech Tests			
Start	JUL 91	JUL 92	JUL 92
Complete	DEC 91	JAN 93	DEC 92(Ch-1)
Type Classification (Limited)	JAN 92	N/A	N/A
Milestone III (DAB) - 155mm and MLRS	APR 92	JUN 94	JUN 94
MLRS SADARM IOT&E			
Start	NOV 92	SEP 93	SEP 93
Complete	JUL 93	FEB 94	FEB 94
Type Classification	SEP 93	N/A	N/A
MLRS SADARM Full Scale Production Award	APR 94	JUN 94	JUN 94
IOC/First Unit Equipped-MLRS SADARM	MAY 94	DEC 95	DEC 95

b. (U) Previous Change Explanations --

The development program was restructured to reduce excessive test schedule risk.

9c. (U) Schedule (Cont'd):
MLRS SADARM Rocket

c. (U) Current Change Explanations --

(Ch-1) The PM estimates that he can accelerate completion of MLRS SADARM Tech Tests, Start from Jan 93 to Dec 92.

d. (U) References --

(U) Development Estimate:
DAE Approved Baseline, 24 July 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated September 6, 1991.

10. (U) Performance Characteristics:
155mm SADARM Projectile

a. (U) Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
(b)(1)					
(M109A w/M185) 155mm Max Range (km)	17.9	17.9	/ 17.9	17.9	17.9
(M109A2/A3 w/M185) 155mm Max Range (km)	22.5	22.5	/ 22.5	22.5	22.5
(M198 series) 155mm Max Range (km)		N/A	/ N/A		
(M109HIP) 155mm Max Range (km)	22.5	30	/ 22.5	22.5	22.5
(M109 A3/E2 HIP)					
(b)(1)					
Storage Life (all SADARM munitions) (yrs)	10	10	/ 10	10	10
(b)(1)					

ACRONYMS:

Pk = Probability of Kill

10a. (U) Performance Characteristics (Cont'd):

155mm SADARM Projectile

RHA = Rolled Homogenous Armor
ROC = Required Operational Capability

b. (U) Previous Change Explanations --

None.

(b)(1)

d. (U) References --

(U) Development Estimate:
DAE Approved Baseline, July 24, 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated September 6, 1991.

MLRS SADARM Rocket

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate	
(b)(1)					
MLRS Max Range (km)	30	30 / 30	30	35	(CH-1)
Storage Life (all SADARM Munitions) (yrs)	10	10 / 10	10	10	

(b)(1)

(b)(1)

d. (U) References --

(U) Development Estimate:
DAE Approved Baseline, 24 July, 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated September 6, 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)
155mm SADARM Projectile

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	237.7	808.5	227.0
Procurement	248.0	667.8	664.6
	(248.0)		(664.6)
Total Flyaway	(248.0)		(664.6)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	485.7	1476.3	891.6
Escalation	49.4	394.1	322.0
Development (RDT&E)	(8.2)	(57.0)	16.8
Procurement	(41.2)	(337.1)	(305.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	535.1	1870.4	1213.6

The approved program (APB dated September 6, 1991) did not separate RDTE costs by end item. The RDTE costs shown for the 155mm SADARM also include the MLRS SADARM.

The development estimate RDTE costs were allocated to each end item in the same manner as the current estimate for the purpose of comparison to the current estimate.

11b. (U) Total Program Cost and Quantity (Cont'd):

155mm SADARM Projectile

b. (U) Quantity --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	132	N/A	132
Procurement	10156	39018	39018
Total	10288	39018	39150

Excludes 772 RDT&E units that are not considered fully configured end items.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --

None.

e. (U) References --

(U) Development Estimate:
DAE Approved Baseline, July 24, 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated September 6, 1991.

MLRS SADARM Rocket

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	416.4	0.0	569.6
Procurement	703.6	1730.9	1754.4
Flyaway	(699.2)		(1749.6)
Total Flyaway	(699.2)		(1749.6)
Other Wpn Sys Cost	(4.4)		(4.8)
Total Other Wpn Sys	(4.4)		(4.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	1120.0	1730.9	2324.0

11a. (U) Total Program Cost and Quantity (Cont'd):
MLRS SADARM Rocket

	Development Estimate	Approved Program	Current Estimate
Escalation	131.7	1067.1	1038.5
Development (RDT&E)	(10.9)	(0.0)	(34.8)
Procurement	(120.8)	(1067.1)	(1003.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1251.7	2798.0	3362.5

The approved program (APB dated September 6, 1991) did not separate RDTE costs by end item.
The RDTE costs shown for the 155mm SADARM also include the MLRS SADARM.

The development estimate RDTE costs were allocated to each end item in the same manner as the current estimate for the purpose of comparison to the current estimate.

b. (U) Quantity --

Development (RDT&E)	0	N/A	38
Procurement	0	23712	23712
Total	0	23712	23750

Excludes 16 RDT&E units that are not considered fully configured end items.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs --
None.

e. (U) References --

(U) Development Estimate:
DAE Approved Baseline, July 24, 1989.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated September 6, 1991.

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary:**

155mm SADARM Projectile

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1213.6	1250.2	1213.6
(2) Quantity	39150	39150	39150
(3) Unit Cost	0.031	0.032	0.031
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	35.5
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	35.5
(2) Quantity	0	0	228
(3) Unit Cost	N/A	N/A	0.156

MLRS SADARM Rocket

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3362.5	3401.3	3362.5
(2) Quantity	23750	23750	23750
(3) Unit Cost	0.142	0.143	0.142
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Due to submunition commonality (93% of components), RDT&E costs for the 155mm SADARM Projectile and MLRS SADARM Rocket are not separable. For the purposes of Calculating Program Acquisition Unit Cost for each, the common costs were prorated based on the total quantities of submunitions that would be produced for each end item.

13. (U) **Cost Variance Analysis:**
Summary - All end items

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Estimate	673.2	1113.6	0.0	1786.8
Previous Changes:				
Economic	+8.9	+800.1	-	+809.0
Quantity	-	+1396.2	-	+1396.2
Schedule	+44.6	+930.3	-	+974.9
Engineering	-	-	-	-
Estimating	+121.9	-444.4	-	-322.5
Other	-	-	-	-
Support	-	+7.1	-	+7.1
Subtotal	+175.4	+2689.3	-	+2864.7
Current Changes:				
Economic	-3.6	-114.3	-	-117.9
Quantity	-	-	-	-
Schedule	-	+3.7	-	+3.7
Engineering	-	-	-	-
Estimating	+3.2	+40.8	-	+44.0
Other	-	-	-	-
Support	-	-5.2	-	-5.2
Subtotal	-0.4	-75.0	-	-75.4
Total Changes	+175.0	+2614.3	-	+2789.3
Current Estimate	848.2	3727.9	-	4576.1

13a. (U) Cost Variance Analysis (Cont'd):

Summary - All end items

a. (U) Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Estimate	654.1	951.6	0.0	1605.7
Previous Changes:				
Quantity	-	+1521.6	-	+1521.6
Schedule	+33.7	+154.8	-	+188.5
Engineering	-	-	-	-
Estimating	+106.1	-234.1	-	-128.0
Other	-	-	-	-
Support	-	+4.8	-	+4.8
Subtotal	+139.8	+1447.1	-	+1586.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-0.1	-	-0.1
Engineering	-	-	-	-
Estimating	+2.8	+24.9	-	+27.7
Other	-	-	-	-
Support	-	-4.4	-	-4.4
Subtotal	+2.8	+20.4	-	+23.2
Total Changes	+142.6	+1467.5	-	+1610.1
Adjustments	-0.2	-	-	-0.2
Current Estimate	796.5	2419.1	-	3215.6

13a. (U) Cost Variance Analysis (Cont'd):
155mm SADARM Projectile

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	245.9	289.2	0.0	535.1
Previous Changes:				
Economic	+3.4	+145.3	-	+148.7
Quantity	-	+375.1	-	+375.1
Schedule	+7.9	+473.5	-	+481.4
Engineering	-	-	-	-
Estimating	-11.9	-278.2	-	-290.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.6	+715.7	-	+715.1
Current Changes:				
Economic	-1.6	-33.9	-	-35.5
Quantity	-	-	-	-
Schedule	-	+3.7	-	+3.7
Engineering	-	-	-	-
Estimating	+0.1	-4.9	-	-4.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1.5	-35.1	-	-36.6
Total Changes	-2.1	+680.6	-	+678.5
Current Estimate	243.8	969.8	-	1213.6

13a. (U) Cost Variance Analysis (Cont'd):
155mm SADARM Projectile

a. (U) Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	237.7	248.0	0.0	485.7
Previous Changes:				
Quantity	-	+351.2	-	+351.2
Schedule	+6.4	+194.2	-	+200.6
Engineering	-	-	-	-
Estimating	-17.4	-125.6	-	-143.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-11.0	+419.8	-	+408.8
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-0.1	-	-0.1
Engineering	-	-	-	-
Estimating	+0.5	-3.1	-	-2.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+0.5	-3.2	-	-2.7
Total Changes	-10.5	+416.6	-	+406.1
Adjustments	-0.2	-	-	-0.2
Current Estimate	227.0	664.6	-	891.6

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised inflation indices.

Schedule: Schedule adjusted to reduce test schedule risk.

Estimating: Program restructured to include two submunition sizes and changed acquisition strategy to a Joint Venture. Reallocated common submunition development costs between 155mm and MLRS due to production quantity changes.

13b. (U) Cost Variance Analysis (Cont'd):
155mm SADARM Projectile

PROCUREMENT

Economic:	Revised inflation indices.
Quantity:	Addition of FY95-FY02 quantities (+53,230) Reduction in quantities by 24,368 to 39,018.
Schedule:	Schedule adjustment related to ammended FY90/91 President's Budget. Delay production start due to RDTE schedule change, and stretch to accomodate funding limitations.
Estimating:	Added costs to fund Process & Reliability Enhancement (PRE), and reduced submunition unit costs due to PRE savings. Revised estimating methodology.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised inflation (Economic)	--	-1.6
Current & Prior Inflation Offset (Estimating)	1.1	1.2
Reallocation to MLRS SADARM (Estimating)	-1.3	-1.7
FY91 Reprogramming (Estimating)	1.1	1.2
Revision to prior estimate (Estimating)	-0.4	-0.6
Total Changes	0.5	-1.5
(2) PROCUREMENT		
Revised inflation (Economic)	--	-33.9
Revised procurement schedule to accomodate budget limitations. (Schedule)	-0.1	3.7
Refined prior estimate (Estimating)	-3.1	-4.9
Total Changes	-3.2	-35.1

13a. (U) Cost Variance Analysis (Cont'd):
MLRS SADARM Rocket

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	427.3	824.4	0.0	1251.7
Previous Changes:				
Economic	+5.5	+654.8	-	+660.3
Quantity	-	+1021.1	-	+1021.1
Schedule	+36.7	+456.8	-	+493.5
Engineering	-	-	-	-
Estimating	+133.8	-166.2	-	-32.4
Other	-	-	-	-
Support	-	+7.1	-	+7.1
Subtotal	+176.0	+1973.6	-	+2149.6
Current Changes:				
Economic	-2.0	-80.4	-	-82.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+3.1	+45.7	-	+48.8
Other	-	-	-	-
Support	-	-5.2	-	-5.2
Subtotal	+1.1	-39.9	-	-38.8
Total Changes	+177.1	+1933.7	-	+2110.8
Current Estimate	604.4	2758.1	-	3362.5

13a. (U) Cost Variance Analysis (Cont'd):
MLRS SADARM Rocket

a. (U) Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	416.4	703.6	0.0	1120.0
Previous Changes:				
Quantity	-	+1170.4	-	+1170.4
Schedule	+27.3	-39.4	-	-12.1
Engineering	-	-	-	-
Estimating	+123.5	-108.5	-	+15.0
Other	-	-	-	-
Support	-	+4.8	-	+4.8
Subtotal	+150.8	+1027.3	-	+1178.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+2.3	+28.0	-	+30.3
Other	-	-	-	-
Support	-	-4.4	-	-4.4
Subtotal	+2.3	+23.6	-	+25.9
Total Changes	+153.1	+1050.9	-	+1204.0
Adjustments	+0.1	-0.1	-	-
Current Estimate	569.6	1754.4	-	2324.0

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised inflation indices.
Schedule: Revised to reduce test schedule risk.
Estimating: Program was restructured to include two submunition sizes, changed acquisition strategy to a Joint Venture. Refined prior estimate.

PROCUREMENT
Economic: Revised inflation indices.
Quantity: Changed quantity from zero to 59,110 then to

SADARM, December 31, 1991

13b. (U) **Cost Variance Analysis (Cont'd):**

MLRS SADARM Rocket

23,712.

Schedule: Started production two years later due to RDTE restructure and funding limitations, stretched an additional year due to funding limitations.

Estimating: Decrease in submunition unit costs, increase in rocket costs due to cancellation of basic MLRS Rocket production after FY91.

Support: Changed support requirements.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised inflation. (Economic)	--	-2.1
Current & Prior Inflation Offset (Estimating)	0.1	0.4
Reallocation from 155mm SADARM (Estimating)	1.3	1.7
FY91 Reprogramming (Estimating)	2.5	2.8
Refinement to prior estimate (Estimating)	-1.5	-1.7
Total Changes	2.4	1.1
(2) PROCUREMENT		
Revised inflation. (Economic)	--	-80.4
Refined prior estimate. (Estimating)	23.6	40.5
Correction of prior variance to reconcile flyaway and support costs. (Estimating)	4.4	5.2
Correction of prior variance to reconcile flyaway and support costs. (Support)	-4.4	-5.2
Total Changes	23.6	-39.9

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

155mm SADARM Projectile
(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.052	0.003	-0.028	0.012	--	-0.008	--	--	-0.021	0.031

MLRS SADARM Rocket
(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
N/A	--	--	--	--	--	--	--	--	0.142

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) SADARM-EMD:	Initial Contract Price Target	Ceiling	Qty
AEROJET ELECTROSYSTEMS CO, AZUSA, CA DAAA21-86-C-0309, CPIF Award: September 1, 1986 Definitized: September 1, 1986	$87.2	N/A	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$156.8	$156.8	0	$321.6	$321.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-1.5	$-3.1
Cumulative Variances To Date (11/30/91)	$-0.2	$0.0
Net Change	$1.3	$3.1

Explanation of Change:

The Price at Completion reflects the DAE approved restructure to reduce test schedule risk and the implementation of the new acquisition strategy combining both Aerojet and Alliant in the same contract in a Prime/Sub arrangement. The contract cost and schedule

15. (U) **Contract Information**: Cont'd (Then-Year Dollars in Millions) baseline was put in place reflecting this change in October 1991. There are no significant variances from this baseline.

This contract applies to the 155mm SADARM and the MLRS SADARM.

(U) SADARM-EMD MLRS INT:	Initial Contract Price Target	Ceiling	Qty
LTVAD, GRAND PRAIRIE, TX DAAH01-88-C-0716, CPIF Award: September 30, 1988 Definitized: September 30, 1988	$70.7	N/A	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$77.7	N/A	0	$89.1	$89.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-0.2	$-6.0
Cumulative Variances To Date (11/30/91)	$-2.6	$-1.3
Net Change	$-2.4	$4.7

Explanation of Change:

The change involves implementing the DAE approved restructure to reduce risk and initiating a pilot line for a new, much smaller facility required due to the elimination of the basic MLRS Rocket production after FY91.

Schedule variance decreased as a result of updating the baseline to reflect the restructure. Cost variance is due to correction of a technical problem with the rocket structure discovered during flight testing.

This contract applies only to the MLRS SADARM.

16. (U) **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 35.0% (7 yrs/20 yrs)

(2) Percent Program Cost Appropriated: 16.2% ($742.7 / $4576.1)

16b. (U) Program Funding Summary (Cont'd):
155mm SADARM Projectile

b. (U) Appropriation Summary -- 155mm SADARM Projectile

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY86-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2004)	Total
RDT&E	163.6	63.8	14.5	1.9	243.8
Procurement	-	-	35.5	934.3	969.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	163.6	63.8	50.0	936.2	1213.6

b. (U) Appropriation Summary -- MLRS SADARM Rocket

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY86-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2005)	Total
RDT&E	429.1	86.2	48.5	40.6	604.4
Procurement	-	-	-	2758.1	2758.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	429.1	86.2	48.5	2798.7	3362.5

16c. (U) Program Funding Summary (Cont'd):
155mm SADARM Projectile

c. (U) Annual Summary -- 155mm SADARM Projectile

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1986				2.7	2.5	2.5	2.5	2.8
1987				14.9	14.2	14.2	14.1	2.7
1988				24.3	24.0	24.0	23.7	3.0
1989				37.9	38.9	38.9	38.3	4.2
1990				48.6	51.8	51.8	51.1	4.0
1991				29.0	32.2	32.2	26.6	3.9
1992				55.7	63.8	17.8	17.8	3.1
1993				12.3	14.5			3.3
1994				1.6	1.9			3.3
1995								3.3
Subtot	132			227.0	243.8	181.4	174.1	

Due to commonality, the RDTE costs for submunitions for the 155mm Projectile and MLRS Rocket are not readily separable. They have been allocated to each system based on the July 91 Baseline Cost Estimate for the purpose of this report.

Appropriation: 2034 Procurement of Ammunition, Army

1993	228	16.4	13.1	29.5	35.5			3.3

16c. (U) Program Funding Summary (Cont'd):
155mm SADARM Projectile

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2034 Procurement of Ammunition, Army (Cont'd)								
1994	1623	18.1	52.6	70.7	87.8			3.3
1995	1592	17.4	41.3	58.7	75.2			3.3
1996	1164	2.7	25.2	27.9	36.9			3.2
1997	1316	2.1	25.7	27.8	38.0			3.2
1998	3154	2.6	53.1	55.7	78.5			3.2
1999	4973	3.0	73.3	76.3	110.9			3.2
2000	4973	3.0	67.7	70.7	106.1			3.2
2001	4973	2.9	63.9	66.8	103.4			3.2
2002	4973	2.5	60.9	63.4	101.3			3.2
2003	4973	2.2	56.9	59.1	97.5			3.2
2004	5076	2.1	55.9	58.0	98.7			3.2
Subtot	39018	75.0	589.6	664.6	969.8			
Grand Total	39150	75.0	589.6	891.6	1213.6	181.4	174.1	

16c. (U) **Program Funding Summary (Cont'd):**
MLRS SADARM Rocket

c. (U) Annual Summary -- MLRS SADARM Rocket

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1986				34.2	31.7	31.7	31.7	2.8
1987				60.4	57.5	57.4	57.3	2.7
1988				77.1	76.1	76.0	75.1	3.0
1989				102.3	105.0	105.0	103.3	4.2
1990				78.0	83.1	83.1	82.0	4.0
1991				68.2	75.7	75.6	62.6	3.9
1992				75.3	86.2	24.0	24.0	3.1
1993				41.0	48.5			3.3
1994				29.0	35.4			3.3
1995				4.1	5.2			3.3
Subtot	38			569.6	604.4	452.8	436.0	

Due to commonality, the RDTE costs for the submunitions for the 155mm Projectile and MLRS SADARM Rocket are not readily severable. They have been allocated to each based on the July 91 Baseline Cost Estimate for the purpose of this report.

Appropriation: 2032 Missile Procurement, Army

1994	330	23.2	49.1	73.8	93.1			3.3

16c. (U) Program Funding Summary (Cont'd):
MLRS SADARM Rocket

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2032 Missile Procurement, Army (Cont'd)

1995	390	25.2	46.6	72.3	94.1			3.3
1996	858	36.8	83.9	121.4	163.2			3.2
1997	780	9.6	68.2	78.1	108.3			3.2
1998	1212	10.2	98.6	108.9	155.9			3.2
1999	1800	10.9	131.1	142.2	210.1			3.2
2000	2040	11.1	138.1	149.4	227.8			3.2
2001	2220	11.2	142.6	154.0	242.2			3.2
2002	2400	11.3	147.5	159.0	258.1			3.2
2003	3480	12.5	201.7	214.5	359.4			3.2
2004	3690	12.6	205.5	218.4	377.6			3.2
2005	4512	18.5	243.6	262.4	468.3			3.2
Subtot	23712	193.1	1556.5	1754.4	2758.1			
Grand Total	23750	193.1	1556.5	2324.0	3362.5	452.8	436.0	

17. (U) **Production Rate Data:**
155mm SADARM Projectile

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1992	560	N/A	0	N/A
1993	3356	N/A	228	N/A
1994	6240	N/A	1623	N/A
1995	0	N/A	1592	N/A
1996	0	N/A	1164	N/A
1997	0	N/A	1316	N/A
1998	0	N/A	3154	N/A
1999	0	N/A	4973	N/A
2000	0	N/A	4973	N/A
2001	0	N/A	4973	N/A
2002	0	N/A	4973	N/A
2003	0	N/A	4973	N/A
2004	0	N/A	5076	N/A

17b. (U) Production Rate Data (Cont'd):
155mm SADARM Projectile

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	891.6	N/A	0.0
(TY $)	N/A	N/A	1213.6	N/A	0.0
PAUC Cost (BY $)	N/A	N/A	0.023	N/A	N/A
(TY $)	N/A	N/A	0.031	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	MAY 93	N/A	N/A
Duration (in MON)	N/A	N/A	148	N/A	N/A
End Date(MON YY)	N/A	N/A	SEP 05	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	520/520
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

DTUPC goals are on a submunition basis, not end item.

17a. (U) Production Rate Data (Cont'd):
MLRS SADARM Rocket

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1992	N/A	N/A	0	N/A
1993	N/A	N/A	0	N/A
1994	N/A	N/A	330	N/A
1995	N/A	N/A	390	N/A
1996	N/A	N/A	858	N/A
1997	N/A	N/A	780	N/A
1998	N/A	N/A	1212	N/A
1999	N/A	N/A	1800	N/A
2000	N/A	N/A	2040	N/A
2001	N/A	N/A	2220	N/A
2002	N/A	N/A	2400	N/A
2003	N/A	N/A	3480	N/A
2004	N/A	N/A	3690	N/A
2005	N/A	N/A	4512	N/A

17b. (U) Production Rate Data (Cont'd):
MLRS SADARM Rocket

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	2324.0	N/A	N/A
(TY $)	N/A	N/A	3362.5	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	0.098	N/A	N/A
(TY $)	N/A	N/A	0.142	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	JUN 94	N/A	N/A
Duration (in MON)	N/A	N/A	147	N/A	N/A
End Date(MON YY)	N/A	N/A	SEP 06	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	13/13
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

DTUPC is for submunitions and Carrier section, not complete end item.

18. (U) Operating and Support Costs:
155mm SADARM Projectile

a. (U) Assumptions and Ground Rules --

Both of the SADARM munitions are considered wooden rounds. The only support costs are for depot storage, stockpile reliability testing and teardown testing. There is no antecedent.

18b. (U) Operating and Support Costs (Cont'd):
155mm SADARM Projectile

b. (U) Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 155MM	Avg Annual Cost Per (Antecedent)
155mm SADARM Projectile	1.5	N/A
Total	1.5	N/A

c. (U) Contractor Support Costs -- None.

MLRS SADARM Rocket

a. (U) Assumptions and Ground Rules --

See 155MM. There is no antecedent.

b. (U) Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per MLRS	Avg Annual Cost Per (Antecedent)
MLRS SADARM Rocket	4.3	N/A
Total	4.3	N/A

c. (U) Contractor Support Costs -- None.

A-6 ASM

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: ASM(ARMORED SYS MOD)

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
   Armored Systems Modernization (ASM) Program

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
   DPEO, Armored Systems Modernization Program
   SFAE-ASM
   Warren, MI 48397-5000

   BG Anthony C. Trifiletti
   Assigned: January 3, 1991
   AV 786-6662 COMM (313) 574-6662

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92-T-0611

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 063004A (Shared) Project D439 (Shared), D223, DL09 (Shared)
PE 063005A (Shared) Project D440 (Shared), D441, D444, D497, D221
PE 063612A Project D096
PE 063774A Project D131
PE 064630A Project DB80, DB81
PE 064645A Project DE02, D414, D416, D417, D418
PE 064819A Project DE07
PE 063645A Project XB80, XB81, DB82, DB83, DB84, DB85, DB86, DB87, DB88
PE 062601A (Shared) Project AH91 (Shared), DC05, AH97
PE 062622A (Shared) Project A553 (Shared), A551
PE 063709D Project P790
PE 023735A (Shared) Project D330 (Shared)
PE 062618A Project AH81
PE 63645 Project D409

5. (U) **Related Programs:**
Bradley Fighting Vehicle Systems (BFVS)

6. (U) **Mission and Description:**
The Army's Armored Systems Modernization (ASM) Program provides for modernization of the six top priority systems in the armored force needed for the next century. Five heavy protection level variants will be developed on a new common chassis. These variants are the Block-III Tank, Advanced Field Artillery System (AFAS), Future Armored Resupply Vehicle-Ammunition (FARV-A), Combat Mobility Vehicle (CMV), and Future Infantry Fighting Vehicle (FIFV). One medium protection level variant is the Line-of-Sight Anti-Tank (LOSAT) which will use the Bradley Chassis. Mission modules will be developed concurrently for all six systems, and each will be acquired on an individual basis although commonality of components will be optimized across the fleet. ASM directly responds to the primary battlefield deficiencies identified in the Close Combat Heavy and Fire Support mission areas. The primary objective of the ASM program is to take full advantage of the synergistic effect of increasing force effectiveness rather than the traditional focus on the impact of individual systems. ASM provides significant warfighting improvements in the areas of lethality, survivability, mobility, and sustainability.

(U) a) The mission of the Block-III Tank is to close with, destroy, and breakthrough enemy defenses, and exploit success in the enemy's rear. The success of future combat operations is contingent upon the integration of survivable, mobile, and lethal combined arms, the timely processing of information, rapid logistical response, and the complete synchronization of all battalion task force assets. Block-III Tank provides significant improvements in lethality, rapid

6. (U) Mission and Description (Cont'd):

combined arms elements.

(U) b) The Combat Mobility Vehicle (CMV) fulfills the need for a capability to breach complex obstacles in stride - a capability currently absent from the force. This allows the combined arms team to move faster due to the ability of the CMV to clear minefields quicker. NOTE: Complex obstacles are combinations of two or more types of obstacles; e.g., anti-tank ditches, posts, rubble,and wire combined with mines or minefields covered by direct and/or indirect forces.

(U) c) The Future Infantry Fighting Vehicle (FIFV) fulfills the need for an advanced infantry fighting vehicle that will move and protect infantry and provide fire support to combined arms elements. The system improves warfighting capabilities by providing rapid fire to destroy enemy reconnaissance and infantry vehicles, tanks, helicopters, bunkers, and personnel (including dug in infantry with anti-tank systems). The enhanced survivability features of the FIFV, due to its common heavy chassis, will provide enhanced personnel and system survivability allowing the FIFV to fight the combined arms battle with the Block-III Tank.

(U) d) The Advanced Field Artillery System (AFAS) fulfills the need for an indirect fire weapon system that has an increased stand-off range and can deliver adequate indirect munitions in support of the maneuver forces. The AFAS will also provide increased rates of fire, hold more ammunition, be more survivable on the battlefield, and reduce manpower requirements.

(U) e) The Future Armored Resupply Vehicle - Ammunition (FARV-A) fulfills the need for an under armor rapid rearm system that can sustain supported forces and survive in the forward battle area. The FARV-A will improve firepower, sustainability, and survivability and reduce manpower requirements.

(U) f) Line-of-Sight AntiTank (LOSAT) fulfills the need for a primary antitank weapon system that can overmatch current and future threat tanks. The LOSAT will provide long-range destruction of threat armored vehicles.

7. (U) Program Highlights:

a. (U) Significant Historical Developments --

The concept for the ASM program evolved from numerous major internal and external analyses developed since 1982. These include the Tank Armament Review Group (TARG) (1982); Future Armored Combat Systems Group (1982-83); the Special Study Group, Armor (1984); Armored Combat Vehicle Science and Technology Working Group (1985); Defense

7a. (U) Program Highlights (Cont'd):

Science Board Summer Study of Armor/Anti-Armor Competition (A3 DSB) (1985); Armored Family of Vehicles Task Force (AFV TF) (1986-89); and the DA Armor/Anti-Armor Special Task Force (1988-89). All these efforts concluded that enhanced survivability/lethality was paramount; and a family of armored vehicles based on a common chassis, optimizing commonality and using advanced technologies, was needed and feasible. The 1985 A3 DSB provided several conclusions and recommendations with significant implication for the Army's close combat heavy force. When compared to Soviet capabilities, the A3 DSB identified inadequate modernization rates and technical advances as key deficiencies in the Armor/Anti-Armor Competition. To correct deficiencies in the close combat heavy force, the A3 DSB recommended the Army begin developing a family of close combat systems to increase warfighting capability and reduce rising operating and supporting costs by maximizing commonality. Both Army and OSD have completed a comprehensive assessment of ASM. The Defense Acquisition Board (DAB) has reviewed the program and has approved the Army's concept for modernizing its armored systems based on maximum commonality. The ASM SAR represents the ASM family of systems. Separate SARs will be submitted when individual systems reach a Milestone II Decision. The planning estimates delineated in this report represent the May 1990 Army Cost Position (ACP) as well as system specific and ASM common (Block-III) technical base development costs included in the President's Budget submission of Feb 3, 1992.

b. (U) Significant Developments Since Last Report --
Funding reductions in FY92 and Congressional direction has required the Army to restructure the ASM program. As a result the Block III, CMV and FIFV FUE's have been deferred beyond FY97, the AFAS/FARV-A system has become the lead system for the heavy chassis vehicles and the FARV-A vehicle has been put on the heavy chassis. Additional work is continuing which may yield a FY03 FUE for the AFAS/FARV-A system.

The LOSAT program realized significant funding reductions which required reprogramming efforts in FY91. This impact delayed the MS II until 1QFY93 which required the FY92 budget to be issued as 6.3b funds instead of 6.4.

The 1991 LOSAT program accomplishments include the integration of the kinetic energy missile (KEM) on a Bradley Chassis, completion of the KEM Demonstration and Validation (DEM/VAL) flight tests from the prototype LOSAT System (KEM integrated on a Bradley Chassis), and the award of the System Design contract.

Since the Block III, CMV and FIFV systems have been deferred beyond FY97, they will no longer be reported until funding resumes.

7b. (U) Program Highlights (Cont'd):

The ASM systems will satisfy mission requirements.

c. (U) Changes Since As Of Date -- None.

8. (U) Threshold Breaches:
There are no breaches to the APB dated 8 Mar 91 for Block III. No APB's exist for the remaining ASM programs.

9. (U) Schedule:
Block-III

a. (U) Milestones --	Planning Estimate	Approved Program	Current Estimate	
DAB Program Review	APR 90		N/A	
Milestone I DAB Review	JUN 90		AUG 90	
ATACS Gun Full Scale Dev (FSD) starts	OCT 90		TBD	(Ch-1)
CCATTD Contract Award (2 Contracts)	JUL 90		DEC 90	
CATTB Demonstration (Phase I)				
Start	APR 91		N/A	
Complete	OCT 91		N/A	
CCATTD Demonstrator Delivered	NOV 92		N/A	
CCATTD Demonstration				
Start	NOV 92		N/A	
Complete	APR 93		N/A	
CATTB Demonstration (Phase II)				
Start	DEC 92		N/A	
Complete	APR 93		N/A	
Common Chassis Contractor Selected	NOV 93		N/A	
CCATTD Demonstration	JUN 93		MAY 94	(Ch-1)
CCATTD Downselection DAB Prog Review	N/A	N/A	N/A	(Ch-1)
Prototype Contract Award	N/A	N/A	TBD	(Ch-1)
Technical Test/EUT&E				
Start	N/A	N/A	TBD	(Ch-1)
Complete	N/A	N/A	TBD	(Ch-1)
Start FDT&E	OCT 96	N/A	N/A	
Milestone II DAB Review	MAR 94	N/A	TBD	(Ch-1)
FSD Contract Award w/Common Chassis	JUN 94	N/A	TBD	(Ch-1)
FSD Technical Test				
Start	JUN 96	N/A	TBD	(Ch-1)
Complete	N/A	N/A	TBD	(Ch-1)
Operations Test II				
Start	N/A	N/A	TBD	(Ch-1)
Complete	N/A	N/A	TBD	(Ch-1)

9a. (U) Schedule (Cont'd):
Block-III

(U) Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate	
LRIP Milestone Review IIIA (DAB)	N/A	N/A	TBD	(Ch-1)
LRIP Contract Award	AUG 97	N/A	TBD	(Ch-1)
Production Qual Test				
Start	FEB 99	N/A	TBD**	(Ch-1)
Complete	N/A	N/A	TBD	(Ch-1)
IOT&E				
Start	MAR 99	N/A	TBD	(Ch-1)
Complete	N/A	N/A	TBD	(Ch-1)
Milestone III DAB Review	MAR 00	N/A	TBD	(Ch-1)
Full Scale Production Contract Award	*APR 00*	*N/A*	*TBD*	*(Ch-1)*
(b)(1) [redacted]				

Acronyms

CATTB = Component Advanced Technology Test Bed
ATACS = Advanced Tank Cannon System
CCATTD = Common Chasis Advanced Technology Demonstrator
EUT&E = Early User Test and Evaluation

b. (U) Previous Change Explanations --

Due to the rescheduling of the Block III Milestone I DAB to Aug 90 from Jun 90, the CCATTD contract award was moved from Jul 90 to Sep 90, the CCATTD Demonstrator Delivered and Demonstration start was moved from Nov 92 to Jun 93, the CATTB Demonstration Start (Phase II) was moved from Dec 92 to Apr 93, the CATTB Demonstration End (Phase II) was moved from Apr 93 to Sep 93, the CCATTD Demonstration End was moved from Apr 93 to Nov 93, the Common Chassis Contractor Selected was moved from Nov 93 to Jun 94, the Block III Tank MS II (DAB) was moved from Mar 94 to May 94, the LRIP Contract Award was moved from Aug 97 to Oct 97, the Production Qualification Test Start was moved from Feb 99 to Mar 99 and the IOT&E Start was moved from Mar 99 to Apr 99.

Milestone for ATACS Gun Full Scale Development (FSD) moved from Oct 90 to Oct 93 due to Congressional restriction on ATACS entering FSD. Due to CCATTD RFP approval CCATTD Contract Award moved from Sep 90 to Dec 90, CCATTD Demo moved from Jun 93 to Jul 93, MSII Review moved from May 94 to Nov 96, LRIP Contract Award moved from Oct 97 to Mar 00, Prod'n Test Start moved from Mar 99 to Jul 01, IOT&E start moved from Apr 99 to Mar 02, M$III Review moved from Mar 00 to Oct 02, Full Scale Prod'n Contract Award moved from Apr 00 to Nov 02 & IOC moved

9b. (U) Schedule (Cont'd):
Block-III
from Oct 00 to Jun 03.

c. (U) Current Change Explanations --

Change 1 -

Funding reductions in FY92 and Congressional direction has required the Army to restructure the ASM program. OSD has acknowledged the restructured ASM program and released the withheld funds under PE63645, however the Army has limited obligations to $200M. These events have significantly impacted the work on the CCATTD contracts.

As a result, the Block III Tank FUE has been deferred beyond FY97. Thus most of the schedule parameters for the Block III Tank program are no longer plausible and will be reported as "to be determined" (TBD).

Specifically these schedule changes from the previous current estimate occurred: ATACS Gun FSD Starts (TBD vs Oct 93); CCATTD Demo (MAY 94 vs JUL 93); CCATTD Downselect DAB Prog Review (N/A vs DEC 93); Proto Contract Award (TBD vs MAR 94); Tech Test/EUT&E Start (TBD vs FEB 96), Complete (TBD vs OCT 96); MS II DAB Review (TBD vs NOV 96); FSD Contract Award w/ Common Chassis (TBD vs NOV 96); FSD Tech Test Start (TBD vs FEB 99), Complete (TBD vs JUN 00); Operational Test Start (TBD vs JUN 99), Complete (TBD vs NOV 99); LRIP MS Review (TBD vs FEB 00); LRIP Contract Award (TBD vs MAR 00); Prod'n Qual Test Start (TBD vs JUL 01), Complete (TBD vs AUG 02); IOT&E Start (TBD vs MAR 02), Complete (TBD vs OCT 02); Full Scale Prod'n Contract Award (TBD vs NOV 02); FUE (TBD vs NOV 02); IOC (TBD vs JUN 03).

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990; AAE Block III Program Baseline dated 7 June 1990.

(U) Approved Program: None.

CMV

a. (U) Milestones --	Planning Estimate	Approved Program	Current Estimate	
Milestone I (DAB)	AUG 90		TBD	(Ch-1)

9a. (U) Schedule (Cont'd):
CMV

(U) Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate
Contract Award-CMV ATTD	DEC 90		MAY 91
CMV Demonstrator Delivered	SEP 92		TBD (Ch-1)
CMV Demonstration			
Start	SEP 92		TBD (Ch-1)
Complete	JAN 94		TBD (Ch-1)
Milestone II (DAB)	JUN 94		TBD (Ch-1)
Contract Award-FSD	JUL 94		TBD (Ch-1)
First Prototype Delivery-FSD	NOV 96		TBD (Ch-1)
Technical Testing -- FSD			
Start	DEC 96		TBD (Ch-1)
Complete	DEC 97		TBD (Ch-1)
User Testing -- FSD			
Start	MAR 97		TBD (Ch-1)
Complete	SEP 97		TBD (Ch-1)
Milestone IIIa (DAB)	JAN 98		TBD (Ch-1)
Contract Award-LRIP	FEB 98		TBD (Ch-1)
First Delivery-LRIP	NOV 98		TBD (Ch-1)
Milestone III (DAB)	FEB 00		TBD (Ch-1)
Contract Award-Full Rate Production	MAR 00		TBD (Ch-1)
FUE	JUN 00		TBD (Ch-1)

b. (U) Previous Change Explanations --

Previous changes due to the impact of the Block III DAB decision concerning the addition of a pre-FSD prototype phase. All date changes were from the Planning Estimate.

c. (U) Current Change Explanations --

Change 1 -

Funding reductions in FY92 and Congressional direction has required the Army to restucture the ASM program. OSD has acknowledged the restructured program and released the withheld funds under PE63645, however the Army has limited the obligations to $200M. These events have significantly impacted the work on the CMV ATTD contract.

As a result, the CMV FUE has been deferred beyond FY97. Thus most of the schedule parameters for the CMV are no longer plausible and will be reported as to be determined.

Specifically, these schedule changes from the previous current estimate occurred: MS I DAB (TBD vs AUG 94); CMV Demonstrator Del

9c. (U) Schedule (Cont'd):

CMV

(TBD vs FEB 93); CMV Demo Starts and Completes (TBD vs FEB 93); MS II DAB (TBD vs FEB 98); Contract Award-FSD (TBD vs APR 98); 1st Proto Del (TBD vs AUG 00); Tech Test Start (TBD vs SEP 00), Complete (TBD vs MAR 02); User Test Start (TBD vs NOV 00), Complete (TBD vs MAY 01); MS IIIa (TBD vs DEC 01); Contract Award-LRIP (TBD vs JAN 02); 1st Del-LRIP (TBD vs OCT 02); MS III DAB (TBD vs JAN 04); Contract Award-Full Rate Prod'n (TBD vs MAR 04); FUE (TBD vs JUN 04).

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

FIPV

a. (U) Milestones --

	Planning Estimate	Approved Program	Current Estimate	
Milestone I (DAB)	MAY 92		TBD	(Ch-1)
Contract Award-Weapons Platform Development	MAR 93		TBD	(Ch-1)
Weapons Platform Demonstration				
Start	MAY 95		N/A	
Complete	FEB 96		N/A	
Milestone II (DAB)	MAR 96		TBD	(Ch-1)
Contract Award-FSD	APR 96		TBD	(Ch-1)
Technical Testing -- FSD				
Start	AUG 97		TBD	(Ch-1)
Complete	APR 99		TBD	(Ch-1)
First Prototype Delivery-FSD	JUL 97		TBD	(Ch-1)
User Testing -- FSD				
Start	JUL 98		TBD	(Ch-1)
Complete	APR 99		TBD	(Ch-1)
Milestone IIIa (DAB)	JUN 99		TBD	(Ch-1)
Contract Award-LRIP	OCT 99		TBD	(Ch-1)
First Delivery-LRIP	JUL 00		TBD	(Ch-1)
Milestone III (DAB)	APR 01		TBD	(Ch-1)
Contract Award-Full Rate Production	JUN 01		TBD	(Ch-1)
FUE	AUG 02		TBD	(Ch-1)

b. (U) Previous Change Explanations --

Previous changes due to impact of Block III DAB decision concerning the addition of a Pre-FSD prototype phase. All dates moved from the Planning Estimate.

9c. (U) Schedule (Cont'd):
FIFV

c. (U) Current Change Explanations --

Change 1 -

Funding reductions in FY92 and Congressional direction has required the Army to restructure the ASM program. As a result, the FIFV FUE has been deferred beyond FY97. Thus all of the schedule parameters for the FIFV are no longer plausible and will be reported as to be determined.

Specifically these schedule changes from the previous current estimate occurred: MS I DAB (TBD vs AUG 94); Contract Award-Weapons (TBD vs NOV 92); Proto Dev (TBD vs OCT 94); MS II DAB (TBD vs SEP 97); Contract Award-FSD (TBD vs OCT 97); Tech Test Start (TBD vs OCT 97), Complete (TBD vs JUL 01); 1st Proto Del (TBD vs AUG 99); User Test Start (TBD vs FEB 00), Complete (TBD vs JUL 01); MS IIIa DAB (TBD vs SEP 01); Contract Award-LRIP (TBD vs OCT 02); 1st Del-LRIP (TBD vs JUL 03); MS III DAB (TBD vs OCT 03); Contract Award-Full Rate Prod'n (TBD vs OCT 03); FUE (TBD vs OCT 04).

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

AFAS

a. (U) Milestones --

	Planning Estimate	Approved Program	Current Estimate
Milestone I (DAB)	SEP 90	N/A	OCT 93 (Ch-1)
Contract Award-AFAS ATTD	JAN 91	N/A	MAY 91
AFAS Propellant Decision	SEP 91	N/A	SEP 91
ATTD Demonstrator Delivered	JUL 94	N/A	N/A (Ch-1)
ATTD Demonstration			
Start	JUL 94	N/A	N/A (Ch-1)
Complete	AUG 95	N/A	N/A (Ch-1)
Milestone II (DAB)	APR 95	N/A	DEC 97 (Ch-1)
Contract Award-FSD	JUL 95	N/A	JAN 98 (Ch-1)
First Prototype Delivery-FSD	OCT 96	N/A	SEP 96 (Ch-1)
Technical Testing -- FSD			

9a. (U) Schedule (Cont'd):
AFAS

(U) Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate
Start	APR 97	N/A	SEP 99(Ch-1)
Complete	JUN 99	N/A	DEC 00(Ch-1)
User Testing -- FSD			
Start	NOV 97	N/A	N/A*
Complete	NOV 97	N/A	N/A
Milestone IIIa (DAB)	APR 99	N/A	N/A (Ch-2)
Contractor Award-LRIP	MAY 99	N/A	OCT 01(Ch-1)
First Delivery-LRIP	SEP 00	N/A	OCT 02(Ch-1)
Milestone III (DAB)	JUN 01	N/A	OCT 03(Ch-1)
Contract Award-Full Rate Production	JUL 01	N/A	OCT 04(Ch-1)
FUE	JAN 02	N/A	MAR 04(Ch-1)

b. (U) Previous Change Explanations --

Previous changes due to impact of Block III DAB decision concerning the addition of a Pre-FSD prototype phase. All changes were from the Planning Estimate.

c. (U) Current Change Explanations --

Change 1 -

Funding reductions in FY92 and Congressional direction has required the Army to restructure the ASM program. OSD has acknowledged the restructured ASM program and released the withheld funds under PE63645, however the Army has limited obligations to $200M. These events have significantly impacted the work on the AFAS ATTD contract.

As a result the following schedule changes are being made: MS I DAB (Oct 93 vs Dec 94); ATTD Demonstrator Del (N/A vs Feb 94); ATTD Demo Start (N/A vs Mar 94), Complete (N/A vs Oct 94); MS II DAB (Dec 97 vs Feb 98); Contract Award-FSD (Jan 98 vs Apr 98); 1st Proto Del (Sep 96 vs Dec 96); Tech Test Start (Sep 99 vs Sep 00), Complete (Dec 00 vs Sep 01); Contractor Award-LRIP (Oct 01 vs Oct 01); 1st Del-LRIP (Oct 02 vs Aug 02); MS III DAB (Oct 03 vs Sep 03); Contract Award-Full Rate Prod'n (Oct 04 vs Oct 03); FUE (Mar 04 vs Jun 03).

Change 2 - Application of the new DODI 5000.1 & 2 removes the MS IIIa decision (N/A vs Sep 01).

9d. (U) Schedule (Cont'd):
AFAS

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

FARV-A

a. (U) Milestones --

	Planning Estimate	Approved Program	Current Estimate
Milestone I (DAB)	JUL 91	N/A	OCT 93 (Ch-1)
Contract Award FARV-A ATTD	OCT 91	N/A	N/A (Ch-1)
ATTD Demonstrator Delivered	MAR 93	N/A	N/A (Ch-1)
EUTE-I (Joint Systems Evaluation) 1/			
Start	JAN 95	N/A	APR 97 (Ch-1)
Complete	MAR 95	N/A	JUN 97 (Ch-1)
Milestone II (DAB)	JUN 95	N/A	SEP 97 (Ch-1)
Contract Award-FSD	JUL 95	N/A	DEC 97 (Ch-1)
First Prototype Delivery-FSD	SEP 97	N/A	NOV 00 (Ch-1)
Technical Testing -- FSD			
Start	JAN 98	N/A	JUL 01 (Ch-1)
Complete	OCT 99	N/A	JAN 02 (Ch-1)
Milestone IIIa (DAB)	JUN 99	N/A	N/A (Ch-2)
User Testing -- FSD			
Start	JUL 99	N/A	JAN 01 (Ch-1)
Complete	JUL 99	N/A	JAN 02 (Ch-1)
Contract Award-LRIP	OCT 99	N/A	OCT 01 (Ch-1)
First Delivery-LRIP	DEC 99	N/A	OCT 02 (Ch-1)
Milestone III (DAB)	JUN 01	N/A	OCT 03 (Ch-1)
Contract Award-Full Rate Production	JUL 01	N/A	OCT 04 (Ch-1)
FUE	JAN 02	N/A	MAR 04 (Ch-1)

1/ Previously FDTE-I

b. (U) Previous Change Explanations --

Previous changes due to impact of Block III DAB decision concerning the addition of a Pre-FSD prototype phase. All changes were from the Planning Estimate. In order to align the FARV-A program with the AFAS program Tech Test End, 1st Del LRIP & MS III moved 3 months from the Planning Estimate.

9c. (U) Schedule (Cont'd):
FARV-A

c. (U) Current Change Explanations --

Change 1 -

Funding reductions in FY92 and Congressional direction has required the Army to restructure the ASM program.

As a result, the following schedule chages are being made: MS I DAB (Oct 93 vs Feb 94); Contract Award-FARV-A ATTD (N/A vs Oct 91); ATTD Demonstrator Del (N/A vs Nov 94); EUTE-I Start (Apr 97 vs Oct 97), Complete (Jun 97 vs Dec 97); MS II DAB (Sep 97 vs Feb 98); Contract Award-FSD (Dec 97 vs Mar 98); 1st Proto Del (Nov 00 vs Oct 99); Tech Test Start (Jul 01 vs Jan 00), Complete (Jan 02 vs Sep 01); User Test-FSD Start (Jan 01 vs Oct 00), Complete (Jan 02 vs Mar 01); Contract Award-LRIP (Oct 01 vs Jun 02); 1st Del-LRIP (Oct 02 vs Aug 02); MS III DAB (Oct 03 vs Jan 04); Contract Award-Full Rate Prod'n (Oct 04 vs Jan 04); FUE (Mar 04 vs Jul 03).

Change 2 - Application of the new DODI 5000.1 & 2 removes the Milestone IIIa decision (N/A vs Sep 01).

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

LOSAT

a. (U) Milestones --	Planning Estimate	Approved Program	Current Estimate
Milestone I (DAB)	AUG 86	N/A	AUG 86
Contract Award-KEM Prototype Development	APR 88	N/A	APR 88
Milestone II (DAB)	MAR 91	N/A	NOV 92
Contract Award-FSD	MAY 91	N/A	NOV 92
First Prototype Delivery-FSD	FEB 93	N/A	MAR 95
Technical Testing -- FSD			
Start	FEB 93	N/A	JAN 95
Complete	MAY 96	N/A	JUN 97
User Testing -- FSD			

9a. (U) Schedule (Cont'd):
LOSAT

(U) Milestones (Cont'd) --	Planning Estimate	Approved Program	Current Estimate
Start	AUG 93	N/A	MAY 97
Complete	MAY 96	N/A	SEP 97
Milestone IIIa (DAB)	AUG 94	N/A	TBD
Contract Award-1st LRIP	DEC 94	N/A	TBD
Contract Award-2nd LRIP	DEC 95	N/A	TBD (Ch-1)
Milestone III (DAB)	AUG 96	N/A	APR 00
Contract Award-3rd LRIP	DEC 96	N/A	TBD (Ch-1)
FUE	SEP 96	N/A	TBD
Contract Award-Full Rate Production	DEC 97	N/A	OCT 00

b. (U) Previous Change Explanations --

FY91 funding reductions of $42M caused program delay. All changes were from dates of Planning Estimate. The items Contract Award-2nd LRIP & Contract Award-3rd LRIP are no longer applicable to this program and are reported N/A.

Funding shortages in FY91 caused two temporary halts to the LOSAT DEM/VAL program. Resulting schedule slip pushed entry into EMD to late 3QFY92. Schedule slip minimized by contractor decision to continue at own risk. DA program review on 13 Sep 91 identified risk reduction tasks to be accomplished prior to EMD pushing MS II to Nov 92 vs Dec 91. This delay caused the following changes in other milestones as follows: Contract Award-EMD (Nov 92 vs Dec 91); 1st Proto Del (Mar 95 vs Mar 94); Tech Test Starts (Jan 92 vs Apr 94); User Test Starts (May 97 vs Oct 95); Milestone IIIa (TBD vs Mar 97); Contract Award-1st LRIP (TBD vs Mar 97); Tech Test Ends (Jun 97 vs Jul 96); User Test Ends (Sep 97 vs Dec 96); MS III (Apr 00 vs Jul 99); FUE (TBD vs Sep 98); & Contract Award-Full Rate Prod'n (Oct 00 vs Oct 99).

c. (U) Current Change Explanations --

Change 1 - The contract Award - 2nd LRIP (TBD vs N/A) and Contract Award - 3rd LRIP (TBD vs N/A) were reported as no longer applicable in error. Dates are to be determined.

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

9d. (U) Schedule (Cont'd):
LOSAT

(U) Approved Program: None.

10. (U) Performance Characteristics:
Block-III

(b)(1)

[redacted]

Mobility/Fuel Consumption BFD (gals)	N/A	N/A	350
Cruising Range (km)	600	N/A	N/A
Deployability/Weight (UST)	62	N/A	62
Sustainability/ Relability:			
(MMBHMF)	260-325	N/A	360
(MMBOMF)	182-228	N/A	N/A

Note:
1/ Lethality and survivability are measured in terms of millimeters of penetration of rolled homogeneous armor

Acronyms:

BFD	=	Battlefield day
CE	=	Chemical Energy
KE	=	Kenetic Energy
MMBHMF	=	Mean Miles Between Hardware Mission Failure
MMBOMF	=	Mean vehicle Miles Between Operational Mission Failure
Ph	=	Probability of Hit
s/s	=	Stationary vehicle versus Stationary target
UST	=	US Tons

10b. (U) Performance Characteristics (Cont'd):
Block-III

b. (U) Previous Change Explanations --

The items listed were not DAB APB performance characteristics, but were reported in the initial ASM Umbrella SAR.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990; AAE Block III Program Baseline dated 7 June 1990.

(U) Approved Program: None.

CMV

a. (U) Performance --	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Deployability				
Weight (UST)	62	N/A / N/A	N/A	62
Width (in) (OP/Ship)	TBD	N/A / N/A	N/A	TBD
Height (in) (OP/Ship)	TBD	N/A / N/A	N/A	TBD
Lethality				
Cleared Lane Width (m)	3.66	N/A / N/A	N/A	3.66
Depth of Cleared Lane (cm)	26	N/A / N/A	N/A	26
Mine Clearing Speed (KPH)	3.2	N/A / N/A	N/A	3.2
Automatic Depth Control (cm)	w/in-10	N/A / N/A	N/A	w/in-10
Arm Reach (m)	8	N/A / N/A	N/A	8
Arm Lift (lbs)				
50% Extension	8000	N/A / N/A	N/A	8000
100% Extension	4000	N/A / N/A	N/A	4000
Arm Dump Height (m)	6	N/A / N/A	N/A	6
Survivability Armor				
Frontal (40 Deg)		N/A / N/A		
KE (mm)	TBD	N/A / N/A	N/A	TBD
CE (mm)	TBD	N/A / N/A	N/A	TBD
Top				
KE (mm)	TBD	N/A / N/A	N/A	TBD

10a. (U) Performance Characteristics (Cont'd):

CMV

	PE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
CE (mm)	TBD	N/A	/ N/A	N/A	TBD
Side					
KE (mm)	TBD	N/A	/ N/A	N/A	TBD
CE (mm)	TBD	N/A	/ N/A	N/A	TBD
Mobility					
Cruising Range (Miles)	TBD	N/A	/ N/A	N/A	TBD
Max. Speed (MPH)	TBD	N/A	/ N/A	N/A	TBD
Acc. 0-20mph (sec)	TBD	N/A	/ N/A	N/A	TBD

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

FIFV

a. (U) Performance --

	PE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Deployability					
Weight (UST)	71	N/A	/ N/A	N/A	62
Width (in) (OP/Ship)	148/134	N/A	/ N/A	N/A	148/134
Height (in) (OP/Ship)	126/111	N/A	/ N/A	N/A	126/111

(b)(1)

[redacted]

10a. (U) Performance Characteristics (Cont'd):
FIFV

	PE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
(b)(1) [redacted]					
Cruising Range (Miles)	372	N/A	/ N/A	N/A	372
Max. Speed (MPH)	TBD	N/A	/ N/A	N/A	TBD
Acc. 0-20 MPH (sec)	TBD	N/A	/ N/A	N/A	TBD
Sustainability					
Reliability (MMBHMF)	231	N/A	/ N/A	N/A	231
Maintainability (M/R)	.1334	N/A	/ N/A	N/A	.1334
Track Life (Miles)	4000	N/A	/ N/A	N/A	4000

b. (U) Previous Change Explanations --

Weight reduction (62 vs 71) attributed to tradeoffs in user community on weight vs performance.

c. (U) Current Change Explanations -- None.

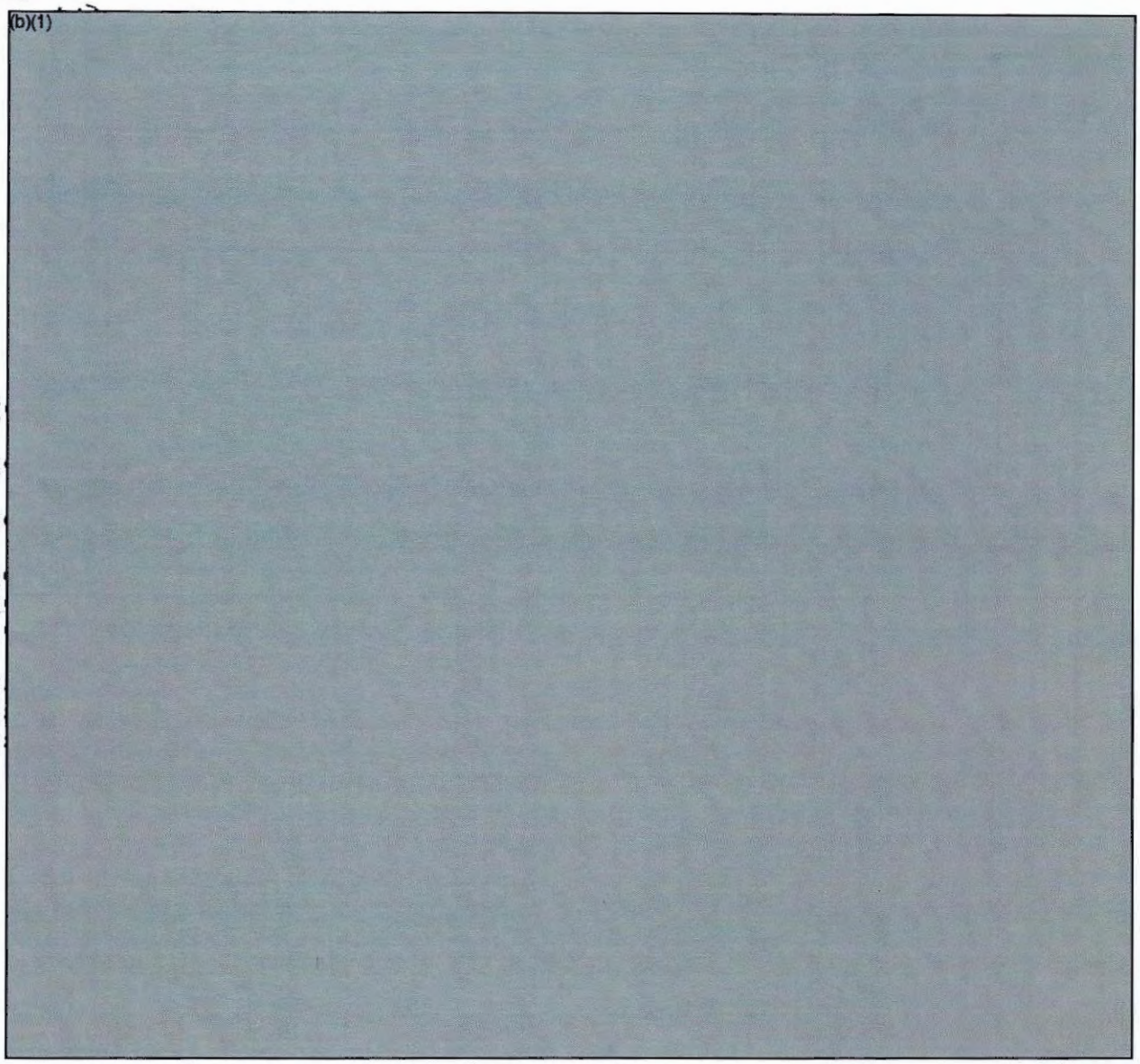
d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

10d. (U) Performance Characteristics (Cont'd):
AFAS

(b)(1)



b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

10d. (U) Performance Characteristics (Cont'd):
AFAS

(U) Approved Program: None.

FARV-A

a. (U) Performance --	PE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Deployability						
Weight (UST)	20	N/A	/ N/A	N/A	TBD	(CH-1)
Width (in) (OP/Ship)	117	N/A	/ N/A	N/A	TBD	(CH-1)
Height (in) (OP/Ship)	109	N/A	/ N/A	N/A	TBD	(CH-1)
Lethality						
Navigation/Location	Find How & ammo in 5 km	N/A	/ N/A	N/A	Find How & ammo in 5 km	
(b)(1) [redacted]						
Cruising Range (Miles)	300	N/A	/ N/A	N/A	TBD	(CH-1)
Max. Speed (MPH)	41	N/A	/ N/A	N/A	TBD	(CH-1)
Acc. 0-20 MPH (sec)	20	N/A	/ N/A	N/A	TBD	(CH-1)
Quick Disconnet (sec)	10	N/A	/ N/A	N/A	10	
Sustainability						
Reliability (MMBHMF)	554	N/A	/ N/A	N/A	TBD	(CH-1)
Maintainability (M/R)	.6	N/A	/ N/A	N/A	TBD	(CH-1)
Track Life (Miles)	3000	N/A	/ N/A	N/A	TBD	(CH-1)
Number of Rounds	90-130+	N/A	/ N/A	N/A	200	(CH-1)
Rearm AFAS (rds/min)	12	N/A	/ N/A	N/A	12	
Payload						
Volume (cuft)	1000	N/A	/ N/A	N/A	TBD	(CH-1)
Weight (UST)	14	N/A	/ N/A	N/A	TBD	(CH-1)
Refuel AFAS						
Pumping Rate (GPM)	35-50	N/A	/ N/A	N/A	35-40	
Level Terrain (sec)	15-30	N/A	/ N/A	N/A	15-30	
Rough Terrain (min)	2	N/A	/ N/A	N/A	2	

10a. (U) Performance Characteristics (Cont'd):

FARV-A

ACRONYMS:

GPM = Gallons per minute

b. (U) Previous Change Explanations --

Weight change (34 vs 20) due to change in weight definition from deployed to transportable.

c. (U) Current Change Explanations --

Change 1 - Changes in performance due to changed mobility platform from a Multiple Launch Rocket System (MLRS) to the common heavy chassis matching AFAS per direction of the AAE. The following performance traits were changed: Weight (TBD vs 34); Width (TBD vs 117); Height (TBD vs 109); Cruising Range (TBD vs 300); Max Speed (TBD vs 41); Acc (TBD vs 20); Reliability (TBD vs 554); Maintainability (TBD vs .6); Track Life (TBD vs 3000); Number of Rounds (200 vs 90-130+); Volume (TBD vs 1000); Payload Weight (TBD vs 14).

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

LOSAT

a. (U) Performance --

	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Deployability				
Weight (UST)	35	N/A / N/A	N/A	35
Width (in) outside hull without armor	117	N/A / N/A	N/A	117
Height (in)				
Commander's Hatch	87	N/A / N/A	N/A	87
Top of Optical Head	109	N/A / N/A	N/A	109
Lethality				
Payload (no. MSL)	14	N/A / N/A	N/A	24

(b)(1)

10a. (U) Performance Characteristics (Cont'd):
LOSAT

	Approved Program			Demon-strated	Current
(b)(1) [redacted]					
Cruising Range (Miles)	265	N/A	/ N/A	N/A	265
Max. Speed (MPH)	38	N/A	/ N/A	N/A	38
Acc. 0-20 MPH (secs)	20	N/A	/ N/A	N/A	20
Sustainability					
Reliability (MMBHMF)	180	N/A	/ N/A	N/A	350
Maintainability (M/R)	TBD	N/A	/ N/A	N/A	.12
Track Life (Miles)	TBD	N/A	/ N/A	N/A	TBD

b. (U) Previous Change Explanations --

(U) Revisions to ROC. All changes were from Planning Estimates.

(b)(1) [redacted]

(U) Mobility Change (10 vs 20) provided by Bradley Project Office.

c. (U) Current Change Explanations -- None.

10d. (U) **Performance Characteristics (Cont'd)**:
LOSAT

d. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

11. (U) **Total Program Cost and Quantity**: **(Current Estimate in Millions of Dollars)**
Block-III

	Planning Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	2264.3	1119.5	1119.5
Procurement	0.0	N/A	0.0
Total Rollaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	2264.3	1119.5	1119.5
Escalation	431.4	151.5	151.5
Development (RDT&E)	(431.4)	(151.5)	(151.5)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2695.7	1271.0	1271.0

As part of the ASM restructure, a reorientation of ASM-F program priorities has placed the howitzer development ahead of the tank which results in the cost of developing the common chassis to be included under the AFAS system and only the costs for ATACS, Multi Target Acquistion System (MTAS), CATTB and Survivability to be included under the Block III system.

b. (U) Quantity --			
Development (RDT&E)	14	N/A	0
Procurement	0	N/A	N/A
Total	14	N/A	0

c. (U) Foreign Military Sales -- None.

11d. (U) Total Program Cost and Quantity (Cont'd):
Block-III

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990; AAE Block III Program Baseline dated 7 June 1990.

(U) Approved Program: None.

CMV

a. (U) Cost --	Planning Estimate	Approved Program	Current Estimate
Development (RDT&E)	503.6	0.0	19.9
Procurement	0.0		0.0
Total Rollaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	503.6	0.0	19.9
Escalation	115.2	0.0	1.7
Development (RDT&E)	(115.2)	(0.0)	(1.7)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	618.8	0.0	21.6

b. (U) Quantity --			
Development (RDT&E)	8	N/A	0
Procurement	0	N/A	N/A
Total	8	N/A	0

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

11e. (U) Total Program Cost and Quantity (Cont'd):
CMV

(U) Approved Program: None.

FIFV

	Planning Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	805.0	0.0	0.0
Procurement	0.0		0.0
Total Rollaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	805.0	0.0	0.0
Escalation	257.4	0.0	0.0
Development (RDT&E)	(257.4)	(0.0)	(0.0)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1062.4	0.0	0.0
b. (U) Quantity --			
Development (RDT&E)	8	N/A	N/A
Procurement	0	N/A	N/A
Total	8	N/A	N/A

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

11a. (U) Total Program Cost and Quantity (Cont'd):
AFAS

a. (U) Cost --	Planning Estimate	Approved Program	Current Estimate
Development (RDT&E)	479.8	0.0	3016.6
Procurement	0.0		0.0
Total Rollaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	479.8	0.0	3016.6
Escalation	130.2	0.0	844.0
Development (RDT&E)	(130.2)	(0.0)	(844.0)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	610.0	0.0	3860.6

As part of the ASM restructure, a reorientation of ASM-F program priorities has placed the howitzer development ahead of the tank which results in the cost of developing the common chassis to be included under the AFAS system.

b. (U) Quantity --			
Development (RDT&E)	8	N/A	14
Procurement	0	N/A	N/A
Total	8	N/A	14

Note: Excludes 2 non-fully configured RDT&E units

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

11a. (U) Total Program Cost and Quantity (Cont'd):
FARV-A

a. (U) Cost --	Planning Estimate	Approved Program	Current Estimate
Development (RDT&E)	251.7	0.0	759.7
Procurement	0.0		0.0
Total Rollaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	251.7	0.0	759.7
Escalation	68.8	0.0	244.5
Development (RDT&E)	(68.8)	(0.0)	(244.5)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	320.5	0.0	1004.2
b. (U) Quantity --			
Development (RDT&E)	8	N/A	8
Procurement	0	N/A	N/A
Total	8	N/A	8

Note: Excludes 2 non-fully configured RDT&E units.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

11a. (U) Total Program Cost and Quantity (Cont'd):
LOSAT

	Planning Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	789.4	0.0	1014.8
Procurement	0.0		0.0
Total Rollaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 90 Base-Year $	789.4	0.0	1014.8
Escalation	94.3	0.0	170.4
Development (RDT&E)	(94.3)	(0.0)	(170.4)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	883.7	0.0	1185.2
b. (U) Quantity --			
Development (RDT&E)	9	N/A	14
Procurement	0	N/A	N/A
Total	9	N/A	14

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:
ASM System Concept Paper (SCP), dated May 1990.

(U) Approved Program: None.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

Block-III

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

CMV

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

FIFV

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

AFAS

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

FARV-A

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

LOSAT

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

13. (U) Cost Variance Analysis:
Summary - All end items

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Estimate	6191.1	0.0	0.0	6191.1
Previous Changes:				
Economic	+158.0	-	-	+158.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+2801.0	-	-	+2801.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2959.0	-	-	+2959.0
Current Changes:				
Economic	-149.6	-	-	-149.6
Quantity	-	-	-	-
Schedule	+88.0	-	-	+88.0
Engineering	+648.2	-	-	+648.2
Estimating	-2394.1	-	-	-2394.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1807.5	-	-	-1807.5
Total Changes	+1151.5	-	-	+1151.5
Current Estimate	7342.6	-	-	7342.6

13a. (U) Cost Variance Analysis (Cont'd):

Summary - All end items

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Estimate	5093.8	0.0	0.0	5093.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1909.8	-	-	+1909.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1909.8	-	-	+1909.8
Current Changes:				
Quantity	-	-	-	-
Schedule	+71.9	-	-	+71.9
Engineering	+489.7	-	-	+489.7
Estimating	-1634.7	-	-	-1634.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1073.1	-	-	-1073.1
Total Changes	+836.7	-	-	+836.7
Current Estimate	5930.5	-	-	5930.5

13a. (U) Cost Variance Analysis (Cont'd):
Block-III

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2695.7	0.0	0.0	2695.7
Previous Changes:				
Economic	+56.8	-	-	+56.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1226.8	-	-	+1226.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1283.6	-	-	+1283.6
Current Changes:				
Economic	-13.0	-	-	-13.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-2695.3	-	-	-2695.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-2708.3	-	-	-2708.3
Total Changes	-1424.7	-	-	-1424.7
Current Estimate	1271.0	-	-	1271.0

13a. (U) Cost Variance Analysis (Cont'd):
Block-III

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2264.3	0.0	0.0	2264.3
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+890.6	-	-	+890.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+890.6	-	-	+890.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-2035.4	-	-	-2035.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-2035.4	-	-	-2035.4
Total Changes	-1144.8	-	-	-1144.8
Current Estimate	1119.5	-	-	1119.5

As part of the ASM restructure, a reorientation of ASM-F program priorities has placed the howitzer development ahead of the tank which results in the cost of developing the common chassis to be included in the AFAS system and only the costs for ATACS, the Multi Target Acquisition System (MTAS), CATTB and Survivability to be included under the Block III system.

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Estimating: Increases due to change in program from full proto and the addition of ASM general tech base funds. Reductions due to Congressional and OSD direction.

13c. (U) Cost Variance Analysis (Cont'd):
Block-III

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 economic escalation rates (Economic)	N/A	-13.0
Current and prior year inflation offset (Estimating)	-3.8	-4.1
Reduction due to restructure of ASM-F program (Estimating)	-2031.6	-2691.2
Estimating	-2035.4	-2695.3
Total Changes	-2035.4	-2708.3

13a. (U) Cost Variance Analysis (Cont'd):
CMV

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	618.8	0.0	0.0	618.8
Previous Changes:				
Economic	+19.8	-	-	+19.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+205.9	-	-	+205.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+225.7	-	-	+225.7
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-822.9	-	-	-822.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-822.9	-	-	-822.9
Total Changes	-597.2	-	-	-597.2
Current Estimate	21.6	-	-	21.6

13a. (U) Cost Variance Analysis (Cont'd):
CMV

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	503.6	0.0	0.0	503.6
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+100.1	-	-	+100.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+100.1	-	-	+100.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-583.8	-	-	-583.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-583.8	-	-	-583.8
Total Changes	-483.7	-	-	-483.7
Current Estimate	19.9	-	-	19.9

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Estimating: Increase due to Block III DAB decision to add pre-FSD proto and reduction due to Congressional and OSD direction.

13c. (U) Cost Variance Analysis (Cont'd):
CMV

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Reduction due to restructure of ASM-F program (Estimating)	-583.8	-822.9
Total Changes	-583.8	-822.9

FIFV

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1062.4	0.0	0.0	1062.4
Previous Changes:				
Economic	+33.1	-	-	+33.1
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+287.9	-	-	+287.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+321.0	-	-	+321.0
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1383.4	-	-	-1383.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1383.4	-	-	-1383.4
Total Changes	-1062.4	-	-	-1062.4
Current Estimate	-	-	-	-

13a. (U) Cost Variance Analysis (Cont'd):
FIFV

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	805.0	0.0	0.0	805.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+178.5	-	-	+178.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+178.5	-	-	+178.5
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-983.5	-	-	-983.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-983.5	-	-	-983.5
Total Changes	-805.0	-	-	-805.0
Current Estimate	-	-	-	-

Costs reflect Feb 91 FYDP.

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Estimating: Increase due to Block III DAB decision to add pre-FSD prototype.

13c. (U) Cost Variance Analysis (Cont'd):
FIFV

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Reduction due to restructure of ASM-F program (Estimating)	-983.5	-1383.4
Total Changes	-983.5	-1383.4

AFAS

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	610.0	0.0	0.0	610.0
Previous Changes:				
Economic	+36.9	-	-	+36.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1101.6	-	-	+1101.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1138.5	-	-	+1138.5
Current Changes:				
Economic	-91.0	-	-	-91.0
Quantity	-	-	-	-
Schedule	+88.0	-	-	+88.0
Engineering	-	-	-	-
Estimating	+2115.1	-	-	+2115.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2112.1	-	-	+2112.1
Total Changes	+3250.6	-	-	+3250.6
Current Estimate	3860.6	-	-	3860.6

13a. (U) Cost Variance Analysis (Cont'd):
AFAS

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	479.8	0.0	0.0	479.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+803.0	-	-	+803.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+803.0	-	-	+803.0
Current Changes:				
Quantity	-	-	-	-
Schedule	+71.9	-	-	+71.9
Engineering	-	-	-	-
Estimating	+1661.9	-	-	+1661.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1733.8	-	-	+1733.8
Total Changes	+2536.8	-	-	+2536.8
Current Estimate	3016.6	-	-	3016.6

As part of the ASM restructure, a reorientation of ASM-F program priorities has placed the howitzer development ahead of the tank which results in the cost of developing the common chassis to be included under the AFAS system.

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Estimating: Addition of funds to reduce risk by inserting pre-FSD proto, and underestimate of number of software lines and cost per software line.

13c. (U) Cost Variance Analysis (Cont'd):
AFAS

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 economic escalation rates (Economic)	N/A	-91.0
Schedule change to transfer AFAS ATTD efforts and associated risk to DEM/VAL phase (Schedule)	71.9	88.0
Current and prior year inflation offset (Estimating)	-3.7	-4.1
Expansion of scope of DEM/VAL proto phase to fabricate 1 add'l proto (Estimating)	60.3	75.0
Expansion of scope of DEM/VAL phase to develop and fabricate common heavy chassis (Estimating)	900.3	1069.6
Expansion of scope of EMD phase to include development of heavy chassis and fabrication of 6 add'l prototypes (Estimating)	680.5	947.6
Result of reinstatement of previous decrements (Estimating)	24.5	27.0
Estimating	1661.9	2115.1
Total Changes	1733.8	2112.1

13a. (U) Cost Variance Analysis (Cont'd):
FARV-A

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	320.5	0.0	0.0	320.5
Previous Changes:				
Economic	+9.4	-	-	+9.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+52.1	-	-	+52.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+61.5	-	-	+61.5
Current Changes:				
Economic	-26.0	-	-	-26.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+648.2	-	-	+648.2
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+622.2	-	-	+622.2
Total Changes	+683.7	-	-	+683.7
Current Estimate	1004.2	-	-	1004.2

13a. (U) Cost Variance Analysis (Cont'd):
FARV-A

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	251.7	0.0	0.0	251.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+18.3	-	-	+18.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+18.3	-	-	+18.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+489.7	-	-	+489.7
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+489.7	-	-	+489.7
Total Changes	+508.0	-	-	+508.0
Current Estimate	759.7	-	-	759.7

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Estimating: Increase due to Block III DAB decision to add pre-FSD proto and reduction due to Congressional and OSD direction.

13c. (U) Cost Variance Analysis (Cont'd):
FARV-A

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 economic escalation rates (Economic)	N/A	-26.0
Change due to changed mobility platform from the MLRS to the common heavy chassis matching AFAS (Engineering)	489.7	648.2
Total Changes	489.7	622.2

13a. (U) Cost Variance Analysis (Cont'd):
LOSAT

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	883.7	0.0	0.0	883.7
Previous Changes:				
Economic	+2.0	-	-	+2.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-73.3	-	-	-73.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-71.3	-	-	-71.3
Current Changes:				
Economic	-19.6	-	-	-19.6
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+392.4	-	-	+392.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+372.8	-	-	+372.8
Total Changes	+301.5	-	-	+301.5
Current Estimate	1185.2	-	-	1185.2

13a. (U) Cost Variance Analysis (Cont'd):
LOSAT

a. (U) Summary -- (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	789.4	0.0	0.0	789.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-80.7	-	-	-80.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-80.7	-	-	-80.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+306.1	-	-	+306.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+306.1	-	-	+306.1
Total Changes	+225.4	-	-	+225.4
Current Estimate	1014.8	-	-	1014.8

b. (U) Previous Change Explanations --

RDT&E
Economic: Revised escalation indices.
Estimating: Reduction due to reflection of President's Budget vs Army Cost Position (Feb 90).

13c. (U) Cost Variance Analysis (Cont'd):
LOSAT

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 economic escalation rates (Economic)	N/A	-19.6
Current and prior year inflation offset (Estimating)	-2.5	-2.7
Development extended 2 years because of funding and program delays (Estimating)	308.6	395.1
Estimating	306.1	392.4
Total Changes	306.1	372.8

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Block-III
(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

CHV
(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

FIFV
(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

AFAS
(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

FARV-A
(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

LOSAT
(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) LOSAT:	Initial Contract Price		
	Target	Ceiling	Qty
LTV, DALLAS, TX DAAH01-89-C-0530, CPIF Award: April 1, 1988 Definitized: December 31, 1989	$31.0	N/A	8

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$75.1	N/A	18	$94.3	$95.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-8.7	$-1.3
Cumulative Variances To Date (12/31/91)	$-9.4	$-1.2
Net Change	$-0.7	$0.1

Explanation of Change:

Cost and schedule variance caused by missile hardware problems and funding shortage which caused the flight test program schedule to slip and resulted in repeat firing missions.

(U) CCATTD:	Initial Contract Price		
	Target	Ceiling	Qty
Armored Veh Tech Associat, Troy, MI DAAE07-91-C-R005, CPIF Award: December 14, 1990 Definitized: December 14, 1990	$286.7	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$286.7	N/A	0	$286.7	$286.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Due to the competitive nature of this contract, the CPR data will be handled on a "need to know" basis. To be permitted to access the data will require an understanding of the "rules of engagement" and the signing and forwarding to the Block III PMO of a non-disclosure statement.

Due to the large number of subcontractors to be reviewed, a

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) validated Cost\Schedule Control (C\SC) system will not occur until at least the 3rd quarter of FY92.

(U) CCATTD:
TELEDYNE CONTINENTAL MOTO, MUSKEGON, MI
DAAE07-91-C-R007, CPIF
Award: December 14, 1990
Definitized: December 14, 1990

Initial Contract Price		
Target	Ceiling	Qty
$342.8	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$342.8	N/A	0	$342.8	$342.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Due to the competitive nature of this contract, the CPR data will be handled on a "need to know" basis. To be permitted to access the data will require an understanding of the "rules of engagement" and the signing and forwarding to the Block III PMO of a non-disclosure statement.

Due to the large number of subcontractors to be reviewed, a validated C\SC system will not occur until at least the 3rd quarter of FY92.

(U) LOSAT:
LTV, GRAND PRAIRIE, TX
DAAH01-91-C-0618, CPIF
Award: September 4, 1991
Definitized: N/A

Initial Contract Price		
Target	Ceiling	Qty
$86.5	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$86.5	N/A	0	$86.5	$86.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.5	$-2.9
Net Change	$0.5	$-2.9

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change:

Positive $.5M and negative $2.9M variances are due to the contractor not staffing up as quickly as indicated.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 33.3% (5 yrs/15 yrs)

(2) Percent Program Cost Appropriated: 16.4% ($1203.1 / $7342.6)

b. (U) Appropriation Summary -- Block-III

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY89-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-99)	Total
RDT&E	464.4	133.0	135.3	538.3	1271.0
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	464.4	133.0	135.3	538.3	1271.0

16b. (U) Program Funding Summary (Cont'd):
CMV

b. (U) Appropriation Summary -- CMV

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	12.1	9.5	-	-	21.6
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	12.1	9.5	-	-	21.6

b. (U) Appropriation Summary -- FIFV - None.

b. (U) Appropriation Summary -- AFAS

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2002)	Total
RDT&E	17.7	278.5	345.8	3218.6	3860.6
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	17.7	278.5	345.8	3218.6	3860.6

16b. (U) Program Funding Summary (Cont'd):
FARV-A

b. (U) Appropriation Summary -- FARV-A

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY90-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2001)	Total
RDT&E	-	-	21.5	982.7	1004.2
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	-	-	21.5	982.7	1004.2

b. (U) Appropriation Summary -- LOSAT

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY88-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	148.1	139.8	122.8	774.5	1185.2
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	148.1	139.8	122.8	774.5	1185.2

16c. (U) Program Funding Summary (Cont'd):
Block-III

c. (U) Annual Summary -- Block-III

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	

Appropriation: 2040 Research, Development, Test + Eval, Army

1989				83.3	82.2	82.2	76.4	4.2
1990				160.2	164.1	164.0	149.5	4.0
1991				204.5	218.1	216.5	77.9	3.9
1992				120.8	133.0	3.6	0.7	3.1
1993				119.0	135.3			3.3
1994				96.3	113.1			3.3
1995				88.1	106.8			3.3
1996				102.6	128.4			3.2
1997				82.9	107.1			3.2
1998				50.9	67.9			3.2
1999				10.9	15.0			3.2
Subtot				1119.5	1271.0	466.3	304.5	
Grand Total				1119.5	1271.0	466.3	304.5	

As part of the ASM restructure, a reorientation of ASM-F program priorities has placed the howitzer development ahead of the tank which results in the cost of developing the common chassis to be included under the AFAS system and only the costs for ATACS, the Multi Target Acquisition System (MTAS), CATTB and Survivability to be included under the Block III system.

16c. (U) Program Funding Summary (Cont'd):
CMV

c. (U) Annual Summary -- CMV

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1991				11.3	12.1	12.0	3.7	3.9
1992				8.6	9.5	0.4	0.2	3.1
Subtot				19.9	21.6	12.4	3.9	
Grand Total				19.9	21.6	12.4	3.9	

c. (U) Annual Summary -- FIFV - None.

c. (U) Annual Summary -- AFAS

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1991				16.6	17.7	17.6	8.4	3.9
1992				253.0	278.5	33.2	0.7	3.1
1993				304.1	345.8			3.3
1994				292.7	343.8			3.3
1995				328.9	398.9			3.3

16c. (U) Program Funding Summary (Cont'd):
AFAS

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)

1996				268.3	335.8			3.2
1997				119.3	154.1			3.2
1998				417.9	557.0			3.2
1999				493.6	679.0			3.2
2000				333.9	474.0			3.2
2001				185.7	272.0			3.2
2002				2.6	4.0			3.2
Subtot	14			3016.6	3860.6	50.8	9.1	
Grand Total	14			3016.6	3860.6	50.8	9.1	

As part of the ASM restructure, a reorientation of ASM-F program priorities has placed the howitzer development ahead of the tank which results in the development of the common chassis to be included under the AFAS system.

16c. (U) Program Funding Summary (Cont'd):
FARV-A

c. (U) Annual Summary -- FARV-A

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate
		Nonrec	Rec		Program	Obligated	Expended	

Appropriation: 2040 Research, Development, Test + Eval, Army

1993				18.9	21.5			3.3
1994				41.7	49.0			3.3
1995				98.4	119.3			3.3
1996				115.7	144.8			3.2
1997				49.5	63.9			3.2
1998				115.1	153.4			3.2
1999				140.6	193.4			3.2
2000				99.3	140.9			3.2
2001				80.5	118.0			3.2
Subtot	8			759.7	1004.2			
Grand Total	8			759.7	1004.2			

16c. (U) Program Funding Summary (Cont'd):
LOSAT

c. (U) Annual Summary -- LOSAT

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate -(U)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	

Appropriation: 2040 Research, Development, Test + Eval, Army

1988				3.5	3.3	3.3	3.3	3.0
1989				36.9	36.4	36.4	36.4	4.2
1990				53.7	55.0	55.0	54.7	4.0
1991				50.1	53.4	51.2	33.8	3.9
1992				127.0	139.8			3.1
1993				108.0	122.8			3.3
1994				223.9	263.0			3.3
1995				199.0	241.3			3.3
1996				122.3	153.0			3.2
1997				78.9	101.9			3.2
1998				11.5	15.3			3.2
Subtot	14			1014.8	1185.2	145.9	128.2	
Grand Total	14			1014.8	1185.2	145.9	128.2	

17. (U) Production Rate Data:

Block-III

a. (U) Not applicable for Pre-Milestone II programs.

b. (U) Not applicable for Pre-Milestone II programs.

c. (U) Not applicable for Pre-Milestone II programs.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Not applicable for Pre-Milestone II programs.

CMV

a. (U) Not applicable for Pre-Milestone II programs.

b. (U) Not applicable for Pre-Milestone II programs.

c. (U) Not applicable for Pre-Milestone II programs.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Not applicable for Pre-Milestone II programs.

FIFV

a. (U) Not applicable for Pre-Milestone II programs.

b. (U) Not applicable for Pre-Milestone II programs.

c. (U) Not applicable for Pre-Milestone II programs.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Not applicable for Pre-Milestone II programs.

AFAS

a. (U) Not applicable for Pre-Milestone II programs.

b. (U) Not applicable for Pre-Milestone II programs.

c. (U) Not applicable for Pre-Milestone II programs.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Not applicable for Pre-Milestone II programs.

17a. (U) Production Rate Data (Cont'd):
FARV-A

a. (U) Not applicable for Pre-Milestone II programs.

b. (U) Not applicable for Pre-Milestone II programs.

c. (U) Not applicable for Pre-Milestone II programs.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Not applicable for Pre-Milestone II programs.

LOSAT

a. (U) Not applicable for Pre-Milestone II programs.

b. (U) Not applicable for Pre-Milestone II programs.

c. (U) Not applicable for Pre-Milestone II programs.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Not applicable for Pre-Milestone II programs.

18. (U) Operating and Support Costs:
Block-III

Block-III
Not applicable for Pre-Milestone II programs.

CMV
Not applicable for Pre-Milestone II programs.

FIFV
Not applicable for Pre-Milestone II programs.

AFAS
Not applicable for Pre-Milestone II programs.

FARV-A
Not applicable for Pre-Milestone II programs.

LOSAT
Not applicable for Pre-Milestone II programs.

A-16 FMTV

91-061

*** UNCLASSIFIED ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: FMTV

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION

MAR 17 1992

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. Designation and Nomenclature (Popular Name):
Family of Medium Tactical Vechicles (FMTV)

2. DoD Component: Army

3. Responsible Office and Telephone Number:
US Army Acquisition Exec Spt Agency
ATTN: SFAE-CS-TVM (COL Day)
PEO, Combat Support
Warren, MI 48397-5000

COL LAWRENCE W. DAY JR.
Assigned: January 21, 1989
AV 786-8665 COMM (313) 574-8665

No SECURITY Objection
to PUBLIC RELEASE
17 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

4. Program Elements/Procurement Line Items:

RDT&E:
PE 64604 Project DH07
PROCUREMENT:
APPN 2035 ICN D15500 (Army)
APPN 2035 ICN DA035A (Army) (Shared)
APPN 2035 ICN DA0073 (Army) (Shared)

5. Related Programs: None.

6. Mission and Description:
The Family of Medium Tactical Vehicles (FMTV) Non-Developmental Item (NDI) program consists of a 2 1/2 ton Light Medium Tactical Vehicle (LMTV), all wheel drive 4x4 in van and cargo body styles and a 5 ton Medium Tactical Vehicle (MTV), all wheel drive 6x6 in nine (9) body styles (cargo, cargo w/MHE, long wheel base (lwb) cargo, lwb cargo

*** UNCLASSIFIED ***

OASD(PA) DEC/SR 92-T-0569

6. Mission and Description (Cont'd):

w/MHE, tractor, dump, wrecker, expansible van and fuel tanker). Commonality of commercial components within the family is the FMTV's central theme which minimizes logistics support and operational cost. The program's Joint Service Operational Requirement document also requires complimentary 2 1/2 ton and 5 ton tactical trailers incorporating off-road performance capability and cargo bed size common with the LMTV and MTV cargo trucks. The trucks incorporate: a Caterpillar turbo-charged diesel engine; an Allison automatic transmission with integral transfer case; Rockwell all-wheel drive axles; Eaton Central Tire Inflation System (CTIS) and Michelin aggressive off-road tubeless radial tires. Low Velocity Air Drop (LVAD) and Low Altitude Parachute Extraction System (LAPES) capable versions of both basic cargo and dump models are being built to support air mobile units. All models except van will be C-130 and C-141 aircraft transportable. The modified commercial Cab Over Engine (COE) tilt type three man cab is ergonometrically designed with three point safety belt harness. Tactical off-road mobility is enhanced by using radial tires, CTIS, high ground clearance chassis with modified suspension and individually damped hub reduction axles to minimize personnel and cargo shock loads, allowing cross country terrain traversing at higher speeds. The integration of all subsystems into an FMTV provides performance exceeding current medium truck fleet capabilities at twice to three times the endurance and reliability levels. The FMTV will perform line haul, local haul, unit mobility, unit resupply and other required missions in combat, combat support and combat service support units. The FMTV will replace existing and aging M44 Series 2 1/2 ton trucks, M39 and M809 Series 5 ton trucks. FMTV will also provide a follow-on to the current M939/A2 Series 5 ton truck.

7. Program Highlights:

a. Significant Historical Developments --

The Family of Medium Tactical Vehicles (FMTV) Program, Operational and Organizational Plan was approved in September 1984. The User Requirement Document (JSOR) was established on 1 May 1986, and subsequently, the Army COEA justified the program initiation on 4 Jun 1987. The FMTV Army Systems Acquisition Review Council (ASARC) approval was obtained on 5 Aug 1987, with further program approval from the Defense Acquisition Board (DAB) on 23 May 1988. Congress approved FY88 prototype funding, and prototype contracts were awarded on 21 Oct 1988. The Army conducted a 2 1/2 T Truck Feasibility Study which validated the requirement for a 2 1/2 T truck variant. In Jul 1989, as a result of the 2 1/2 T Truck Study, the LMTV was restored in the first year of the production contract. The Dec 88 SAR represented a procurement program of 15 years. As a result of the Army approved Tactical Wheeled Vehicle Modernization Plan (TWVMP) report to Congress dated 12 Apr 1989, the Dec 89 SAR reflected the

7a. Program Highlights (Cont'd):

current 30 year procurement program. An exception SAR was submitted for 31 Mar 90 to report a Nunn-McCurdy breach, which resulted primarily from the change in procurement schedule as identified in the TWVMP. The Request For Proposal (RFP) responses were received from the three contractors on 7 Dec 1990. The Source Selection Board convened on 8 Dec 1990 to evaluate the proposals. As a result of budget reductions, the model mix was changed to maximize procurement dollars against requirements during the first five-year multiyear contract, with several high cost, low priority variants being deferred until the second five-year multiyear contract. Cost proposals from the three competing contractors were received in Feb 1991. A quarterly exception SAR was submitted in Jun 1991 due to Nunn-McCurdy unit cost breaches and schedule slips of over 180 days. The FMTV ASARC IIIA milestone review was completed on 10 Jun 1991, and granted approval to proceed to Low Rate Initial Production.

b. Significant Developments Since Last Report --
The Secretary of Defense Certification for the Jun 1991 Nunn-McCurdy breaches was granted on 12 Sep 1991. The FMTV production contract was awarded to Stewart & Stevenson Services Inc. of Houston, TX on 11 Oct 1991. The 5-year multiyear fixed price contract with an escalation clause, procures 10,843 trucks and includes option provisions. The Post Award Conference and Start of Work meeting was held 5-7 Nov 1991 at the contractor's production facility in Sealy, TX.

The current estimate reflects the technical data in the awarded contract and the establishment of updated thresholds for reliability indicators. The schedule reflects the impact of the four month delay in ASARC IIIA and actual contract-driven milestones. An increase in the PAUC of 0.71% has been realized, primarily from incorporating the actual contract prices and projecting those prices for the life of the program. Other contributing factors to the PAUC increase were cessation of estimated 12% reduction in unit prices after the initial contract, and a change in MTV variants requiring Federal Retail Excise Tax (FRET).

The FMTV system is expected to satisfy mission requirements.

c. Changes Since As Of Date --
A revised Acquisition Program Baseline incorporating the results of contract award into the program was approved by the AAE on 29 Jan 92. The current program reflects the FY93 Amended President's Budget Submission.

8. **Threshold Breaches:**
There are no breaches to the approved Acquisition Program Baseline (APB) dated 29 Jan 92. There are no Nunn-McCurdy unit cost breaches.

9. **Schedule:**

a. Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone I/II (ASARC)	AUG 87	MAY 87	MAY 87
Joint Service Operational Requirement (JSOR) Approval	NOV 87	N/A	NOV 87
DAB Program Review	N/A	MAY 88	MAY 88
Prototype Contract Awards	OCT 88	OCT 88	OCT 88
First Prototype Delivery	DEC 89	JAN 90	JAN 90
FSD Development Testing			
Start	DEC 89	JAN 90	JAN 90
Complete	OCT 90	DEC 90	DEC 90
Early User Test and Evaluation			
Start	MAY 90	MAY 90	MAY 90
Complete	OCT 90	OCT 90	OCT 90
ASARC IIIA	JAN 91	SEP 91	SEP 91(Ch-1)
Production Award (MYP)	JAN 91	OCT 91	OCT 91(Ch-1)
Call up 2nd Year of MYP	N/A	AUG 92	AUG 92(Ch-1)
Production Qualification Test (PQT)			
Start	N/A	MAY 92	JUL 92(Ch-1)
Complete	N/A	NOV 92	NOV 92(Ch-1)
First Production Delivery	MAR 92	NOV 92	NOV 92(Ch-1)
Initial Production Test (IPT)			
Start	MAR 92	NOV 92	NOV 92(Ch-1)
Complete	OCT 92	AUG 93	AUG 93(Ch-1)
IOT&E			
Start	N/A	JAN 93	JAN 93(Ch-1)
Complete	N/A	JUN 93	JUN 93(Ch-1)
Interim IPT/IOT&E Progress Report	N/A	AUG 93	AUG 93(Ch-1)
Call Up 3rd Year of MYP Increment 1/	N/A	DEC 92	DEC 92(Ch-1)
ASARC IIIB	N/A	SEP 93	SEP 93
Call Up 3rd Year of MYP Increment 2	N/A	DEC 93	DEC 93(Ch-1)
First Unit Equipped (FUE)/Initial Operational Capability (IOC)-FMTV	DEC 92	OCT 93	OCT 93
Call up 4th Year of MYP	N/A	DEC 93	DEC 93(Ch-1)
Call Up 5th Year of MYP	N/A	DEC 94	DEC 94(Ch-1)
Production Decision Review Van, Tanker, & Trailer	N/A	JUN 95	JUN 95
PQT, Van & Tanker 3/			
Start	N/A	NOV 96	NOV 96(Ch-2)

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
Complete	N/A	DEC 96	DEC 96(Ch-2)
IPT, Van & Tanker 3/			
Start	N/A	FEB 97	FEB 97(Ch-2)
Complete	N/A	OCT 97	OCT 97(Ch-2)
IOT&E, Van & Tanker 3/			
Start	N/A	APR 97	APR 97(Ch-2)
Complete	N/A	AUG 97	AUG 97(Ch-2)
PQT, Trailer 3/			
Start	N/A	NOV 01	NOV 01(Ch-2)
Complete	N/A	DEC 01	DEC 01(Ch-2)
IPT Trailer 3/			
Start	N/A	FEB 02	FEB 02(Ch-2)
Complete	N/A	OCT 02	OCT 02(Ch-2)
IOT&E, Trailer 3/			
Start	N/A	APR 02	APR 02(Ch-2)
Complete	N/A	AUG 02	AUG 02(Ch-2)

1/ Group A vehicles: LMTV Cargo, MTV Cargo, Long Wheel Base Cargo, Tractor and Wrecker.
2/ Group B Vehicles: LMTV Van, MTV Expansible Van, Dump Truck and Fuel Tanker.
3/ The previously combined milestones for van, tanker and trailer are deleted and replaced with milestones for van and tanker, and delayed milestones for trailer. Due to affordability issues, the funding profile for FMTV has caused delay in trailer acquisition and associated testing milestones.

b. Previous Change Explanations --

The milestones for Initial Production Test (IPT) and IOT&E Testing were no longer applicable as formerly reported for different groups of FMTV vehicles, and have been deleted from the APB. IPT and IOT&E were set up to report on two groups of FMTV vehicles: Group A and Group B, with separate sets of testing dates. As a result of PL 101-189, 29 Nov 89, "Low Rate Initial Production" (LRIP) the FMTV was restructured into a two-step decision for LRIP and Full Rate Production. Per OUSD(A) letter dated 9 Feb 90, an ASARC review will replace the DAB for the FMTV program LRIP and Full Rate decisions. A joint FUE/IOC for FMTV was reestablished due to the validation of the 2 1/2 T (i.e. LMTV) variant. Reduced funding for the FMTV program required an amendment to the solicitation, which delayed most of the subsequent milestones by one to two months. The reduced funding resulted in restructuring of the model mix, and deletion of the

9b. Schedule (Cont'd):
separate model (Group A/Group B) designations. The call up for increment 2 of the 3rd year multiyear procurement (MYP) was established at 90 days following completion of IPT. Additional testing milestones were added to the APB for the 2nd MYP models (van, tanker, and trailer), which were moved to second and subsequent buys as a result of the funding reduction in the budget. The final ASARC IIIA milestone review was delayed until 10 Jun 91, and all subsequent milestones where adjusted accordingly. PQT testing dates changed, and duration increased from a three months to seven months.

c. Current Change Explanations --

(Ch-1) Due primarily to the delay in concluding ASARC IIIA, subsequent planned milestones were delayed. The ASARC IIIA was Jun 91 and is now Sep 91; Prod Contract Award was Sep 91 and is now Oct 91; Call up 2nd Year of MYP was Jan 92 and is now Aug 92; PQT Start and Complete were Apr 92 and Oct 92 and are now Jul 92 and Nov 92; First Prod Deliv was Oct 92 and is now Nov 92; IPT Start and Complete were Oct 92 and Jul 93 and are now Nov 92 and Aug 93; IOT&E Start and Complete were Dec 92 and May 93 and are now Jan 93 and Jun 93; Interim IPT/IOT&E Progress Report was Jan 93 and is now Aug 93; Call Up 3rd Year of MYP Incr 1 was Jan 93 and is now Dec 92; Call up 3rd Year of MYP Incr 2 was Oct 93 and is now Dec 93; Call Up 4th Year of MYP was Nov 93 and is now Dec 93; Call Up 5th Year of MYP was Nov 94 and is now Dec 94. The current estimate is the new Acquisition Program Baseline (APB), dated 29 Jan 92.

(Ch-2) As a result of changes to the FMTV funding profile, trailer production has been further delayed. The new Approved Program and Current Estimate reflect new milestones associated with this delay.

d. References --

Development Estimate:
DAE Program Baseline, Mar 1989; SDDM decision 7 Oct 1988.

Approved Program:
AAE approved Acquisition Program Baseline dated 29 January 1992.

10. Performance Characteristics:

10a. Performance Characteristics (Cont'd):

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Highway Speed on 2% Grade at GVW (mph)	55	55	/ 55		55	
Highway Speed on 3% Grade at GVW (mph)	45	45	/ 45		45	
Highway Speed on 2% Grade at GCW (mph)	40	40	/ 40		40	
Highway Speed on 3% Grade at GCW (mph)	30	35	/ 30		35	(CH-1)
LMTV Payload (tons)	2.5	2.5	/ 2.5		2.5	
MTV Payload (tons)	5	5	/ 5		5	
LMTV Towed Load (lbs)	7500	7500	/ 7500		7500	
MTV Towed Load (lbs)	20000	21000	/ 21000		21000	
Longitudinal Grade Operation (%)	60	60	/ 60		60	
Slide Slope Operation (%)	30	30	/ 30		30	
Fording Without Kit (inches)	30	30	/ 30		30	
Fording With Kit (inches)	60	60	/ 60		60	
Operating Range on Integral Fuel at GCW (miles)	300	300	/ 300		300	
Reliability:						
MMBHMF (miles)						
Truck, Cargo (LMTV)	2140	3000	/ 2450		3000	
Truck, Cargo (MTV)	1600	2700	/ 1950		2700	
Tractor	3300	3300	/ 2600		3300	
Wrecker	2300	2300	/ 2000		2300	
Trailer (LMTV)	2800	2800	/ 1985		2800	
Trailer (MTV)	2600	2600	/ 1600		2600	
MMBOMF (miles)						
Truck, Cargo (LMTV)	1605	2228	/ 1832		2228	(CH-1)
Truck, Cargo (MTV)	1200	2035	/ 1446		2035	(CH-1)
Tractor	2500	2480	/ 1960		2480	(CH-1)
Wrecker	1900	1875	/ 1500		1875	(CH-1)
Trailer (LMTV)	2100	2056	/ 1489		2056	(CH-1)
Trailer (MTV)	1900	1913	/ 1200		1913	(CH-1)
MMHPOM						
Truck, Cargo (LMTV)	.011	0.01	/ 0.011		0.01	(CH-1)

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
Truck, Cargo (MTV)	.012	0.011	/ 0.012		0.011	(CH-1)
Tractor	.0135	0.012	/ 0.015		0.012	(CH-1)
Wrecker	.017	0.015	/ 0.018		0.015	(CH-1)
Trailer (LMTV)	.004	0.003	/ 0.005		0.003	(CH-1)
Trailer (MTV)	.004	0.003	/ 0.005		0.003	(CH-1)
Transportability:						
Surface Transportation (Highway, Ship & Rail)	H,S & R	H,S&R	/ H,S&R		H,S&R	
Air Transportation	C-141	C-141	/ C-141		C-141	
Mobility: (vehicle cone index)						
Truck Cargo	25	25	/ 25		25	
Truck & Trailer Combination	35	35	/ 35		35	

1/ Reliabilty/maintenance performance parameters during FSD phase are established for truck only; crane/trailer parameters shown are production requirememts which will be demonstrated during IPT as indicated.

2/ Unit Level Only

ACRONYMS:*
MMBHMF = Mean Miles Between Hardware Mission Failure
MMBOMF = Mean Miles Between Operational Mission Failure
MMHPOM = Maintenance Man Hour/Operating Mile
GVW = Gross Vehicle Weight
GCW = Gross Combined Weight

b. Previous Change Explanations --

Values had been changed from development estimate values to production values as identified in the solicitation for the FMTV production contract.

c. Current Change Explanations --

(Ch-1) The Current Estimate represents production values and contract specifications reflecting the program as of contract award. Highway Speed on 3% Grade at GCW (mph) was 30 and is now 35; MMBOMF (miles) for Truck, Cargo (LMTV) was 1605 and is now 2228; Truck,

10c. **Performance Characteristics (Cont'd):**
Cargo (MTV) was 1200 and is now 2035; Tractor was 2500 and is now 2480; Wrecker was 1900 and is now 1875; Trailer (LMTV) was 2100 and is now 2056; Trailer (MTV) was 1900 and is now 1913; MMHPOM Truck, Cargo (LMTV) was 0.011 and is now 0.01; Truck, Cargo (MTV) was 0.012 and is now 0.011; Tractor was 0.0135 and is now 0.012; Wrecker was 0.017 and is now 0.015; Trailer (LMTV) and (MTV) were 0.002 and are now 0.003. These values are reflected in the Approved Program and Current Estimate, based on the new Acquisition Program Baseline dated 29 Jan 92.

d. References --

Development Estimate:
DAE Program Baseline, Mar 1989; SDDM decision 7 Oct 1988.

Approved Program:
AAE approved Acquisition Program Baseline dated 29 January 1992.

11. **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	57.9	164.8	163.4
Procurement	6567.4	10197.2	10278.6
Rollaway	(6089.0)		(9548.0)
Total Rollaway	(6089.0)		(9548.0)
Other Wpn Sys Cost	(239.3)		(658.7)
Total Other Wpn Sys	(239.3)		(658.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(239.1)		(71.9)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	6625.3	10362.0	10442.0
Escalation	1943.3	11292.2	10117.6
Development (RDT&E)	(2.0)	(65.4)	(61.3)
Procurement	(1941.3)	(11226.8)	(10056.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	8568.6	21654.2	20559.6

11b. Total Program Cost and Quantity (Cont'd):

b. Quantity --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	0	N/A	0
Procurement	118995	112322	112322
Total	118995	112322	112322

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Development Estimate:
DAE Program Baseline, Mar 1989; SDDM decision 7 Oct 1988.

Approved Program:
AAE approved Acquisition Program Baseline dated 29 January 1992.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(JUN 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	20559.6	20408.0	20559.6
(2) Quantity	112322	112322	112322
(3) Unit Cost	0.183	0.182	0.183
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	172.7	172.7	294.1
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	172.7	172.7	294.1
(2) Quantity	1197	1197	2384
(3) Unit Cost	0.144	0.144	0.123

The Program Acquisition quantity of 112322 consists of 102050 trucks and 10272 trailers.

Excludes 147 RDT&E prototypes (111 trucks and 36 trailers).

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	59.9	8508.7	0.0	8568.6
Previous Changes:				
Economic	+6.8	+2189.5	-	+2196.3
Quantity	+141.1	+3492.6	-	+3633.7
Schedule	-11.2	+894.4	-	+883.2
Engineering	-	-	-	-
Estimating	+22.9	+4140.5	-	+4163.4
Other	-	-	-	-
Support	-	+962.8	-	+962.8
Subtotal	+159.6	+11679.8	-	+11839.4
Current Changes:				
Economic	-5.1	-1041.1	-	-1046.2
Quantity	-	-	-	-
Schedule	-	+124.9	-	+124.9
Engineering	-	-	-	-
Estimating	+10.3	+1284.8	-	+1295.1
Other	-	-	-	-
Support	-	-222.2	-	-222.2
Subtotal	+5.2	+146.4	-	+151.6
Total Changes	+164.8	+11826.2	-	+11991.0
Current Estimate	224.7	20334.9	-	20559.6

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	57.9	6567.4	0.0	6625.3
Previous Changes:				
Quantity	+83.6	+1107.9	-	+1191.5
Schedule	-	-321.3	-	-321.3
Engineering	-	-	-	-
Estimating	+14.6	+2053.7	-	+2068.3
Other	-	-	-	-
Support	-	+373.2	-	+373.2
Subtotal	+98.2	+3213.5	-	+3311.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-0.3	-	-0.3
Engineering	-	-	-	-
Estimating	+7.3	+619.0	-	+626.3
Other	-	-	-	-
Support	-	-121.0	-	-121.0
Subtotal	+7.3	+497.7	-	+505.0
Total Changes	+105.5	+3711.2	-	+3816.7
Current Estimate	163.4	10278.6	-	10442.0

For purposes of the SAR, Federal Retail Excise Tax (FRET) will continue to be considered a non-rollaway (Support) cost.

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation indices

Quantity: Additional R&D quantities due to change from 15 to 30 year program

Schedule: Synchronized future prototype phase with production schedule

Estimating: Increase in cost of testing; revised testing and engineering costs; increase in estimate of prototype hardware

13b. Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic:	Revised escalation indices
Quantity:	Implementation of Tactical Wheeled Vehicle Modernization Plan (TWVMP) extended program from 15 to 30 years, and decrease in trailer quantity; revision of model mix IAW TWVMP
Schedule:	Trucks rescheduled for purchase in later years and model mix changes; change in average truck and trailer cost due to change in schedule
Estimating:	Reduction of excess warranty costs and change from conventional to level pricing on total rollaway cost; additional testing requirements; increased estimate based on M939A2 award
Support:	Support, testing and additional contracts, System Technical Support, Federal Retail Excise Tax (FRET) and additional spares due to extended program; total Package Fielding/First Destination Transportation (TPF/FDT) added per Congressional ruling; adjustments in FRET due to change in model mix; update initial spares to align with President's Budget and reduction of wholesale requirements; PM salaries transferred from OMA Appn; increase in PM salaries; decrease in TPF/FDT due to revised fielding plan

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)	--	-5.1
Current and prior year inflation offset (Estimating)	-0.2	-0.2
Additional testing for MTV tankers, vans and both LMTV and MTV trailers (Estimating)	7.5	10.5
Total Changes	7.3	5.2

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)	--	-1026.9
Economic adjustment for negative program change (Economic)	--	-14.2
Truck schedule changed due to incorporation of actual contract unit prices within the program. (Schedule)	-0.3	124.9
Current and prior year inflation offset (Estimating)	3.1	3.7
Adjustment for actual contract prices; previous methodology assumed follow-on contract prices less 12% (Estimating)	538.6	1146.4
New contract identifies more costs for contract testing. (Estimating)	78.0	134.7
Change in MTV variants requiring FRET (Support)	-135.9	-248.5
Initial spares aligned with FY93 President's Budget Submission (Support)	6.9	4.1
TPF/FDT current guidance adds OCONUS/CONUS technical assistance and NET (Support)	7.3	22.2
Total Changes	497.7	146.4

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.072	0.010	0.036	0.009	--	0.049	--	0.007	0.111	0.183

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

FMTV:	Initial Contract Price Target	Ceiling	Qty
Stewart & Stevenson Serv., Houston, TX DAAE07-92-C-R001, FP/EPA Award: October 11, 1991 Definitized: October 11, 1991	$1196.2	N/A	10843

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$1196.2	N/A	10843	$1196.2	$1196.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and performance reporting is not required on this FP/EPA contract.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 14.7% (5 yrs/34 yrs)

(2) Percent Program Cost Appropriated: 1.5% ($310.9 / $20559.6)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY88-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2021)	Total
RDT&E	63.1	8.8	-	152.8	224.7
Procurement	66.3	172.7	294.1	19801.8	20334.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	129.4	181.5	294.1	19954.6	20559.6

16c. Program Funding Summary (Cont'd):

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research, Development, Test + Eval, Army								
1988				10.1	9.8	9.8	9.8	3.0
1989				25.6	27.0	26.9	25.3	4.2
1990				18.3	19.5	19.5	19.0	4.0
1991				6.1	6.8	6.4	2.2	3.9
1992				7.7	8.8	6.3		3.1
1993								3.3
1994								3.3
1995				0.7	0.9			3.3
1996				2.1	2.7			3.2
1997								3.2
1998				21.7	30.1			3.2
1999				27.4	39.2			3.2
2000				13.9	20.5			3.2
2001								3.2
2002								3.2
2003								3.2
2004								3.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)

Appropriation: 2040 Research, Development, Test + Eval, Army (Cont'd)

2005								3.2
2006								3.2
2007								3.2
2008								3.2
2009				15.2	29.8			3.2
2010				14.6	29.6			3.2
Subtot				163.4	224.7	68.9	56.3	

Appropriation: 2035 Other Procurement, Army

1991	277	15.5	35.8	57.6	66.3	66.0		3.9
1992	1197	7.1	121.3	145.3	172.7	16.2		3.1
1993	2384	9.7	212.0	239.7	294.1			3.3
1994	3585	1.9	287.3	308.4	390.7			3.3
1995	3634	1.8	281.3	306.1	400.2			3.3
1996	2654	13.4	238.0	274.8	370.8			3.2
1997	1781	16.9	94.2	141.3	196.8			3.2
1998	4425	2.2	364.6	389.4	559.6			3.2
1999	4427	2.0	352.8	377.1	559.3			3.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2035 Other Procurement, Army (Cont'd)								
2000	4429	2.0	342.2	365.6	559.6			3.2
2001	3856	10.0	332.7	362.1	571.9			3.2
2002	3832	16.2	319.6	363.1	591.9			3.2
2003	4340	1.8	353.0	385.2	648.0			3.2
2004	4360	1.8	343.6	370.6	643.4			3.2
2005	4621	1.8	355.2	382.2	684.8			3.2
2006	3018	10.0	253.8	283.0	523.3			3.2
2007	2924	16.2	236.6	277.7	529.9			3.2
2008	3749	1.8	305.8	336.1	661.9			3.2
2009	3883	1.8	307.8	334.2	679.2			3.2
2010	7097	1.8	577.9	610.9	1281.2			3.2
2011	5684	10.0	512.3	551.9	1194.5			3.2
2012	2255	16.2	171.1	209.3	467.4			3.2
2013	3747	1.8	302.9	333.8	769.4			3.2
2014	4679	1.8	375.4	399.9	951.2			3.2
2015	6385	1.8	510.6	539.6	1324.7			3.2
2016	4645	10.0	452.6	488.1	1236.6			3.2
2017	1669	16.2	156.0	199.0	520.2			3.2

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars Nonrec	Flyaway FY89 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)

Appropriation: 2035 Other Procurement, Army (Cont'd)

2018	3503	1.8	319.7	350.4	945.5			3.2
2019	4198	1.8	383.6	408.8	1138.2			3.2
2020	5084	2.6	448.6	476.6	1369.5			3.2
2021				10.8	32.1			3.2
Subtot	112322	199.7	9348.3	10278.6	20334.9	82.2		
Grand Total	112322	199.7	9348.3	10442.0	20559.6	151.1	56.3	

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1991	1235	0	277	N/A
1992	4850	0	1197	N/A
1993	8443	0	2384	N/A
1994	9772	0	3585	N/A
1995	7679	0	3634	N/A
1996	4735	0	2654	N/A
1997	9834	0	1781	N/A
1998	9838	0	4425	N/A
1999	9867	0	4427	N/A
2000	9843	0	4429	N/A
2001	4734	0	3856	N/A
2002	9827	0	3832	N/A
2003	9833	0	4340	N/A
2004	9537	0	4360	N/A
2005	8908	0	4621	N/A
2006	0	0	3018	N/A
2007	0	0	2924	N/A
2008	0	0	3749	N/A
2009	0	0	3883	N/A
2010	0	0	7097	N/A

17a. Production Rate Data (Cont'd):

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
2011	0	0	5684	N/A
2012	0	0	2255	N/A
2013	0	0	3747	N/A
2014	0	0	4679	N/A
2015	0	0	6385	N/A
2016	0	0	4645	N/A
2017	0	0	1669	N/A
2018	0	0	3503	N/A
2019	0	0	4198	N/A
2020	0	0	5084	N/A

Funded delivery periods for years that are other than 12 months are:
FY91 - 4 months
FY92 - 11 months

Quantities are the sum of trucks and trailers.

17b. Production Rate Data (Cont'd):

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	10442.0	N/A	N/A
(TY $)	N/A	N/A	20559.6	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	0.093	N/A	N/A
(TY $)	N/A	N/A	0.183	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	AUG 91	N/A	N/A
Duration (in MON)	N/A	N/A	359	N/A	N/A
End Date(MON YY)	N/A	N/A	JUL 21	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	147/147
Procurement	0/0

e. Approved Design-to-Cost Objective -- N/A.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The average miles/vehicle/year for the LMTV truck is 3,324 miles; the MTV truck is 6,006 miles; the LMTV trailer is 1,725 miles; the MTV trailer is 3,000 miles. The average years of operation (useful life) is 20 years. The dedicated crew/vehicle/year for LMTV trucks is .1 annual manyears per vehicle; for MTV trucks is .25 annual manyears per vehicle. Dedicated crew is not applicable for trailers. The current Baseline Cost Estimate dated Apr 1991 was used to develop the costs in section 18 b.

18a. Operating and Support Costs (Cont'd):

Due to the low dollar value of the Operating and Support Costs, all values in 18.b. are shown in FY89 Constant [Base-Year] Dollars in Thousands. There is no antecedent.

b. Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per LMTV	Avg Annual Cost Per (Antecedent)
Personnel	3.9	N/A
O&S Consumables	3.2	N/A
Direct Depot Maint	0.0	N/A
Sustaining Investment	0.1	N/A
Other Direct Costs	0.0	N/A
Indirect Costs	1.5	N/A
Total	8.7	N/A

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Other	0.5	---	---	---	0.5
Total	0.5	---	---	---	0.5

18. b. Costs--

(FY89 Constant [Base-Year] Dollars in Thousands)

Cost Element	Avg Annual Cost/MTV	Avg Annual Cost/LMTV Trailer	Avg Annual Cost/MTV Trailer
Personnel	6.93	1.10	1.23
O&S Consumables	7.72	0.18	0.37
Direct Depot Maint	0.06	0.00	0.00
Sustaining Investment	0.09	0.01	0.01

18. Operating and Support Costs (Cont'd):

Other Direct Costs	0.10	0.00	0.00
Indirect Costs	2.90	0.34	0.38
Total	17.80	1.63	1.99

A-29 PLS

91-060

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: FHTV (PLS)

AS OF DATE: December 31, 1991

INDEX

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1. **Designation and Nomenclature (Popular Name):**
   Family of Heavy Tactical Vehicles (FHTV)/Palletized Load System (PLS)

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
   US Army Acquisition Exec Spt Agency
   ATTN: SFAE-CS-TVH (COL Stoddart)
   PEO, Combat Support
   Warren, MI 48397-5000

   COL WILLIAM J. STODDART
   Assigned: June 5, 1989
   AV 786-5800 COMM (313) 574-5800

4. **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 64622 PROJECT D659
   Project D659
   PROCUREMENT:
   APPN 2035 ICN D16500 (Army)
   APPN 2035 ICN DA035A (Army) (Shared)
   APPN 2035 ICN DA0073 (Army) (Shared)

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AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

21

No SECURITY Objection to PUBLIC RELEASE
17 MAR 1992
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5. **Related Programs:** None.

6. **Mission and Description:**

The Palletized Load System (PLS) program is a 16.5 ton tactical

OASD(PA) DFOISR 92-T-0578

[redacted]

6. Mission and Description (Cont'd):

vehicle composed of a prime mover with integral self-load/unload capability, 16.5 ton trailer and flatracks (demountable cargo beds). Model variances include with and without Materiel Handling Equipment (MHE) crane, with and without winch. The PLS will perform line haul, local haul, unit resupply, and other required missions in support of modernized, highly mobile organizations. The PLS prime movers with associated trailers will selectively replace or augment, as established by individual proponent doctrine, the standard tactical non-PLS cargo vehicles currently authorized in units such as Field Artillery and Transportation. The objectives of the PLS program are to be interoperable with the United Kingdom and Germany, increase efficiency of ammunition distribution, reduce operating and support costs, and correct major deficiencies in the current heavy vehicle fleet.

7. Program Highlights:

a. Significant Historical Developments --

The PLS program conducted a successful Organizational/Operational conceptual evaluation at Ft. Lewis, WA in 1984. Force Development Test and Experimentation was conducted in late 1986 at Ft. Hood, TX.

Following this success, the Army Systems Acquisition Review Council (ASARC) approved the program in May 87. Congressional guidance stipulated that the program receive Non-Developmental Item (NDI) determination, that manufacture and assembly occur in the U.S.A., and that authority for source selection would be vested in the Department of the Navy. The Request for Proposal for the prototype phase was released to three competing contractors in Nov 88, and three contracts were awarded in Jan 89. The contractors receiving awards were GM-MVO, Oshkosh Truck Corporation and PACCAR Government Group. A formal request was made of Congress in Jul 89 for an extension to the original Dec 89 deadline for selection of the production source until Jun 90. This extension was approved in the FY90/91 Defense Authorization Act. The first prototype vehicle was delivered in Aug 89, and testing proceeded on schedule.

A Memorandum of Understanding has been executed with Great Britain and Germany to ensure interoperability of PLS flatracks with their comparable systems. Technical data has been exchanged between the three parties to define the necessary interfaces. The British flatrack was successfully tested on the U.S. PLS during the prototype phase. The German flatrack will be evaluated when it is available.

On 10 Sep 90 the Milestone IIIA Defense Acquisition Board (DAB) approved PLS for Low Rate Initial Production. In Jul 90, Oshkosh Truck Corp. was selected as the apparent successful bidder for the PLS solicitation. A five year multiyear contract was awarded to

7a. Program Highlights (Cont'd):

Oshkosh on 28 Sep 90. A quarterly exception SAR was submitted for 30 Sep 90 to report Nunn-McCurdy breaches in accordance with public law. The Secretary of the Army notified Congress on 13 Nov 90 that breaches had occurred in both Current Procurement Unit Cost (CPUC) for trucks, trailers and flatracks, and the Program Acquisition Unit Cost (PAUC) for trailers and flatracks. These breaches resulted primarily from repricing the reduced program quantities with the prices from the contract awarded on 28 Sep 90.

The Project Manager submitted a Unit Cost Report (UCR) on 10 Oct 90 for the quarter ending 30 Sep 90. This report reflected CPUC breaches identified above. Subsequently, the total program was re-estimated utilizing the prices from the 28 Sep 90 contract award and, in addition, PAUC breaches using this cost basis were identified.

Due to the above breaches, Secretary of Defense certification was submitted to Congress on 13 Dec 90. The current Acquisition Program Baseline dated 31 Oct 90, was approved and established costs in FY91 Base Year Dollars (previous base year was FY89).

b. Significant Developments Since Last Report --

Oshkosh Truck Corp. applied to the Internal Revenue Service for and received exemption from Federal Retail Excise Tax (FRET), since the PLS will primarily be used for off-road tactical missions.

An enhanced flatrack program was initiated to evaluate additional airlift and sealift capability. Enhanced features will be incorporated into production as directed by Congress. Shakedown testing was delayed due to an axle problem. This did not cause any serious delays in subsequent milestones. In Nov 91 the Test and Evaluation Master Plan (TEMP) was approved by OSD (Dir of Op Test & Eval).

The most significant changes reflected in the current estimate are in the cost area. Due to budget reductions associated primarily with a reduction in the projected rate of inflation, the quantity of flatracks was reduced. Other funds were reprogrammed to support Operation Desert Storm (ODS). There was a minor schedule change associated with a short delay in the start of the Shakedown Test. All technical parameters are unchanged from the previous report. This report previews the change in the PLS reporting to a single unit of measure from three, separate units of measure. This change will simplify reporting.

The PLS system is expected to satisfy mission requirements.

7b. **Program Highlights (Cont'd):**

c. Changes Since As Of Date --
The first IPT test vehicle arrived at the test site in Jan 92.

8. **Threshold Breaches:**
There are no breaches to the approved Acquisition Program Baseline (APB) dated 31 Oct 90. There are no Nunn-McCurdy unit cost breaches.

9. **Schedule:**

a. Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone I/II (ASARC)	MAY 87	MAY 87	MAY 87
ROC Approval	NOV 87	NOV 87	NOV 87
DAB Program Review	MAY 88	MAY 88	MAY 88
Prototype Contract Awards (3 Contractors)	JAN 89	JAN 89	JAN 89
First Prototype Delivery	AUG 89	AUG 89	AUG 89
FSD Development Testing			
Start	SEP 89	SEP 89	SEP 89
Complete	SEP 89	MAR 90	MAR 90
Early User Test and Experimentation Testing			
Start	DEC 89	JAN 90	JAN 90
Complete	FEB 90	MAR 90	MAR 90
Milestone IIIA (DAB)	APR 90	SEP 90	SEP 90
Production Award	APR 90	SEP 90	SEP 90
Pre-Shakedown Test			
Start	N/A	JAN 91	JAN 91
Complete	N/A	MAR 91	MAR 91
Shakedown Test			
Start	N/A	JUN 91	JUL 91(Ch-1)
Complete	N/A	JUL 91	DEC 91(Ch-1)
First Production Delivery	JAN 91	OCT 91	JAN 92(Ch-1)
Initial Production Test			
Start	JAN 91	NOV 91	JAN 92(Ch-1)
Complete	AUG 91	MAY 92	OCT 92(Ch-1)
IOT&E			
Start	N/A	NOV 91	APR 92(Ch-1)
Complete	N/A	MAY 92	MAY 92(Ch-1)
Milestone IIIB (ASARC)	N/A	AUG 92	NOV 92(Ch-1)
First Unit Equipped (FUE)	JAN 92	AUG 92	FEB 93(Ch-1)
Initial Operating Capability (IOC)	JAN 92	AUG 92	FEB 93(Ch-1)

9c. Schedule (Cont'd):

c. Current Change Explanations --

(Ch-1) Shakedown Test was delayed, and has caused the following changes to the schedule: Shakedown Test start and complete were Jun 91 and Jul 91, and are now Jul 91 and Dec 91; First Prod Deliv was Oct 91 and is now Jan 92; IPT start and complete were Nov 91 and May 92 and are now Jan 92 and Oct 92; IOT&E start and complete were Nov 91 and May 92 and are now Apr 92 and May 92; Milestone IIIB was Aug 92 and is now Nov 92; FUE and IOC were Oct 92 and are now Feb 93.

d. References --

Development Estimate:
DAE Program Baseline, Mar 1989; SDDM decision 7 Oct 1988.

Approved Program:
AAE Approved Acquisition Program Baseline dated 31 October 1990.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Highway Speed on 2% Grade at GVW (mph)	50	50 / 45		50/45
Highway Speed on 2% Grade at GCW (mph)	35	35 / 30		35/30
PLS Truck/Trailer Load (tons)	16.5	16.5 / 16.5		16.5
Longitudinal Grade Operation (%)	30	30 / 30		30
Side Slope Operation (%)	30	30 / 30		30
Fording Capability (inches)	30	30 / 30		30
Operating Range on Integral Fuel at GCW (miles)	225	225 / 225		225
RELIABILITY				
Truck				
MMBHMF (miles)	1600	2250 / 2250		2250
MMBOMF (miles)	1500	1500 / 1500		1500
Trailer				
MMBHMF (miles)	1200	2280 / 2280		2280
MMBOMF (miles)	1900	1900 / 1900		1900

MHC

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
MHBHMF (hours)	225	225 / 225		225
MHBOMF (hours)	150	150 / 150		150
MAINTENANCE RATIO				
TRUCK				
MMHPOM (Operational)	.018	0.015 / 0.015		0.015
MMHPOM (Technical)	.016	0.013 / 0.013		0.013
Trailer				
MMHPOM (Operational)	.005	0.005 / 0.005		0.005
MMHPOM (Technical)	.004	0.004 / 0.004		0.004
MHC				
MMHPOH (Operational)	.100	0.100 / 0.100		0.100
MMHPOH (Technical)	.083	0.083 / 0.083		0.083
TRANSPORTABILITY				
Surface Transportation (Highway, Ship & Rail)	(H,S&R)	(H,S&R) / (H,S&R)		(H,S&R)
Air Transportation	C-141	C-141 / C-141		C-141
MOBILITY (Vehicle Cone Index)				
Truck with MHC	39	39 / 39		39
Truck without MHC	37	37 / 37		37
Truck & Trailer Combination	43	50 / 50		50

There are no demonstrated production performance values available at this time.

MMBHMF = Mean Miles Between Hardware Mission Failure
MMBOMF = Mean Miles Between Operational Mission Failure
MHBHMF = Mean Hours Between Hardware Mission Failure
MHBOMF = Mean Hours Between Operational Mission Failure
MMHPOM = Maintenance Man Hour/Operating Mile
MMHPOH = Maintenance Man Hour/Operating Hour

GVW = Gross Vehicle Weight
GCW = Gross Combined Weight
MHC = Material Handling Crane

b. Previous Change Explanations -- None.

c. Current Change Explanations -- None.

10d. Performance Characteristics (Cont'd):

d. References --

Development Estimate:
DAE Program Baseline, Mar 1989; SDDM decision 7 Oct 1988.

Approved Program:
AAE Approved Acquisition Program Baseline dated 31 October 1990.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	41.4	44.6	43.8
Procurement	1805.5	1250.8	1195.6
Recurring Production	(1644.8)		(1112.6)
Non-recurring Production	(10.5)		(14.3)
Total Rollaway	(1655.3)		(1126.9)
Other Wpn Sys Cost	(83.8)		(31.3)
Total Other Wpn Sys	(83.8)		(31.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(66.4)		(37.4)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 91 Base-Year $	1846.9	1295.4	1239.4
Escalation	150.0	199.4	179.2
Development (RDT&E)	(-2.4)	(-1.9)	(-1.8)
Procurement	(152.4)	(201.3)	(181.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1996.9	1494.8	1418.6

b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	4333	3462	3462
Total	4333	3462	3462

There are RDT&E prototype quantities of 27 trucks, 18 trailers and 90 flatracks which are not considered fully-configured end items.

c. Foreign Military Sales --
International Developments of Interest:

Although PLS is not an International Cooperative Program in the formal sense, a Memorandum of Understanding has been made with Great Britain and Germany to ensure interoperability of PLS flatracks with

11c. Total Program Cost and Quantity (Cont'd):
their comparable systems. Technical data has been exchanged between the three parties to define the necessary interfaces. The British flatrack was successfully tested on the U.S. PLS during the prototype program. The German flatrack will be evaluated when it is available. There is no shared FMS funding for the PLS program.

d. Nuclear Costs -- None.

e. References --

Development Estimate:
DAE Program Baseline, Mar 1989; SDDM decision 7 Oct 1988.

Approved Program:
AAE Approved Acquisition Program Baseline dated 31 October 1990.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1070.6	1101.9	1418.6
(2) Quantity	3462	3462	3462
(3) Unit Cost	0.309	0.318	0.410
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	83.2	83.2	326.1
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	83.2	83.2	326.1
(2) Quantity	281	281	961
(3) Unit Cost	0.296	0.296	0.339

Trailers:	Current Estimate (DEC 91 SAR)	Current Year UCR Baseline (DEC 90 SAR)	Budget Year UCR Baseline (DEC 91 SAR)
a. Program Acquisition			
(1) Cost (TY$)	61.7	62.1	N/A
(2) Quantity	1441	1441	N/A
(3) Unit Cost	.043	.043	N/A
b. Current Procurement	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	4.7	4.7	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus PY Adv Proc	N/A	N/A	N/A
Net Total	4.7	4.7	N/A

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

(2)	Quantity	112	112	N/A
(3)	Unit Cost	.042	.042	N/A

Flatracks:	Current Estimate (DEC 91 SAR)	Current Year UCR Baseline (DEC 90 SAR)	Budget Year UCR Baseline (DEC 91 SAR)
a. Program Acquisition			
(1) Cost	286.3	326.5	N/A
(2) Quantity	39771	45242	N/A
(3) Unit Cost	.007	.007	N/A
b. Current Procurement	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost	12.9	12.9	N/A
Less CY Adv Proc	N/A	N/A	N/A
Plus PY Adv Proc	N/A	N/A	N/A
Net Total	12.9	12.9	N/A
(2) Quantity	1833	1833	N/A
(3) Unit Cost	.007	.007	N/A

The UCR Baseline for the budget year reflects a change in the unit of measure for PLS, i.e., from trucks, trailers and flatracks to trucks only.

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	39.0	1957.9	0.0	1996.9
Previous Changes:				
Economic	+0.1	+143.0	-	+143.1
Quantity	-	-674.5	-	-674.5
Schedule	+5.5	+43.1	-	+48.6
Engineering	-	-	-	-
Estimating	-2.5	+54.0	-	+51.5
Other	-	-	-	-
Support	-	-75.1	-	-75.1
Subtotal	+3.1	-509.5	-	-506.4
Current Changes:				
Economic	-	-23.5	-	-23.5
Quantity	-	-40.8	-	-40.8
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.1	+1.7	-	+1.6
Other	-	-	-	-
Support	-	-9.2	-	-9.2
Subtotal	-0.1	-71.8	-	-71.9
Total Changes	+3.0	-581.3	-	-578.3
Current Estimate	42.0	1376.6	-	1418.6

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	41.4	1805.5	0.0	1846.9
Previous Changes:				
Quantity	-	-534.3	-	-534.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+2.3	+40.7	-	+43.0
Other	-	-	-	-
Support	-	-74.2	-	-74.2
Subtotal	+2.3	-567.8	-	-565.5
Current Changes:				
Quantity	-	-34.2	-	-34.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.1	-0.6	-	-0.5
Other	-	-	-	-
Support	-	-7.3	-	-7.3
Subtotal	+0.1	-42.1	-	-42.0
Total Changes	+2.4	-609.9	-	-607.5
Current Estimate	43.8	1195.6	-	1239.4

b. Previous Change Explanations --

RDT&E

Economic: Revised escalation indices

Schedule: Correction to previous variance to reconcile schedule change.

Estimating: Miscellaneous reductions for bill payers
Revised estimate for Technical Data Package and other efforts
Reprogramming to Family of Medium Tactical Vehicles
Correction to previous variance to reconcile schedule change

13b. Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic:	Revised escalation indices
Quantity:	Revised engineering, test and QA/test support efforts
	Increased quantity of storage flatracks
Schedule:	Army force structure reductions
	Change in flatrack procurement schedule
Estimating:	Revised engineering, test and QA/test support efforts; Gov't estimated prices replaced with actual contract prices
	Correction to previous variance to reconcile rollaway and support costs
	Decrease in System Technical Support
	Increases in testing, quality assurance and engineering
	Former Federal Retail Excise Tax (FRET) funding awaiting below threshold reprogramming
	Contract program level pricing changed constant dollar totals
Support:	Reduced initial spares and change in cost elements for FRET and STS
	IRS Revenue Ruling waived FRET for PLS
	Realignment of Initial Spares
	Inclusion of Total Package Fielding/First Destination Transportation
	PM salaries transferred from OMA Appn

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Correction of prior year values (Estimating)	0.1	-0.1
Total Changes	0.1	-0.1

13c. Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation indices (Economic)	--	-23.5
Flatracks and associated warranty reduced from the program. (Quantity)	-34.2	-40.8
Current & Prior Year Inflation Offset (Estimating)	--	3.3
Below threshold reprogramming of Federal Retail Excise Tax (FRET) savings for ODS and other support (Estimating)	-17.1	-18.0
Adjustment to off-set negative economic change and resulting loss of program funds and flatrack quantity reduction. (Estimating)	19.5	19.8
Reduction to ECO's resulting from loss of program funds (Estimating)	-3.0	-3.4
Minor reductions in documentation, initial spares, special tools and TPF/FDT. (Support)	-7.3	-9.2
Total Changes	-42.1	-71.8

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
0.461	0.035	-0.091	0.014	--	0.015	--	-0.024	-0.051	0.410

The above data reflects a single unit of measure (trucks) which is being proposed for the Budget Year UCR Baseline.

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

Production PLS (FHTV):	Initial Contract Price Target	Ceiling	Qty
OSHKOSH TRUCK CORPORATION, OSHKOSH, WI DAAE07-90-C-R035, FP-EPA Award: September 28, 1990 Definitized: September 28, 1990	$859.6	N/A	14706

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$859.6	N/A	14706	$859.6	$859.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

Cost and performance reporting is not required on this FP/EPA contract.

Contract prices and the quantity of 14,706 reflect the total basic contract for trucks, trailers, and flatracks on the five year multi-year contract.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 55.6% (5 yrs/9 yrs)

(2) Percent Program Cost Appropriated: 22.4% ($318.2 / $1418.6)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY88-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-96)	Total
RDT&E	36.5	5.5	-	-	42.0
Procurement	175.4	100.8	326.1	774.3	1376.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	211.9	106.3	326.1	774.3	1418.6

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2040 Research, Development, Test + Eval, Army								
1988				5.4	4.9	4.9	4.9	3.0
1989				29.6	28.0	28.0	27.9	4.2
1990				3.7	3.6	3.5	3.4	4.0
1991								3.9
1992				5.1	5.5			3.1
Subtot				43.8	42.0	36.4	36.2	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY91 Dollars Nonrec	Flyaway FY91 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 2035 Other Procurement, Army								
1990	81	8.7	25.0	42.9	44.2	31.5	3.6	4.0
1991	423	0.8	122.2	123.2	131.2	129.7	9.1	3.9
1992	281	1.1	84.4	91.7	100.8			3.1
1993	961	1.3	272.5	287.2	326.1			3.3
1994	961	1.2	342.5	357.0	418.5			3.3
1995	755	1.2	266.0	281.4	340.5			3.3
1996				12.2	15.3			3.2
Subtot	3462	14.3	1112.6	1195.6	1376.6	161.2	12.7	
Grand Total	3462	14.3	1112.6	1239.4	1418.6	197.6	48.9	

Quantities shown are for trucks only. Procurement quantities for trailers and flatracks are:

	Trailers	Flatracks
1990	32	339
1991	169	1776
1992	112	1833
1993	385	4981
1994	385	17601
1995	358	13241
Total	1441	39771

17. Production Rate Data:

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1990	105	0	81	N/A
1991	784	0	423	N/A
1992	967	0	281	N/A
1993	948	0	961	N/A
1994	922	0	961	N/A
1995	607	0	755	N/A

The Quantities shown in 17a are for Trucks, the corresponding data for Trailers and Flatracks are as follows:

Trailers:

Fiscal Year	Development Estimate	Production Estimate	Current Estimate	Max Economic
90	83	N/A	32	N/A
91	342	N/A	169	N/A
92	386	N/A	112	N/A
93	378	N/A	385	N/A
94	368	N/A	385	N/A
95	358	N/A	358	N/A
96	N/A	N/A	N/A	N/A

Flatracks:

Fiscal Year	Development Estimate	Production Estimate	Current Estimate	Max Economic
90	565	N/A	339	N/A
91	3379	N/A	1776	N/A
92	4076	N/A	1833	N/A
93	3992	N/A	4981	N/A
94	22148	N/A	17601	N/A
95	34420	N/A	13241	N/A
96	34420	N/A	N/A	N/A

The production rates which have a funded delivery period which are other than 12 months are: FY90 - 4 months

17d. **Production Rate Data (Cont'd):**

FY91 - 14 months
FY92 - 5 months
FY93 - 10 months

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	1239.4	N/A	0.0
(TY $)	N/A	N/A	1418.6	N/A	0.0
PAUC Cost (BY $)	N/A	N/A	0.358	N/A	N/A
(TY $)	N/A	N/A	0.410	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	SEP 90	N/A	N/A
Duration (in MON)	N/A	N/A	73	N/A	N/A
End Date(MON YY)	N/A	N/A	OCT 96	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	27/27
Procurement	0/0

RDT&E deliveries to date represent trucks only. There were also 18 trailers and 90 flatracks planned and delivered.

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs:**

18a. Operating and Support Costs (Cont'd):

a. Assumptions and Ground Rules --

The average miles per vehicle year for the PLS with crane with winch is 3,000 miles; the PLS with crane without winch is 3,000 miles; the PLS without crane without winch is 4,900 miles; the trailer is 4,900 miles. The average Years of Operation (Useful Life) is 20 years. The dedicated Crew/Vehicle/Year for PLS trucks is 1.337 manyear/vehicle/year. There are no separately estimated Operating and Support Costs for flatracks. The Baseline Cost Estimate dated February 1990 is the source of the costs in section 18 b, modified to reflect program changes subsequent to publication.

Due to the low dollar value of the Operating and Support Costs, all values in 18.b. are shown in FY91 Constant [Base-Year] Dollars in Thousands. There is no antecedent.

b. Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Truck	Avg Annual Cost Per (Antecedent)
Personnel	41.3	N/A
O&S Consumables	8.6	N/A
Direct Depot Maint	0.0	N/A
Sustaining Investment	0.2	N/A
Other Direct Costs	0.3	N/A
Indirect Costs	6.1	N/A
Total	56.5	N/A

c. Contractor Support Costs -- None.

18. b. Costs--

(FY91 Constant [Base-Year] Dollars in Thousands)

Cost Element	Avg Annual Cost Per Trailer
Personnel	1.7
O&S Consumables	0.6
Direct Depot Maint	0.0

18. Operating and Support Costs (Cont'd):

Sustaining Investment	0.0
Other Direct Costs	0.3
Indirect Costs	0.0
Total	2.6

N-1 AAAM

~~SECRET~~

SELECTED ACQUISITION REPORT (RCS:DD-COMP(QSA)823)
PROGRAM: Advanced Air-to-Air Msl

AS OF DATE: December 31, 1991

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AS AMENDED

MAR 24 1992

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (WHS/ESD/OSR)
DEPARTMENT OF DEFENSE

1. (U) **Designation and Nomenclature (Popular Name):**
ADVANCED AIR-TO-AIR MISSILE (AAAM)

2. (U) **DoD Component:** Navy

3. (U) **Responsible Office and Telephone Number:**
Program Executive Officer (PEO) (T) CAPT M. W. O'BAR
PMA259 Assigned: March 1, 1991
WASHINGTON, DC 20361-1259 AV 222-8228/2676
COMM (703) 692-8228/2676

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 0603321N

5. (U) **Related Programs:**
F-14, F/A-18, AX Aircraft

No Security Objection to Publication
93-0249
MAR 24 1993
Office of the Chief of
Naval Operations Dept. of the Navy

~~Classified by: OPNAVINST 5513.2A-09.1~~
~~Declassify on: Originating Agency Determination Required (OADR)~~
~~Downgrade Instructions: Not Subject to Automatic Downgrade~~

(THIS PAGE IS UNCLASSIFIED)

OASD(PA) DPOISR 92-T-0681

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6. (U) Mission and Description:
The Advanced Air-to-Air Missile (AAAM) is a high energy, multi-mode, multi-spectrum long range missile designed for carriage by multiple aircraft in both the maritime Power Projection and Air Superiority mission areas. These missions include: a) support of the classical air superiority campaign, b) strike protection, and c) maritime air superiority. These missions include fighter, bomber, fighter-bomber, command and control and anti-ship missile threats. With the proliferation of modern aircraft and weapons to third world nations AAAM is designed to counter the regional as well as global threat.

Initial integration is planned on the F/A-18. The F/A-18 sensor suite will be able to fully exploit the AAAM in tactical scenarios that demand low altitude launches versus medium to high altitude targets, shots against retreating targets, and shots against targets with high bearing rates. AAAM will provide a multi-spectrum seeker to enable effectiveness against small radar cross section targets and targets employing ECM. AAAM, with its high energy capabilities, will provide the F/A-18, F-14 and AX Aircrft with an air superiority capability by providing a large shooting region from which there is no escape.

7. (U) Program Highlights:

a. (U) Significant Historical Developments —
The program has had two major reviews at the Navy and OSD level since its inception. A Defense Acquisition Board (DAB) Milestone I approval was granted 26 September 1988. Hughes & Raytheon (H&R) and General Dynamics/Westinghouse (GD/WEC) are the Joint Venture Contract Teams for Demonstration and Validation (D&V). Cost Plus Incentive Fee (CPIF) Contracts were awarded to each team in September 1988. A mid-term D&V OSD Conventional Systems Committee (CSC) review was conducted on 6 November 1990. No changes to the program resulted from these reviews, but three working groups were recommended to coordinate on matters of T&E, exit criteria, and the cost and operational effectiveness analysis effort. At an April 1991 program review, ASN (RDA) approved a $28.2M addition of funds to the AAAM program for GD/WEC cost growth as well as anticipated increased government support costs.

The two competing contractors are making steady progress in system design concepts. Wind tunnel testing has been completed and several risk reduction form-factored component designs have been fabricated. Laboratory tests have been performed on selected critical guidance section components. Rocket motors are in preliminary flight rating tests. The Separation and Control Test Vehicle (SCTV) design and parts fabrication are complete. Integration of the vehicle is in process.

b. (U) Significant Developments Since Last Report —
Contract modifications for FY 1992 were awarded to both Joint Venture Teams in December 1991. Hughes/Raytheon received $40.0M and General

7b. (U) Program Highlights (Cont'd):

Dynamics/Westinghouse received $32.2M. The General Dynamics/Westinghouse team also received $18.2M of FY 1991 overrun funds approved in a ASN (RDA) April 1991 program review. The AAAM Missile System will satisfy mission requirements.

The program was terminated by a SECDEF 29 January 1992 memorandum, and the program cost is below the dollar threshold for major defense acquisition program (MDAP) (10 USC 2430).

c. (U) Changes Since As Of Date —

A SECDEF 29 January 1992 memorandum directed that AAAM research and development not be funded beyond fiscal year 1992. This will necessitate foregoing AAAM EMD, although completion of DEMVAL was directed. Program activity and funding required to support the completion of DEMVAL is under review and will be provided when determined.

8. (U) Threshold Breaches:

There are no breaches to the APB dated 27 April 1989 and no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones —

	Planning Estimate	Approved Program	Current Estimate
Milestone 0	APR 87	APR 87	APR 87
Milestones I (DAB)	SEP 88	SEP 88	SEP 88
Milestones II (DAB)	MAR 93	N/A	MAR 93

b. (U) Previous Change Explanations —

None.

c. (U) Current Change Explanations — None.

d. (U) References —

(U) Planning Estimate:
FY 1992/93 President's Budget dated Feb 1991.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated January 28, 1992.

UNCLASSIFIED

10. (U) **Performance Characteristics:**

a. (U) Performance —

	PE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
(b)(1)				

ACRONYMS

MOAT - Missile-On-Aircraft Test
BIST - Built-In-Self Test
BIT- Built-In-Test

b. (U) Previous Change Explanations —

None.

c. (U) Current Change Explanations — None.

d. (U) References --

(U) Planning Estimate:
FY 1992/93 President's Budget dated Feb 1991.

10d. (U) **Performance Characteristics (Cont'd):**

(U) Approved Program:
DAE approved Acquisition Program Baseline dated January 28, 1992.

11. (U) **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

	Planning Estimate	Approved Program	Current Estimate
a. (U) Cost —			
Development (RDT&E)	1111.8	250.8	250.8
Procurement	0.0	N/A	0.0
Total Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 85 Base-Year $	1111.8	250.8	250.8
Escalation	477.2	57.6	57.6
Development (RDT&E)	(477.2)	(57.6)	(57.6)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1589.0	308.4	308.4
b. (U) Quantity —			
Development (RDT&E)	45	N/A	45
Procurement	0	N/A	N/A
Total	45	N/A	45

c. (U) Foreign Military Sales — None.

d. (U) Nuclear Costs — None.

e. (U) References —

(U) Planning Estimate:
FY 1992/93 President's Budget dated Feb 1991.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated January 28, 1992.

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary:**

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

13. (U) **Cost Variance Analysis:**

a. (U) Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1589.0	0.0	0.0	1589.0
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-1.7	-	-	-1.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1278.9	-	-	-1278.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1280.6	-	-	-1280.6
Total Changes	-1280.6	-	-	-1280.6
Current Estimate	308.4	-	-	308.4

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary — (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1111.8	0.0	0.0	1111.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-861.0	-	-	-861.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-861.0	-	-	-861.0
Total Changes	-861.0	-	-	-861.0
Current Estimate	250.8	-	-	250.8

b. (U) Previous Change Explanations —

c. (U) Current Change Explanations —

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Jan 92 economic escalation rates. (Economic)	—	-1.7
Reduction resulting from cancelling program after FY 1992. (Estimating)	861.0	-1278.9
Total Changes	861.0	-1280.6

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Total Changes	—	—

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) RDT&E —

(U) Dem/Val:	Initial Contract Price Target	Ceiling	Qty
GD/WEC, Pomona, CA N00019-88-C-0151, CPIF Award: September 30, 1988 Definitized: September 30, 1988	$110.0	$0.0	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$142.2	$142.2	0	$142.2	$150.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-15.9	$-4.8
Cumulative Variances To Date (11/11/91)	$-0.9	$-0.6
Net Change	$15.0	$4.2

Explanation of Change:

A contract modification was issued to fund an overrun of $22.2M. This same contract modification capped the contract price at $142.2M. Funding was provided in the amount of $18.2M. The difference of $4.0M will be handled through the FY-93 apportionment process. Variances are attributable to the following: costs are overhead, G&A, program management and system engineering analysis; schedules are overhead, G&A, IR seeker, control section, airborne test and systems engineering.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

(U) Dem/Val:	Initial Contract Price Target	Ceiling	Qty
Hughes/Raytheon, Canoga Park, CA N00019-88-C-0152, CPIF Award: September 30, 1988 Definitized: September 30, 1988	$110.0	$0.0	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$139.9	$139.9	0	$131.5	$150.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-10.6	$-3.4
Cumulative Variances To Date (11/30/91)	$-16.3	$-2.4
Net Change	$-5.7	$1.0

Explanation of Change:

The unfavorable cumulative cost variance is largely attributed to the following: the dewar and sensor/platform integration tasks on the IR Subsystem required extensive rework; the flight control system has required redesign and unplanned labor expenditures; the airframe has unanticipated redesign and parts growth and higher than anticipated labor requirements in the areas of program management, subcontract management, and systems analysis. The leading contributors to the unfavorable schedule performance are in the following areas: flight control, IR subsystem, airframe, systems engineering/program management, propulsion subsystem, and RF integration. The contractor is using fee to prevent increases in contract price as cost grows above his management baseline.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status —

(1) Percent Program Completed: 50.0% (6 yrs/12 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($308.4 / $308.4)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary —

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY87-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	219.9	88.5	-	-	308.4
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	219.9	88.5	-	-	308.4

c. (U) Annual Summary —

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 0400 RDT&E, Defense Agencies								
1987				4.0	4.3	4.3	4.2	2.7
1988				14.5	16.1	16.1	15.9	3.0
1989				25.5	29.6	29.6	29.3	4.2
1990				57.2	68.9	68.9	68.4	4.0
1991				80.9	101.0	101.0	87.9	3.9
1992				68.7	88.5	77.9	34.9	3.1
1993								3.3
1994								3.3

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 0400 RDT&E, Defense Agencies (Cont'd)								
1995								3.3
1996								3.2
1997								3.2
1998								3.2
Subtot	45			250.8	308.4	297.8	240.6	
Grand Total	45			250.8	308.4	297.8	240.6	

17. (U) **Production Rate Data:**

a. (U) Not applicable for Pre-Milestone II programs.

b. (U) Not applicable for Pre-Milestone II programs.

c. (U) Not applicable for Pre-Milestone II programs.

d. (U) Deliveries (Plan/Actual) — None.

e. (U) Not applicable for Pre-Milestone II programs.

18. (U) **Operating and Support Costs:**

Not applicable for Pre-Milestone II programs.

UNCLASSIFIED

AE2 AIWS

91-139

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AIWS

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name)**:
Advanced Interdiction Weapon System (AIWS), Baseline Weapon

2. (U) **DoD Component**: Navy

Joint Participants:
Air Force

3. (U) **Responsible Office and Telephone Number**:

Conventional Strike Weapons
PMA-201
Washington, DC 20361-1201
COMM (703) 286-2633

CAPT R. L. RAMSAY, III
Assigned: April 7, 1989
AV DSN 286-2633

4. (U) **Program Elements/Procurement Line Items**:

RDT&E:
PE 0604727N Project W2068, E2068

No Security Objection to Open Publication
(AS AMENDED)
93-CD-444
MAR 20 1992
Office of the Chief of
Naval Operations Dept. of the Navy

~~Classified by: MULTIPLE SOURCES~~
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OASD(PA) DEPSE 92-0602
AS AMENDED
FOR OPEN PUBLICATION
MAR 20 1992 22
DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

[redacted]

5. (U) **Related Programs**:
None.

6. (U) **Mission and Description**:
The AIWS is an air-to-ground weapon designed to attack a variety of targets during day, night, and adverse weather conditions. AIWS will enhance aircraft survivability as compared to current interdiction weapon systems by providing the capability for launch aircraft to standoff outside the range of most target area surface-to-air threat systems. The AIWS launch-and-leave capability will allow several target kills per aircraft sortie. AIWS will be integrated with Navy F/A-18, AV-8B, A-6 and A-X aircraft. A main focus of the AIWS development has been high payoff, low risk, low cost engineering solutions to effectively achieve both operational requirements and a low unit procurement cost. The program objective is to obtain an ample inventory of precision standoff weapons for use against the numerous less-than-high-value yet tactically significant targets which must be attacked in any given sustained conflict. The AIWS program will first develop a baseline weapon for use against fixed area targets. The baseline AIWS variant will include a kinematically efficient airframe, an integrated inertial/GPS navigation capability, and a BLU-97/B submunition payload. This weapon will be designed upfront for pre-planned product improvements (P3I) to enable the attack of blast/frag sensitive or moving point targets. The P3I variant will add a terminal seeker, a man-in-the-loop data link, and a unitary warhead. P3I will provide increased accuracy and lethality, and the capability for aimpoint selection, target discrimination, and bomb impact assessment. Through adherence to MIL STDs 8591 and 1760, and minimized weight and dimension considerations, AIWS will have considerable potential for compatibility with Air Force or NATO aircraft. Acquisition agreements are being definitized with the Air Force to integrate the BLU-108 SKEET submunition into the baseline AIWS for use on F-16 and other Air Force aircraft, and also to ensure mid-course guidance and terminal seeker are common between AIWS and USAF/USN Joint Direct Attack Munition (JDAM) programs.

This SAR reports only the RDT&E Baseline AIWS weapon.

7. (U) **Program Highlights**:
a. (U) Significant Historical Developments --
The Navy Strike/Anti-Surface Warfare Master Plan clearly identifies the need to replace the current inventory of interdiction weapons (Mavericks, Laser Guided Bombs, Skipper, and Walleye) with a weapon possessing a point target kill capability as well as the need for a standoff submunition dispensing weapon with the area target effectiveness of ROCKEYE and APAM. The AIWS technical requirements have been generated by the shortcomings and expense of these existing systems. AIWS will take advantage of state of the art technological

7a. (U) **Program Highlights (Cont'd)**:

opportunities to achieve significant operational effectiveness improvements over these current weapons. The upfront design of the baseline AIWS system allows for pre-planned product improvements (P3I) to provide increased accuracy, enhanced kill capability, an expanded target set and man-in-the-loop data link. The original Acquisition Plan (AP), AP-88-21, was approved on 1 July 1988. The AIWS program reviewed by the Defense Acquisition Board (DAB) on 5 June 1989 and an Acquisition Decision Memorandum (ADM) dated 29 June 1989 granted Milestone-I approval to enter an 18 month Demonstration/Validation (DEM/VAL) phase for the baseline AIWS program and directed the Navy to develop a plan for P3I. The P3I program will commence in fiscal year 1994. The baseline AIWS program completed DEM/VAL in July 1991 and the Source Selection process in December 1991. Current efforts support preparation for the Milestone-II DAB review in April 1992. Upon approval of Milestone-II, the Engineering and Manufacturing Development (E&MD) phase will commence.

b. (U) Significant Developments Since Last Report -- RDT&E Only SAR -- limited reporting is permitted for pre-Milestone II programs in accordance with Title 10, United States Code, Section 2432, "Selected Acquistion Reports". This is the initial SAR.

This system will satisfy mission requirements.

c. (U) Changes Since As Of Date -- None.

8. (U) **Threshold Breaches**:
There are currently four schedule breaches and a development cost breach of 34.8 percent to the Approved Program Baseline dated 27 June 1989. There are no Nunn McCurdy Unit Cost breaches.

9. (U) **Schedule**:

a. (U) Milestones --

	Planning Estimate	Approved Program	Current Estimate
Milestone I	JUN 89	JUN 89	JUN 89
Milestone II	MAR 91	MAR 91	APR 92(Ch-1)
Milestone IIIA	JUN 94	JUN 94	SEP 96(Ch-1)
[redacted]			

(b)(1)

b. (U) Previous Change Explanations -- None.

9c. (U) **Schedule (Cont'd)**:

c. (U) Current Change Explanations --

(CH-1) Milestone IIIA/IIIB terminology is not in accordance with the new DOD 5000.2 instructions. Low-Rate-Initial-Production (LRIP) is scheduled for September 1996 with Milestone III Full Production occurring July 1998.

MS-II delayed due to additional risk reduction efforts added to the DEM/VAL phase. Another twelve months delay pushed MS-III back to July 1998 due to administrative procurement lead times for tools and special test equipment.

d. (U) References --

(U) Planning Estimate:
Defense Acquisition Board (DAB), 5 June 89 and Deputy Secretary of Defense Acquisition Decision Memorandum (ADM), 29 June 1989.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 27 June 1989.

10. (U) **Performance Characteristics**:

a. (U) Performance --

	PE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

10a. (U) **Performance Characteristics (Cont'd)**:

	Approved Program	Demon-strated	Current
(b)(1)	[redacted]		

Acronyms:

AGL = above ground level
IMN = indicated mach no.
LBA = limits of basic airframe
MSL = mean sea level

10a. (U) **Performance Characteristics (Cont'd)**:

1. Including supersonic dash by F/A-18.

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

The target error budget has been better defined as a result of DEMVAL efforts.

d. (U) References --

(U) Planning Estimate:
Defense Acquistion Board (DAB), 5 June 89 and Deputy Secretary of Defense Acquisition Decision Memorandum (ADM), 29 June 89.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 27 June 1989.

11. (U) **Total Program Cost and Quantity**: **(Current Estimate in Millions of Dollars)**

	Planning Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	206.5	206.5	278.4
Procurement	0.0	N/A	0.0
Flyaway	(0.0)		(0.0)
Total Flyaway	(0.0)		(0.0)
Flyaway	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	44.2	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 85 Base-Year $	206.5	250.7	278.4
Escalation	53.5	66.3	94.4
Development (RDT&E)	(53.5)	(53.5)	(94.4)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(12.8)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	260.0	317.0	372.8
b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	N/S	N/A	N/A
Total	0	N/A	0

11c. (U) **Total Program Cost and Quantity (Cont'd)**:

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Planning Estimate:
Defense Acquisition Board (DAB), 5 June 89 and Deputy Secretary of Defense Acquisition Decision Memorandum (ADM), 29 June 1989.

(U) Approved Program:
DAE approved Acquisition Program Baseline dated 27 June 1989.

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary**:

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

13. (U) **Cost Variance Analysis**:

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	260.0	0.0	0.0	260.0
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	+14.9	-	-	+14.9
Quantity	-	-	-	-
Schedule	+35.8	-	-	+35.8
Engineering	-	-	-	-
Estimating	+62.1	-	-	+62.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+112.8	-	-	+112.8
Total Changes	+112.8	-	-	+112.8
Current Estimate	372.8	-	-	372.8

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	206.5	0.0	0.0	206.5
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	+26.1	-	-	+26.1
Engineering	-	-	-	-
Estimating	+45.8	-	-	+45.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+71.9	-	-	+71.9
Total Changes	+71.9	-	-	+71.9
Current Estimate	278.4	-	-	278.4

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Additional A/C integration requirements (Estimating)	15.9	21.8
Risk Reduction in E&MD (Estimating)	2.5	2.7
DAB decision on prototyping in DEMVAL (Estimating)	3.6	5.0
ILS Plans and management to support extended ILS development program (Estimating)	9.5	13.0
Test assets requirement increased from 65 to 102 units (Estimating)	14.3	19.6
Systems engineering and program management required as a result of the extended program schedule (Schedule)	16.3	22.3
Extension of 18 to 25 months DEMVAL (Schedule)	9.8	13.5
Adjustment of escalation rates. (Economic)	--	14.9
Total Changes	71.9	112.8

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Not required for Pre-Milestone II programs in accordance with 10 USC 2433.

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) AIWS E&MD:

TEXAS INSTRUMENTS, Lewisville, TX
TBD - - -, CPIF
Award: N/A
Definitized: N/A

Initial Contract Price		
Target	Ceiling	Qty
$0.0	$0.0	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$0.0	$0.0	0	$0.0	$0.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

15. (U) **Contract Information**: **Cont'd** (Then-Year Dollars in Millions)

Explanation of Change: None.

E&MD contract projected for award April 1992 to Texas Instruments.

16. (U) **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 54.5% (6 yrs/11 yrs)

(2) Percent Program Cost Appropriated: 29.9% ($111.3 / $372.8)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY87-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	58.5	52.8	66.9	194.6	372.8
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	58.5	52.8	66.9	194.6	372.8

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1987				0.9	1.0	1.0	1.0	2.7
1988				15.6	17.4	17.4	17.4	3.0

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars Nonrec	Flyaway FY85 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1989				13.0	15.1	15.1	15.1	4.2
1990				7.1	8.6	8.6	8.6	4.0
1991				13.1	16.4	16.4	12.6	3.9
1992				41.0	52.8	6.9		3.1
1993				50.3	66.9			3.3
1994				55.4	76.1			3.3
1995				46.9	66.6			3.3
1996				25.6	37.5			3.2
1997				9.5	14.4			3.2
Subtot				278.4	372.8	65.4	54.7	
Grand Total				278.4	372.8	65.4	54.7	

17. (U) **Production Rate Data**:

a. (U) Not applicable for Pre-Milestone II programs.

b. (U) Not applicable for Pre-Milestone II programs.

c. (U) Not applicable for Pre-Milestone II programs.

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Not applicable for Pre-Milestone II programs.

18. (U) **Operating and Support Costs**:

Not applicable for Pre-Milestone II programs.

N-27 LSD 41 CV

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LSD 41 CLASS (CV)

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
LSD 41 Class (Cargo Variant) Dock Landing Ship

2. (U) DoD Component: Navy

Joint Participants:
NONE

3. (U) Responsible Office and Telephone Number:
AMPHIBIOUS WARFARE AND STRATEGIC SEALIFT PROGRAM OFFICE (PMS377)
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, DC 20362-5101

MR. E.E. SHOULTS
Assigned: April 29, 1985
AV 332-8511 COMM (703)-602-8511

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 0603564N (Shared) Project 00408
PE 0604567N (Shared) Project 01803

AS AMENDED
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

Classified by: OPNAVINST S5513.2B-41
Declassify on: Originating Agency Determination Required (OADR)
Downgrade Instructions: Not Subject to Automatic Downgrade

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- 1 -

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No Security Objection to Public Release
MAR 23 1992
Office of the Chief of Naval Operations, Department of the Navy

92-T-0473

92-T-0649

4. (U) Program Elements/Procurement Line Items (Cont'd):

PROCUREMENT:
APPN 1611 ICN 3045 (Navy)
MILCON:
PE 0204796N

5. (U) Related Programs:
LCAC; LSD 41

6. (U) Mission and Description:
To conduct sustained combat operations; to project naval power ashore by transporting landing force elements, cargo, Landing Craft (LCAC) and Assault Amphibians to the objective area and by launching preloaded assault craft and amphibians, to support amphibious assault; and to operate in the amphibious warfare environment.

The LSD 41 (CV) is a variant of the LSD 41 Class and takes advantage of the considerable experience gained during design, construction, and initial fleet operation of the LSD 41 Class. The ship will differ from the LSD 41 Class in its larger capacities to lift vehicles and cargo with a reduction in size of the well deck to accommodate two LCAC instead of four. The LSD 41 (CV) will retain the capability to operate conventional and air-cushion landing craft and to launch and recover helicopters. The LSD 41 (CV) Hull Form and diesel propulsion plant are the same as for the LSD 41 Class.

7. (U) Program Highlights:
a. (U) Significant Historical Developments --
The Tentative Operational Requirement (TOR), promulgated on 27 November 1983, provided guidance to examine the feasibility of three alternative designs for a LSD 41 Class follow ship. The Ships Characteristics and Improvement Board (SCIB) on 3 January 1985 approved the LSD 41 (CV) configuration.

The LSD 41 Cargo Variant has no requirement for operational or development test and evaluation as all systems have been demonstrated on the LSD 41 Class.

Milestone II approval was given at the 10 December 1987 Navy Programming Decision Memorandum (NPDM) Review. On 17 June 1988, the Navy competitively awarded a Fixed Price Incentive Contract to Avondale Industries, Inc. for detail design and construction of the LSD 49 with options for LSD 50 through 53. On 20 November 1989, Milestone III approval was granted by ASN(S&L). On 22 December 1989, the option for construction of the LSD 50 was exercised.

Construction (PREFAB) of the LSD 49 started on 15 October 1990.

7b. (U) Program Highlights (Cont'd):

b. (U) Significant Developments Since Last Report — Construction (PREFAB) of LSD 50 started on 22 March 1991.

The option for construction of the LSD 51 was exercised on 27 March 1991.

On 27 December 1991 an Acquisition Program Baseline change request was submitted for approval to reflect a seven month slip in lead ship Delivery and IOC (BT and AT also) based on the Program Manager's estimate of shipbuilder performance.

The LSD 41 (CV) Program is planned to be removed from the Major Defense Acquisition Program list, therefore this is expected to be the Final SAR.

The LSD 41 (CV) Program is expected to meet its mission requirement.

c. (U) Changes Since As Of Date --
The Acquisition Program Baseline change submitted on 27 December 1991 was approved on 21 January 1992.

8. (U) Threshold Breaches:
Based on the 21 January 1992 NAE approved Baseline, which amended the Acquisition Program Baseline (APB) (dated 24 August 1990), there are no schedule or unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Production Estimate	Approved Program	Current Estimate
Milestone I	MAY 84	MAY 84	MAY 84
Milestone II	DEC 87	DEC 87	DEC 87
Contract Award	JUN 88	JUN 88	JUN 88
Milestone III	NOV 89	NOV 89	NOV 89
Launch First Ship	OCT 92	OCT 92	DEC 92(Ch-1)
Builders Trial	JUL 93	JAN 94	JAN 94(Ch-1)
Acceptance Trial	SEP 93	MAR 94	MAR 94(Ch-1)
Delivery	NOV 93	JUN 94	JUN 94(Ch-1)

(b)(1) [redacted]

IOC - Reflects date the lead ship is ready for operational deployment.

9b. (U) Schedule (Cont'd):

b. (U) Previous Change Explanations —

Launch First Ship, Current Estimate, changed to May 92 to reflect shipbuilders construction schedule.

c. (U) Current Change Explanations —

Change - 1
The Approved Program Baseline for BT, AT, Delivery, and IOC was revised based on the Shipbuilder's: past performance on the LSD 41 class ships; failure to maintain the LSD 49 construction schedule; current production workload; and alleged schedule impacts due to inclement weather and contract changes. Concurrently, the Current Estimate for Launch, BT, AT, Delivery, and IOC were revised to reflect the Program Manager's estimate.

d. (U) References —

(U) Production Estimate:
DCP, dated 7 November 1989, Subject "LSD 41 Cargo Variant."

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 21 Jan 1992.

10. (U) Performance Characteristics:

a. (U) Performance —	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Accommodations					
Troops	504	504	/ 504		504
Crew	419	419	/ 419		419
Vehicle Square Feet	14200	14200	/ 14200		14200
Marine Cargo (Cubic Feet)	40000	40000	/ 40000		40000
Helicopter Spots	1 + 1	1 + 1	/ 1 + 1		1 + 1
Landing Craft (LCAC)	2	2	/ 2		2
Length (ft)	609	609	/ 609		609
Beam (ft)	84	84	/ 84		84
Draft (ft)	20'4"	20'4"	/ 20'4"		20'4"
Speed (kts)	21.6	21.6	/ 21.6		21.6
(b)(1) [redacted]					
Mission Completion Success Probability (%)	75	75	/ 75		75

10a. (U) Performance Characteristics (Cont'd):

	Approved Program	Demon-strated	Current
(b)(1)	[redacted]		

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Production Estimate:
DCP, dated 7 November 1989, Subject "LSD 41 Cargo Variant."

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 21 Jan 1992.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	12.9	12.9	12.9
Procurement	1340.7	1340.7	715.3
Sailaway costs	(1336.2)		(710.6)
Total Sailaway	(1336.2)		(710.6)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(4.5)		(4.7)
Construction (MILCON)	3.3	3.3	3.4
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 88 Base-Year $	1356.9	1356.9	731.6
Escalation	338.2	338.2	93.1
Development (RDT&E)	(-0.4)	(-0.4)	(-0.4)
Procurement	(338.1)	(338.1)	(93.1)
Construction (MILCON)	(0.5)	(0.5)	(0.4)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1695.1	1695.1	824.7
b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	6	6	3
Total	6	6	3

11c. (U) Total Program Cost and Quantity (Cont'd):

c. (U) Foreign Military Sales — None.

d. (U) Nuclear Costs — None.

e. (U) References —

(U) Production Estimate:
DCP, dated 7 November 1989, Subject "LSD 41 Cargo Variant."

(U) Approved Program:
NAE approved Acquisition Program Baseline dated 21 Jan 1992.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	824.7	1336.5	824.7
(2) Quantity	3	5	3
(3) Unit Cost	274.90	267.30	274.90
b. (U) Current Procurement —	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	25.0	25.0	13.5
Less CY Adv Proc	25.0	25.0	13.5
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Note: The Budget Year UCR Baseline for FY 1993 CY Advance Procurement line reflects outfitting associated with prior ships.

13. (U) Cost Variance Analysis:

a. (U) Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	12.5	1678.8	3.8	1695.1
Previous Changes:				
Economic	-	-9.5	-	-9.5
Quantity	-	-324.7	-	-324.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+13.1	-	+13.1
Other	-	-	-	-
Support	-	-37.5	-	-37.5
Subtotal	-	-358.6	-	-358.6
Current Changes:				
Economic	-	-52.2	-0.1	-52.3
Quantity	-	-535.0	-	-535.0
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+37.9	+0.1	+38.0
Other	-	-	-	-
Support	-	+37.5	-	+37.5
Subtotal	-	-511.8	-	-511.8
Total Changes	-	-870.4	-	-870.4
Current Estimate	12.5	808.4	3.8	824.7

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary — (FY 1988 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	12.9	1340.7	3.3	1356.9
Previous Changes:				
Quantity	-	-238.5	-	-238.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+12.0	-	+12.0
Other	-	-	-	-
Support	-	-28.5	-	-28.5
Subtotal	-	-255.0	-	-255.0
Current Changes:				
Quantity	-	-434.0	-	-434.0
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+34.9	+0.1	+35.0
Other	-	-	-	-
Support	-	+28.7	-	+28.7
Subtotal	-	-370.4	+0.1	-370.3
Total Changes	-	-625.4	+0.1	-625.3
Current Estimate	12.9	715.3	3.4	731.6

b. (U) Previous Change Explanations —

PROCUREMENT

Economic: Revised Economic Escalation Rates

Quantity: Deletion of FY94 Ship

Estimating: Increase due to current & prior year inflation offset and cost growth partially offset by reduced cost estimates and CAAS reductions.

Support: Reduction for outfitting and post delivery associated with deleted FY94 ship and reduced estimates.

13c. (U) Cost Variance Analysis (Cont'd):

c. (U) Current Change Explanations —

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised economic escalation rates (Economic)	N/A	-52.2
Deletion of FY92 and FY93 ship (Quantity)	-419.0	-544.9
Estimating change based on reduced quantity (Estimating)	-8.9	-12.9
Economic adjustment for Negative PCR (Quantity)	N/A	31.1
Congressional addition of LLTM funding for future ship (Estimating)	20.8	25.0
Current & Prior Year Inflation Offset (Estimating)	36.9	42.5
Revised Cost Estimates (Estimating)	-0.3	-0.5
Revised Cost Estimates (Support)	0.1	0.1
Mis-categorization of outfitting and post delivery as Support vice sailaway in prior SARs. (Support)	28.6	37.4
Correction of prior SAR outfitting and post delivery changes from Support to Quantity. (Quantity)	-15.0	-21.2
Correction of prior SAR outfitting and post delivery changes from Support to Estimating. (Estimating)	-13.6	-16.2
Total Changes	-370.4	-511.8
(2) MILCON		
Revised economic escalation rates (Economic)	N/A	-0.1
Current & Prior Inflation Offset (Estimating)	0.1	0.1
Total Changes	0.1	--

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Prod Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
330.30	17.30	-8.20	6.60	--	-65.08	--	1.60	-47.78	282.52

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
282.52	-20.60	-4.05	--	--	17.03	--	--	-7.62	274.90

15. (U) Contract Information: (Then-Year Dollars in Millions)

a. (U) Procurement —

(U) LSD 49 CONSTRUCTION:

Avondale Industries, Inc., New Orleans, LA
N00024-88-C-2048, FPI
Award: June 17, 1988
Definitized: June 17, 1988

Initial Contract Price		
Target	Ceiling	Qty
$147.0	$173.9	1

Current Contract Price		
Target	Ceiling	Qty
$151.5	$179.4	1

Estimated Price At Completion	
Contractor	Program Manager
$175.7	$179.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-12.1	$-2.3
Cumulative Variances To Date (12/31/91)	$-34.0	$-12.0
Net Change	$-21.9	$-9.7

Explanation of Change:

Cost Variance: The unfavorable net change of $21.9M is identified with greater than planned engineering efforts, higher than planned engineering and production labor rates, higher than planned overhead rates, and growth resulting from an underestimation of work bid.

Schedule Variance: The unfavorable net change of $9.7M is primarily

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) due to material as a result of major equipment subcontractors being behind schedule plus labor and overhead due to delays in resolving drawing issues, late material, and lack of labor resources. The unfavorable change was partially offset by an authorized baseline replanning.

The PM's Estimated Price at Completion takes these variances into consideration.

The Program Manager's Estimated Price at Completion is equal to the Ceiling Price of the contract. The PM's LRE exceeds ceiling and projects an overrun of $74.0M which results in a contractor loss of $32.8M after absorbing profit. The financial loss is reduced to $29.3M when the potential ILS Award Fee, imputed Facility Cost of Money, and profit on other FFP items are considered.

(U) LSD 50 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
Avondale Industries, Inc., New Orleans, LA N00024-88-C-2048, FPI Award: December 22, 1989 Definitized: December 22, 1989	$127.8	$139.7	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$128.3	$140.3	1	$140.0	$140.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$-0.3
Cumulative Variances To Date (12/31/91)	$-1.8	$-10.1
Net Change	$-1.8	$-9.8

Explanation of Change:

Cost Variance: The unfavorable net change of $1.8M is primarily associated with material costs being greater than planned together with labor and overhead rates being greater than planned and increased use of engineering subcontractors.

Schedule Variance: The unfavorable net change of $9.8M is primarily due to late delivery and non-issuance of material together with labor due to manpower shortages and shifting of available skilled labor resources to other in yard efforts plus lower than scheduled progress payments.

The PM's Estimated Price at Completion takes these variances into consideration.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) The Program Manager's Estimated Price at Completion is equal to the Ceiling Price. The PM's LRE exceeds ceiling and projects a $60.7M overrun which results in a contractor loss of $37.3M after absorbing profit. The financial loss is reduced to $34.3M when the potential ILS Award Fee, imputed Facility Cost of Money, and profit on other FFP items are considered.

(U) LSD 51 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
Avondale Industries, Inc., New Orleans, LA N00024-88-C-2048, FPI Award: March 27, 1991 Definitized: March 27, 1991	$127.2	$139.2	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$128.5	$140.8	1	$133.8	$140.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/31/91)	$-0.3	$0.4
Net Change	$-0.3	$0.4

Explanation of Change:

Since the LSD 51 option exercise was executed after the Dec 90 SAR, this is the first SAR to report variances.

Cost Variance: The current unfavorable variance is identified primarily with material.

Schedule Variance: The current favorable variance is identified primarily with early receipt of material.

The Program Manager's Estimated Price at Completion is equal to the Ceiling Price. The PM's LRE exceeds ceiling and projects a $60.2M overrun which results in a contractor loss of $36.9M after absorbing profit. The financial loss is reduced to $33.5M when the potential ILS Award Fee, imputed Facility Cost of Money, and profit on other FFP items are considered.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status —

(1) Percent Program Completed: 76.9% (10 yrs/13 yrs)

(2) Percent Program Cost Appropriated: 93.4% ($770.2 / $824.7)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY83-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-95)	Total
RDT&E	12.5	-	-	-	12.5
Procurement	728.9	25.0	13.5	41.0	808.4
MILCON	3.8	-	-	-	3.8
O&M	-	-	-	-	-
Total	745.2	25.0	13.5	41.0	824.7

c. (U) Annual Summary —

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1983				0.3	0.3	0.3	0.3	4.9
1984				0.8	0.7	0.7	0.7	3.8
1985				3.0	2.8	2.8	2.7	3.8
1986				0.7	0.7	0.7	0.7	2.8
1987				7.0	6.9	6.9	6.6	3.4

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1988				1.1	1.1	1.1	1.0	3.0
Subtot				12.9	12.5	12.5	12.0	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1988	1	39.2	219.6	247.7	264.5	240.6	118.4	2.3
1989								2.8
1990	1		213.0	199.6	225.7	195.5	71.1	1.3
1991	1		218.0	204.6	238.7	195.1	17.3	1.3
1992			20.8	20.8	25.0			3.1
1993				10.9	13.5			3.3
1994				23.9	30.7			3.3
1995				7.8	10.3			3.3
1996								3.2
1997								3.2
Subtot	3	39.2	671.4	715.3	808.4	631.2	206.8	

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY88 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1205 Military Construction, Navy								
1990				3.4	3.8	3.2	3.2	4.0
Subtot				3.4	3.8	3.2	3.2	
Grand Total	3	39.2	671.4	731.6	824.7	646.9	222.0	

17. (U) Production Rate Data:

a. (U) Annual Production Rates — None.

b. (U) Cost Variance — None.

c. (U) Schedule Variance — None.

d. (U) Deliveries (Plan/Actual) — None.

e. (U) Approved Design-to-Cost Objective — N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules —

LSD 49 (CV) Class O&S cost estimates were developed September 1991 based on historical return costs from LSD 36 and LSD 41 Class ships and are approximation using a mathematical model. The LSD 49 (CV) Class O&S cost estimates are given as an average annual O&S cost for each ship of the Class. The estimates are in FY88 constant dollars, the year of the first construction contract for an LSD 49 (CV) Class Ship. Direct personnel costs are the annual cost for enlisted and officers based on LSD 49 (CV) manning levels. Direct operations include the cost of fuel, repair parts, supplies, training, expended stores and purchased services. Direct maintenance is intermediate and depot maintenance costs. Indirect costs include training,

18a. (U) Operating and Support Costs (Cont'd):
publications, ammo handling, engineering and technical services. Personnel retirement costs are now included in Indirect costs.

b. (U) Costs — (FY 1988 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per LSD 41 (CV)	Avg Annual Cost Per LSD 36
Direct Personnel	7.5	6.2
Direct Operations	3.3	2.7
Direct Maintenance	7.3	7.1
Indirect Costs	2.9	0.3
Total	21.0	16.3

c. (U) Contractor Support Costs — None.

N-28 McM 1

91-145

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: MCM 1

AS OF DATE: December 31, 1991

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1. **Designation and Nomenclature (Popular Name):**
   MCM 1 (Avenger Class) Mine Countermeasures Ship

2. **DoD Component:** Navy

3. **Responsible Office and Telephone Number:**

MINE WARFARE Ship Acq. Program	SES JAMES D. COLLIE
Code PMS 303, Naval Sea Systems Com.	Assigned: December 20, 1991
Room 10S10, National Center # 3	AV 332-6481, 6482
Washington D.C. 20362-5101	COMM 703-602-6481,6482

CLEARED
FOR OPEN PUBLICATION

MAR 20 1992 9

DIRECTORATE FOR FREEDOM OF INFORMATION
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

4. **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 0603564N (Shared)
   PROCUREMENT:
   APPN 1611 ICN 32401500 (Navy)

5. **Related Programs:**
AN/SQQ-32 ADVANCED MINEHUNTING SONAR (MCMs 1 AND 10-14), AN/SQQ-30 MINEHUNTING SONAR (MCMs 2-9), AN/SLQ-48 MINE NEUTRALIZATION SYSTEM, AND AN/SSN-2 PRECISE INTEGRATED NAVIGATION SYSTEM

6. **Mission and Description:**
The MCM Ship Acquisition Program provides a new class of state of the art technology mine countermeasures ships which will replace the aging MSO 422/508 class ocean minesweeper fleet. The MCM is a 224 foot long wooden hull ship with 1312 ton full load displacement. It

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MAR 20 1992
M. Newell
Office of the Chief of
Naval Operations Dept. of the Navy

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OASD(PA) DFOISR 92-T-0606

6. Mission and Description (Cont'd):

utilizes low magnetic signature equipment, diesel propulsion, two controllable reversible pitch propellers, and a bow thruster. The ship is equipped with the AN/SQQ-30 Sonar (hulls 2-9) or AN/SQQ-32 Advanced Minehunting Sonar for hulls 1 and 10-14), AN/SLQ-48 Mine Neutralization System, AN/SSN-2 Precise Integrated Navigation System, AN/SLQ-38 Mechanical Sweep System, AN/SLQ-37 Accoustic and Magnetic Sweep System, and the AN/WQN-1 Channel Finder Navigation System.

7. Program Highlights:

a. Significant Historical Developments --
In June 1979, several alternative program approaches were evaluated in replacing the aging MSO 422/508 ocean minesweeper fleet. The CNO approved the basic MSO 523 ship design as a candidate for the new MCM ship and directed that variations of the MSO 523 design be investigated. In consideration of operational and mission requirements, the most appropriate alternative was selected in countering the deep ocean mine threat. This "trade off" analysis, completed during March 1980, was accomplished in lieu of a preliminary design effort. During the latter portion of the contract design effort, two Ship System Design Support (SSDS) contractors, one designated primary, the other secondary, were selected to participate in the ship design effort. The primary SSDS contractor, Peterson Builders, Inc. of Sturgeon Bay, WI, was awarded the contract for detail design and construction of the leadship (MCM 1 AVENGER). The MCM contract design was completed in February 1982 and award of the MCM 1 leadship was made in June 1982. Marinette Marine Corp. of Marinette, WI was selected as the follow yard and awarded MCM 2 in May 1983. The program entails the construction and delivery of fourteen MCMs. MCMs 1, 2, 3, 4, 5, 6, 7, and 8 have been delivered. The MCMs 9 and 10 are scheduled to deliver in August and October 1992, respectively. In addition the MCM 1 performed satisfactorily in the Persian Gulf and has returned after deployment.

b. Significant Developments Since Last Report --
Since the 31 December 1990 SAR report, MCM 4 was delivered during January 1991 and MCM 7 during August 1991. There has been an OT&E during this SAR period for the AN/SLQ 48 Mine Nuetralization Vehicle and a Class Shock test on the MCM 3 was conducted. Both were considered successful in testing and performance to standards. The MCM 7 was favorably inspected by the Navy's Board of Inspection and Survey prior to delivery. In addition, MCM 5 deployed to the Persian Gulf in June 1991 and satisfied all its mission requirements.

c. Changes Since As Of Date --
None.

8. Threshold Breaches:
There are currently no breaches to the acquisition program baseline (APB) (31 December 1988) and no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --

	Production Estimate	Approved Program	Current Estimate
Milestone I	APR 79	APR 79	APR 79
CEB Approval of Tradeoff Analysis	MAR 80	MAR 80	MAR 80
Milstone II	AUG 81	AUG 81	AUG 81
Leadership Award	JUN 82	JUN 82	JUN 82
Followyard Leadship Award	MAY 83	MAY 83	MAY 83
Milestone III	JUL 83	JUL 83	JUL 83
Leadship Delivery	AUG 87	AUG 87	AUG 87
Followyard Leadship Dlv	NOV 89	NOV 89	NOV 89

(1) CEB approved mission definition/commence tradeoff study in lieu of preliminary design.
(2) ASN (S&L) -- production decision memo.
(3) SECNAV authorization for followship production.

b. Previous Change Explanations --

Follow yard leadship delivered two months early.

c. Current Change Explanations --

NONE

d. References --

Production Estimate:
Initial (31 Dec 88) SAR baseline.

Approved Program:
DAE Approved Acquisiton Program Baseline dated 31 December 1988.

10. Performance Characteristics:

a. Performance --	PdE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Operating Crew	74	74 / 74	74	74
Beam (ft)	39	39 / 39	39	39
Draft (ft)	11.5	11.5 / 11.5	11.5	11.5
Length (ft)	224	224 / 224	224	224

10a. **Performance Characteristics (Cont'd):**

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Displace (tons)	1312	1312	/ 1312	1312	1312
Speed (knots)	13.5	13.5	/ 13.5	13.5	13.5
Endur (N.M. @10kts)	2500	2500	/ 2500	2500	2500

b. Previous Change Explanations -- None.

c. Current Change Explanations -- None.

d. References --

Production Estimate:
Initial (31 Dec 88) SAR baseline.

Approved Program:
DAE Approved Acquisiton Program Baseline dated 31 December 1988.

11. **Total Program Cost and Quantity:** (Current Estimate in Millions of Dollars)

a. Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	21.2	21.2	21.2
Procurement	1445.1	1445.1	1504.9
Basic Ship Cost	(838.3)		(924.3)
Government Furn. Equipment	(490.2)		(476.7)
Other Sailaway	(29.3)		(26.8)
Outfit/Post Delivery	(87.3)		(77.1)
Total Sailaway	(1445.1)		(1504.9)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 82 Base-Year $	1466.3	1466.3	1526.1
Escalation	271.1	271.1	261.9
Development (RDT&E)	(0.0)	(0.0)	(0.0)
Procurement	(271.1)	(271.1)	(261.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1737.4	1737.4	1788.0

11b. Total Program Cost and Quantity (Cont'd):

b. Quantity --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	0	0	0
Procurement	14	14	14
Total	14	14	14

c. Foreign Military Sales -- None.

d. Nuclear Costs --
NONE

e. References --

Production Estimate:
Initial (31 Dec 88) SAR baseline.

Approved Program:
DAE Approved Acquisiton Program Baseline dated 31 December 1988.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1788.0	1803.7	1788.0
(2) Quantity	14	14	14
(3) Unit Cost	127.71	128.84	127.71
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	19.5	19.5	15.1
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	19.5	19.5	15.1
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	21.2	1716.2	0.0	1737.4
Previous Changes:				
Economic	-	-2.7	-	-2.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+78.9	-	+78.9
Other	-	-	-	-
Support	-	-9.9	-	-9.9
Subtotal	-	+66.3	-	+66.3
Current Changes:				
Economic	-	-2.2	-	-2.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-10.3	-	-10.3
Other	-	-	-	-
Support	-	-3.2	-	-3.2
Subtotal	-	-15.7	-	-15.7
Total Changes	-	+50.6	-	+50.6
Current Estimate	21.2	1766.8	-	1788.0

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	21.2	1445.1	0.0	1466.3
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+65.1	-	+65.1
Other	-	-	-	-
Support	-	-10.5	-	-10.5
Subtotal	-	+54.6	-	+54.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+4.9	-	+4.9
Other	-	-	-	-
Support	-	+0.3	-	+0.3
Subtotal	-	+5.2	-	+5.2
Total Changes	-	+59.8	-	+59.8
Current Estimate	21.2	1504.9	-	1526.1

Net

b. Previous Change Explanations --

PROCUREMENT

Economic: Revised escalation indices.

Estimating: Net changes associated with increase for MCM 9-14 basic construction contract awards; increase required to cover Marinette Marine Corp. contract settlement; and reduction in GFE and Program Manager's Growth estimates.

Support: Reestimate of MCM outfitting and post delivery account requirements.

13c. Cost Variance Analysis (Cont'd):

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) PROCUREMENT		
Revised January 1992 economic escalation rates. (Economic)	--	-2.2
Net change for decreased coverage of REAs/Claims (-$3.7M), Change Orders (-$5.2M), and other revised estimates. (Estimating)	4.9	-10.3
Reestimate of MCM outfitting and post delivery account requirements. (Support)	0.3	-3.2
Total Changes	5.2	-15.7

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
124.100	-0.350	--	--	--	4.900	--	-0.936	3.614	127.714

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

MCM 9-11 CONSTRUCTION:
PETERSON BUILDERS, INC., STURGEON BAY, WI
N00024-89-C-2126, FFP
Award: February 14, 1989
Definitized: February 14, 1989

Initial Contract Price		
Target	Ceiling	Qty
$185.1	N/A	3

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$186.5	N/A	3	$186.5	$186.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-1.0	$-26.5
Cumulative Variances To Date (11/17/91)	$-4.4	$-14.1
Net Change	$-3.4	$12.4

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change: None.

For MCM 9-11 contract performance, the last annual SAR (12/90) contained contract variance data showing -$1.0M for cost and -$26.5M for schedule. Cost variance since the last annual SAR has increased unfavorably by -$3.4M. This variance is labor driven due to lower productivity levels and higher than expected overhead. The schedule improvement was due to a contractual change in delivery dates.

MCM 12-14 CONSTRUCTION:	Initial Contract Price Target	Ceiling	Qty
PETERSON BUILDERS, INC., STURGEON BAY, WI N00024-89-C-2126, FFP OPT Award: December 12, 1989 Definitized: December 12, 1989	$180.5	N/A	3

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$180.9	N/A	3	$180.9	$180.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.3	$4.3
Cumulative Variances To Date (11/03/91)	$3.6	$-7.0
Net Change	$3.3	$-11.3

Explanation of Change: None.

The MCM 12-14 contract performance reported on the last annual SAR (12/91) was a favorable cost variance of .3M and a favorable schedule variance of $4.3M. Since then the cost variance has become $3.3M more favorable, primarily due to lower than anticipated material costs. The schedule variance has become more unfavorable by -$11.3M due to late material delivery, primarily on the first ship (MCM-12), and temporary reallocation of labor resources to the previous flight of ships to effect workarounds and minimize overall program schedule variance.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 82.4% (14 yrs/17 yrs)

(2) Percent Program Cost Appropriated: 98.5% ($1761.1 / $1788.0)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY79-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-95)	Total
RDT&E	21.2	-	-	-	21.2
Procurement	1720.4	19.5	15.1	11.8	1766.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1741.6	19.5	15.1	11.8	1788.0

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1979				2.6	2.3	2.3	2.3	8.4
1980				3.7	3.3	3.3	3.3	10.6
1981				4.6	4.5	4.5	4.5	10.6
1982				3.1	3.2	3.2	3.2	7.6
1983				4.6	4.9	4.9	4.9	4.9
1984				1.0	1.1	1.1	1.1	3.8
1985				0.8	0.9	0.9	0.9	3.4
1986				0.3	0.4	0.4	0.4	2.8

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars Nonrec	Flyaway FY82 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1987				0.5	0.6	0.6	0.6	2.7
Subtot				21.2	21.2	21.2	21.2	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1982	1		119.7	119.7	130.4	114.3	111.6	7.5
1983	1		120.2	120.2	132.9	130.0	127.4	3.8
1984	3		346.9	346.9	390.7	369.0	358.1	3.6
1985	4		348.2	348.2	399.2	364.1	337.3	2.1
1986	2		244.4	244.4	286.2	267.8	197.2	1.1
1987			9.5	9.5	11.4	8.4	7.3	1.5
1988			2.5	2.5	3.1	3.0	2.9	2.3
1989			4.8	4.8	6.1	5.3	4.0	2.8
1990	3		267.8	267.8	349.1	306.3	162.1	1.3
1991			8.4	8.4	11.3	3.5	2.1	1.3
1992			14.0	14.0	19.5			3.1
1993			10.5	10.5	15.1			3.3
1994			7.8	7.8	11.5			3.3
1995			0.2	0.2	0.3			3.3

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
Subtot	14		1504.9	1504.9	1766.8	1571.7	1310.0	
Grand Total	14		1504.9	1526.1	1788.0	1592.9	1331.2	

17. **Production Rate Data:**

a. Annual Production Rates -- None.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	1526.1	N/A	N/A
(TY $)	N/A	N/A	1788.0	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	109.007	N/A	N/A
(TY $)	N/A	N/A	127.714	N/A	N/A

17c. **Production Rate Data (Cont'd):**

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	8/8

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules --

O & S costs associated with the Mine Countermeasures (MCM) ship are based on a 35 year service life. Estimates are based on an "operating tempo" approach and include direct costs to support the primary personnel to operate the ships (currently authorized force level of 14 ships), Operations (including fuel, repair parts, supplies, training, and purchased services), IMA and depot maintenance, and Indirect Costs including training, pubs, Eng/Tech services, retirement, and PCS transfer costs.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1982 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per MCM 1 Class Ship	Avg Annual Cost Per
DIRECT PERSONNEL	2.0	N/A
UNIT OPERATIONS	0.3	N/A
FUEL	0.1	N/A
DIRECT MAINTENANCE	1.2	N/A
INDIRECT COSTS	0.0	N/A
Total	3.6	N/A

c. Contractor Support Costs -- None.

Indirect costs are estimated at $11,000 ($82BY) per year ($.011M).

N-29 MHC 51

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SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: MHC 51

AS OF DATE: December 31, 1991

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MAR 24 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (WASD-PA) DEPARTMENT OF DEFENSE

9

1. **Designation and Nomenclature (Popular Name):**
MHC 51 (OSPREY Class) Coastal Minehunter Ship

2. **DoD Component:** Navy

3. **Responsible Office and Telephone Number:**

Mine Warfare Ship Program Office	SES James D. Collie
Code PMS 303, Naval Sea System Com.	Assigned: December 20, 1991
Room 10S10, National Center 3	AV 332-6481,6482
Washington D.C. 20362-5101	COMM 703-602-6481,6482

4. **Program Elements/Procurement Line Items:**

RDTGE:
PE 0604567N (Shared)
PROCUREMENT:
APPN 1611 ICN 32401500 (Navy)

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...Chief of
...Dept. of the Navy

5. **Related Programs:**
AN/SQQ-32 ADVANCED MINEHUNTING SONAR, AN/SLQ-48 MINE NEUTRALIZATION SYSTEM, AND AN/SYQ-13 NAVIGATION COMMAND & CONTROL (NAVC2) SYSTEM

OASD(PA) DFOISR 92-T-0682

6. **Mission and Description:**
The MHC 51 Coastal Minehunter Ship class will provide the the Navy with an enhanced surface minehunting, minesweeping, and mine neutralization capability into the 21st century. The MHC is a 57.2 meter long glass reinforced plastic (GRP) hull ship which will utilize low magnetic signature equipment, diesel engines and

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6. Mission and Description (Cont'd):

cycloidal propulsion. Major payload equipments include AN/SYQ-13 navigation, command, and control system, AN/SQQ 32 Advanced Minehunting Sonar, and, as modularly deployed, either a AN/SLQ-48 Mine Neutralization System or a mechanical minesweeping system. The MHC ship will serve as the "low-mix" complement to the ocean going Mine Countermeasures (MCM) ship and will operate in coastal waters and harbors worldwide to clear acoustic, magnetic, and pressure/ contact type mines from the bottom and surrounding water volume. The MHC may operate in coordination with both Airborne Mine Countermeasures (AMCM) helicopters and MCM ships.

7. Program Highlights:

a. Significant Historical Developments --
In May 1982, an Operational Requirement (OR) was issued for a "low mix" minehunter complement to the larger ocean going MCM ship. This effort culminated in the MSH-1 class design. MSH was terminated in November 1986 due to lack of shipbuilder ability to make sufficient progress and problems with the overall design development. The MHC program was initiated in 1986 to replace the MSH. The MHC design is based on the Italian LERICI Class Minesweepers designed and built by Intermarine S.p.A. (IMSpA), an Italian shipbuilder. IMSpA was awarded a design contract to modify the LERICI design to meet U.S. Navy operational requirements. Milestone I was approved June 1986. The MHC acquisition Program Endorsement Memo (PEM) for Milestone II (leadship production authorization) was issued by the Ass't Secretary of the Navy (Shipbuilding and Logistics) on 11 December 1986. This PEM granted approval to proceed with steps necessary for award of the first MHC contract sole source to Intermarine USA (IMUSA) with requirements to competitively select a second source shipbuilder. The production leadship (MHC 51) contract was awarded to IMUSA on 22 May 1987. IMUSA started hull construction in May 1988. Milestone IIIA (authorization for limited production) was approved in February 1989. The follow builder, Avondale Industries, Inc. (AII), was awarded the MHC 53 contract on 3 Oct 1989. Milestone IIIB (full rate production) approval was authorized in January 1990. The current MHC program force level authorization is for procurement of twelve ships. Award of the contract for the remaining 5 ships of the class (3 FY 92 with future option for 2 FY 93 ships) is planned for May 1992.

b. Significant Developments Since Last Report --
N/A -- This is initial SAR submission.

c. Changes Since As Of Date --
None.

8. Threshold Breaches:
N/A -- Initial SAR

9. Schedule:

a. Milestones --

	Production Estimate	Approved Program	Current Estimate
Milestone I 1/	JUN 86	JUN 86	JUN 86
Milestone II 2/	DEC 86	DEC 86	DEC 86
MHC 51 (Leadship) Award	MAY 87	MAY 87	MAY 87
Milestone IIIA 3/	FEB 89	FEB 89	FEB 89
MHC53, 1st ship to 2nd yard	OCT 89	OCT 89	OCT 89
Milestone IIIB 4/	JAN 90	JAN 90	JAN 90
Launch MHC 51 Leadship	MAR 91	MAR 91	MAR 91
MHC 51 Acceptance Trial	NOV 92	NOV 92	NOV 92
MHC 51 Delivery	DEC 92	DEC 92	DEC 92
MHC 53 Delivery	MAR 94	MAR 94	MAR 94

1/ ASN S&L authorization for contract design.
2/ ASN S&L Program Endorsement Memo authorizing Leadship production.
3/ ASN S&L authorization for limited production (MHCs 52 and 53).
4/ ASN S&L authorization for full rate production.

b. Previous Change Explanations --

N/A -- Initial SAR

c. Current Change Explanations --

N/A -- Initial SAR

d. References --

Production Estimate:
NAE approved Acquisition Program Baseline dated March 11, 1992.

Approved Program:
NAE approved Acquisition Program Baseline dated March 11, 1992.

10. Performance Characteristics:

10a. Performance Characteristics (Cont'd):

a. Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Operating Crew (Auth)	51	51	/ 51		51
Beam (meters)	11.0	11.0	/ 11.0		11.0
Draft (Nav) (meters)	2.8	2.8	/ 2.8		2.8
Length (meters)	57.2	57.2	/ 57.2		57.2
Full Load Disp (metric tons)	918	918	/ 964	*	918.0
Speed (knots)	10.0	10.0	/ 10.0	**	10.0
Endurance (NM @ 10 kts)(@ 80% power)	1500.0	1500.0	/ 1500.0	**	1500
Diesels (cyl)	2/8	2/8	/ 2/8		2/8
Shafts	2	2	/ 2		2
Horsepower @ (RPM)	1600 @ 1800	1600 @ 1800	/ 1600 @ 1800		1600 @ 1800

* Demonstrated Performance at Inclining Experiment. Current Estimate for MHC 51.
** Demonstrated Performance at Acceptance Trials (Scheduled currently for November 1992 timeframe).

b. Previous Change Explanations --

N/A -- Initial SAR

c. Current Change Explanations --

N/A -- Initial SAR

d. References --

Production Estimate:
NAE approved Acquisition Program Baseline dated March 11, 1992.

Approved Program:
NAE approved Acquisition Program Baseline dated March 11, 1992.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	17.2	17.2	17.2
Procurement	1440.2	1440.2	1440.2
Basic	(966.4)		(966.4)
Government Furnished Equipment	(346.9)		(346.9)
Other	(31.9)		(31.9)
Outfitting/Post Delivery	(80.1)		(80.1)
Total Sailaway	(1425.3)		(1425.3)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(14.9)		(14.9)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 92 Base-Year $	1457.4	1457.4	1457.4
Escalation	90.9	90.9	90.9
Development (RDT&E)	(-2.2)	(-2.2)	(-2.2)
Procurement	(93.1)	(93.1)	(93.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1548.3	1548.3	1548.3

Then year program cost values and quantities are to the Amended FY 92/93 President's Budget Submit.

b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	12	12	12
Total	12	12	12

c. Foreign Military Sales -- None.

d. Nuclear Costs --
N/A

e. References --

Production Estimate:
NAE approved Acquisition Program Baseline dated March 11, 1992.

Approved Program:
NAE approved Acquisition Program Baseline dated March 11, 1992.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	1548.3	1548.3	1548.3
(2) Quantity	12	12	12
(3) Unit Cost	129.03	129.03	129.03
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	355.9	355.9	267.4
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	355.9	355.9	267.4
(2) Quantity	3	3	2
(3) Unit Cost	118.63	118.63	133.70

13. Cost Variance Analysis:

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	15.0	1533.3	0.0	1548.3
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	15.0	1533.3	-	1548.3

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1992 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	17.2	1440.2	0.0	1457.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	17.2	1440.2	-	1457.4

N/A -- Initial SAR

b. Previous Change Explanations --

c. Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year
(1) PROCUREMENT		
Total Changes	--	--

14. **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
129.025	--	--	--	--	--	--	--	--	129.025

15. **Contract Information:** (Then-Year Dollars in Millions)

a. Procurement --

MHC 51 (LEADSHIP):	Initial Contract Price Target	Ceiling	Qty
INTERMARINE U.S.A., SAVANNAH, GA N00024-87-C-2136, FPI Award: May 22, 1987 Definitized: February 14, 1989	$80.3	$116.4	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$83.5	$121.1	1	$121.1	$121.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (11/30/91)	$-97.2	$-4.7
Net Change	$-97.2	$-4.7

Explanation of Change: None.

($ In Millions) MHC 51 contract is forward priced -- dollars in then year. Cumulative variances to date are based on 30 November 91 CPR values. Total cost estimate at completion: Contractor, $188.2M; PM, $198.5M.

MHC 52:	Initial Contract Price Target	Ceiling	Qty
INTERMARINE U.S.A., SAVANNAH, GA N00024-89-C-2152, FPI Award: February 17, 1989 Definitized: February 17, 1989	$59.4	$65.7	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$60.6	$68.4	1	$68.4	$68.4

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (11/30/91)	$-12.0	$-4.6
Net Change	$-12.0	$-4.6

Explanation of Change: None.

($ in Millions) Values are expressed in then year dollars. Contractor and PM estimate at completion cost is $80.6M.

MHC 53:	Initial Contract Price Target	Ceiling	Qty
AVONDALE INDUSTRIES, GULFPORT, MS N00024-89-C-2162, FPI Award: October 3, 1989 Definitized: October 3, 1989	$62.4	$75.0	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$63.0	$75.6	1	$75.6	$75.6

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/31/91)	$-18.3	$-7.1
Net Change	$-18.3	$-7.1

Explanation of Change: None.

($ in Millions) Values in contract base year dollars. Contract values include technical manual contract effort. PM and contractor estimate at completion cost is $87.8M.

MHC 54:	Initial Contract Price Target	Ceiling	Qty
AVONDALE INDUSTRIES, GULFPORT, MS N00024-90-C-2304, FPI Award: August 2, 1990 Definitized: August 2, 1990	$63.6	$66.2	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$63.7	$66.6	1	$64.9	$64.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/31/91)	$1.1	$-5.3
Net Change	$1.1	$-5.3

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change: None.

($ In Millions) Values in contract base year dollars. Contract values include technical manual and technical repair standards contract effort.

MHC 55:	Initial Contract Price Target	Ceiling	Qty
INTERMARINE USA, SAVANNAH, GA N00024-91-C-2214, FPI Award: April 1, 1991 Definitized: April 1, 1991	$77.5	$85.3	1

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$77.6	$85.3	1	$77.9	$78.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (11/30/91)	$0.3	$0.8
Net Change	$0.3	$0.8

Explanation of Change: None.

($ IN MILLIONS) Values are expressed in then year dollars.

MHC 56/57 (OPTION):	Initial Contract Price Target	Ceiling	Qty
AVONDALE INDUSTRIES, GULFPORT, MS N00024-90-C-2304, FPI Award: March 29, 1991 Definitized: March 29, 1991	$111.0	$115.3	2

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$111.0	$115.3	2	$114.0	$115.3

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/31/91)	$-0.3	$-0.2
Net Change	$-0.3	$-0.2

Explanation of Change: None.

Exercised option to MHC 54 contract. ($ IN MILLIONS -- expressed in contract base years)

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 53.8% (7 yrs/13 yrs)

(2) Percent Program Cost Appropriated: 78.5% ($1215.0 / $1548.3)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY86-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	15.0	-	-	-	15.0
Procurement	844.1	355.9	267.4	65.9	1533.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	859.1	355.9	267.4	65.9	1548.3

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY92 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1986				1.8	1.5	1.5	1.5	2.8
1987				7.9	6.7	6.7	6.7	2.7
1988				4.3	3.8	3.8	3.8	3.0
1989				2.4	2.2	2.2	2.2	4.2
1990				0.8	0.8	0.8	0.8	4.0

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY92 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
Subtot				17.2	15.0	15.0	15.0	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1986	1		187.2	187.2	174.8	110.0	98.7	1.1
1987			0.8	0.8	0.8			1.5
1988								2.3
1989	2		219.2	219.2	221.5	181.4	116.1	2.8
1990	2		221.4	236.3	245.7	183.7	49.1	1.3
1991	2		187.7	187.7	201.3	202.1	23.4	1.3
1992	3		321.4	321.4	355.9	24.7		3.1
1993	2		233.9	233.9	267.4			3.3
1994			20.3	20.3	24.0			3.3
1995			14.1	14.1	17.2			3.3
1996			14.2	14.2	17.9			3.2
1997			2.5	2.5	3.3			3.2
1998			2.6	2.6	3.5			3.2
Subtot	12		1425.3	1440.2	1533.3	701.9	287.3	
Grand								

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY92 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
Total	12		1425.3	1457.4	1548.3	716.9	302.3	

FY 1990 excludes $15.5M TY ($14.9M FY 92 base year) of SQQ 32 Sonar and SLQ 48 MNS battle spares.

17. **Production Rate Data:**

a. Annual Production Rates -- None.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	1457.4	N/A	N/A
(TY $)	N/A	N/A	1548.3	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	121.450	N/A	N/A
(TY $)	N/A	N/A	129.025	N/A	N/A

17c. **Production Rate Data (Cont'd):**

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules --

O & S costs associated with the Coastal Minehunter (MHC) are based on a 35 year service life. Factors and associated O & S cost estimates are based on a new design ship class with first unit delivering December 1992. Estimates are based on an "operating tempo" approach and include direct costs to support the primary personnel to operate the ships (currently authorized force level of 12 ships), Operations (including fuel, repair parts, supplies, training, and purchased services), IMA and depot maintenance, and Indirect Costs including training, pubs, Eng/Tech services, retirement, and PCS transfer costs.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per MHC 51 Class Ship	Avg Annual Cost Per
Direct Personnel	1.8	N/A
Unit Operations	0.2	N/A
Fuel	0.1	N/A
Direct Maintenance	0.8	N/A
Indirect Costs	0.0	N/A
Total	2.9	N/A

c. Contractor Support Costs -- None.

Indirect cost are estimated at $10,000 per year ($.01M).

N-38 T-AGOS

91-085

*** UNCLASSIFIED ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: T-AGOS SURV SHIP

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. **Designation and Nomenclature (Popular Name):**
T-AGOS CLASS OCEAN SURVEILLANCE SHIP

2. **DoD Component:** Navy

3. **Responsible Office and Telephone Number:**
Zachary Taylor Building (NC #3)
2531 Jefferson Davis Highway
Arlington, VA 20362-5101
CAPT Theodore Dorpshank, USN
Assigned: August 2, 1991
AV 332-3507 COMM (703) 602-3507

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 0603564N (Shared) Project 0408 (Shared)
PE 0604567N (Shared) Project 1803 (Shared), 0857 (Shared)
PROCUREMENT:
APPN 1611 ICN 5030 (Navy)

5. **Related Programs:**

Surveillance Towed Array Sensor System (SURTASS)

No Security Objection to Open Publication
MAR 23 1992
Office of the Chief of Naval Operations Dept. of the Navy

*** UNCLASSIFIED ***

92-0642

6. Mission and Description:
MISSION: Under the Military Sealift Command (MSC), the T-AGOS will collect, process, and transmit acoustic data in support of the Navy Integrated Undersea Surveillance System (IUSS).

DESCRIPTION: The program consists of eighteen T-AGOS 1 Class (Monohull), and four T-AGOS 19 and six 23 Class (Small Waterplane Area Twin Hull - SWATH) ships. The T-AGOS 1 and 19 Classes serve as a platform for the SURTASS (SURveillance Towed Array Sensor System) and have accommodations for 30 (22 MSC crew and 8 technicians) and 34 (22 MSC crew and 12 technicians) respectively. The T-AGOS 23 Class serve as platforms for the SURTASS with a second acoustic system and have accommodations for 45 (26 MSC crew and 19 technicians). The T-AGOS are built to commercial standards and designed to support the SURTASS towed arrays and associated data processing/transmitting equipments.

7. Program Highlights:
a. *Significant Historical Developments* --
The T-AGOS 1 Class Program was established by Top Level Requirement OPNAVINST C9010.315 of 15 NOV 77. A production contract for the first twelve T-AGOS monohulls was awarded to Tacoma Boat Co. (TBC) on 15 SEP 80. When it became evident that TBC would be unable to complete construction of the twelve ships, Navy rescoped the TBC contract to ten ships on 27 SEP 85. The last of these monohulls (T-AGOS 10) was delivered on 20 JAN 87. The T-AGOS 11-12 were recompeted; a production contract was awarded to TBC on 18 SEP 87. T-AGOS 11 and 12 monohulls were delivered on 7 JUN 89 and 2 OCT 89 respectively.

A production contract for T-AGOS 13-18 was awarded to Halter Marine on 3 APR 85. Accommodations for these ships were for 33 personnel vice 30 as on prior ships. The last of these ships delivered on 12 JAN 90.

Operational Requirement 106-095-85 dated 23 JUN 86 and Top Level Requirement OPNAVINST C9010.339 of 4 FEB 88 established the T-AGOS 19 Class Program. McDermott Inc. was awarded a production contract on 4 OCT 86 for T-AGOS 19-22. T-AGOS 19 was delivered on 13 AUG 91. The Best Estimated Delivery Dates (BEDD) for T-AGOS 20, 21, and 22 are 13 APR 92, 9 OCT 92, and 24 APR 93, respectively.

Operational Requirement 164-095-88 dated 12 JUN 87 established the T-AGOS 23 Class Program. Tampa Shipyards Inc. was awarded a production contract for T-AGOS 23 on 28 MAR 91 with options for up to five additional ships. The BEDD for T-AGOS 23 is 28 MAY 94.

7b. Program Highlights (Cont'd):

b. Significant Developments Since Last Report --
N/A Initial Submission

c. Changes Since As Of Date --
None

8. Threshold Breaches:
There are no breaches to the Approved Program Baseline (APB) dated 11 MAR 92 and no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --	Production Estimate	Approved Program	Current Estimate
Top Level Requirement (T-AGOS 1 Class)	NOV 76	NOV 76	NOV 76
Production Contract Award: (T-AGOS 1)	SEP 80	SEP 80	SEP 80
Production Started: (T-AGOS 1)	APR 82	APR 82	APR 82
Launch: (T-AGOS 1)	JUL 83	JUL 83	JUL 83
Acceptance Trials: (T-AGOS 1)	MAR 84	MAR 84	MAR 84
Delivery: (T-AGOS 1)	APR 84	APR 84	APR 84
IOC (T-AGOS 1 Class)	SEP 84	SEP 84	SEP 84
Prod Contract Award (T-AGOS 13-18)	APR 85	APR 85	APR 85
Operational Requirement: (T-AGOS 19) Class	JUN 86	JUN 86	JUN 86
Prod Contract Award: (T-AGOS 19-22)	OCT 86	OCT 86	OCT 86
Operational Requirement: (T-AGOS 23 Class)	JUN 87	JUN 87	JUN 87
Prod. Contract Award: (T-AGOS 11-12)	SEP 87	SEP 87	SEP 87
Production Started: (T-AGOS 19)	SEP 87	SEP 87	SEP 87
Follow on Prod. Decision (T-AGOS 20-22)	SEP 88	SEP 88	SEP 88
Delivery: (T-AGOS 18)	JAN 90	JAN 90	JAN 90
Launch: (T-AGOS 19)	MAY 90	MAY 90	MAY 90
Prod. Contract Award: (T-AGOS 23)	MAR 91	MAR 91	MAR 91
Acceptance Trials: (T-AGOS 19)	JUN 91	JUN 91	JUN 91
Delivery: (T-AGOS 19)	AUG 91	AUG 91	AUG 91
IOC (T-AGOS 19 Class)	SEP 92	SEP 92	SEP 92
Delivery: (T-AGOS 22)	APR 93	APR 93	APR 93
Delivery: (T-AGOS 23)	MAY 94	MAY 94	MAY 94
IOC (T-AGOS 23 Class)	DEC 96	DEC 96	DEC 96
Delivery: (T-AGOS 28)	JAN 00	JAN 00	JAN 00
T-AGOS 19 Class NPDM	N/A	N/A	SEP 88
T-AGOS 23 Class DCP	N/A	N/A	AUG 89

9b. Schedule (Cont'd):

b. Previous Change Explanations --

N/A Initial Submission

c. Current Change Explanations --

N/A Initial Submission

d. References --

Production Estimate:
NAE approved Acquisition Program Baseline dated March 11, 1992.

Approved Program:
NAE approved Acquisition Program Baseline dated March 11, 1992.

10. Performance Characteristics:

a. Performance --	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
T-AGOS 1 Class					
Length Overall (ft)	224	224	/ 224	224	224
Beam (maximum) (ft)	43	43	/ 43	43	43
Draft (mean) (ft)	15'1"	15'1"	/ 15'1"	15'1"	15'1"
Displacement (Ltons)	2285	2285	/ 2285	2285	2285
Propulsion					
Diesel Electric	4	4	/ 4	4	4
Shafts	2	2	/ 2	2	2
SHP (ea)	800	800	/ 800	800	800
Accommodations					
Ship's Company	22	22	/ 22	22	22
Technicians	8	8	/ 8	8	8
Speed (kts)	11	11	/ 11	11	11
Radars	2	2	/ 2	2	2
Sonars	1	1	/ 1	1	1
T-AGOS 19 Class					
Length Overall (ft)	234'6"	234'6"	/ 234'6"	234'6"	234'6"
Beam (maximum) (ft)	93'6"	93'6"	/ 93'6"	93'6"	93'6"
Draft (mean) (ft)	24'9"	24'9"	/ 24'9"	24'9"	24'9"
Displacement (Ltons)	3397	3397	/ 3397	3397	3397
Propulsion					
Diesel Electric	4	4	/ 4	4	4
Shafts	2	2	/ 2	2	2
SHP (ea)	800	800	/ 800	800	800
Accommodations					

10a. Performance Characteristics (Cont'd):

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Ship's Company	20	20	/ 20	20	20
Technicians	14	14	/ 14	14	14
Speed (kts)	9.6	9.6	/ 9.6	9.6	9.6
Radars	2	2	/ 2	2	2
Sonars	1	1	/ 1	1	1
T-AGOS 23 Class					
Length Overall (ft)	281'6"	281'6"	/ 281'6"		281'6"
Beam (maximum) (ft)	95'9"	95'9"	/ 95'9"		95'9"
Draft (mean) (ft)	26	26	/ 26		26
Displacement (Ltons)	5380	5380	/ 5380		5380
Propulsion					
Diesel Electric	3	3	/ 3		3
Shafts	2	2	/ 2		2
SHP (ea)	2500	2500	/ 2500		2500
Accommodations					
Ship's Company	26	26	/ 26		26
Technicians (19)	19	19	/ 19		19
Speed (kts)	12	12	/ 12		12
Radars	2	2	/ 2		2
Sonars	1	1	/ 1		1

NOTE: For T-AGOS 13-18 Accommodations is 33 (22 MSC crew and 11 technicians.

b. Previous Change Explanations --

N/A Initial Submission

c. Current Change Explanations --

N/A Initial Submission

d. References --

Production Estimate:
NAE approved Acquisition Program Baseline dated March 11, 1992.

Approved Program:
NAE approved Acquisition Program Baseline dated March 11, 1992.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	22.9	22.9	22.9
Procurement	1104.9	1105.0	1104.9
Sailway	(1057.1)		(1057.1)
Total Sailaway	(1057.1)		(1057.1)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(47.8)		(47.8)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 78 Base-Year $	1127.8	1127.9	1127.8
Escalation	903.5	903.4	903.5
Development (RDT&E)	(15.5)	(15.5)	(15.5)
Procurement	(888.0)	(887.9)	(888.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2031.3	2031.3	2031.3
b. Quantity --			
Development (RDT&E)		N/A	0
Procurement	28	28	28
Total	28	28	28

c. Foreign Military Sales --
None

d. Nuclear Costs --
None

e. References --

Production Estimate:
NAE approved Acquisition Program Baseline dated March 11, 1992.

Approved Program:
NAE approved Acquisition Program Baseline dated March 11, 1992.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2031.3	2031.3	2031.3
(2) Quantity	28	28	28
(3) Unit Cost	72.546	72.546	72.546
b. Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	157.5	157.5	6.4
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	157.5	157.5	6.4
(2) Quantity	1	1	0
(3) Unit Cost	157.500	157.500	N/A

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	38.4	1992.9	0.0	2031.3
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	38.4	1992.9	-	2031.3

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1978 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	22.9	1104.9	0.0	1127.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	22.9	1104.9	-	1127.8

b. Previous Change Explanations -- None.

c. Current Change Explanations -- None.

14. **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
72.546	--	--	--	--	--	--	--	--	72.546

15. **Contract Information:** (Then-Year Dollars in Millions)

a. Procurement --

T-AGOS 19-22:	Initial Contract Price Target	Ceiling	Qty
MCDERMOTT SHIPYARD, AMELIA, LA N00024-87-C-2087, FPIF Award: October 10, 1986 Definitized: October 10, 1986	$83.5	$91.4	4

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$92.9	$102.3	4	$141.8	$147.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$-55.2	$-3.2
Net Change	$-55.2	$-3.2

Explanation of Change:

The factors contributing to the negative COST and Schedule Variances are McDermott's low manhour efficiencies in design and production; labor and overhead rates that are higher than budgeted rates; and overruns in material costs.

NOTE: Estimated Price at Completion exceeds the Current Contract Ceiling Price.

T-AGOS 23-28:	Initial Contract Price Target	Ceiling	Qty
TAMPA SHIPYARDS, INC., TAMPA, FL N00024-91-C-2308, FPIF Award: March 28, 1991 Definitized: March 28, 1991	$53.6	$63.4	1

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$53.6	$63.4	1	$56.8	$63.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date	N/A	N/A
Net Change	$0.0	$0.0

Explanation of Change:

Tampa Shipyards, Inc. (TSI) has not yet submitted an acceptable CPR. Lack of accurate cost and schedule information precludes variance calculations.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 73.9% (17 yrs/23 yrs)

(2) Percent Program Cost Appropriated: 68.2% ($1385.6 / $2031.3)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY76-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	33.2	2.5	0.8	1.9	38.4
Procurement	1192.4	157.5	6.4	636.6	1992.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1225.6	160.0	7.2	638.5	2031.3

16c. Program Funding Summary (Cont'd):

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1976				0.7	0.6	0.6	0.6	6.6
197T								2.9
1977				1.3	1.3	1.3	1.3	2.6
1978				0.7	0.7	0.7	0.7	6.8
1979				0.8	0.9	0.9	0.9	8.4
1980				1.1	1.4	1.4	1.4	10.6
1981				0.1	0.1	0.1	0.1	10.6
1982				0.2	0.3	0.3	0.3	7.6
1983				0.3	0.5	0.5	0.5	4.9
1984				0.4	0.6	0.6	0.6	3.8
1985				0.9	1.4	1.4	1.4	3.4
1986				3.0	5.0	5.0	5.0	2.8
1987				1.5	2.6	2.6	2.6	2.7
1988				4.2	7.5	7.5	7.5	3.0
1989				3.0	5.5	5.5	5.5	4.2
1990				1.2	2.3	2.3	2.3	4.0
1991				1.2	2.5	2.5	2.5	3.9

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1992				1.2	2.5			3.1
1993				0.4	0.8			3.3
1994				0.5	1.4			3.3
1995				0.2	0.5			3.3
Subtot				22.9	38.4	33.2	33.2	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1979	2		83.2	62.1	83.2	83.2	81.9	9.6
1980	1		39.0	26.8	39.0	39.0	38.5	9.9
1981	5		193.4	128.8	193.4	192.8	189.8	9.6
1982	4		177.6	114.9	177.6	177.0	173.2	7.5
1983								3.8
1984				1.6	2.6	2.6	2.5	3.6
1985	2		69.3	45.1	73.4	73.1	71.0	2.1
1986	1		30.6	22.4	37.2	37.2	36.1	1.1
1987	4		176.8	105.5	179.1	148.7	135.8	1.5
1988				6.3	11.0	1.9	1.1	2.3
1989	3		207.7	116.1	208.6	155.6	93.3	2.8

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY78 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1990	1		182.1	99.3	183.7	127.4	26.9	1.3
1991				1.9	3.6	0.7	0.2	1.3
1992	1		148.5	80.0	157.5			3.1
1993				3.1	6.4			3.3
1994	1		148.0	75.0	157.5			3.3
1995	2		287.0	134.3	291.0			3.3
1996				7.2	16.1			3.2
1997	1		154.3	69.1	159.4			3.2
1998				5.4	12.6			3.2
Subtot	28		1897.5	1104.9	1992.9	1039.2	850.3	
Grand Total	28		1897.5	1127.8	2031.3	1072.4	883.5	

17. **Production Rate Data:**

a. Annual Production Rates -- None.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	1127.8	N/A	
(TY $)	N/A	N/A	2031.3	N/A	
PAUC Cost (BY $)	N/A	N/A	40.279	N/A	N/A
(TY $)	N/A	N/A	72.546	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	19/19

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules --

The T-AGOS 1/19/23 Class Ocean Surveillance Ships are designed to support the Surveillance Towed Array Sensor System (SURTASS) and to collect, process, and transmit acoustic data. The O&S costs associated with these ship classes are based on a useful life of 25 years. Ship design parameters indicate that each ship will consume about 11,000 BBL of fuel each year. Direct personnel costs

18a. Operating and Support Costs (Cont'd):
involve the annual cost for civilian mariners, plus the embarked Navy Military Detachment through FY92. Personnel retirement costs are not included in these costs. Direct operating costs include the cost of fuel, repair parts, supplies, training, expended stores, and purchased services. Direct maintenance is based on annual costs of $3.9M averaged over the three T-AGOS programs; indirect costs include overhead. The baseline used to derive the estimates are an average of the FY 91 Actuals, five-year maintenance cost averages, and the FY 92 approved expenses.

b. Costs -- (FY 1978 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per T-AGOS 19 Class	Avg Annual Cost Per T-AGOS 1 Class
Direct Personnel	1.5	1.8
Direct Operations	0.3	0.3
Direct Maintenance	1.2	0.8
Indirect Costs	1.1	0.6
Total	4.1	3.5

c. Contractor Support Costs -- None.

NOTE for Section 18b. Costs: The T-AGOS Class Program consists of three separate and distinct ship classes (T-AGOS 1 Class (Monohull), T-AGOS 19 Class (SWATH), and T-AGOS 23 Class (SWATH)). CARS software does not provide the capability to list the O&S data for these three programs. The following additional information is provided:

COST ELEMENT	Avg Annual Costs Per T-AGOS 1 Class	Avg Annual Costs Per T-AGOS 1 Class*
Direct Personnel	1.8	1.8
Direct Operations	0.3	0.3
Direct Maintenance	0.8	0.8
Indirect Costs	0.6	0.6
TOTAL:	3.5	3.5

* MSC does not have operating experience for an equivalent hull.

18. Operating and Support Costs (Cont'd):

COST ELEMENT	Avg Annual Costs Per T-AGOS 23 Class	Avg Annual Costs Per T-AGOS 1 Class
Direct Personnel	1.5	1.8
Direct Operations	0.3	0.3
Direct Maintenance	1.2	0.8
Indirect Costs	1.1	0.6
TOTAL:	4.1	3.5

AF-3 ATARS

UNCLASSIFIED

91-093

*** UNCLASSIFIED ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(QA)823)
PROGRAM: ATARS

AS OF DATE: December 31, 1991

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1. Designation and Nomenclature (Popular Name):
Advanced Tactical Air Reconnaissance System (ATARS)

2. DoD Component: USAF

3. Responsible Office and Telephone Number:
Director, ATARS Joint Sys Pro Office COL JAMES M. BELLAN, II
Aeronautical Systems Division Assigned: October 15, 1991
Wright-Patterson AFB AV 785-2939 COMM (513) 255-2939
Dayton, OH 45433-6503

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DEPARTMENT OF DEFENSE

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4. Program Elements/Procurement Line Items:

RDT&E:
PE 0207217F (Shared) with JSIPS
Project 3201, 3792
PE 0603239F Project 3048
PROCUREMENT:
APPN 3010 ICN P01600 (Air Force)

5. Related Programs:
Tactical reconnaissance aircraft (F-16R). Unmanned Air Vehicle-Medium Range (UAV-MR). Joint Services Imagery Processing Systems (JSIPS). Department of Navy F/A-18D(RC). Electro Optical-Long Range Oblique Photography (EO-LOROP) System.

OASD(PA) DFOISR PL-T- 04-1

SAF/PAS

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6. Mission and Description:
The ATARS program, within the Follow-on Tactical Reconnaissance (FOTR) program element, is designed to meet the needs of the tactical commander for detection, location and classification of tactical targets with sufficient location accuracy and detail to permit the timely delivery of appropriate air or ground launched weapons. The Tactical Air Force Statement of Need 320-79, and corresponding justification for a major system new start, as approved by the Office of the Secretary of Defense in August 1982, identified the requirement for near-real-time intelligence information. ATARS focuses on full-scale development of a common family of Electro-Optical/Infrared (EO/IR) sensor suites, data-link sets, recorders, and a reconnaissance management system for upgrade of both US Air Force (USAF) and Department of Navy (DON) manned and unmanned reconnaissance systems. The program is designed to replace the existing film based reconnaissance systems with the above digitized EO/IR sensor suites. These sensor suites will be integrated into a mix of tactical reconnaissance platforms, including stand-off and penetrating manned and unmanned vehicles. The ATARS program consists of the following projects:

A. The Tactical Air Reconnaissance System (TARS) project will develop a common reconnaissance suite for manned platforms (DON F/A-18D (RC)), a tactical reconnaissance pod (F-16R), follow-on DON/USAF manned platform, and the RF-4C test bed.

B. The Unmanned Air Reconnaissance System (UARS) consists of either an EO or an IR sensor suite integrated into an unmanned vehicle. The Unmanned Air Vehicle-Medium Range (UAV-MR) is being developed by the Navy Joint Program Office (JPO) for USAF and DON. The funding provided by OSD for UARS and the UAV-MR effort is not included in the scope of this report.

C. The Joint Services Imagery Processing System (JSIPS) is a Joint (USAF/USMC/USA) ground station development program with the USAF designated as the lead service. The ground station will provide processing and exploitation of ATARS imagery. The funding provided for JSIPS in not included in the scope of this report.

D. The USAF has identified the F-16R as the Follow-On Tactical Reconnaissance aircraft and directed program initiation in FY92. The F-16R reconnaissance system will be integrated into an external pod for development and operational test and production of the system.

7. Program Highlights:
a. Significant Historical Developments —
— ATARS Statement of Need 7 Aug 1979 (TAF-SON 320-79), ATARS Mission Element Need Statement validated 22 Sep 1980, USDRE approved a Justification for a Major System New Start (JMSNS) 24 Mar 1982,

7a. Program Highlights (Cont'd):

funding approved by Congress in FY85 budget, program review DSARC 1985, program review/milestone II DSARC Nov/Dec 86, Milestone II Acquisition Decision Memorandum (ADM) 30 Mar 1987, ATARS FSD source selection began 9 Jul 1987, USAF UARS funding was transferred to the JPO in Jan 1988, firm fixed price contract awarded to Control Data Corporation on 16 May 1988, hardware Preliminary Design Review (PDR) was 31 Oct - 13 Dec 1988, software PDR was 14-16 Dec 1988, hardware Critical Design Review (CDR) was 22-25 Sep 1989, software CDR was 13-18 Nov 1989, and the F-18/ATARS PDR was 26-27 Oct 1989. The UAV-MR contract was awarded by the Navy to Teledyne Ryan Aeronautical on 30 June 1989. Funding for F-16R development was zeroed by a program budget decision in Nov 1988. On 6 Dec 89, the Air Force Program Review Committee (PRC) approved a 6 squadron F-16R program with full scale development starting in FY91 and production starting in FY93. The Under Secretary of Defense for Acquisition received a Joint Resources Oversight Council (JROC) recommendation for an OSD decision on 24 May 1990 and validated the Air Force requirement for manned reconnaissance. The ATARS program has changed from a major Defense Acquisition Board (DAB) program to a DOD Acquisition Category (ACAT) 1C Program (Component Program). RF-4C has been designated as test bed only. The ATARS prime contractor, Control Data Corporation, sold the ATARS contract to Martin Marietta Electronic Systems, Orlando, Florida. The novation was signed in Feb 1991.

— In Dec 90, the UAV-MR program incurred a 3 year delay, which defers sensor suite integration pending completion of the UAV development and testing. The Joint Program Office (JPO) determined that the design configuration utilizing composite materials for the Unmanned Air Vehicle-Medium Range (UAV-MR) would not meet user requirements. The JPO determined that a full vehicle redesign including material change would be undertaken by redefining the full program acquisition strategy and recompeting the program.

— The first ATARS RF-4C contractor flight occurred on 27 Feb 91 and successfully acquired imagery from the Low Altitude Electro-Optical sensor, controlled by the Reconnaissance management System and recorded on the Digital Tape Recorder. The ATARS Contractor Flight Test continues with an extended schedule.

— Funding for the F-16R program was added to the FY92 President's Budget. A revised Program Management Directive (PMD 5063(10), 27 Mar 91) authorized an F-16R reconnaissance capability program for start-up in FY92. An F-16R program strategy was briefed to HQ TAC in Jul 91.

7b. Program Highlights (Cont'd):

b. Significant Developments Since Last Report —
-- A new program manager, Col James M. Bellan, II, was assigned on 15 Oct 91. The PM requested a hold on the Acquisition Program Baseline (APB) update pending a major program scrub (requirements/technical, schedule, and cost). Late hardware deliveries and programmatic issues created a schedule breach which impacts other program schedules, development flight test, and low rate initial production decision planning.

— A revised APB was signed by the Designated Acquisition Commander (DAC) and forwarded to the AFAE on 9 Aug 91. A schedule slip was noted: Development Test Start slipped from Oct 90 to Sep 91, and the Low Rate Initial Production slipped from Jun 92 to Apr 93. The 9 Aug 92 APB was placed on hold by SAF/AQX per request from the ATARS Program Manager. An updated APB will be submitted upon completion of the program scrub.

— ATARS is expected to meet mission requirements.

c. Changes Since As Of Date —
None.

8. Threshold Breaches:
— An APB cost breach alert was reported on 23 Mar 91 as well as an APB deviation report also submitted 23 Mar 91. The breach was due to the addition of F-16R funding.

— A Program Deviation Report (PDR) was signed by the DAC and forwarded to the AFAE on 25 Nov 91.
— There were no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones —	Development Estimate	Approved Program	Current Estimate
Defense Acquisition Board (DAB) 0	AUG 82	AUG 82	AUG 92
Defense Acquisition Board I	DEC 85	DEC 85	DEC 85
Defense Acquisition Board II	NOV 86	NOV 86	NOV 86
ATARS Acquisition Decision Milestone (ADM)	MAR 87	MAR 87	MAR 87
FSD Contract Award	MAY 88	MAY 88	MAY 88
Hardware Preliminary Design Review (PDR)	OCT 88	NOV 88	NOV 88

9a. Schedule (Cont'd):

Milestones (Cont'd) —	Development Estimate	Approved Program	Current Estimate
Software Preliminary Design Review	N/A	DEC 88	DEC 88
Hardware Critical Design Review (CDR)	APR 89	SEP 89	SEP 89
Software Critical Design Review	N/A	NOV 89	NOV 89
First FSD ATARS Sensor Suite Delivery	N/A	DEC 90	JAN 91
RF-4C First Development Flight Test Release	N/A	N/A	N/A
First Development Flight Release	N/A	JAN 91	FEB 91
Combined DT&E/OA Start	N/A	N/A	APR 91
Development Test Start	N/A	FEB 91	SEP 91
ACSS Milestone IIIA (LRIP) Production Decision	AUG 91	JUN 92	APR 93
Development Test Complete	N/A	DEC 94	MAR 95
Operational Test Start	N/A	MAR 92	AUG 92
Operational Test Complete (F-18, UARS, F-16)	N/A	JUN 95	DEC 95
First LRIP Delivery - ATARS common sensor suites	N/A	MAR 94	DEC 94
ACCS MS IIIB/F-16 MS III	SEP 93	JUN 95	MAR 96
IOC	SEP 93	N/A	N/A

b. Previous Change Explanations —

Critical Design Review was changed from Apr 89 to Jul-Sep 89 due to difficulties in receiving technical data on the ATARS platform; However, there is no impact to cost or other milestones.

The hardware PDR began 31 Oct 88 but is recognized as occurring in Nov 88.

The Hardware CDR was completed in Sep 89.

ATARS no longer baselines F-18 milestones.

c. Current Change Explanations — None.

d. References —

Development Estimate:
Program Management Directive 5063(5)
/0207217F/0207213F/0207435F/0301328F/0603239F, 15 APR 87.

Approved Program:
AFAE Approved Acquisition Program Baseline dated 20 July 1991.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Modes					
Low Altitude Sensor	N/A	Forward oblique or vertical position.	/ Forward oblique or vertical position.	N/A N/A N/A N/A N/A	**
Medium Altitude Sensor	N/A	Left/ right oblique or vertical position	/ Left/ right oblique or vertical position	N/A N/A	**
Mission Conditions	N/A	Day/ night & under-the-weather conditions.	/ Day/ night & under-the-weather conditions.	N/A	**
Physical Characteristics					
Weight	N/A	Will not exceed max equip wt limits on carriage platforms.	/ Will not exceed max equip wt limits on carriage platforms.	N/A	**

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Dimensions	N/A	Fit existing RF-4C msn equip bay & not exceed dimension limitations of UARS, & F/A-18D, & F-16 pod. / Fit existing RF-4C msn equip bay & not exceed dimension limitations of UARS, & F/A-18D, & F-16 pod.	N/A	**
Structural Criteria	N/A	Must withstand low-high altitude operations & tactical standoff tactics. Equip shall operate w/in flight maneuver envelope of applicable aircraft to accomplish ATARS msns. / Must withstand low-high altitude operations & tactical standoff tactics. Equip shall operate w/in flight maneuver envelope of applicable aircraft to accomplish ATARS msns.	N/A	**

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Environmental Criteria	N/A	Climatic extremes as defined in ATARS System Req't Spec for multi-platform applications.	/ Climatic extremes as defined in ATARS System Req't Spec for multi-platform applications.	N/A	**
Environmental Control	N/A	Compatible w/req'd platforms.	/ Compatible w/req'd platforms.	N/A	**
Image Quality	N/A	Adequate to detect, recognize & identify (Phase I) the 17 classes of tactical targets.	/ Adequate to detect, recognize & identify (Phase I) the 17 classes of tactical targets.	N/A	**
Field of View (FOV) Infrared Sensor	N/A	Min FOV of 180 deg.	/ Min FOV of 140 deg.	N/A	**

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Low Altitude Visible Light Sensor	N/A	Min FOV of 140 deg. Wide FOV to provide vertical and forward oblique imaging capabilities in manual or automatic.	/ Min FOV of 140 deg. Wide FOV to provide vertical and forward oblique imaging capabilities in manual or automatic.	N/A	**
Medium Altitude Visible Light Sensor	N/A	Min FOV of 21 deg. Narrow FOV to provide vertical & side oblique imaging capabilities in manual or automatic.	/ Min FOV of 21 deg. Narrow FOV to provide vertical & side oblique imaging capabilities in manual or automatic.	N/A	**
Image Interpretability Rating Scale (IIRS)					
Low Altitude Visible Light Sensor	N/A	Produce IIRS 5 quality imagery.	/ Produce IIRS 5 quality imagery.	N/A	IRRS 5
Medium Altitude Visible Light Sensor	N/A	Min IIRS 7 quality.	/ Min IIRS 5 quality.	N/A	IRRS 5

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Velocity	N/A	Altitude ratios V/H between 0.04 and 5.0 rad per sec. Operation velocities 200-600 knot ground speed.	/ Altitude ratios V/H between 0.04 and 5.0 rad per sec. Operation velocities 200-600 knot ground speed.	N/A	**
Infrared Sensor	N/A	New IR sensor for all platform applications with operational performance equal to or better than AAD - 5.	/ New IR sensor for all platform applications with operational performance equal to or better than AAD - 5.	N/A	**
Computer Hardware/ Software Language	N/A	Operational SW for ATARS PMH shall be programmed in ADA.	/ Operational SW for ATARS PMH shall be programmed in ADA.	N/A	**

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Memory Reserve	N/A	67% of total memory.	/ 67% of total memory.	N/A	**
Throughput Reserve	N/A	67% usable spare.	/ 67% usable spare.	N/A	**
Memory Growth	N/A	Expandable to 200%.	/ Expandable to 200%.	N/A	**

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Architecture	N/A	Firmware shall be designed documented, & otherwise treated as software. All newly developed software shall be designed using object-oriented design, which is a top down structured technique. All newly developed software shall be developed in accordance with DOD-STD-2167 as tailored. / Firware shall be designed documented, & otherwise treated as software. All newly developed software shall be designed using object-oriented design, which is a top down structured technique. All newly developed software shall be developed in accordance with DOD-STD-2167 as tailored.	N/A	**

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Data Bus	N/A	MIL-STD-1553B Multiplex Bus.	/ MIL-STD-1553B Multiplex Bus.	N/A	**
Data Link	N/A	Installation in pod for RF-4C. Near realtime sensor transmission. Installation in F-16 pod.	/ Installation in pod for RF-4D. Near realtime sensor transmission. Installation in F-16 pod.	N/A	**
Mission Readiness					
Launch From Combat Alert					
UARS (min)	N/A	3	/ 5	N/A	**
F/A-18D (min)	N/A	3	/ 5	N/A	**
F-16 (min)	N/A	3	/ 5	N/A	**
Integrated Combat Turnaround					
UARS (hrs)	N/A	4	/ 6	N/A	**
F/A-18D (min)	45	35	/ 35	N/A	**
F-16 (min)	N/A	25	/ 25	N/A	**
Reliability and Maintainability					
Subsystem Break Rate (%)					
UARS 1/	N/A	.75	/ .75	N/A	**
F/A-18D	1.2	1.22	/ 1.22	N/A	**
F-16 Pod	NA	1.24	/ 1.24	N/A	**
Subsystem Mean Repair Time (min)					
UARS on Equip	20	20	/ 60	N/A	**
UARS off Equip	60	60	/ 60	N/A	**
F/A-18D on Equip	N/A	20	/ 20	N/A	**

10a. Performance Characteristics (Cont'd):

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
F/A-18D off Equip	N/A	60	/ 60	N/A	**
F-16 on Equip	N/A	20	/ 20	N/A	**
F-16 off Equip	N/A	60	/ 60	N/A	**
Airlift Support: One Squadron w/ O-level maintenance, C-141B equivalent.					
UARS Sensor Suite Support	N/A	1 463-L pallet	/ 1 463-L pallet		
F/A-18D	N/A	.22 463-L pallet	/ .22 463-L pallet	N/A	**
F-16 Pod	N/A	1 463-L pallet	/ 1 463-L pallet	N/A	**

NOTES:

** All current estimates are the same as the threshold in the Approved Baseline.

1/ UARS break rate is based on use of visual sensors only.

b. Previous Change Explanations --

Negotiated change from 1.2 to .95 at FSD contract award for the Sensor suite break rate.

c. Current Change Explanations --

None.

d. References --

Development Estimate:
Program Management Directive 5063(5)
/0207217F/0207213F/0207435F/0301328F/0603239F, 15 APR 87.

Approved Program:
AFAE Approved Acquisition Program Baseline dated 20 July 1991.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. Cost —			
Development (RDT&E)	163.8	231.8	231.8
Procurement	811.0	340.8	340.8
Flyaway	(697.6)		(298.3)
Total Flyaway	(697.6)		(298.3)
Other Wpn Sys	(73.3)		(40.7)
Total Other Wpn Sys	(73.3)		(40.7)
Peculiar Support	(0.0)		(0.2)
Initial Spares	(40.1)		(1.6)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 85 Base-Year $	974.8	572.6	572.6
Escalation	317.7	236.1	224.7
Development (RDT&E)	(30.1)	(55.5)	(54.2)
Procurement	(287.6)	(180.6)	(170.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1292.5	808.7	797.3
b. Quantity —			
Development (RDT&E)	0	9	0
Procurement	560	105	105
Total	560	114	105

NOTE:

(1) There are 9 RDT&E development estimate units and 12 RDT&E current estimate units that are not intended to be used as operational end items; therefore, are not included in the above quantity total.

c. Foreign Military Sales — None.

d. Nuclear Costs — None.

e. References —

Development Estimate:
Program Management Directive 5063(5)
/27217F/27213F/27435F/31328F/63239F, 15 APR 87.

Approved Program:
AFAE Approved Acquisition Program Baseline dated 20 July 1991.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	797.3	808.7	808.7
(2) Quantity	105	105	105
(3) Unit Cost	(b)(1)	7.702	7.702
b. Current Procurement —	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	10.1	0.0	50.2
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	10.1	0.0	50.2
(2) Quantity	0	0	20
(3) Unit Cost	N/A	N/A	2.510

13. Cost Variance Analysis:

a. Summary — (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	193.9	1098.6	0.0	1292.5
Previous Changes:				
Economic	+2.4	-17.3	-	-14.9
Quantity	-	-559.9	-	-559.9
Schedule	-	-	-	-
Engineering	+119.4	-	-	+119.4
Estimating	-4.2	+115.1	-	+110.9
Other	-16.4	-	-	-16.4
Support	-7.8	-115.1	-	-122.9
Subtotal	+93.4	-577.2	-	-483.8
Current Changes:				
Economic	-2.8	-13.4	-	-16.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.5	-9.9	-	-8.4
Other	-	-	-	-
Support	-	+13.2	-	+13.2
Subtotal	-1.3	-10.1	-	-11.4
Total Changes	+92.1	-587.3	-	-495.2
Current Estimate	286.0	511.3	-	797.3

13a. Cost Variance Analysis (Cont'd):

a. Summary — (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	163.8	811.0	0.0	974.8
Previous Changes:				
Quantity	-	-470.2	-	-470.2
Schedule	-	-	-	-
Engineering	+90.0	-	-	+90.0
Estimating	-3.7	+75.2	-	+71.5
Other	-11.9	-	-	-11.9
Support	-6.4	-75.2	-	-81.6
Subtotal	+68.0	-470.2	-	-402.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-4.3	-	-4.3
Other	-	-	-	-
Support	-	+4.3	-	+4.3
Subtotal	-	-	-	-
Total Changes	+68.0	-470.2	-	-402.2
Current Estimate	231.8	340.8	-	572.6

b. Previous Change Explanations —

RDT&E

Economic: Revised escalation indices.

Engineering: Addition of RF-16 Multi-National Pod. Deletion of funding for RF-16 effort.

Estimating: Addition of dual sourcing, 3 Common sensor suites moved to TARS (Formerly under UARS, but directed to be under TARS), funding for RF-16 planning effort was added then subsequently reduced, reduction of dual sourcing previously added, and adjustment for current & prior year escalation.

Other: Funding for UARS effort transferred to Joint UAV program.

Support: Deletion of Simulator.

13b. Cost Variance Analysis (Cont'd):

PROCUREMENT

Economic: Revised escalation indices.

Quantity: Production funding not approved for manned aircraft and funding for UARS effort transferred to Joint UAV program.

Estimating: Correction to the Dec 89 SAR to reconcile other weapon systems and initial spares.

Support: Correction to the Dec 89 SAR to reconcile other weapon systems and initial spares.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Economic Escalation Indices (Economic)	--	-2.8
Adjustment for Current and Prior year funding. (Estimating)	--	1.5
Total Changes	--	-1.3
(2) PROCUREMENT		
Revised Economic Escalation Indices (Economic)	--	-13.4
Adjustments for current year funding (Estimating)	-4.3	-9.9
Increase in peculiar support equipment (Support)	4.3	13.2
Total Changes	--	-10.1

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.308	-0.296	4.669	--	1.137	0.976	-0.156	-1.045	5.285	7.593

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E —

ATARS SENSOR SUITES:	Initial Contract Price Target	Ceiling	Qty
Martin Marietta, Orlando, FL F33657-87-C-0103, FFP Award: May 16, 1988 Definitized: May 16, 1988	$118.6	N/A	9

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$148.2	N/A	12	$148.2	$148.2

CPR information is not a requirement on this FFP contract.

NOTE:
—The ATARS original prime contractor, Control Data Corporation, was awarded the ATARS contract in May 1988. Control Data Corporation sold the ATARS contract to Martin Marietta Electronic Systems, Orlando, Florida. The novation was signed in Feb 1991.

—Based on the current disconnects in the program, the Program Manager as well as the contractor cannot make a reasonably accurate estimate at completion.

—FSD (FFP) has no required C/SCSC reporting. Will require Cost performance reports when the LRIP options (FPIF) are exercised.

—Total contract quantity of 12 units is made up of 6 Air Force, 3 F/A-18D(RC), and 3 UARS units.

—Exercise of options and additional work has increased target to $148.2 million.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status —

(1) Percent Program Completed: 57.1% (8 yrs/14 yrs)

(2) Percent Program Cost Appropriated: 28.2% ($224.7 / $797.3)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY85-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	165.2	49.4	50.3	21.1	286.0
Procurement	-	10.1	50.2	451.0	511.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	165.2	59.5	100.5	472.1	797.3

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1985				2.7	2.8	2.8	2.8	3.4
1986				2.1	2.2	2.2	2.2	2.8
1987				8.2	8.9	8.9	7.5	2.7
1988				29.1	32.5	32.5	24.6	2.9
1989				39.5	45.9	45.9	33.0	4.2
1990				37.1	44.6	44.6	34.5	4.0
1991				22.6	28.3	15.5	5.7	3.9
1992				38.3	49.4			3.1

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 3600 Research, Development, Test + Eval, AF (Cont'd)								
1993				37.8	50.3			3.3
1994				5.0	6.9			3.3
1995				1.4	2.0			3.3
1996				1.3	1.9			3.2
1997				1.3	1.9			3.2
1998				5.4	8.4			3.2
Subtot				231.8	286.0	152.4	110.3	

— RDT&E funds are under a shared program element between JSIPS and ATARS, above funds reflect ATARS development only.

— FY87 includes .2M of Air Force funded UARS from PE 0603239F.

— UARS FY88 and out year funds will be obtained through the OSD/C3I DOD family of remotely piloted vehicles (RPVS), PE 0305141D, and is not included in this report. The UAV will be developed by the Navy under the UAV-MR program.

Appropriation: 3010 Aircraft Procurement, Air Force								
1992		7.2		7.4	10.1			3.1
1993	20	7.0	29.5	35.8	50.2			3.3
1994	30		67.4	67.5	97.6			3.3
1995	30		79.0	86.2	128.7			3.3

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY85 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3010 Aircraft Procurement, Air Force (Cont'd)								
1996	25		108.2	91.9	141.6			3.2
1997				42.3	67.2			3.2
1998				9.7	15.9			3.2
Subtot	105	14.2	284.1	340.8	511.3			
Grand Total	105	14.2	284.1	572.6	797.3	152.4	110.3	

17. Production Rate Data:

a. Annual Production Rates —

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1991	21	0	0	N/A
1992	33	0	0	N/A
1993	68	0	20	N/A
1994	68	0	30	N/A
1995	66	0	30	N/A
1996	44	0	25	N/A

Note:
(1) Development estimate was for RF-4C. The current estimate is based on the F-16 as the ATARS platform.

b. Cost Variance — Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	572.6	N/A	N/A
(TY $)	N/A	N/A	797.3	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	5.453	N/A	N/A
(TY $)	N/A	N/A	7.593	N/A	N/A

17c. Production Rate Data (Cont'd):

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	AUG 92	N/A	N/A
Duration (in MON)	N/A	N/A	78	N/A	N/A
End Date(MON YY)	N/A	N/A	FEB 99	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	9/0
Procurement	0/0

e. Approved Design-to-Cost Objective -- N/A.

Note: The ATARS ADM (30 Mar 87) does not include approved Design-to-Cost information.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

-- A new program manager, Col. James M. Bellan, was assigned on 15 Oct 91. The PM requested a hold on the APB update pending a major program scrub (requirements/technical, schedule, and cost). An O&S estimate will be completed at this time.

b. Costs -- None.

c. Contractor Support Costs -- None.

AF-20 RAIL GARRISON

91-242
245

[redacted]

SELECTED ACQUISITION REPORT (RCS:DD-COMP(O&A)823)
PROGRAM: RAIL GARRISON

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 3 1992 1[illegible]
DIRECTORATE FOR FREEDOM OF INFORMATIC
AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. (U) **Designation and Nomenclature (Popular Name):**
   Peacekeeper Rail Garrison (PRG)

2. (U) **DoD Component:** USAF

3. (U) **Responsible Office and Telephone Number:**
   BMO/MC
   Ballistic Missile Organization
   Norton AFB
   San Bernardino, CA 92409-6468

   Col. Wayne Chenard
   Assigned: August 2, 1991
   AV 876-4847 COMM (714) 382-4847

4. (U) **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 0604312F (Shared)
   PROCUREMENT:
   APPN 3020 ICN 0101215F (Air Force) (Shared)
   MILCON:
   PE 0101215F (Shared)

SAF/PAS
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~~Classified by: Multiple Sources~~
~~Declassify on: Originating Agency's Determination Required (OADR)~~
~~Downgrade Instructions: Not Subject to Automatic Downgrade~~

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OASD(PA) DFOISR 92-0353

5. (U) Related Programs:
Peacekeeper in Minuteman Silo, Small ICBM.

6. (U) Mission and Description:
The Peacekeeper Rail Garrison System (PRG) was defined as 50 Peacekeeper missiles deployed on 25 trains consisting of two locomotives, two security cars, two missile launch cars, one launch control car, a maintenance car, a fuel car, and additional cars as required. The trains would be parked in train alert shelters at secure garrisons located at existing Air Force Bases. The trains would have the capability to deploy along the commercial rail network with prompt launch capability from either garrison or deployed modes.

The program was changed to a research, development, test and evaluation program in March 1991 whose primary objective was demonstration of launch of a Peacekeeper missile from a train and the conduct of mobility exercises to evaluate the test of train operational and physical security concepts. SAF/AQQ message Oct 91 directed program termination.

7. (U) Program Highlights:
a. (U) Significant Historical Developments —
On 19 Dec 86, the President selected Peacekeeper Rail Garrison (PRG) as the basing mode for the second 50 Peacekeeper (PK) missiles. A 7 Jan 87 message amendment to Program Management Directive (PMD) 0075 (17), ICBM Modernization, directed Air Force Systems Command to begin development of the Rail Garrison basing mode for Peacekeeper.

In Jan 87, the Ballistic Missile Office (BMO) began siting work at the 11 candidate bases previously identified. The Main Operating Base would have been at F. E. Warren AFB, WY, as directed.

Rail Garrison development contractual efforts were divided into three major contracts: (1) Basing Test and System Support (BT&SS), (2) Missile Launch Car (MLC), and (3) Launch Control System (LCS). The BT&SS contract was awarded in Sep 87 to Boeing Aerospace Company. The MLC and LCS contracts were awarded in May 88 to Westinghouse Electric Corporation and Rockwell International (Autonetics ICBM Division), respectively.

The PRG Milestone II Acquisition Decision Memorandum (ADM) was signed by the Secretary of Defense (OSD) on 13 May 88 as a result of Defense Acquisition Board (DAB) II. This memorandum authorized the Secretary of the Air Force to proceed with Full Scale Development (FSD) of the PRG basing system. The PRG System Design Review (SDR) was completed in Aug 88; an executive presentation of the SDR was held in Sep 88.

The site-specific Environmental Impact Statement for the final garrison sites was submitted in Feb 89. Preliminary Design Reviews

7a. (U) Program Highlights (Cont'd):

(PDR) began in Feb 89. The Record of Decision (ROD) announcing the final six bases was filed in Nov 89. They were Barksdale AFB, LA; Grand Forks AFB, ND; Fairchild AFB, WA; Dyess AFB, TX; Little Rock AFB, AR; and Wurtsmith AFB, MI. In accordance with PMD 0075 (19) dated 17 Oct 89, PRG was to be the basing mode for the redeployment of the first 50 PK missiles. In Nov 89, Congress authorized advanced procurement and military construction (MILCON) funds in order to begin production of the PRG basing.

In Jan 90, the critical design reviews began and a moratorium was placed on all MILCON funds. In Mar 90, the Peacekeeper Guidance and Control (G&C) contract, a major development contract awarded to Rockwell International in Oct 89, was definitized. In Apr 90, direction was received to delay the award of production advance buy contracts. The preliminary design reviews were successfully completed in May 90. In Aug 90, Milestone III was postponed indefinitely; consequently, the schedule for First Asset Delivered (FAD) and Full Operational Capability (FOC) was shown as to be determined (TBD). In Oct 90, Phase II of the Car Assembly and Launch Test Program, involving the launch of a simulated Peacekeeper missile (concrete slug with same dimensions) from a missile launch car, successfully met system requirements. The FY91 RDT&E funding request for Small ICBM and PRG was combined by Congress and reduced by $70 million. Congress directed the Office of the Secretary of Defense (OSD) to allocate where the reduction would take place.

Procurement funds were not appropriated for FY91. Further, an Air Force funding request had not supported a PRG production decision.

The PRG weapon system had significant changes in program content and schedule due to reduction in RDT&E funding and elimination of the MILCON and procurement funds. This resulted in a major program restructure that no longer satisfied the mission requirement. However, the program did have sufficient funding to continue a RDT&E effort whose primary objective was the demonstration of missile launch capability from a train and the conduct of mobility exercises to evaluate train operational and physical security concepts.

b. (U) Significant Developments Since Last Report —
The FY91 RDT&E funding request for Small ICBM and PRG was combined by Congress and reduced by $70 million. Congress directed OSD to allocate where the reduction would take place. OSD allocated the reduction to PRG. The Air Force requested reprogramming of $126 million of FY91 RDT&E from PRG. This brought the total FY91 reduction to $196 million ($126 + 70M allocated to SICBM) leaving $352 million available from the original request of $548 million. A Program Management Directive was issued in March 91 directing a

7b. (U) Program Highlights (Cont'd):

single flight and mobility demonstration RDT&E only program.

The Rail Garrison Program termination was announced by the President on 27 Sep 91. Contract termination notices were distributed on 11 Oct 91. Some of the major termination efforts were disposition of contracts and archiving of program and engineering design data. The four major contracts were terminated: Boeing/BT&SS; Westinghouse/MLC; Rockwell/LCS and Rockwell/G&C. Since 1 Oct 91 the SPO obligated $10.041M of FY92 3600 funds under the Continuing Resolution Authority to terminate the above contracts and to fund other SPO commitments.

OSD has determined this will be the final PRG SAR as a result of program termination.

This system would have satisfied the mission requirement.

c. (U) Changes Since As Of Date --
Funding responsibility for VAFB mitigation is at SAF/AQ for resolution. Reassignment of personnel and other resources has begun. The remaining rolling stock has been dispositioned to various Federal agencies. The remaining 60 percent of unique PRG assets are to be disposed of by the Termination Contracting Officers.

8. (U) Threshold Breaches:
There are no Acquisition Program Baseline (date 28 Oct 91) breaches and no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate	
Milestone II	MAY 88	MAR 88	MAY 88	
System Design Review	AUG 88	AUG 88	AUG 88	
Preliminary Design Review (PDR)	N/A	MAY 90	MAY 90	
Critical Design Review (CDR)	MAR 90	AUG 91	AUG 91	
Flight Demonstration	N/A	DEC 92	DEC 92	
Mobility Demonstration	N/A	DEC 92	DEC 92	
Milestone III	APR 90	N/A	N/A	(Ch-1)
IOC/FAD	JUN 92	N/A	N/A	(Ch-1)
IOT&E Complete	MAR 92	N/A	N/A	(Ch-1)
Full Operational Capability (FOC)	JUN 94	N/A	N/A	(Ch-1)

First Asset Delivered (FAD) was defined as one complete train, including support equipment and missiles, delivered and available for alert.

9a. (U) Schedule (Cont'd):
Full Operational Capability (FOC) was defined as 50 missiles deployed on trains.

The Schedule Milestone nomenclatures are software controlled and cannot be changed at the SPO level. The "Flight Demonstration" Milestone was called "First Flight" and identified as a Ch-1 item in the 1990 SAR and the "Mobility Demonstration" Milestone was not listed as a milestone but, was listed as a Ch-1 item in the 1990 SAR.

b. (U) Previous Change Explanations —

- SDR and CDR schedules determined, previously TBD.
- Delay in receiving formal OSD approval.
- Established approved program dates for SDR and CDR.
- Reflects USD(A) baseline approval.
- FSD authorized by OSD ADM.
- Incorporation of DAE baseline milestones into SAR.
- Funding cuts and content changes since the 31 Dec 88 SAR have resulted in milestone slips. CDR, Milestone III, IOC/FAD, and FOC have slipped.
- Since the Dec 88 SAR, the PRG program has experienced both funding and content changes that have affected the milestone schedule resulting in a new APB 8 Mar 91.
- Preliminary Design Review (PDR) and First Flight whose emphasis is a one missile launch from a train and mobility demonstration, have been added.
- Critical Design Review (CDR) slipped from Jan 91 to Aug 91 due to lack of funding and design changes. This was reported in the PRG Program Deviation Report submitted in Dec 90. Design changes occurred primarily because of evolution in security requirements such as the addition of the delay barrier system. Also, the deletion of the advanced procurement funds stretched the RDT&E program and caused a rephasing of some design milestones.
- Milestone III, Initial Operational Test and Evaluation (IOT&E), Initial Operational Capability (IOC)/First Asset Delivered (FAD) and Full Operational Capability (FOC) were postponed indefinitely because of the FY91 Congressional Appropriations Bill reduced procurement to zero. Also, current funding will not support production or deployment.

c. (U) Current Change Explanations —

(Ch-1) The Rail Garrison program termination deleted the requirement for these milestones.

9d. (U) Schedule (Cont'd):

d. (U) References --

(U) Development Estimate:
Peacekeeper Rail Garrison Milestone II Acquisition Decision Memorandum, 13 May 88, as amended by FY90-91 President's Budget.

(U) Approved Program:
AAE approved Acquisition Program Baseline dated October 28, 1991.

10. (U) Performance Characteristics:

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	[redacted]			

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
Peacekeeper Rail Garrison Milestone II Acquisition Decision Memorandum, 13 May 88, as amended by FY90-91 President's Budget.

10d. (U) Performance Characteristics (Cont'd):

(U) Approved Program:
AAE approved Acquisition Program Baseline dated October 28, 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	1945.4	1522.0	1490.1
Procurement	2235.5	0.0	0.0
Flyaway	(1985.2)		(0.0)
Total Rollaway	(1985.2)		(0.0)
Other Weapon Systems	(25.6)		(0.0)
Total Other Wpn Sys	(25.6)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(224.7)		(0.0)
Construction (MILCON)	497.3	81.9	42.4
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 82 Base-Year $	4678.2	1603.9	1532.5
Escalation	2148.6	516.4	506.8
Development (RDT&E)	(660.1)	(516.4)	(490.3)
Procurement	(1285.1)	(0.0)	(0.0)
Construction (MILCON)	(203.4)	(0.0)	(16.5)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	6826.8	2120.3	2039.3

The current estimate relects the program termination. It includes all funds spent to date, known contract termination costs, and required residual efforts such as VAFB mitigation and disposition of program assets.

b. (U) Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	50	0	N/A
Total	50	0	0

The end item basing unit was defined as one missile launch car and all associated support equipment, not including the missile.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

11e. (U) Total Program Cost and Quantity (Cont'd):

e. (U) References --

(U) Development Estimate:
Peacekeeper Rail Garrison Milestone II Acquisition Decision Memorandum, dated 13 May 88; as amended by FY90-91 President's Budget.

(U) Approved Program:
AAE approved Acquisition Program Baseline dated October 28, 1991.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2039.3	2550.5	0.0
(2) Quantity	0	N/A	N/A
(3) Unit Cost	N/A	N/A	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0		
(3) Unit Cost	N/A	N/A	N/A

The end item was defined as one MLC and all associated support equipment, not including the missile.

Production missile costs were included in the Peacekeeper in Minuteman Silo program.

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	2605.5	3520.6	700.7	6826.8
Previous Changes:				
Economic	+29.9	+228.5	+25.1	+283.5
Quantity	-	-3707.5	-	-3707.5
Schedule	+184.3	+36.0	-	+220.3
Engineering	-222.0	+344.5	-	+122.5
Estimating	-163.0	-12.8	-86.0	-261.8
Other	-	-	-	-
Support	-	-409.3	-524.0	-933.3
Subtotal	-170.8	-3520.6	-584.9	-4276.3
Current Changes:				
Economic	-17.5	-	+0.7	-16.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-436.8	-	-57.6	-494.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-454.3	-	-56.9	-511.2
Total Changes	-625.1	-3520.6	-641.8	-4787.5
Current Estimate	1980.4	0.0	58.9	2039.3

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1945.4	2235.5	497.3	4678.2
Previous Changes:				
Quantity	-	-2179.8	-	-2179.8
Schedule	+116.0	-	-	+116.0
Engineering	-157.1	+202.7	-	+45.6
Estimating	-123.2	-8.1	-63.6	-194.9
Other	-	-	-	-
Support	-	-250.3	-351.8	-602.1
Subtotal	-164.3	-2235.5	-415.4	-2815.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-291.0	-	-39.5	-330.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-291.0	-	-39.5	-330.5
Total Changes	-455.3	-2235.5	-454.9	-3145,7
Current Estimate	1490.1	-	42.4	1532.5

Procurement missile costs were not included in PRG; the cost of five PK missiles to support the basing verification were included in RDT&E; however, the restructured program consists of one flight test. Residual hardware will be turned over to SAC and AFLC.

b. (U) Previous Change Explanations --

RDT&E

Economic: (U) Revised escalation indices

Schedule: (U) RDT&E schedule extension through FY93 due to loss of FY90 advance procurement funds

(U) Program extension for unspecified program content

Engineering: (U) Restructured program: deleted production and development activities; garrison

13b. (U) Cost Variance Analysis (Cont'd):

deployment activities; some operational model hardware; dedicated IOT&E; MSE; HEMP test; trainer development; and launch of 4 BVMs

Estimating: (U) Adjustment for current and prior year inflation

(U) Refinement of estimate; favorable contract negotiation and Congressional funding cuts

PROCUREMENT

Economic: (U) Revised escalation indices

Quantity: (U) Termination of production program

Schedule: (U) Adjustment for change in procurement profile

Engineering: (U) PDR changes including the delay barrier system, external appearance, and system security; additional funds required for break in production

(U) Adjustment for miscategorization of previous support costs

Estimating: (U) Adjustment for current and prior year inflation

Support: (U) PDR changes including the delay barrier system, external appearance, and system security; additional funds required for break in production

(U) Termination of production program

(U) Adjustment for miscategorization of previous support costs

MILCON

Economic: (U) Revised escalation indices

Estimating: (U) Adjustment for current and prior year inflation

(U) Refinement of estimate as a result of updated Program Estimate

Support: (U) Termination of MILCON program

c. (U) Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation indices (Economic)		-17.5
Adjustment for current and prior years inflation (Estimating)	9.8	13.4
Program termination (Estimating)	-316.9	-473.3
USAF reprogramming action (Estimating)	-1.6	-2.1
Contract termination cost (Estimating)	14.4	20.5
Additional termination funds for the Dual Frequency MEECN Receiver (Estimating)	3.3	4.7
Total Changes	-291.0	-454.3
(2) PROCUREMENT		
Total Changes	--	--
(3) MILCON		
Revised escalation indices (Economic)		0.7
Adjustment for current and prior years inflation (Estimating)	-0.5	-0.7
Hill AFB storage not previously shown (Estimating)	4.3	5.6
Congress recission of MILCON funds in the 1992 Act for PRG facilities at F.E. Warren AFB, WY (Estimating)	-44.6	-64.3
USAF reprogramming action (Estimating)	1.3	1.8
Total Changes	-39.5	-56.9

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions) (Cont'd)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
182.10	1.00	--	1.80	--	-42.60	--	-5.80	-45.60	136.50

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
136.54	--	--	--	--	--	--	--	--	N/A

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) Basing Test & System Spt:
Boeing Aerospace Company, Seattle, WA
F04704-87-C-0108, CPIF/AF
Award: September 14, 1987
Definitized: September 14, 1987

Initial Contract Price		
Target	Ceiling	Qty
$235.5	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$391.3	N/A	0	$414.3	N/A

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-37.7	$-2.7
Cumulative Variances To Date (10/11/91)	$1.1	$0.0
Net Change	$38.8	$2.7

Explanation of Change:

The increase in Current Contract Price was mainly due to the negotiation of authorized unpriced work since the last report.

The decrease in the Estimated Price at Completion was mainly the descoping of the Boeing contract. The restructured contract

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) reflected the transition of a program oriented towards eventual production, to one oriented to demonstration of a missile launch from a train and conduct of mobility exercises to evaluate operational and security concepts.

The favorable change in cost variance was due to the PCO authorizing an Over Target Baseline (OTB) on 22 March 1991. This OTB allowed Boeing to enhance their cost variance by $40.8M.

The favorable change in schedule variance was due to contract restructure.

Projected overruns were accounted for in the program restructure, no program impacts were expected.

Program manager's Estimated Price at Completion is under the purview of the Termination Contracting Officer.

(U) Missile Launch Car:	Initial Contract Price		
	Target	Ceiling	Qty
Westinghouse, Sunnyvale, CA F04704-88-C-0026, FPIF/AF Award: May 18, 1988 Definitized: May 18, 1988	$167.0	$188.0	8

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$264.7	$284.6	6	$265.8	N/A

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-26.4	$-3.6
Cumulative Variances To Date (10/11/91)	$-28.0	$-14.2
Net Change	$-1.6	$-10.6

Explanation of Change:

The increase in Current Contract Price was mainly due to authorized unpriced work such as: the operational support equipment bay; follow-on test and evaluation; pad allowables; Joint Operational Procedures between ASCONS; and guidance and control condensing units were added to the contract since the last report. Also, the delay barrier system and external appearance projects were definitized.

The quantity of eight MLCs changed to six due to deletion of two operational models under the restructure program. The six MLCs were not counted as program units because they did not fit the defined unit constraints. The RDT&E units were to be used for engineering

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions) evaluation and basing verification tests.

The increase in Estimated Price at Completion was due to additional work definitization.

The unfavorable change in cost variance was mainly due to drafting growth for design differences between the engineering and operational models and the Canister Assembly Launch and Test Program (CALTP) slippage. Also, there were added costs from subcontractors' design delays of operational models roof, operational support equipment bays, rail car structures, hot gas generators and signal conditioning units and rate variances.

The unfavorable change in schedule variance was due to CDR and CALTP slippage, as well as subcontractors' late delivery of operational components.

Projected overruns were accounted for in the program restructure, no program impacts were expected.

Program manager's Estimated Price at Completion is under the purview of the Termination Contracting Officer.

(U) Launch Control System:	Initial Contract Price Target	Ceiling	Qty
Rockwell International, San Bernardino, CA			
F04704-88-C-0043, FPIP/AF	$161.8	$183.5	0
Award: May 18, 1988			
Definitized: May 18, 1988			

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$364.0	$369.8	0	$352.1	N/A

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-29.1	$-11.7
Cumulative Variances To Date (08/08/91)	$-38.0	$-10.9
Net Change	$-8.9	$0.8

Explanation of Change:

The increase in Current Contract Price was mainly due to definitization of the Fuel Car/Locomotive Interchange, Secure Coded Device Off Home Monitor and Magnetic Shielding since the last report.

The increase in Estimated Price at Completion was mainly due to definitization of added authorized work.

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

The unfavorable change in cost variance was due to material and labor growth in the command and control area, rail car design, rail car/train electrical power system, the Rail Garrison Executive Program (REP) software design test and program management, and the associated indirect and G&A costs.

The favorable change in schedule variance was mainly due to rail car design and the Rail Garrison Executive Program (REP).

Projected overruns were accounted for in the program restructure, no program impacts were expected.

Program manager's Estimated price at Completion is under the purview of the Termination Contracting Officer.

(U) Guidance & Control:
Rockwell International, Anaheim, CA
F04704-89-C-0103, CPIF/AF
Award: October 2, 1989
Definitized: June 13, 1990

Initial Contract Price		
Target	Ceiling	Qty
$66.3	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$55.8	N/A	0	$55.8	N/A

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.4	$-0.9
Cumulative Variances To Date (08/30/91)	$0.4	$-1.3
Net Change	$0.0	$-0.4

Explanation of Change:

The contract deliveries are not complete program end items and are not included in the total program quantity for RDT&E.

The Current Contract Price and Estimated Price at Completion decreased because the code effort was removed from this contract and placed on a separate contract.

The unfavorable change in schedule variance was mainly due to unforeseen difficulties with hardware mobility testing and Nuclear Event Protection recovery software code and checkout.

Program manager's Estimated Price at Completion is under the purview of the Termination Contracting Officer.

15. (U) **Contract Information:** **Cont'd** (Then-Year Dollars in Millions)

(U) System Eng/Tech Assist:	Initial Contract Price Target	Ceiling	Qty
TRW, Redondo Beach, CA F04704-91-C-0002, CPFF/AF Award: October 1, 1991 Definitized: October 1, 1991	$62.7	N/A	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$62.7	N/A	0	$62.7	$62.7

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (12/31/91)	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

This is a new contract since the last report.

This contract is level of effort and has been completed.

16. (U) **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. (U) Program Status —

(1) Percent Program Completed: 100.0% (6 yrs/6 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($2039.3 / $2039.3)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY87-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	1970.3	10.1	-	-	1980.4
Procurement	-	-	-	-	-
MILCON	58.9	-	-	-	58.9
O&M	-	-	-	-	-
Total	2029.2	10.1	-	-	2039.3

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3600 Research, Development, Test + Eval, AF								
1987				74.0	90.0	88.7	86.9	2.8
1988				256.3	322.4	315.8	312.9	2.9
1989				357.4	468.2	463.9	448.4	4.2
1990				544.7	737.0	730.8	645.2	4.0
1991				250.7	352.7	331.0	155.0	3.9
1992				7.0	10.1	10.1	7.4	3.1
Subtot				1490.1	1980.4	1940.3	1655.8	

Obligated/expended only for B/A released to the Ballistic Missile Organization.

16c. (U) Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY82 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 3300 Military Construction, Air Force								
1988				7.0	9.1			2.9
1989				9.8	13.2	13.2	2.7	4.2
1990				7.5	10.8	8.4	8.4	4.0
1991				18.1	25.8			3.9
Subtot				42.4	58.9	21.6	11.1	
Grand Total				1532.5	2039.3	1961.9	1666.9	

17. (U) Production Rate Data:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1990	0	0	0	N/A
1991	20	0	0	N/A
1992	23	0	0	N/A
1993	24	0	0	N/A
1994	0	0	0	N/A
1995	0	0	0	N/A
1996	0	0	0	N/A
1997	0	0	0	N/A

The FY91 Congressional Appropriations reduced the procurement for PRG to zero.

b. (U) Cost Variance -- None.

c. (U) Schedule Variance -- None.

d. (U) Deliveries (Plan/Actual) -- None.

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules -- None

b. (U) Costs -- None.

c. (U) Contractor Support Costs -- None.

N-6 AOE 6

91-117 R2

*** UNCLASSIFIED ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AOE 6 SUPPORT SHIP

AS OF DATE: December 31, 1991

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FOR OPEN PUBLICATION
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

9

1. **Designation and Nomenclature (Popular Name):**
AOE 6 CLASS FAST COMBAT SUPPORT SHIP

2. **DoD Component:** Navy

3. **Responsible Office and Telephone Number:**
Zachary Taylor Building (NC #3)
2531 Jefferson Davis Highway
Arlington, VA 20362-5101

CAPT Theodore Doroshenk, USN
Assigned: August 2, 1991
AV 332-3507 COMM (703) 602-3507

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 0604567N (Shared) Project 1803 (Shared), 0857 (Shared)
PE 0603564N (Shared) Project 0408 (Shared)
PROCUREMENT:
APPN 1611 ICN 5025 (Navy)
MILCON:
PE 0702096N, 0702228N, 0204441N, 0204796N
O & M:
PE 070801N

5. **Related Programs:**

T-AO 187 CLASS FLEET OILER

No Security Objection to Open Publication (AS AMENDED)
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MAR 20 1992
Office of the Chief of Naval Operations Dept. of the Navy

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OASD(PA) DFOISR 92-T-0626

6. Mission and Description:

MISSION. The Fast Combat Support Ship operates as an integral part of the Carrier Battle Group (CVBG) providing simultaneous multiproduct underway replenishment (UNREP) by means of connected replenishment (CONREP) and vertical replenishment (VERTREP) using embarked helicopters. The ship delivers on-station munitions, bulk petroleum/oil/lubricants (POL) products, and fresh, frozen, and dry provisions to the CVBG underway in hostile environments. The ship delivers and receives fleet freight, mail, and personnel to/from combatant forces underway. The ship will be capable of replenishing from six stations simultaneously.

DESCRIPTION. A 156,000 barrel cargo fuel capacity, twin screw, 20+ knots sustained speed, gas turbine geared drive ship, 753'8" in overall length, 107'0" in beam, and with a draft of 38'3". The ship will have the design capacity for 1800 long tons of ammunition, 400 long tons of Chill and Freeze Storage, 250 long tons of other cargo stowage, two H-46 VERTREP helicopters, and will have accommodations for 667 crew and detachment people, plus 38 transient personnel.

7. Program Highlights:

a. Significant Historical Developments --

The AOE 6 Class Program was approved by a NDCP on 20 MAR 86. The lead ship contract for detail design and construction was awarded on 23 JAN 87. The award was a one plus three option-type, fixed price incentive (FPI), subject to escalation, contract (50/50 share). The option for the first follow ship (AOE 7) was awarded on 3 NOV 88 and for the second (AOE 8), on 6 DEC 89.

Production on the lead ship commenced on 22 JUN 88 with the launch of the AOE 6 (without Reversing Reduction Gears (RRG)) on 6 OCT 90. The starboard RRGs were landed on 7 JAN 92; the port on 18 JAN 92. The Best Estimated Delivery Date (BEDD) for AOE 6 is 1 APR 93.

As a result of the FY 1992/1993 Congressional Budget of FEB 91, the AOE 6 Class Program was reduced from 7 to 4 ships; the FY 91 ship (AOE 9) was rescinded and a FY 92 ship (AOE 10) was added. The fourth ship (AOE 10) is to be recompeted as a stand-alone procurement, with award scheduled for late FY 92.

In MAY 91, as a result of the FY 1991 Dire Emergency Supplemental Appropriations Act, the AOE 6 Class Program was provided $237.0M. Congress provided these funds in order to cover cost growth associated with shipbuilder claims entitlements; thereby enabling completion of the three ships at NASSCO.

b. Significant Developments Since Last Report --

The claims negotiations with NASSCO were completed on 1 NOV 91; final settlement was reached 26 DEC 91. NASSCO submitted claims in the

7b. Program Highlights (Cont'd):

amount of $460.0M; a settlement modification was executed for $239.0M (target price). As part of this settlement, the contract delivery date for the first ship was changed to 1 APR 93.

This system will satisfy mission requirements.

c. Changes Since As Of Date --
The port and starboard AOE 6 Reversing Reduction Gear (RRG) were landed on 18 JAN 92 and 7 JAN 92, respectively.

8. Threshold Breaches:
There are no breaches to the Approved Program Baseline (APB) dated 19 DEC 91 and no Nunn-McCurdy unit cost breaches.

9. Schedule:

a. Milestones --

	Production Estimate	Approved Program	Current Estimate
Operational Requirement (OR)	JUL 82	JUL 82	JUL 82
Ship Characteristics Imp. Board (SCIB)	JUL 83	JUL 83	JUL 83
Characteristics Approved	OCT 84	OCT 84	OCT 84
Production Decision	MAR 86	MAR 86	MAR 86
Production Contract Award	JAN 87	JAN 87	JAN 87
Production Started - 1st Ship	JUN 88	JUN 88	JUN 88
Follow-On Production Decision	NOV 88	NOV 88	NOV 88
Exercise Option (AOE 7)	N/A	NOV 88	NOV 88
Exercise Option (AOE 8)	N/A	DEC 89	DEC 89
Launch - 1st Ship	FEB 90	OCT 90	OCT 90
Acceptance Trials - 1st Ship	MAR 91	FEB 93	FEB 93 (Ch-1)
Delivery - 1st Ship	APR 91	APR 93	APR 93 (Ch-2)
Initial Operational Capability	AUG 91	MAY 93	MAY 93 (Ch-3)
Last AOE Delivery	FEB 98	NOV 96	APR 97 (Ch-4)

b. Previous Change Explanations --

ACCEPTANCE TRIALS - 1ST SHIP: The delay from JUN 92 to DEC 92 is due to continued NASSCO production inefficiencies and late delivery of Government furnished Reversing Reduction Gears (RRG).

DELIVERY - 1ST SHIP: The delay from SEP 92 to FEB 93 was due to the delay in Acceptance Trials.

INITIAL OPERATING CAPABILITY: The delay from OCT 92 to APR 93 was due to the change in fitting out period caused by delay in delivery.

9c. **Schedule (Cont'd)**:

c. Current Change Explanations --

(Ch-1) ACCEPTANCE TRIALS - 1ST SHIP: The delay from DEC 92 to FEB 93 is due to continued NASSCO production inefficiencies and to reprogramming resulting from claims settlement due to late delivery of Government furnished RRG.

(Ch-2) DELIVERY - 1ST SHIP: The delay from FEB 93 to APR 93 is due to continued NASSCO production inefficiencies and to reprogramming resulting from late receipt of the RRG, which led to extension of contract delivery date as part of claims settlement concluded 26 DEC 91.

(Ch-3) INITIAL OPERATING CAPABILITY: The delay from APR 93 to MAY 93 is due to the change in the fitting out period caused by change in delivery.

(Ch-4) LAST AOE DELIVERY: The delay from NOV 96 to APR 97 is due to the delay in anticipated contract award.

d. References --

Production Estimate:
NDCP Approved 20 March 1986: Lead Ship Production

DCP Approved 25 May 1989: Follow Ship Production

Approved Program:
NAE approved Acquisition Program Baseline dated 19 December 1991.

10. **Performance Characteristics**:

a. Performance --

		Approved Program		Demon-strated	Current
	PdE	Objective/Threshold		Perf	Estimate
Length Overall (ft)	753'8"	753'8"	/ 753'8"	753'8"	753'8"
Beam (maximum) (ft)	107'0	107'0"	/ 107'0"	107'0"	107'0"
Draft (mean) (ft)	37'9"	38'3"	/ 38'3"	38'3"	38'3"
Displacement (long tons)	48500	48998	/ 48998	48998	48998
Propulsion					
Gas Turbines	4	4	/ 4	4	4
Shafts	2	2	/ 2	2	2
Shaft Horsepower	100000	100000	/ 100000	100000	100000
Accommodations	667	667	/ 667	667	667
Speed (kts)	20+	20+	/ 20+	-	20+

10a. **Performance Characteristics (Cont'd)**:

	PdE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
Armament					
NSSMS	1	1	/ 1	1	1
CIWS	2	2	/ 2	2	2
25mm Guns	2	2	/ 2	2	2
.50 Cal Guns	4	4	/ 4	4	4
Cargo Fuel Cap. (bbls)	156000	156000	/ 156000	156000	156000
DFM-JP5-Conv. (%)	30-40-30	30-40-30	/ 30-40-30	30-40-30	30-40-30
Ordnance Storage (long tons)	1800	1800	/ 1800	1800	1800
Chill & Freeze (long tons)	400	400	/ 400	400	400
Other Cargo (long tons)	250	250	/ 250	250	250
H-46 Helo (UNREP)	2	2	/ 2	2	2

b. Previous Change Explanations -- None.

c. Current Change Explanations -- None.

d. References --

Production Estimate:
NDCP Approved 20 March 1986: Lead Ship Production

DCP Approved 25 May 1989: Follow Ship Production

Approved Program:
NAE approved Acquisition Program Baseline dated 19 December 1991.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Production Estimate	Approved Program	Current Estimate
a. Cost --			
Development (RDT&E)	29.4	30.1	31.2
Procurement	2303.1	1791.6	1818.6
Sailaway Costs	(2230.6)		(1764.5)
Total Sailaway	(2230.6)		(1764.5)
Sailaway Costs	(72.5)		(0.0)
Total Other Wpn Sys	(72.5)		(0.0)
Peculiar Support	(0.0)		(54.1)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	124.2	123.7
Ops. and Maint. (O&M)	0.0	N/A	0.4
Total FY 86 Base-Year $	2332.5	1945.9	1973.9
Escalation	502.3	418.0	344.9
Development (RDT&E)	(-0.6)	(-0.5)	(-0.3)
Procurement	(502.9)	(358.9)	(300.5)
Construction (MILCON)	(0.0)	(59.6)	(44.6)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.1)
Total Then-Year $	2834.8	2363.9	2318.8
b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	7	4	4
Total	7	4	4

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Production Estimate:
NDCP Approved 20 March 1986: Lead Ship Production

DCP Approved 25 May 1989: Follow Ship Production

Approved Program:
NAE approved Acquisition Program Baseline dated 19 December 1991.

12. **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(SEP 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2318.8	2364.4	2318.8
(2) Quantity	4	4	4
(3) Unit Cost	579.70	591.10	579.70
b. Current Procurement --	(FY 1992)	(FY 1992)	(FY 1993)
(1) Cost (TY$)	505.6	505.6	28.2
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	505.6	505.6	28.2
(2) Quantity	1	1	0
(3) Unit Cost	505.60	505.60	N/A

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	28.8	2806.0	0.0	0.0	2834.8
Previous Changes:					
Economic	-	+130.9	-	-	+130.9
Quantity	-	-1374.3	-	-	-1374.3
Schedule	-	+133.0	-	-	+133.0
Engineering	-	-	-	-	-
Estimating	+0.8	+488.8	+183.8	+0.5	+673.9
Other	-	-	-	-	-
Support	-	-33.9	-	-	-33.9
Subtotal	+0.8	-655.5	+183.8	+0.5	-470.4
Current Changes:					
Economic	-0.1	-78.7	-5.4	-	-84.2
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+1.4	+40.6	-10.1	-	+31.9
Other	-	-	-	-	-
Support	-	+6.7	-	-	+6.7
Subtotal	+1.3	-31.4	-15.5	-	-45.6
Total Changes	+2.1	-686.9	+168.3	+0.5	-516.0
Current Estimate	30.9	2119.1	168.3	0.5	2318.8

13a. **Cost Variance Analysis (Cont'd)**:

a. Summary -- (FY 1986 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	29.4	2303.1	0.0	0.0	2332.5
Previous Changes:					
Quantity	-	-979.0	-	-	-979.0
Schedule	-	+100.1	-	-	+100.1
Engineering	-	-	-	-	-
Estimating	+0.7	+391.1	+124.2	+0.4	+516.4
Other	-	-	-	-	-
Support	-	-23.7	-	-	-23.7
Subtotal	+0.7	-511.5	+124.2	+0.4	-386.2
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+1.1	+21.7	-0.5	-	+22.3
Other	-	-	-	-	-
Support	-	+5.3	-	-	+5.3
Subtotal	+1.1	+27.0	-0.5	-	+27.6
Total Changes	+1.8	-484.5	+123.7	+0.4	-358.6
Current Estimate	31.2	1818.6	123.7	0.4	1973.9

b. Previous Change Explanations --

RDT&E
Estimating: Increase in Engineering Development Costs.

PROCUREMENT
Economic: Revised inflation indices.
Quantity: Change in program: 7 to 4 ships.
Schedule: Change in acquisition strategy: from 1-1-0 to 1-0-1 (FY90 to FY92).
Estimating: Repricing based on prior year ship costs.
Support: Decrease in estimated Outfitting and Material costs.

13b. Cost Variance Analysis (Cont'd):

MILCON
Estimating: Addition of Homeport Requirements.

O & M
Estimating: MILCON Planning/Design and Site Survey Studies.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Economic Escalation Indices (Economic)	N/A	-0.1
Current and Prior Inflation Offset (Estimating)	0.1	0.1
Increase in Engineering Development costs for AOE 10 ship contract design. (Estimating)	1.0	1.3
Total Changes	1.1	1.3
(2) PROCUREMENT		
Revised Economic Escalation Indices (Economic)	N/A	-78.7
Current and Prior Inflation Offset (Estimating)	64.5	76.2
Congressional reductions to FY 1992 program. (Estimating)	-42.8	-35.6
Increase in Outfitting Material Costs and Post Delivery Allowance for shock tests. (Support)	5.3	6.7
Total Changes	27.0	-31.4
(3) MILCON		
Revised Economic Escalation Indices (Economic)	N/A	-6.4
Economic Adjustment for Negative Program Change (Economic)	N/A	1.0
Current and Prior Inflation Offset (Estimating)	0.9	0.1
Revised Homeport requirements estimate (Estimating)	-1.4	-10.2
Total Changes	-0.5	-15.5

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
404.97	11.68	-39.85	33.25	--	176.45	--	-6.80	174.73	579.70

15. Contract Information: (Then-Year Dollars in Millions)

a. Procurement --

AOE 6/7/8:
NASSCO, San Diego, CA
N00024-87-C-2002, FPI
Award: January 23, 1987
Definitized: January 23, 1987

Initial Contract Price		
Target	Ceiling	Qty
$281.5	$319.9	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$958.7	$1079.0	3	$1045.7	$1049.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-197.8	$-37.0
Cumulative Variances To Date (12/31/91)	$-223.2	$-55.7
Net Change	$-25.4	$-18.7

Explanation of Change:

CONTRACT VARIANCE

The factors contributing to the COST variances are mainly associated with late delivery of Government furnished RRG. Also contributing are NASSCO's low manhour efficiencies in design and production; labor and overhead rates higher than budgeted rates; and overruns in material costs. Variance is expected to reach zero with reprogramming resulting from claims settlement.

The factors contributing to the SCHEDULE variances are mainly associated with late delivery of Government furnished RRG. Current SCHEDULE variances should reach zero with reprogramming resulting from claims settlement.

16. **Program Funding Summary**: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 68.8% (11 yrs/16 yrs)

(2) Percent Program Cost Appropriated: 93.2% ($2161.4 / $2318.8)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY82-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-97)	Total
RDT&E	30.5	0.4	-	-	30.9
Procurement	1556.3	505.6	28.2	29.0	2119.1
MILCON	40.1	28.0	0.9	99.3	168.3
O&M	0.5	-	-	-	0.5
Total	1627.4	534.0	29.1	128.3	2318.8

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1982				2.7	2.4	2.4	2.4	7.6
1983				4.0	3.7	3.7	3.7	4.9
1984				7.9	7.6	7.6	7.6	3.8
1985				7.7	7.6	7.6	7.6	3.4
1986				4.5	4.6	4.6	4.6	2.8

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1987				1.5	1.6	1.6	1.6	2.7
1988				0.1	0.1	0.1	0.1	3.0
1989								4.2
1990				0.9	1.0	1.0	1.0	4.0
1991				1.6	1.9	1.9	1.9	3.9
1992				0.3	0.4	0.1	0.1	3.1
Subtot				31.2	30.9	30.6	30.6	
Appropriation: 1611 Shipbuilding and Conversion, Navy								
1987	1		520.0	520.1	560.2	479.4	417.3	1.5
1988								2.3
1989	1		325.3	327.3	373.5	316.6	207.8	2.8
1990	1		324.3	327.4	384.5	247.8	124.1	1.3
1991			195.8	196.6	238.1	139.7	60.7	1.3
1992	1		399.1	404.4	505.6	0.6	0.3	3.1
1993				21.8	28.2			3.3
1994				9.5	12.6			3.3
1995				0.5	0.7			3.3

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Obligated	Expended	Escl Rate (%)
Appropriation: 1611 Shipbuilding and Conversion, Navy (Cont'd)								
1996				10.6	15.0			3.2
1997				0.4	0.7			3.2
Subtot	4		1764.5	1818.6	2119.1	1184.1	810.2	
Appropriation: 1205 Military Construction, Navy								
1991				32.4	40.1			3.9
1992				21.9	28.0			3.1
1993				0.7	0.9			3.3
1994								3.3
1995				28.9	40.6			3.3
1996				23.6	34.3			3.2
1997				16.2	24.4			3.2
1998								3.2
Subtot				123.7	168.3			
Appropriation: 1804 Operation and Maintenance, Navy								
1990				0.4	0.5	0.5	0.5	4.0
Subtot				0.4	0.5	0.5	0.5	

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY86 Dollars Nonrec	Flyaway FY86 Dollars Rec	Total Base Year$	Total Then-Year $ Program	Total Then-Year $ Obligated	Total Then-Year $ Expended	Escl Rate (%)
Appropriation: 1804 Operation and Maintenance, Navy (Cont'd)								
Grand Total	4		1764.5	1973.9	2318.8	1215.2	841.3	

17. **Production Rate Data:**

a. Annual Production Rates -- None.

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	1973.9	N/A	
(TY $)	N/A	N/A	2318.8	N/A	
PAUC Cost (BY $)	N/A	N/A	493.475	N/A	N/A
(TY $)	N/A	N/A	579.700	N/A	N/A

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

17d. **Production Rate Data (Cont'd)**:

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. Approved Design-to-Cost Objective -- N/A.

18. **Operating and Support Costs**:

a. Assumptions and Ground Rules --

The AOE 6 Class Fast Combat Support Ship is designed to operate independently or as a unit of an underway replenishment group, furnishing petroleum-oil-lubricant (POL) products and fresh, frozen, and dry stores to operating forces. The O&S costs associated with this ship class are based on a useful life of 30 years. Ship design parameters indicate that each ship will consume about 110,900 BBL of fuel each year. Direct personnel costs involve the annual cost for the embarked crew. Retirement costs are not included in these direct personnel costs. Direct operating costs include the cost of fuel, repair parts, supplies, training, expended stores, and purchased services. Direct maintenance is based on the average annual costs of the AOE 1 Class (AOE 1-4) Intermediate and Depot Level Maintenance. Indirect costs include training, personnel retirement costs, publications, ammunition handling, and engineering/technical services support. The baseline used to derive the estimates are an average of the FY 91 Actuals, five-year maintenance cost averages, and the FY 92 approved expenses.

b. Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per AOE 6 Class	Avg Annual Cost Per AOE 1 Class
Direct Personnel	14.5	14.4
Direct Operations	6.3	7.6
Direct Maintenance	16.1	14.7
Indirect Costs	0.8	0.8
Total	37.7	37.5

18c. Operating and Support Costs (Cont'd):

c. Contractor Support Costs -- None.

A-33 STINGRAY

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: STINGRAY AN/VLQ-7()

AS OF DATE: December 31, 1991

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1. (U) Designation and Nomenclature (Popular Name):
Countermeasure Set AN/VLQ-7(), Combat Protection System STINGRAY

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:

PM EW/RSTA
ATTN: SFAE-IEW-EW
FORT MONMOUTH, NJ 07703-5210

COL ARTHUR D. HURTADO
Assigned: January 7, 1991
AV 996-5673 COMM (908)-544-5673

Product Manager:
PM STINGRAY
ATTN: SFAE-IEW-EW
FORT MONMOUTH, NJ 07703-5210

LTC JOSEPH W. KITCHELL
Assigned: June 1, 1990
AV 996-5489 COMM (908)-544-5489

CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 20 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

~~Classified by: STINGRAY SCG 28 SEP 89~~
~~Declassify on: OADR~~
~~Downgrade Instructions: OADR~~

(THIS PAGE IS UNCLASSIFIED)

OASD(PA) DFOISR 96-T-0597

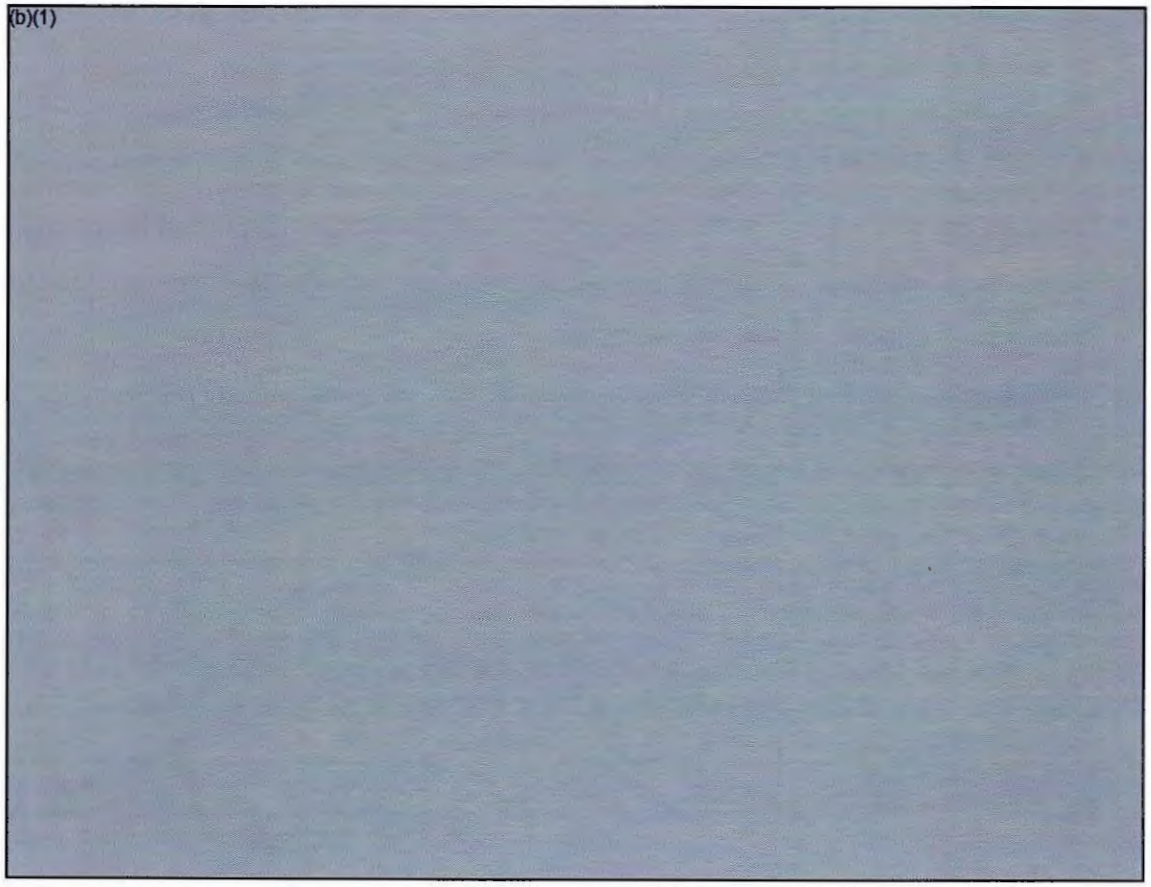
*** [redacted] ***

4. (U) Program Elements/Procurement Line Items:

RDT&E:
PE 64270A (Shared) Project D540
PROCUREMENT:
APPN 2035 ICN BA3020 (Army)
APPN 2035 ICN BA9103 (Army)

5. (U) Related Programs: None.

(b)(1)



7. (U) Program Highlights:

a. (U) Significant Historical Developments --
Concept exploration of the STINGRAY program was initiated by the ARMY in FY 1980. A contract was awarded to Martin Marietta Orlando Aerospace for development of a brassboard optical warning/optical jamming system. The brassboard was fabricated through the modification of existing hardware and consequently did not satisfy all the user requirements. In an effort to satisfy the user's remaining operational and performance issues, a competitive contract was awarded to Martin Marietta Orlando Aerospace in FY 1982 for development of a STINGRAY advanced development system. Under this

7a. (U) Program Highlights (Cont'd):

contract, Martin Marietta Orlando Aerospace developed an advanced development model and integrated the system into a Bradley Fighting Vehicle. Government tests were performed on the advanced development model at White Sands Missile Range From August 1986 to April 1987. The results of these tests were made available to the Army Material Systems Analysis Agency for preparation of an independent evaluation report. The test and analysis resulted in support for the STINGRAY program. However, some necessary improvements were identified, and a risk reduction program was initiated to resolve them. On 26 April 1990, HQDA approved a capstone ROC for the Family of Combat Protection Systems (CPS) of which the STINGRAY Combat Protection System is Annex A.

In September 1990, HQDA requested two STINGRAY systems be deployed in support of Operation Desert Storm. These systems were deployed in February 1991 and attached to the 1ST BDE, 1ST CAV DIV. This deployment facilitated the development of new tactics and doctrine for the system. These systems were 100% operational, however, the enemy forces offered so little resistance that they were not used.

On 19 July 1991, a MS II ASARC approved the program entry into the Engineering and Manufacturing Development (E&MD) Phase for 6 E&MD models with a total procurement objective quantity of 164 systems as proposed. The Acquisition Decision Memorandum directed that all bidders' proposals include a diode pumped laser.

The competitive E&MD Phase RFP was released 30 July 1991 with proposals received on 13 September 1991 leading to a planned April 1992 award. Contractors were required to propose their Design-to-Unit-Production Cost (DTUPC) goals within the E&MD Phase contract. The follow-on production contract is planned for sole-source award to the successful E&MD contractor.

b. (U) Significant Developments Since Last Report -- None.

c. (U) Changes Since As Of Date --
The E&MD contract award date has slipped from February 1992 to April 1992 due to the delay in availability of the STINGRAY funds. This causes all succeeding milestones to slip by two months.

8. (U) Threshold Breaches:
There are no breaches to the Approved Acquisition Program Baseline (APB) dated 16 OCT 1991 and no Nunn-McCurdy unit cost breaches.

9. (U) Schedule:

a. (U) Milestones --

	Development Estimate	Approved Program	Current Estimate
Milestone I (ASARC)	APR 82	APR 82	APR 82
Advanced Development Contract Award	SEP 82	SEP 82	SEP 82
Critical Design Review	JUN 83	JUN 83	JUN 83
Concept Demonstration	NOV 85	NOV 85	NOV 85
Integrated Systems Acceptance Testing	JUN 86	JUN 86	JUN 86
Milestone II (ASARC)	JUL 91	JUL 91	JUL 91
E&MD Contract Award	FEB 92	FEB 92	APR 92(Ch-1)
Critical Design Review	FEB 93	FEB 93	APR 93(Ch-1)
First Prototype Delivered	AUG 93	AUG 93	OCT 93(Ch-1)
Developmental Testing			
Start	NOV 93	NOV 93	JAN 94(Ch-1)
Complete	SEP 94	SEP 94	NOV 94(Ch-1)
IOT&E			
Start	MAR 94	MAR 94	MAY 94(Ch-1)
Complete	OCT 94	OCT 94	DEC 94(Ch-1)
Milestone III (DAB)	DEC 94	DEC 94	FEB 95(Ch-1)
Production Contract Award	JAN 95	JAN 95	MAR 95(Ch-1)
First Unit Equipped (FUE)	N/A	N/A	N/A

(b)(1) [redacted]

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations --

(Ch-1) The E&MD contract award has slipped from FEB 92 to APR 92 due to the delay in availability of the STINGRAY funds. This causes all succeeding milestones to slip by two months.

d. (U) References --

(U) Development Estimate:
AAE Approved Acquisition Program Baseline dated 16 OCT 1991.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 16 October 1991

10. (U) Performance Characteristics:

10a. (U) Performance Characteristics (Cont'd):

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
(b)(1)				

b. (U) Previous Change Explanations -- None.

c. (U) Current Change Explanations -- None.

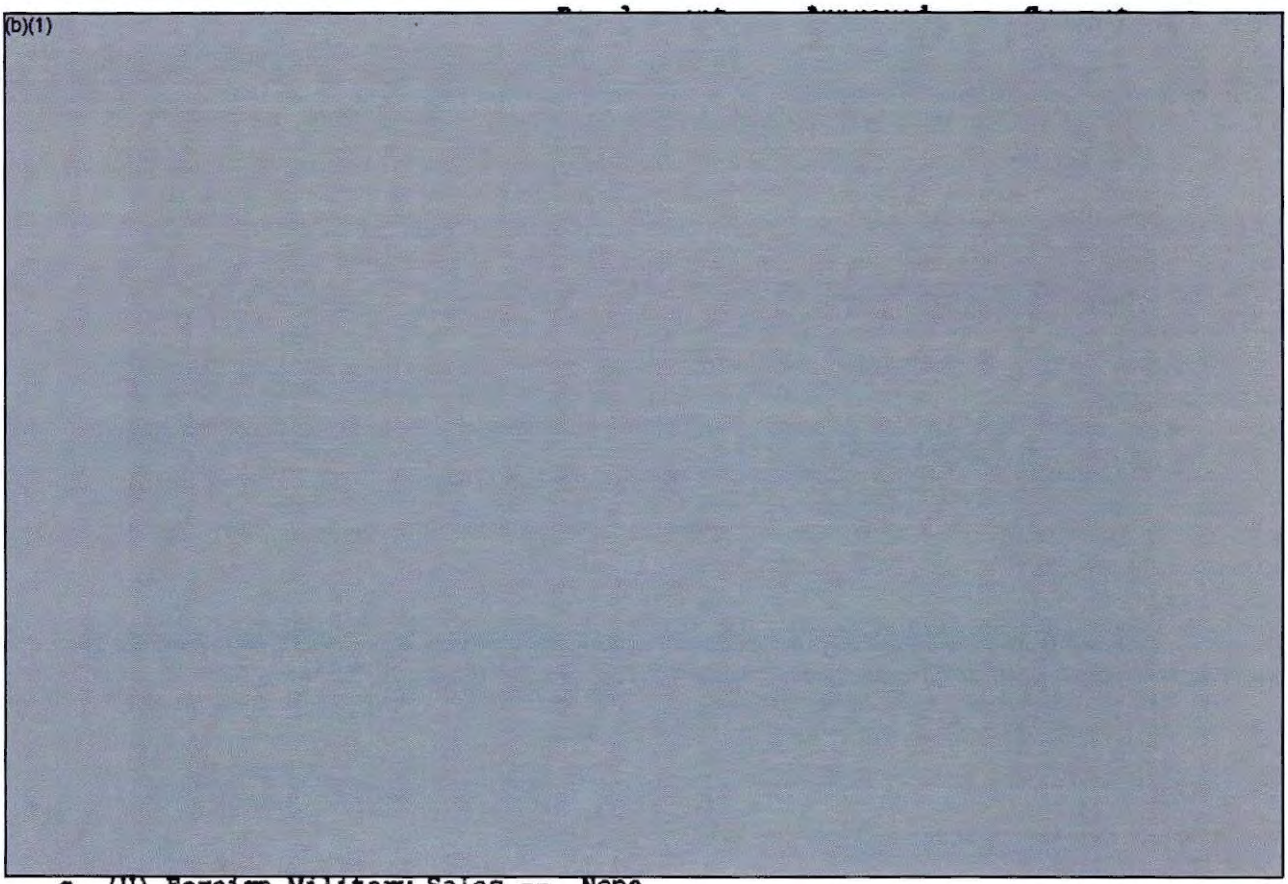
d. (U) References --

(U) Development Estimate:
AAE Approved Program Baseline (APB) dated 16 OCT 1991.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 16 October 1991

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

(b)(1)



c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
AAE Approved Program Baseline (APB) dated 16 OCT 1991.

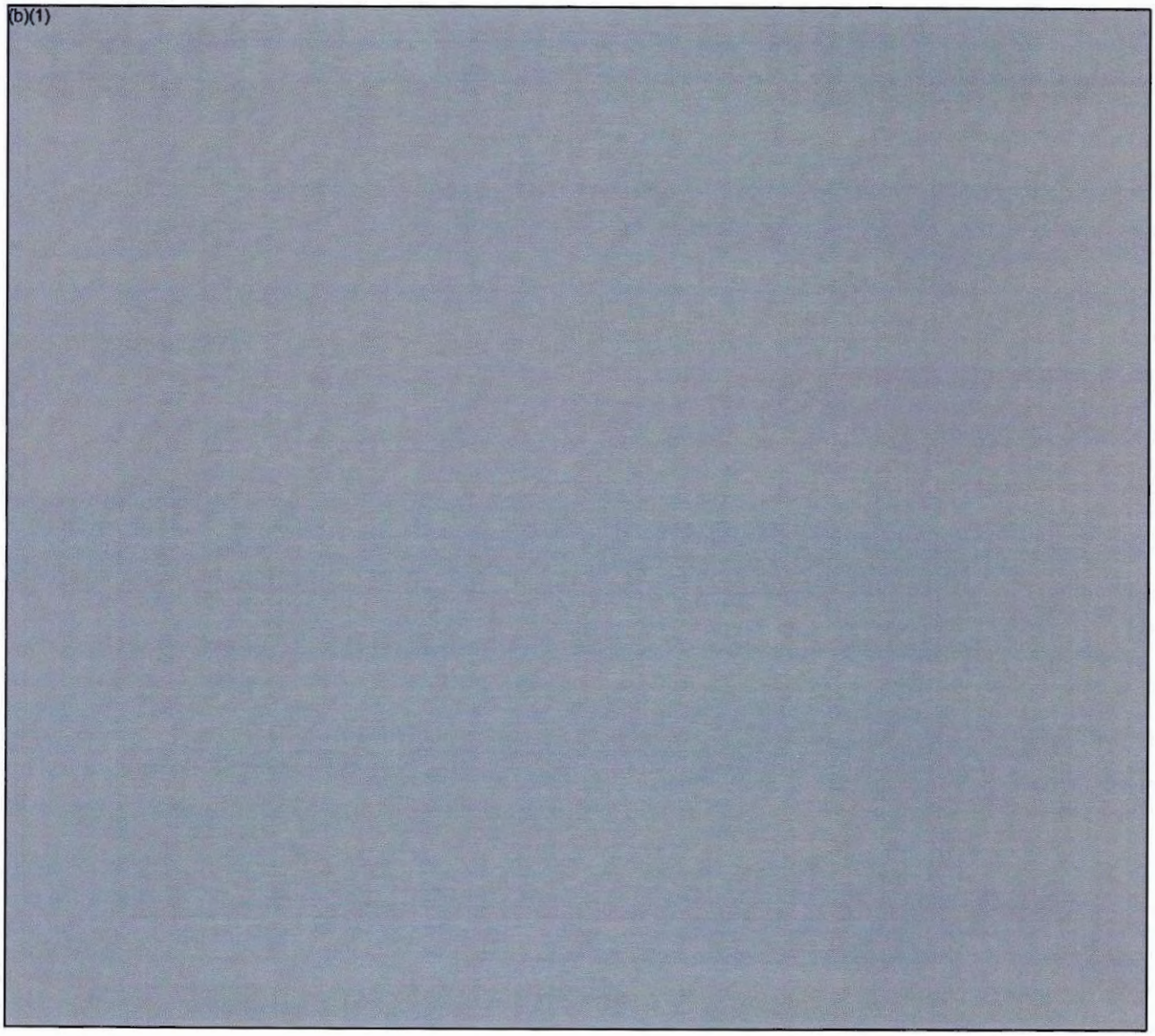
(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 16 October 1991

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current	Current Year	Budget Year
(b)(1)			

13. (U) Cost Variance Analysis:

(b)(1)



STINGRAY AN/VLQ-7(), December 31, 1991

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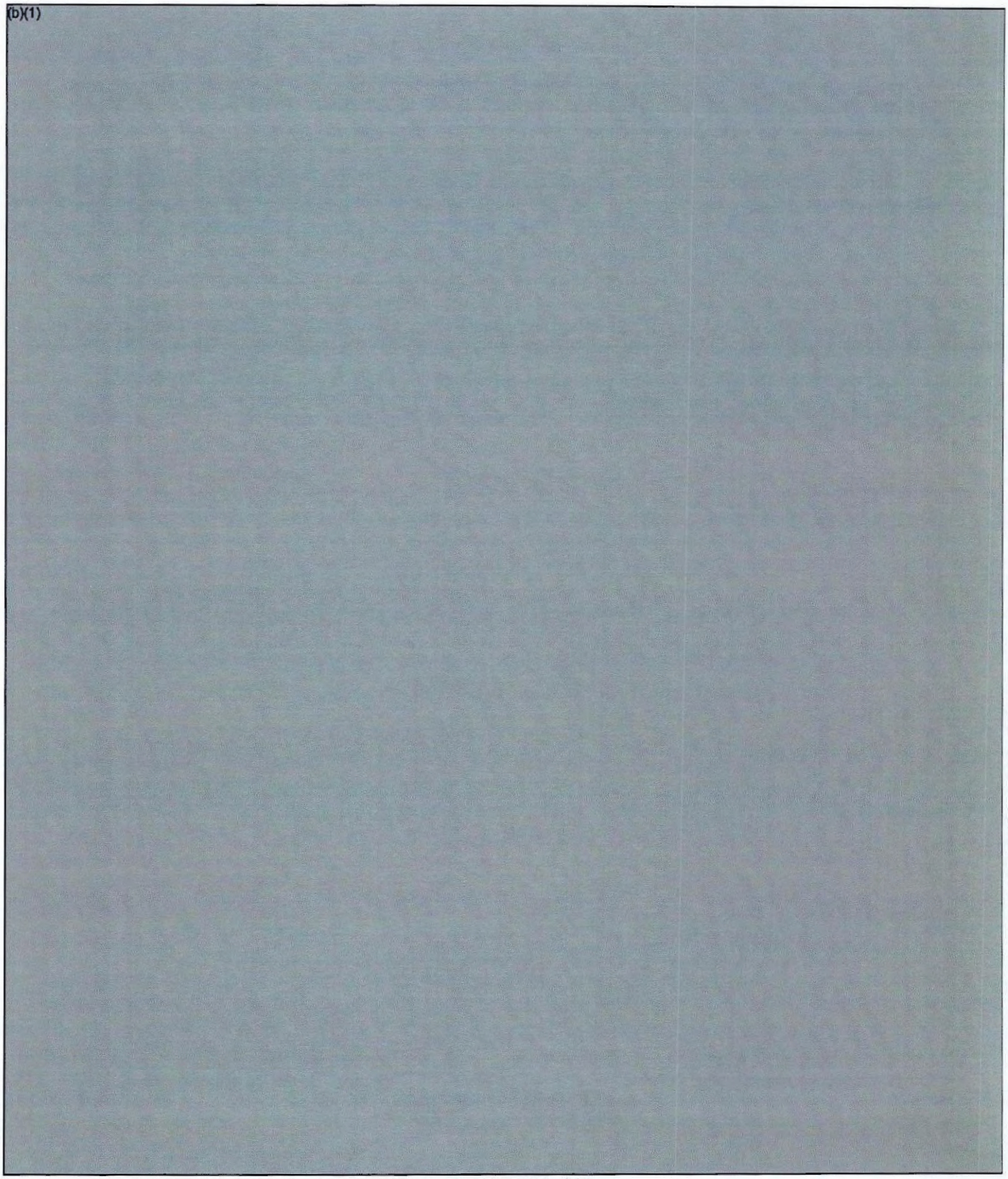


(b)(1)

[redacted]

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
2.527	-0.026	--	--	-0.023	0.027	--	--	-0.022	2.505

15. (U) Contract Information: None.

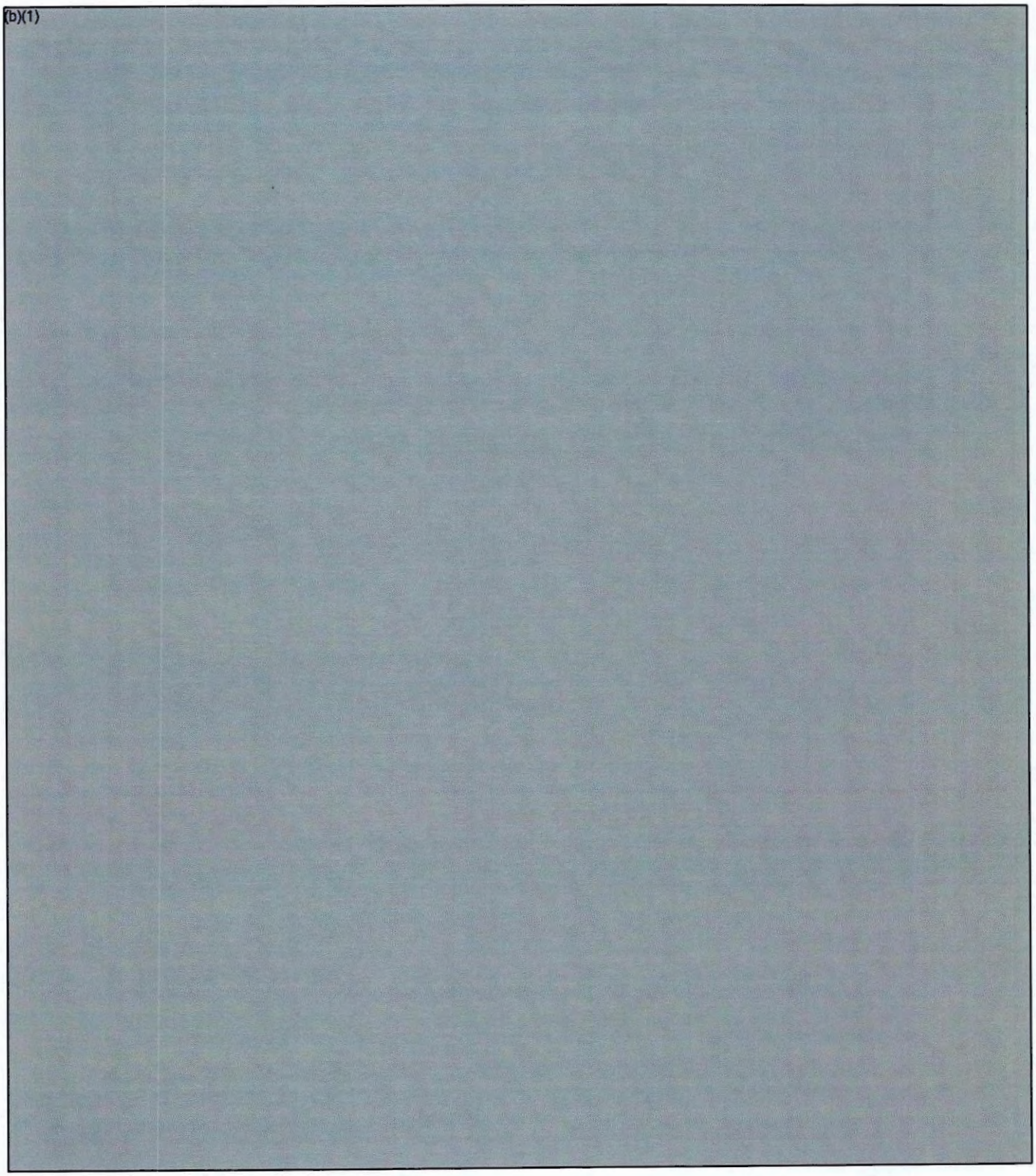
16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 52.6% (10 yrs/19 yrs)

(2) Percent Program Cost Appropriated: 20.4% ($83.7 / $410.8)

(b)(1)



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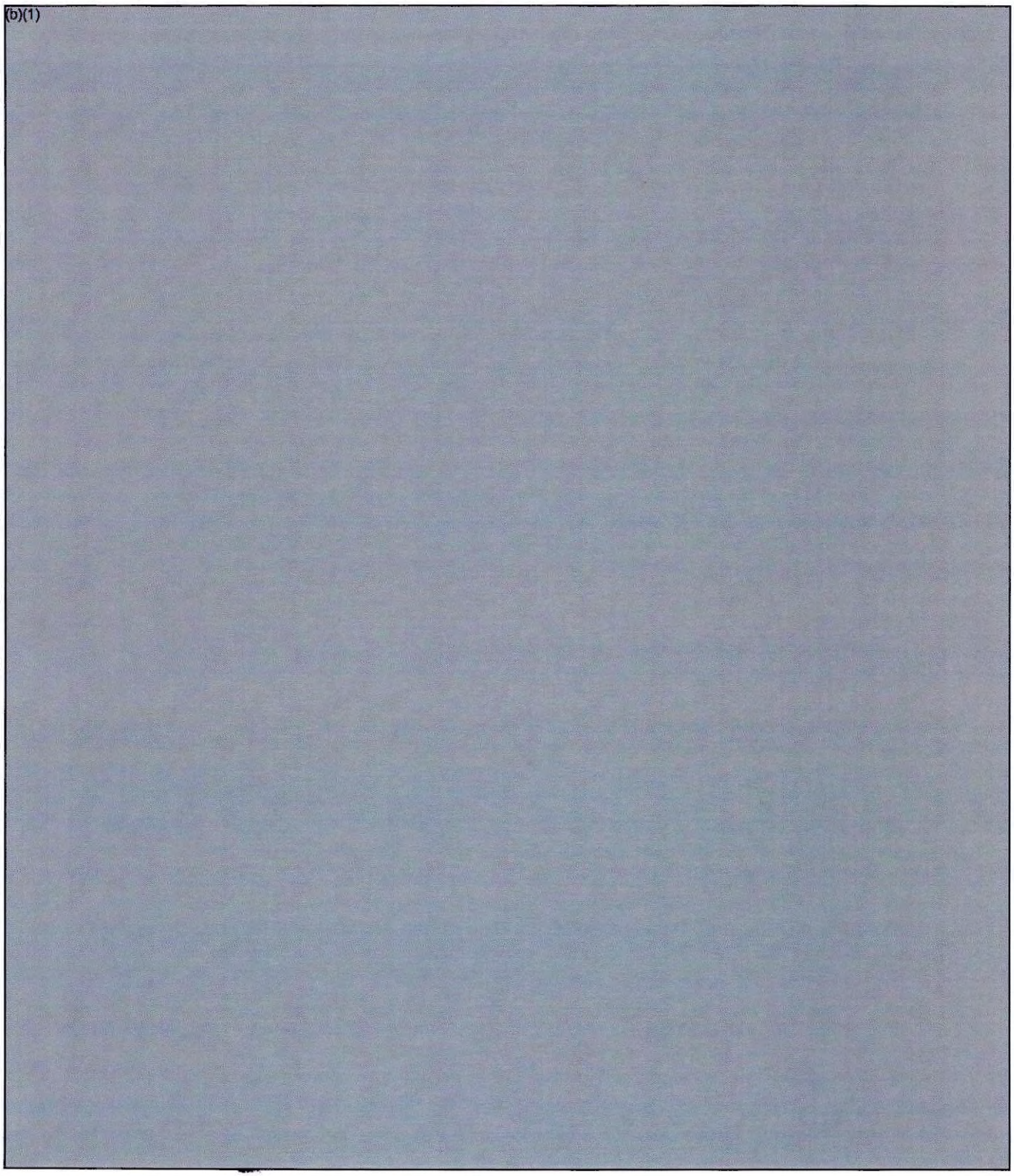

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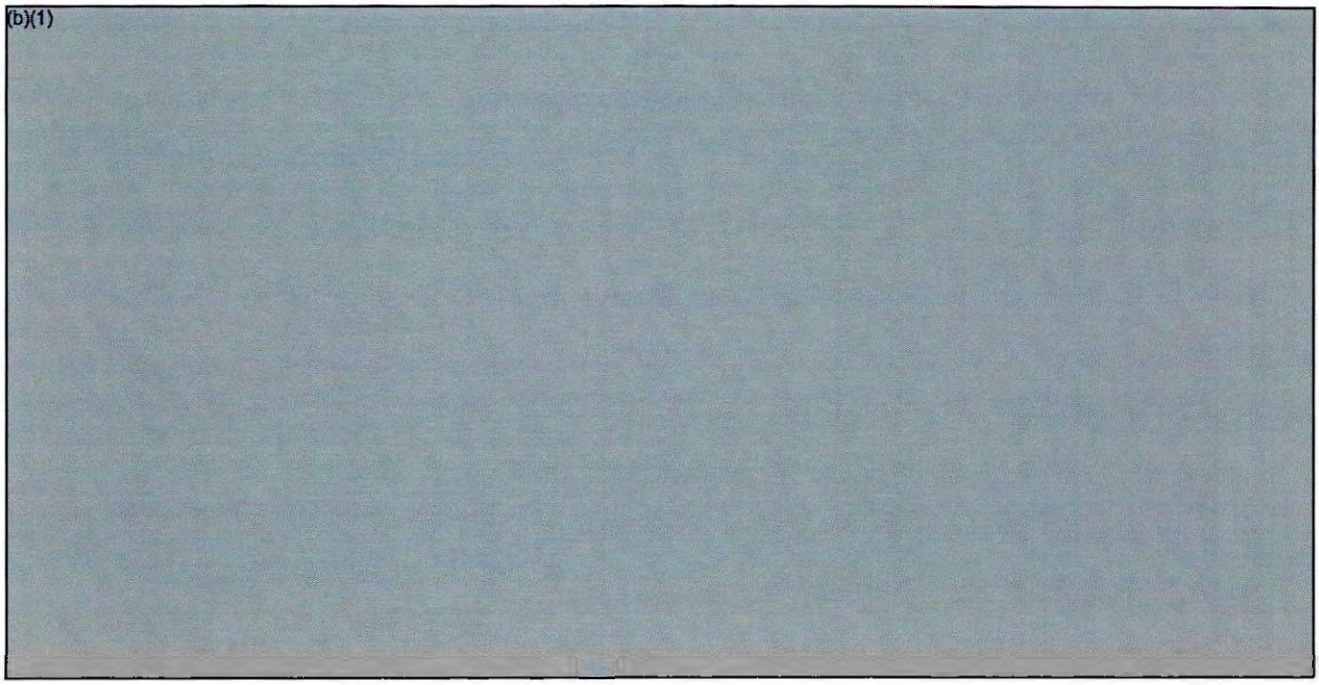

17. (U) Production Rate Data:

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1995	24	0	24	0
1996	29	0	29	0
1997	36	0	36	0
1998	39	0	39	0
1999	36	0	36	0

6 E&MD models that will be refurbished in FY 1995 and entered into the inventory are included in FY 1995 total above.

(b)(1)



c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

The Design-to-Cost Objective will be established in APR 1992 upon E&MD contract award.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

Government civilian salaries are based on the General Schedule Pay Scale, dated January 1991. Military salaries are based on Memo AMCRM-ER, Subject: Military Pay Rates in BCE's, dated January 1991. There will be no additional soldier crew requirements to operate the STINGRAY. STINGRAY will have a 15 year life cycle. STINGRAY

18a. (U) Operating and Support Costs (Cont'd):
operating tempo will be 801 hours per year. The following is assumed to be the STINGRAY distribution plan:

Location	(b)(1)
CONUS	
Korea	

The maintenance concept consists of contractor and organic support. Contractor support commences with fielding in 1996 and consists of two (2) year interim contractor support (ICS) at all levels. Organic support consists of military organizational and direct support for the life of the system. RAM considerations include a Mean Time Between Operational Mission Failure (MTBOMF) of not less than sixty (60) hours and a Mean Time to Repair (MTR) of not more than .6 hours at unit. There is no antecedent.

b. (U) Costs -- (FY 1992 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Stingray	Avg Annual Cost Per (Antecedent)
Spares & Repairs	18.0	N/A
Depot Maintenance	3.0	N/A
Other O&M Funded Sust	2.0	N/A
Total	23.0	N/A

c. (U) Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To	Total
PROC (ICS)	---	---	---	(b)(1)	
O&M (Depot Maint)	---	---	---		
Total	---	---	---		

18. (U) Operating and Support Costs (Cont'd):
18b Operating and Support Costs.
Costs are expressed in thousands not in millions as indicated above.

A-21 LONGBOW APACHE

91-338

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: LONGBOW APACHE

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
Longbow

CLEARED
FOR OPEN PUBLICATION
AS AMENDED
MAR 23 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
LONGBOW PROJECT MANAGER
ATTN: SFAE-AV-LB
4300 GOODFELLOW BLVD.
ST. LOUIS, MO 63120-1798

COL ROBERT C. ATWELL
Assigned: August 19, 1991
AV 693-1992 COMM (314) 263-1992

4. (U) **Program Elements/Procurement Line Items:**

RDT&E:
PE 63776 Project D472
PE 64816 Project DC27 (Shared), DC31
PROCUREMENT:
APPN 2031 ICN AA6605 (Army)
APPN 2031 ICN AA6670 (Army)

Concur in Classification as marked
23 MAR 1992
SECURITY REVIEW, ODCSINT, HQDA

~~Classified By: LONGBOW Security Classification Guide, 13 November 1991~~
Declassify on: Originating Agency Determination Required (OADR)
~~Downgrade Instructions: Not Subject to Automatic Downgrade~~

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*** [redacted] ***

9J-T-0636

4. (U) **Program Elements/Procurement Line Items (Cont'd):**

PE 23744 Project D423 was restructured as PE 64816 Project DC31.

5. (U) **Related Programs:**
AH-64 Apache, Hellfire Modular Missile System (HMMS), Longbow Hellfire, and RAH-66 Comanche.

6. (U) **Mission and Description:**
The Longbow consists of a mast-mounted Fire Control Radar (FCR), which will be integrated into the AH-64 airframe, and a Radio Frequency (RF) autonomous seeker in an upgraded Hellfire missile (Longbow Hellfire). Longbow will provide the AH-64 and RAH-66 a true fire-and-forget capability, greatly increasing weapon system effectiveness and aircraft survivability. The weapon system will be employable day or night in adverse weather and in obscurants. Hellfire must effectively engage and destroy advanced threat armor on the AirLand Battlefield of the late 1990's and into the next century. To be effective and survive on this future battlefield, the attack helicopter team must rapidly engage multiple targets with minimum exposure time, and deploy a system that is inherently resistant to threat countermeasures. The term Longbow AH-64D refers to the Longbow system (radar and associated components) integrated onto an AH-64 airframe.

7. (U) **Program Highlights:**
a. (U) Significant Historical Developments --
The Longbow program evolved from the Helicopter Adverse Weather Target Acquisition and Designation System (HAWTADS) activity initiated in 1978. Industry-wide interaction led to the initiation of the Helicopter Adverse Weather Fire Control and Acquisition Radar (HAWFCAR) program. Martin Marietta Corporation (MMC) and Westinghouse Electric Corporation (WEC) were awarded parallel competitive technology demonstration contracts for an RF FCR to be integrated and tested on the AH-64 Apache. In late 1981, a [redacted] program was initiated to add an RF Seeker for Hellfire to the FCR yielding a total system approach for Apache. In 1982, WEC and MMC were awarded parallel competitive contracts for the first phase, Critical Technology Demonstration (CTD).

Following the August 1985 Milestone I In-Process Review (IPR), a Joint Venture (JV) contract was awarded in November 1985 to MMC and WEC for tactical Longbow preliminary design. The JV was formed to take advantage of the technical expertise in the companies and to ensure a competition option throughout the program. In August 1986, a Proof of Principle (POP) demonstration contract was awarded to the JV.

Concurrent with POP, the engineering development program was approved

7a. (U) Program Highlights (Cont'd):

in the Army Acquisition Decision Memorandum (ADM), 20 July 1989. This decision authorized integration of the Longbow Fire Control Radar onto four AH-64 prototype airframes. A thirteen-month Initial Design Phase (IDP) contract was awarded to the JV, 28 September 1989.

Early User Test and Experimentation (EUTE) concluded the POP phase in April 1990. A Milestone II Defense Acquisition Board (DAB) reviewed the Longbow program on 5 December 1990, and approved entry of the Longbow Apache into Full Scale Development (FSD). An Office of the Secretary of Defense ADM was signed by the Under Secretary of Defense (Acquisition) on 7 December 1990, documenting the DAB decisions.

The Longbow Hellfire and Longbow AH-64D systems are separate SARs and share a program element in RDT&E.

b. (U) Significant Developments Since Last Report --
The Fire Control Radar (FCR) Full Scale Development (FSD) contract became effective 12 January 1991. The airframe program was replanned to the new 70-month schedule in June 1991 as a result of the Defense Acquisition Board (DAB) mandate to align the FCR, airframe, and missile contract efforts. Critical Design Reviews were held for the airframe hardware and software in October 1991 and for the FCR hardware in November 1991. The Mast Mounted Assembly was returned to a symmetric shape due to vibration problems with the asymmetric design. In accordance with the Secretary of Defense Acquisition Decision Memorandum, additional clutter data in three different environments have been collected and continue to be analyzed as part of the algorithm maturation process. Development Testing is scheduled to begin in July 1994; Initial Operational Test and Evaluation is scheduled to begin in January 1995.

The Longbow AH-64D system is expected to satisfy the mission requirements.

c. (U) Changes Since As Of Date --
None.

8. (U) Threshold Breaches:
There are currently no Acquisition Program Baseline (APB) (8 March 1991) or Nunn-McCurdy Unit Cost breaches.

9. (U) Schedule:

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
Milestone I In Process Review	AUG 85	AUG 85	AUG 85
Prelimin Design Contract Award	NOV 85	NOV 85	NOV 85
Contract Award (Proof of Principle)	AUG 86	AUG 86	AUG 86
LBA Phase I Contract Award	AUG 88	AUG 88	AUG 88
Milestone IB (DAB)	JUL 89	JUL 89	JUL 89
LBA Phase 2 Contract Award	AUG 89	AUG 89	AUG 89
IDP Contract Award	SEP 89	SEP 89	SEP 89
Dev Test/Early User Test and Eval			
Start	FEB 90	FEB 90	FEB 90
Complete	APR 90	APR 90	APR 90
Milestone II/IV (DAB)	DEC 90	DEC 90	DEC 90
Full Scale Development Contract Award	DEC 90	DEC 90	DEC 90
Verification of Apache Action Tm Fixes			
Start	SEP 91	SEP 91	APR 91(Ch-1)
Complete	MAR 92	MAR 92	JUL 91(Ch-1)
LBA Force Develop Test and Experimentation			
Start	APR 92	APR 92	N/A (Ch-2)
Complete	SEP 92	OCT 92	N/A (Ch-2)
First Flight of Prototype w/o Longbow	APR 92	APR 92	APR 92
Prelim Airworthiness Eval			
Start	JAN 93	JAN 93	JAN 93
Complete	MAR 93	MAR 93	MAR 93
LBA Initial Prod Readiness Rev	JUL 92	JUL 92	OCT 92(Ch-3)
First Flight w/ Longbow	AUG 93	AUG 93	AUG 93
Component Qualification	DEC 93	DEC 93	DEC 93
LBA Long Lead IPR	JAN 94	JAN 94	JAN 94
Long Lead Time Items Contract Award	APR 94	APR 94	APR 94
Development Test			
Start	JUL 94	JUL 94	JUL 94
Complete	SEP 94	SEP 94	SEP 94
Force Dev Test and Experimentation			
Start	OCT 94	OCT 94	OCT 94
Complete	NOV 94	NOV 94	NOV 94
Production Readiness Review	DEC 94	DEC 94	DEC 94
Milestone IIIA (DAB)	MAR 95	MAR 95	MAR 95
LRIP Contract Award (LBA & FCR)	APR 95	APR 95	APR 95
IOT&E			
Start	JAN 95	JAN 95	JAN 95
Complete	MAR 95	MAR 95	MAR 95
Milestone IIIB (DAB)	OCT 96	OCT 96	OCT 96

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
First Production Delivery (LBA & FCR)	APR 96	APR 96	APR 96
Full Rate Production Contract Award (FCR)	NOV 96	NOV 96	NOV 96
Full Rate Production Conversion Award (LBA)	NOV 96	NOV 96	NOV 96
First Unit Equipped	FEB 97	FEB 97	FEB 97
Organic Spt for Intermed Level of Repair	FEB 97	FEB 97	FEB 97
IOC	APR 97	APR 97	APR 97
Reliability Maturation Program Review	DEC 99	DEC 99	DEC 99
Organic Spt for Depot Level of Repair	APR 00	APR 00	APR 00

b. (U) Previous Change Explanations --

The start of DT/EUTE was delayed from Jan 90 to Feb 90 due to unavailability of test ranges.

DT/EUTE completion delayed from Feb 90 to Apr 90 due to administrative delays in conducting tests.

MS II/IV was changed from Jul 90 to Dec 90 due to unavailability of DAB principals and two additional unscheduled reviews of the program by the Conventional Systems Committee (CSC). Delay of contract award from Oct 90 to Dec 90 due to delay in DAB approval.

Production milestones were delayed due to budget decrements and DAB decision to eliminate program concurrency.

Milestones considered not critical during DAB review were dropped from baseline.

Milestones pertaining to Seeker missile were transitioned to Hellfire SAR.

c. (U) Current Change Explanations --

(Ch-1) -- Verification of Apache Action Team Fixes was expected to start in September 1991 but actually started in April 1991. The completion date was originally March 1992, but completion occurred in July 1991.

(Ch-2) -- The Longbow Project Manager and the TRADOC System Manager have agreed that Force Development Test and Experimentation Phase I

9c. (U) Schedule (Cont'd):
is no longer required and should be removed from the Approved Program Milestones.

(Ch-3) -- The Longbow airframe Initial Production Readiness Review has been moved from July 1992 to October 1992.

d. (U) References --

(U) Development Estimate:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

10. (U) Performance Characteristics:

a. (U) Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
LONGBOW APACHE (LBA) SYSTEM:				
VERTICAL Rate of Climb (ft per min) @ 4000'/95 deg F/95% MRP loaded with 4 laser and 4 RF Hellfire, 4 ATAS, 320 rds of 30mm, and fuel for 1.83 hr mission endurance	850	850 / 450	N/A	850
Cruise Speed (primary mission config) (knots)	145	145 / 145	N/A	145
Primary Mission Endurance (hrs)	1.83	1.83 / 1.83	N/A	1.83
Alternate Mission Endurance with full fuel (hrs, sea level, standard)	2.5	2.5 / 2.5	N/A	2.5
Ordnance Load (primary mission config)				
Hellfire (no.)	16	16 / 8	N/A	8
30mm Rounds (no.)	1200	1200 / 320	N/A	320

(b)(1) [redacted]

10a. (U) **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate	
(b)(1) [redacted]						
Maintainability (Mean Maint Hrs/Flt Hr)	7.6	7.6	/ 13.0	N/A	7.6	
Reliability (Mean Time Between Failure) (hrs)						
Mission 1/	17.0	17.0	/ 15.3	N/A	17.0	
System	3.9	3.9	/ 2.8	4.0	3.2	
TADS	125	125	/ 63	212.5	212.5	(CH-1)
PNVS	219	219	/ 160	390	390	(CH-1)
Operational Availability (Ao) (%) 1/	80	80	/ 75	N/A	80	
Max Mission Gross Weight (lbs)	16800	16800	/ 16900	N/A	16800	
Mean Time Between Maint Actions						
Scheduled	TBD	TBD	/ TBD	N/A	N/A	
Unscheduled	TBD	TBD	/ TBD	N/A	N/A	
Built-in-Test Effectiveness (fault detection % of Electronic Components)	95	95	/ 80	N/A	95	
(b)(1) [redacted]						

10a. (U) **Performance Characteristics (Cont'd):**

	DE	Approved Program Objective/Threshold		Demonstrated Perf	Current Estimate
(b)(1)					
Mean Time To Repair (hrs)	0.5	0.5	/ 0.7	N/A	.5
Mean Time Between Failure (MTBF) (system) (hrs)	114.0	114.0	/ 102.0	N/A	114
(b)(1)					

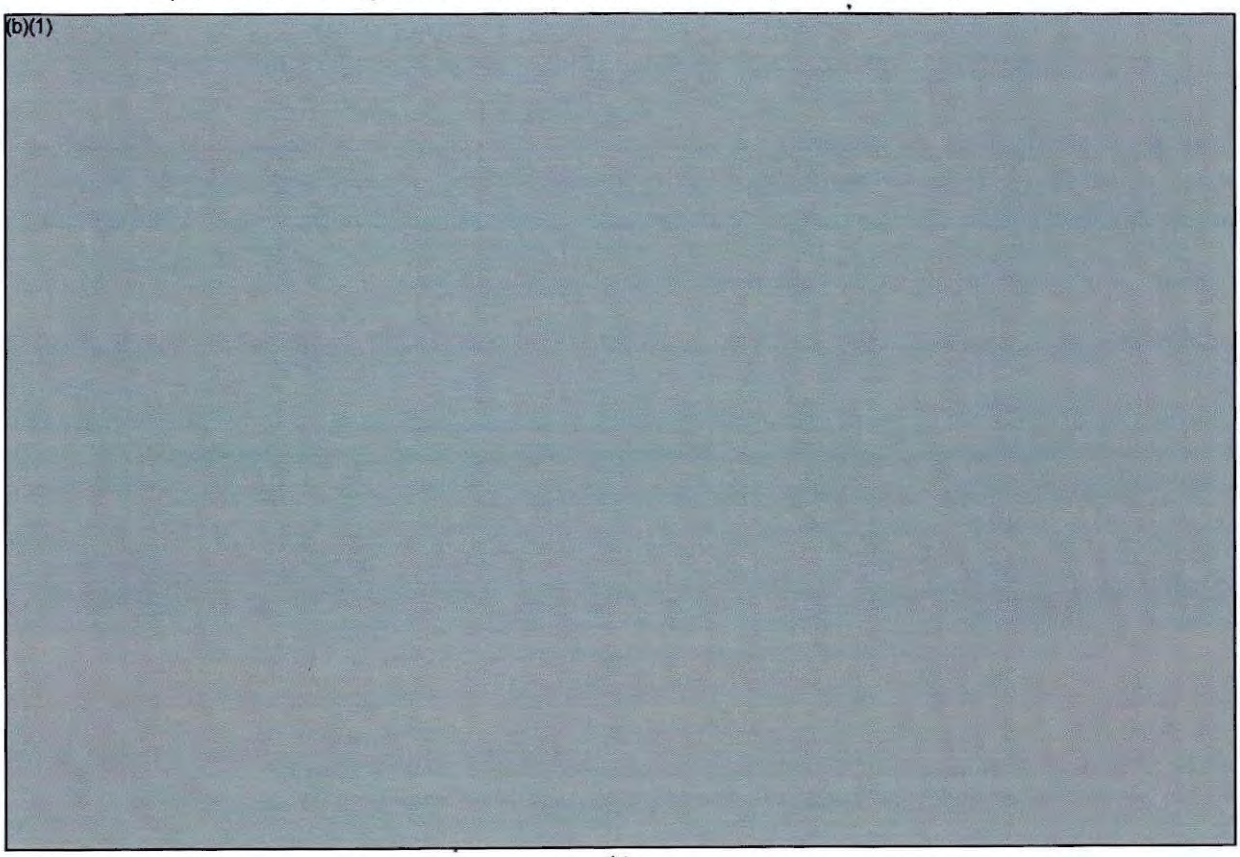
10a. (U) Performance Characteristics (Cont'd):

Acronyms:

ATAS = air-to-air stinger
MRP = military rated power
PNVS = pilot night vision sensor
TADS = target acquisition designation site

1/ Mission Reliability and availability objectives and thresholds of 19.5/17.0 and 150/114 will be reached at 50,000 flt hrs.

(b)(1)



d. (U) References --

(U) Development Estimate:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

	Development Estimate	Approved Program	Current Estimate
a. (U) Cost --			
Development (RDT&E)	1105.5	1105.5	1156.9
Procurement	1520.7	1520.7	1537.5
A/F Modifications	(824.9)		(834.7)
FCR	(406.4)		(415.4)
Total Flyaway	(1231.3)		(1250.1)
A/F Modifications	(155.6)		(156.6)
FCR	(65.0)		(61.2)
Total Other Wpn Sys	(220.6)		(217.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(68.8)		(69.6)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 91 Base-Year $	2626.2	2626.2	2694.4
Escalation	544.5	544.5	502.0
Development (RDT&E)	(11.6)	(11.6)	(13.5)
Procurement	(532.9)	(532.9)	(488.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	3170.7	3170.7	3196.4
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	227	227	227
Total	227	227	227

Number of nonfully-configured RDT&E units: 10 FCRs. Number of LRIP units approved at Milestone II decision: 28 Longbow AH-64Ds.

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

(U) Approved Program:
DAE Approved Acquisition Program Baseline dated 8 March 1991.

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary:**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	3196.4	3170.7	3196.4
(2) Quantity	227	227	227
(3) Unit Cost	14.081	13.968	14.081
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

The estimate includes Longbow AH-64D airframe development and modification costs, and Longbow Fire Control Radar development and production costs. (Longbow Hellfire RDT&E and production costs are not included.)

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1117.1	2053.6	0.0	3170.7
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-4.1	-53.4	-	-57.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+57.4	+26.1	-	+83.5
Other	-	-	-	-
Support	-	-0.3	-	-0.3
Subtotal	+53.3	-27.6	-	+25.7
Total Changes	+53.3	-27.6	-	+25.7
Current Estimate	1170.4	2026.0	-	3196.4

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1105.5	1520.7	0.0	2626.2
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+51.4	+18.8	-	+70.2
Other	-	-	-	-
Support	-	-2.0	-	-2.0
Subtotal	+51.4	+16.8	-	+68.2
Total Changes	+51.4	+16.8	-	+68.2
Current Estimate	1156.9	1537.5	-	2694.4

b. (U) Previous Change Explanations --

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised escalation rates (Economic)		-4.1
Current/prior inflation offset (Estimating)	4.9	4.1
Costs related to schedule extension from 51 months to 70 months (Estimating)	46.5	53.3
Total Changes	51.4	53.3

13c. (U) Cost Variance Analysis (Cont'd):

	(Dollars in Millions) Base-Year	Then-Year
(2) PROCUREMENT		
Revised escalation rates (Economic)	N/A	-53.4
Changes in recurring aircraft modification flyaway costs (Estimating)	18.8	26.1
Reduction in support costs due to funding reduction (Support)	-2.0	-0.3
Total Changes	16.8	-27.6

14. (U) Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

a. (U) Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Dev Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
11.750	0.008	-0.001	1.047	0.066	0.970	--	0.128	2.218	13.968

b. (U) Initial Baseline Estimate to Current Estimate - -

PAUC (Dev Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
13.968	-0.253	-0.001	--	--	0.368	--	-0.001	0.113	14.081

15. (U) Contract Information: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) LONGBOW FCR FSD:
JOINT VENTURE MMC/WEC, ORLANDO, FL
DAAJ09-91-C-0175, CPIF/AF
Award: December 21, 1990
Definitized: December 21, 1990

Initial Contract Price		
Target	Ceiling	Qty
$312.6	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$312.6	N/A	0	$312.6	$312.6

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date (11/22/91)	$-0.4	$-3.4
Net Change	$-0.4	$-3.4

Explanation of Change:

The cumulative cost variance of -$0.4M is an unfavorable 0.7 percent. The cumulative schedule variance of -$3.4M is an unfavorable 5.3 percent. These variances are primarily caused by the Mast Mounted Assembly design change, late receipt of test equipment material, delays in Built In Test and kernel software development, delays in facility preparation, and late completion of components.

(U) AH-64 LONGBOW PHASE II:	Initial Contract Price		
	Target	Ceiling	Qty
MCDONNELL DOUGLAS, MESA, AZ			
DAAJ09-89-C-A086, CPIF	$194.7	N/A	0
Award: August 30, 1989			
Definitized: August 30, 1989			

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$299.9	N/A	0	$294.9	$299.9

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-1.0	$-8.1
Cumulative Variances To Date (11/24/91)	$-7.0	$-5.5
Net Change	$-6.0	$2.6

Explanation of Change:

The cumulative cost variance of $-7.0M is an unfavorable 5.3 percent, primarily the result of additional labor resources required. The cumulative schedule variance of $-5.5M is an unfavorable 4.0 percent. The schedule variance is caused by the delayed receipt of subcontractor components. The contractor states that the late deliveries will not have any impact on First Flight. The contract is 52 percent complete. During the DAB review process, the program schedule was extended by 19 months, resulting in a total program replan. A total of $50.1M still remains in the undistributed budget due to the replan.

The Initial Contract Price is $194.7M (not $199.9M as shown in the December 1990 SAR).

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 47.1% (8 yrs/17 yrs)

(2) Percent Program Cost Appropriated: 24.6% ($785.9 / $3196.4)

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY85-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2001)	Total
RDT&E	655.0	130.9	195.8	188.7	1170.4
Procurement	-	-	-	2026.0	2026.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	655.0	130.9	195.8	2214.7	3196.4

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1985				17.7	14.7	14.7	14.7	3.4
1986				35.2	30.2	30.2	30.2	2.8
1987				88.1	77.6	77.6	77.6	2.7
1988				111.4	101.7	101.7	101.7	3.0
1989				139.5	132.6	132.6	127.7	4.2

16c. (U) **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army (Cont'd)								
1990				164.7	162.4	162.5	155.5	4.0
1991				132.3	135.8	134.8	106.5	3.9
1992				123.5	130.9	19.9	0.8	3.1
1993				178.9	195.8			3.3
1994				122.9	138.9			3.3
1995				42.7	49.8			3.3
Subtot				1156.9	1170.4	674.0	614.7	
Appropriation: 2031 Aircraft Procurement, Army								
1994				88.0	102.3			3.3
1995	13	83.5	128.8	168.2	201.8			3.3
1996	15	7.1	95.7	136.5	169.0			3.2
1997	18	3.9	109.6	131.3	167.8			3.2
1998	48		241.9	333.6	440.0			3.2
1999	60		270.9	316.3	430.5			3.2
2000	60		244.8	281.7	395.8			3.2
2001	13		63.9	81.9	118.8			3.2
Subtot	227	94.5	1155.6	1537.5	2026.0			

16c. (U) **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY91 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2031 Aircraft Procurement, Army (Cont'd)								
Grand Total	227	94.5	1155.6	2694.4	3196.4	674.0	614.7	

17. (U) **Production Rate Data:**

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1995	13	0	13	0
1996	15	0	15	0
1997	18	0	18	0
1998	48	0	48	0
1999	60	0	60	0
2000	60	0	60	0
2001	13	0	13	0

17b. (U) **Production Rate Data (Cont'd)**:

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	2694.4	N/A	N/A
(TY $)	N/A	N/A	3196.4	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	11.870	N/A	N/A
(TY $)	N/A	N/A	14.081	N/A	N/A

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	APR 95	N/A	N/A
Duration (in MON)	N/A	N/A	83	N/A	N/A
End Date(MON YY)	N/A	N/A	MAR 02	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 227 - @ Peak Rate: 5/mo			
FY 91 Base-Year $	5.4	5.4	5.4
Then Year $	7.3	7.3	7.3
@ Qty 46 (1st three years) - @ Peak Rate: 5/mo			
FY 91 Base-Year $	9.3	9.3	9.3
Then Year $	11.7	11.7	11.7

18. (U) **Operating and Support Costs:**

a. (U) Assumptions and Ground Rules --

Assumes 32 LONGBOW aircraft in CONUS for training purposes, each aircraft flying 50 hours per month. Assumes 195 Longbow Apaches OCONUS each flying 20 hours per month. Maintenance concept is 2 level maintenance, contractor depot support. An operational readiness of 90% is to be achieved. Mean Time Between Failure (MTBF) goal is 150 hours at Maturity (50,000 flight hours). Source: November 1991 Baseline Cost Estimate (BCE). The Longbow Apache system has no antecedent.

b. (U) Costs -- (FY 1991 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per aircraft	Avg Annual Cost Per antecedent aircraft
Replenishment	0.3	N/A
Depot Maintenance	0.7	N/A
Military Personnel	0.4	N/A
Modification Kits	0.1	N/A
Other	0.2	N/A
Total	1.7	N/A

c. (U) Contractor Support Costs -- None.

N-17 EMSP

91-130

*** UNCLASSIFIED ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AN/UYS-2A(V) EMSP

AS OF DATE: December 31, 1991

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CLEARED
FOR OPEN PUBLICATION
MAR 24 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA)
DEPARTMENT OF DEFENSE

1. **Designation and Nomenclature (Popular Name):**
AN/UYS-2A(V) Enhanced Modular Signal Processor (EMSP), SEM E VARIANT

2. **DoD Component:** Navy

3. **Responsible Office and Telephone Number:**

COMNAVSEASYSCOM	CAPT DAVID BURGESS
PMS412	Assigned: February 7, 1992
NC3/11E28	AV 332-9078
WASHINGTON, DC 20363-5101	COMM (703) 602-9078/9079

4. **Program Elements/Procurement Line Items:**

RDT&E:
PE 00604507N Project S1440
PROCUREMENT:
APPN 1810 ICN 297500 (Navy)
APPN 1810 ICN 264000 (Navy)
O & M:
PE 00702827Y, 0078017Y

No Security Objection to Publication
MAR 23 1992
Office of the Chief of Naval Operations, Department of the Navy

5. **Related Programs:**
The P3C Update IV, Airborne Low Frequency Sonar (ALFS), AN/SQQ-89 Surface Ship ASW Sonar System, and the SURTASS/Low Frequency Active (LFA) programs are directly related to the AN/UYS-2A(V) development and will be affected by changes in schedule or performance. Each of these programs has the potential to affect the AN/UYS-2A(V) program

92 0679

5. Related Programs (Cont'd):

through changes in required performance which could require new technology or interface development or changes in the desired unit quantity which could have a significant impact on the unit cost.

6. Mission and Description:

The AN/UYS-2 Enhanced Modular Signal Processor responds to expanding requirements for significant increases in signal processing power to meet the needs of emerging systems (countering evolving threat). Replacing the earlier 1960s/70s-based AN/UYS-1 technology, AN/UYS-2 provides state-of-the-art signal processing capability founded on an open architecture conducive to capitalizing on the advantages of industry's on-going technology initiatives. The AN/UYS-2 is a programmable, data-flow, high-throughput, modular Navy Standard Signal Processor capable of meeting Navy weapons systems processing needs into the twenty-first century. The AN/UYS-2 consists of a family of signal processors having diversified capabilities which can be matched to individual weapons system's specific requirements. The AN/UYS-2, and the associated software support environment, the Processing Graph Method (PGM), is more efficient to program and will have lower life cycle costs than currently available systems of similar capability; such as the IBM Common Signal Processor (CSP), the Hughes Modular Array Processor (MAP), and the Computing Devices Company AN/UYS-501 and AN/UYS-503 family of signal processors. AN/UYS-2 initial development and production was in the form of the Standard Electronics Module (SEM) Format B variant, the AN/UYS-2(V). Aircraft requirements and packaging volume benefits for other applications called for a smaller, lighter signal processor with similar capacity and reduced power consumption. These requirements led to repackaging the SEM B version into a SEM Format E variant (AN/UYS-2A(V)).

7. Program Highlights:

a. Significant Historical Developments --

The Milestone I decision, and resultant Navy Decision Coordination Paper of September 1981, directed development of the AN/UYS-2 as the Navy's next generation standard signal processor. The FY83 Defense Authorization Proceedings, Title II, and Congressional Armed Services Committees directed that the AN/UYS-2 development program include a demonstration of the capability to use Very High Speed Integrated Circuit (VHSIC) technology. A comprehensive Milestone II process initiated in December 1982 led to approval for Engineering and Manufacturing Development (EMD), formerly referred to as Full Scale Engineering Development (FSED), in March 1983. Milestone II authorized FSED based on a forty-eight month schedule; directed parallel development of the VHSIC insertion program; and, planned for the procurement of a limited number of development units to be made available to user combat systems to support their development. In

7a. Program Highlights (Cont'd):

April 1987, ASN (RE&S) made the decision to proceed with development of both the SEM B and SEM E variants of AN/UYS-2. A SECNAV Program Decision Memorandum of July 1989 directed that all user programs transition to the AN/UYS-2A(V), SEM E no later than FY93. MSIII, SEM E Full Production, is planned for January 1993.

This is the Initial Selected Acquisition Report for this program.

AN/UYS-2A(V) DT&E is scheduled to complete in December 1992.

OT&E of the AN/UYS-2A(V) will be conducted by the user programs as an integral portion of their weapon systems OT&E programs.

b. Significant Developments Since Last Report --

N/A Initial SAR

c. Changes Since As Of Date --

Program Manager changed from CAPT Dale Onyon to CAPT David Burgess in February 1992.

Contract for Engineering and Manufacturing Development (EMD) completion awarded January 1992.

8. Threshold Breaches:

There are currently no Acquisition Program Baseline (APB) breaches or unit cost breaches.

9. Schedule:

a. Milestones --	Development Estimate	Approved Program	Current Estimate
SEM E Multi-Year Procurement (MPY) Contract	MAR 92	N/A	MAR 92
Airborne Low Frequency Sonar (ALFs) Enclosure CDR	APR 92	N/A	APR 92
SEM E PRR (Complete)	MAY 92	N/A	MAY 92
SEM E DT-IID Testing	DEC 92	N/A	DEC 92
Milestone III (NPDM)	JAN 93	N/A	JAN 93
Provisioning Tech Data Delivered to SPCC	AUG 93	N/A	AUG 93

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
First MYP Unit Delivered (ALFs)	SEP 93	N/A	SEP 93
Material Support Date	AUG 96	N/A	AUG 96
Navy Support Date	AUG 97	N/A	AUG 97

MSD date of August 1996 is driven by SURTASS requirements.

b. Previous Change Explanations --

N/A Initial SAR

c. Current Change Explanations --

N/A Initial SAR

d. References --

Development Estimate:
Amended FY1992/93 President's Budget dtd Jan 92.

Approved Program: None.

10. Performance Characteristics:

a. Performance --	DE	Approved Program Objective/Threshold	Demonstrated Perf	Current Estimate
Mission performance (MM/sec)				
High Throughput	100	N/A / N/A		102
Medium Throughput	50	N/A / N/A		51
Low Throughput	25	N/A / N/A		25
Readiness/Support				
MTBF High Perf Level	750	N/A / N/A		1465
MTBF Med Perf Level	1200	N/A / N/A		1890
MTBF Low Perf Level	1500	N/A / N/A		2230
MTTR (hrs)	<.50	N/A / N/A		<.25
Inherent Avail	>.99	N/A / N/A		>.99
Fault Detection (%)	98	N/A / N/A		98%

(1) ACRONYMS:
MM/SEC = Million Multiples Per Second
MTBF = Mean Time Between Failures (hours)
MTTR = Mean Time To Repair (hours)

10a. Performance Characteristics (Cont'd):

(2) The MTBF required is dependent upon the configuration complexity of the signal processor, with the more complex configurations having shorter MTBF requirements. The following configurations are defined in the Test and Evaluation Master Plan:

PERFORMANCE LEVEL	ARITHMETIC PROCESSORS	GLOBAL MEMORIES	INPUT/OUTPUT PROCESSORS	INPUT SIGNAL CONDITIONER
HIGH (9/6/1/0)	9	6	1	0
MEDIUM (5/3/1/0)	5	3	1	0
LOW (3/2/1/0)	3	2	1	0

When an AN/UYS-2A(V) configuration is not identical to one of the configurations defined above, a reliability model will be used to extrapolate the required MTBF for the configuration.

b. Previous Change Explanations --

N/A Initial SAR

c. Current Change Explanations --

N/A Initial SAR

d. References --

Development Estimate:
Amended FY1992/93 President's Budget dtd Jan 92.

Approved Program: None.

11. Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	151.3	0.0	151.3
Procurement	258.0	0.0	258.0
Cabinets/SEMs	(225.1)		(225.1)
Total Flyaway	(225.1)		(225.1)
Total Other Wpn Sys	(0.0)		(0.0)
Peculiar Support	(32.9)		(32.9)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	89.1	N/A	89.1
Total FY 90 Base-Year $	498.4	0.0	498.4

11a. Total Program Cost and Quantity (Cont'd):

	Development Estimate	Approved Program	Current Estimate
Escalation	66.4	0.0	66.4
Development (RDT&E)	(7.6)	(0.0)	(7.6)
Procurement	(46.6)	(0.0)	(46.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(12.2)	(N/A)	(12.2)
Total Then-Year $	564.8	0.0	564.8
b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	151	N/A	151
Total	151	N/A	151

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Development Estimate:
Amended FY1992/93 President's Budget dtd Jan 92.

Approved Program: None.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(DEC 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	564.8	564.8	564.8
(2) Quantity	151	151	151
(3) Unit Cost	3.740	3.740	3.740

12. Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	94.4	94.4	69.9
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	94.4	94.4	69.9
(2) Quantity	21	21	23
(3) Unit Cost	4.495	4.495	3.039

Because a multi-year procurement strategy including economic order quantity is being used, the OPN obligated for each year is not directly related to the number of units procured in that year.

13. Cost Variance Analysis: - None.

14. Program Acquisition Unit Cost (PAUC) History: (Then-Year Dollars in Millions)

Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
3.740	--	--	--	--	--	--	--	--	3.740

15. Contract Information: (Then-Year Dollars in Millions)

a. RDT&E --

ASIP*:	Initial Contract Price Target	Ceiling	Qty
AT&T FSAT**, GREENSBORO, NC N00024-91-C-5219, CPAF Award: October 8, 1991 Definitized: N/A	$49.5	$0.0	0

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$49.5	$0.0	0	$49.5	$49.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.6	$0.0
Cumulative Variances To Date (12/31/91)	$0.3	$0.0
Net Change	$-0.3	$0.0

15. Contract Information: Cont'd (Then-Year Dollars in Millions)

Explanation of Change: None.

* ASIP = Acoustic Systems Integration Program.
** AT&T FSAT = Federal Systems Advanced Technologies.

PMS 412 manages the ASIP contract for the EMSP users. All funding is appropriated to EMSP user programs and provided to PMS 412 for obligation on the ASIP contract. The $49.5M is not appropriated to the EMSP PE.

Total ASIP requirement for FY92, $32.7M; FY93, $14.7M; FY94, $2.1M.

	Initial Contract Price		
SERVICE TEST MODEL (STM):	Target	Ceiling	Qty
AT&T FSAT, GREENSBORO, NC N00024-89-C-5239, FFP Award: September 29, 1989 Definitized: June 30, 1990	$67.5	$0.0	16

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
$71.7	$0.0	19	$71.7	$71.7

CPR information is not a requirement on this FFP contract.

STM contract represents FY89 and FY90 funds from both users and PMS 412. PMS 412 total obligation on this contract is $1.6M for FY89 and $5.4M for FY90. All other funding was provided by EMSP users.

16. Program Funding Summary: (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 50.0% (6 yrs/12 yrs)

(2) Percent Program Cost Appropriated: 47.3% ($267.2 / $564.8)

16b. Program Funding Summary (Cont'd):

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY87-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-98)	Total
RDT&E	89.2	20.3	15.3	34.1	158.9
Procurement	20.6	94.4	69.9	119.7	304.6
MILCON	-	-	-	-	-
O&M	34.3	8.4	5.6	53.0	101.3
Total	144.1	123.1	90.8	206.8	564.8

In FY87, $37M was provided by NAVAIR to begin AN/UYS-2A(V), SEM B, development. It is not included in the AN/UYS-2 Program Element.

Additional funds expended solely for AN/UYS-2(V), SEM B, in FY87 thru FY91 are not included in this document.

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy								
1987				17.4	15.2			2.7
1988				8.6	7.8			3.0
1989				19.5	18.3			4.2
1990				27.2	27.8			4.0
1991				19.0	20.1			3.9

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 1319 Research, Development, Test + Eval, Navy (Cont'd)								
1992				18.6	20.3			3.1
1993				13.5	15.3			3.3
1994				6.0	7.0			3.3
1995				5.4	6.5			3.3
1996				5.3	6.6			3.2
1997				5.4	6.9			3.2
1998				5.4	7.1			3.2
Subtot				151.3	158.9			

FY92-FY98 reflect current controls plus anticipated user funding for ASIP FY92-FY94 of $49.5M.

Appropriation: 1810 Other Procurement, Navy								
1988				2.8	2.4			3.0
1989				7.8	7.0			4.2
1990	1		3.4	7.8	8.4			4.0
1991				2.5	2.8			3.9
1992	21		79.7	82.5	94.4			3.1
1993	23		55.4	59.2	69.9			3.3

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1810 Other Procurement, Navy (Cont'd)								
1994	36		38.2	39.9	48.7			3.3
1995	38		28.3	30.3	38.1			3.3
1996	32		20.1	21.8	28.3			3.2
1997				1.7	2.3			3.2
1998				1.7	2.3			3.2
Subtot	151		225.1	258.0	304.6			

Unit production prices for FY92 - FY96 are based on a multi-year buy.

Multi-Year Procurement (MYP) Then Year dollars reflect AT&T's NTE of $265M.

Flyaway costs for the MYP were calculated by converting Then Year procurement costs to Base Year. Because a multi-year procurement strategy including economic order quantity is being used, the annual flyaway costs do not directly relate to the number of units procured in that year.

Appropriation: 1804 Operation and Maintenance, Navy								
1988				3.9	3.5			3.0
1989				9.1	8.9			4.2
1990				10.9	11.2			4.0
1991				10.1	10.7			3.9

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY90 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obli-gated	Ex-pended	
Appropriation: 1804 Operation and Maintenance, Navy (Cont'd)								
1992				7.7	8.4			3.1
1993				5.0	5.6			3.3
1994				6.9	8.1			3.3
1995				9.0	10.9			3.3
1996				9.0	11.2			3.2
1997				8.7	11.2			3.2
1998				8.8	11.6			3.2
Subtot				89.1	101.3			
Grand Total	151		225.1	498.4	564.8			

TY$ reflect Current Controls for FY92 - FY93 and FYDP (FY94 - FY98) figures. PMS 412 requirements exceed these controls. Funding used support both SEM B and SEM E configurations as well as AN/UYS-1. These funds are not separately identified.

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1990	0	1	1	47
1991	0	0	0	47
1992	0	21	21	47
1993	0	23	23	47
1994	0	36	36	47
1995	0	38	38	47
1996	0	32	32	47

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	498.4	N/A	
(TY $)	N/A	N/A	564.8	N/A	
PAUC Cost (BY $)	N/A	N/A	3.301	N/A	N/A
(TY $)	N/A	N/A	3.740	N/A	N/A

17c. **Production Rate Data (Cont'd):**

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	1/1

e. Approved Design-to-Cost Objective --

(Average Unit Flyaway Cost)

	Development Estimate	Current Estimate	Latest Approved Threshold
@ Qty 151 - @ Peak Rate: 3.2/mo			
FY 90 Base-Year $	0.000	0.000	0.000
Then Year $	0.000	0.000	0.000
@ Qty 80 (1st three years) - @ Peak Rate: 3.0/mo			
FY 90 Base-Year $	0.000	0.000	0.000
Then Year $	0.000	0.000	0.000

No average unit cost has been presented. EMSP does not lend itself to defining an average unit cost. Each user requires a different size machine to satisfy their unique signal processing needs, e.g., SURTASS needs an 9/6/2/0 while ALFS requires only an 3/2/1/1. These differences in configuration requirements preclude meaningful definition of an average unit cost. NAVSEA has established an alternative method of measuring the Average Unit Procurement Cost (AUPC) for the AN/UYS-2A(V). Since AN/UYS-2A(V) is configurable to many sizes, the customary AUPC is primarily dependent on the configuration of most of the units procured. This tends to cause dramatic changes in AUPC data, which could cause artifical breaches. The alternative method is based on a cost for an average unit configuration instead of an average unit cost.

The derived average unit configuration is 7.77 Arithmetic Processors, 5.76 Global Memories, 1.07 Input/Output Processors, and 0.60 Input Signal Conditioners with a resultant AUPC of $1.827M (BY FY90). This is the unit cost PMS 412 will track.

17e. Production Rate Data (Cont'd):

The average unit description has been calculated from summing the number of units (by configuration) procured during the production cycle and determining the average configuration procured over this cycle. This average unit configuration remains fixed throughout the life of the program. The AUPC is calculated by predicting the cost for one average unit configuration in each year of production and then dividing by the number of years.

There are no approved cost designs for this program.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The AN/UYS-2A(V) is a component of a host weapon system. For this reason, the basic logistics element planning was developed with the flexibility to fit within the host system logistics planning environment. The AN/UYS-2A(V) logistics products developed for 20 years fleet use are designed to support the EMSP in a maintenance mode only. EMSP maintenance software provided to host systems was developed to be run in conjunction with their computer programs. Each user will be required to provide logistics support for the composite hardware and software system.

b. Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per AN/UYS-2A(V) PROGRAM	Avg Annual Cost Per NONE
H/W MAINTENANCE	1.1	N/A
S/W MAINTENANCE	6.8	N/A
USER ENGR SUPPORT	8.2	N/A
PROGRAM SUPPORT	5.1	N/A
Total	21.2	N/A

c. Contractor Support Costs -- None.

Operating and Support costs reflect estimates of the costs which will be incurred by the AN/UYS-2A(V) program to support Engineering Change

18. Operating and Support Costs (Cont'd):
Proposals (ECPs), software maintenance, and In-Service Engineering Activities (ISEA). These estimates were developed assuming a steady level of effort concurrent with 20 years in fleet use.

Due to the nature of this program, only one average annual cost per AN/UYS-2A(V) unit can be identified.

A-8 AVENGER

91-049

*** UNCLASSIFIED ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: AVENGER

AS OF DATE: December 31, 1991

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CLEARED AS AMENDED
FOR OPEN PUBLICATION
MAR 19 1992 21
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OASD-PA) DEPARTMENT OF DEFENSE

1. **Designation and Nomenclature (Popular Name):**
   Forward Area Air Defense (FAADS) Line of Sight REAR (LOS-R); AVENGER

2. **DoD Component:** Army

3. **Responsible Office and Telephone Number:**
   AVENGER PROJECT OFFICE
   SFAE-AD-AVG
   REDSTONE ARS, AL 35898-5799

   LTC ALBERT J. HAMILTON III
   Assigned: July 2, 1990
   AV 746-6193 COMM (205)876-6193

No SECURITY Objection to PUBLIC RELEASE
19 MAR 1992
SECURITY REVIEW, DOCCINT, HODA

4. **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 64306A (Shared) Project D646
   PROCUREMENT:
   APPN 2032 ICN C14900 (Army) (Superseded C9803)
   APPN 2032 ICN CA0260 (Army)

5. **Related Programs:**
Line of Sight-Forward-Heavy; Non-Line of Sight; Forward Area Air Defense Command, Control, and Intelligence; STINGER Reprogrammable Microprocessor.

6. **Mission and Description:**
The Forward Area Air Defense System (FAADS) encompasses an integrated air defense program to meet the growing air threat to the forward

*** UNCLASSIFIED ***

OASD(PA) PROJECT 92-T-0588

6. Mission and Description (Cont'd):

area of the battlefield through the 1990's. The FAADS provides total coverage in the division area and permits the enemy no preferred attack option. ,The FAADS Line of Sight-Rear component is AVENGER. The LOS-R system is a lightweight, highly mobile and transportable surface-to-air missile/0.50 caliber machine gun system. It is operated by a two man crew for defense against helicopters and fixed-wing aircraft at low altitude in day or night operations and in clear or adverse weather. This system is mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV) and incorporates an operator's position with controls and displays, fire control electronics, and a Standard Vehicle Mounted Launcher (SVML) (including seeker coolant bottles and related hardware) to support and launch multiple STINGER missiles. The SVML provides output signals that are used to display to the gunner exactly where the STINGER missile is pointed. This driven sight reticle capability aids the gunner in severe background clutter and electronic countermeasures (ECM) environments. The system interfaces and functions with standard unmodified Basic STINGER, STINGER-POST and STINGER-RMP missile rounds. The AVENGER incorporates a 0.50 caliber machine gun to provide virtual attrition/suppression of threat aircraft operation, ranging from degradation of ordnance delivery accuracy to total abort of mission. The AVENGER Fire Unit (FU) provides man machine interface to maximize STINGER missile operational effectiveness in the threat environment. The AVENGER FU includes subsystems necessary for an operator to conduct an engagement sequence (detect, acquire, identify, track, and fire) against hostile aircraft with either the missile or the machine gun.

7. Program Highlights:

a. Significant Historical Developments --

A production contract was awarded to the Boeing Company in Aug 87. This contract provided for the production of 20 LOS-R units in conjunction with other support efforts such as Product Assurance, Configuration Management, Test and Evaluation, and Logistics Planning. Option II of the contract was awarded in Mar 88 for 39 fire units. The 1988 annual SAR submission rebaselined the SAR from a Planning Estimate to a Production Estimate. A Decision Coordinating Paper (DCP) was drafted in support of the Defense Acquisition Board (DAB) Milestone IIIB decision necessary for the Full-Rate Production phase of the AVENGER (LOS-R) weapon system. The US Army Missile Command (MICOM) Materiel Acquisition Review Board (MARB) package was approved November 28, 1989, and the preliminary Army Systems Acquisition Review Council (Pre-ASARC) was convened on November 30, 1989. AVENGER successfully completed Milestone Decision Review (MDR) III B April 90 for full-scale production. Production contract - Option IV was awarded May 1990. On January 17, 1991 the Army exercised the final option of the FY 87 contract to procure 72 fire units. The 100th fire unit was delivered in a ceremony on

7a. **Program Highlights (Cont'd)**:

January 22, 1991 marking this achievement only 26-1/2 months after the 1st fire unit delivery. The ceremony received favorable coverage by all local media.

Army Type [redacted] - Standard February 1990. The FY 91 President's Budget increased the quantity of fire units to be procured by 572, from 1207 to 1779. This was a result of the HQDA decision to convert Chaparral Corps Battalions to AVENGER, provide POMCUS stock, and realignment of units to fill Force Package III.

AVENGER was deployed to Southwest Asia (SWA). No problems were encountered affecting operational readiness. All fire units have been returned. First Unit Equipped (FUE) EUSA occured in September 1991.

AVENGER exceeded the 15% PAUC threshold on 26 September 91.

b. Significant Developments Since Last Report --
(U) Fire unit delivery is 17 ahead of schedule with a total of 190 delivered as of December 31, 1991.

(U) Boeing "ramp-up" in production was achieved in September 1991. Normal monthly delivery rate will now remain at 12 per month.

(U) The program acquisition cost decreased $-1.2M TY and increased $36.2M BY. 25 fire units were moved from FY 96 and 10 from FY 97 to FY 00. No milestones or technical parameters changed.

(U) The AVENGER is expected to satisfy mission requirements.

c. Changes Since As Of Date --
The FY 91 - FY 95 multiyear contract for 679 fire units (600 Army/79 USMC) was awarded 20 February 1992.

8. **Threshold Breaches**:
There are currently no breaches to the Acquisition Program Baseline (APB) dated February 4, 1991, and no Nunn - Mc Curdy unit cost breaches.

9. **Schedule**:

9a. Schedule (Cont'd):

a. Milestones --	Production Estimate	Approved Program	Current Estimate
Joint Requirements Management Board	JAN 86	JAN 86	JAN 86
Milestone IIIA	MAR 86	MAR 86	MAR 86
Nondevelopmental Item Candidate Evaluation (NDICE)			
Start	NOV 86	NOV 86	NOV 86
Complete	JUL 87	JUL 87	JUL 87
Type [redacted] - Limited Production Urgent (LPU)	APR 87	APR 87	APR 87
Initial Prod Contract Award - Option I	AUG 87	AUG 87	AUG 87
Contract Award - Option II	MAR 88	MAR 88	MAR 88
Force Dev Test & Experimentation (FDTE) I			
Start	MAY 88	MAY 88	MAY 88
Complete	JUN 88	JUN 88	JUN 88
Test Evaluation Master Plan (TEMP) Approved (Army)	JUL 88	JUL 88	JUL 88
Type [redacted] - LPU Extension	SEP 88	SEP 88	SEP 88
Initial Prod Deliveries Start	NOV 88	NOV 88	NOV 88
Contract Award - Option III (FY89)	DEC 88	DEC 88	DEC 88
FDTE II			
Start	FEB 89	FEB 89	FEB 89
Complete	MAR 89	MAR 89	MAR 89
Prod Qual Test (PQT)			
Start	MAR 89	MAR 89	MAR 89
Complete	SEP 89	DEC 89	DEC 89
Initial Oper Test & Eval (IOT&E)			
Start	APR 89	APR 89	APR 89
Complete	AUG 89	SEP 89	SEP 89
FUE-FORSCOM	APR 89	APR 89	APR 89
Option II Deliveries Start	JUL 89	JUL 89	JUL 89
Type [redacted] - Standard	NOV 89	FEB 90	FEB 90
Milestone IIIB	DEC 89	APR 90	APR 90
Contract Award - Option IV (FY 90)	DEC 89	MAY 90	MAY 90
Option III Deliveries Start	APR 90	APR 90	JUL 90
Contract Award - Option V (FY 91)	NOV 90	NOV 90	JAN 91
FUE-USAREUR	FEB 91	N/A	JUL 93
Option IV Deliveries Start	APR 91	APR 91	SEP 91
Option V Deliveries Start	MAR 92	MAR 92	JUL 92
FUE-EUSA	JUN 92	N/A	SEP 91
FUE-WESTCOM	APR 96	N/A	NOV 95

9a. Schedule (Cont'd):

Milestones (Cont'd) --	Production Estimate	Approved Program	Current Estimate
FUE-ARNG	AUG 96	N/A	FEB 95
Initial Operational Capability (IOC)	N/A	FEB 91	JAN 91

b. Previous Change Explanations --

The IOT&E Complete changed from August 1989 to September 1989 and the PQT Complete changed from September 1989 to December 1989 to accomodate test activity master schedules. The Type [redacted] - Standard changed from November 1989 to February 1990 and Milestone IIIB changed from December 1989 to April 1990 to accomodate completion of operational and technical tests. Contract Award - Option IV (FY 90) for Full Scale Production was delayed from December 1989 to May 1990 and Option IV Deliveries Start was changed from April 1991 to September 1991 as the Defense Acquisition Board production decision was not granted until April 1990. Contract Award - Option V (FY91) changed from November 1990 to January 1991 and Option V Deliveries Start changed from March 1992 to July 1992 to align award date, production lead time and planned deliveries. All FUEs were adjusted in previous SARs to reflect revised fielding schedule. First Unit Equipped (FUE) EUSA, FUE-USAREUR, and FUE-WESTCOM were changed from June 1992 to September 1991, October 1992 to July 1993, and June 1994 to November 1995, respectively, due to a HQDA directed change in sequencing of the deployment schedule. Initial Operational Capability (IOC) date added in accordance with DOD guidance and changed from August 1990 to January 1991. August 1990 represented deployment to Operation Desert Shield; January 1991 reflects the date of operational capability in Operation Desert Storm.

c. Current Change Explanations -- None.

d. References --

Production Estimate:
DAE approved Baseline dated March 2, 1989.

Approved Program:
AAE Approved Acquisition Program Baseline dated February 4, 1991.

10. **Performance Characteristics:**

a. Performance --	PdE	Approved Program Objective/Threshold		Demon-strated Perf	Current Estimate
Number of STINGER Missiles	4	8	/ 4	8	8
(b)(1) [redacted]					
Fire unit full reload time (DAY, MOPP O) (min)	15	15	/ 15	15	15
(b)(1) [redacted]					
range (deg F) (includes solar radiation)	140	140	140	140	140
Remote Operation (M)	50	50	/ 50	50	50
Laser Range Finder					
Min Range (km)	.5	.5	/ .5	.5	.5
Max Range (km)	10	10	/ 10	10	10
Fire Unit					
Operational availability (Ao) with ALDT of 7 hrs	.71	.71	/ .71	.83	.71
MTBOMF (hrs)	45	45	/ 45	31	45
MTTR ORG (hrs)	1.5	1.5	/ 1.5	.4	.4
MTTR above ORG (hrs)	3	3	/ 3	3	3
Weapon Subsystem					
Operational availability (Ao) with ALDT of 7 hrs	.89	.89	/ .89	.90	.89
MTBOMF (hrs)	54	54	/ 54	57	54
MTTR ORG (hrs)	1.5	1.5	/ 1.5	.37	.37
MTTR above ORG (hrs)	3	3	/ 3	3	3

The STINGER missile must be capable of being fired both in MANPADS and AVENGER configuration. STINGER missile performance must not be degraded in either configuration.

Acronyms
ALDT = Administrative and Logistics Down Time
MTBOMF = Mean Time Between Operational Failures
MTTR ORG = Mean Time to Repair at Organizational Level

10a. **Performance Characteristics (Cont'd):**
MTTR above ORG = Mean Time to Repair above Organizational Level
MOPP O = Mission Oriented Protective Posture Zero

b. Previous Change Explanations --

Number of STINGER Missiles changed from 4 to 8, MTTR ORG changed from 1.5 hrs to .40 hrs, and MTTR changed from 1.5 hrs to .37 hrs to reflect demonstrated performance.

c. Current Change Explanations -- None.

d. References --

Production Estimate:
DAE approved Baseline dated March 2, 1989.

Approved Program:
AAE Approved Acquisition Program Baseline dated February 4, 1991.

11. **Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)**

a. Cost --	Production Estimate	Approved Program	Current Estimate
Development (RDT&E)	13.3	13.3	13.3
Procurement	1089.8	1638.8	1709.7
Flyaway	(887.3)		(1384.5)
Total Rollaway	(887.3)		(1384.5)
Other Weapon Systems	(124.7)		(190.2)
Total Other Wpn Sys	(124.7)		(190.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(77.8)		(135.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	1103.1	1652.1	1723.0
Escalation	163.6	515.9	508.5
Development (RDT&E)	(-0.5)	(-0.5)	(-0.5)
Procurement	(164.1)	(516.4)	(509.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	1266.7	2168.0	2231.5
b. Quantity --			
Development (RDT&E)	0	N/A	0
Procurement	1207	1779	1779
Total	1207	1779	1779

11b. Total Program Cost and Quantity (Cont'd):
Quantity is in fire units.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

e. References --

Production Estimate:
DAE approved Baseline dated March 2, 1989.

Approved Program:
AAE Approved Acquisition Program Baseline dated February 4, 1991.

12. Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. Program Acquisition	(Dec 91 SAR)	(SEP 91 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	2231.5	2232.7	2231.5
(2) Quantity	1779	1779	1779
(3) Unit Cost	1.254	1.255	1.254
b. Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	183.6	183.6	160.1
Less CY Adv Proc	52.7	52.7	44.9
Plus PY Adv Proc	25.7	25.7	32.6
Net Total	156.6	156.6	147.8
(2) Quantity	144	144	144
(3) Unit Cost	1.088	1.088	1.026

13. **Cost Variance Analysis:**

a. Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	12.8	1253.9	0.0	1266.7
Previous Changes:				
Economic	-	+84.3	-	+84.3
Quantity	-	+519.8	-	+519.8
Schedule	-	+11.0	-	+11.0
Engineering	-	-	-	-
Estimating	-	+170.9	-	+170.9
Other	-	-	-	-
Support	-	+180.0	-	+180.0
Subtotal	-	+966.0	-	+966.0
Current Changes:				
Economic	-	-57.3	-	-57.3
Quantity	-	-	-	-
Schedule	-	+9.0	-	+9.0
Engineering	-	-	-	-
Estimating	-	+23.4	-	+23.4
Other	-	-	-	-
Support	-	+23.7	-	+23.7
Subtotal	-	-1.2	-	-1.2
Total Changes	-	+964.8	-	+964.8
Current Estimate	12.8	2218.7	-	2231.5

13a. Cost Variance Analysis (Cont'd):

a. Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	13.3	1089.8	0.0	1103.1
Previous Changes:				
Quantity	-	+344.7	-	+344.7
Schedule	-	+0.8	-	+0.8
Engineering	-	-	-	-
Estimating	-	+127.1	-	+127.1
Other	-	-	-	-
Support	-	+111.1	-	+111.1
Subtotal	-	+583.7	-	+583.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+3.7	-	+3.7
Engineering	-	-	-	-
Estimating	-	+20.9	-	+20.9
Other	-	-	-	-
Support	-	+11.6	-	+11.6
Subtotal	-	+36.2	-	+36.2
Total Changes	-	+619.9	-	+619.9
Current Estimate	13.3	1709.7	-	1723.0

b. Previous Change Explanations --

PROCUREMENT

Economic: Revised escalation indices.

Schedule: Increase cost for schedule of buy quantities. 28 FUs moved to outyears. 18 FUs moved from FY 95 to FY 00.

Estimating: Procurement of HMMWVs transferred to AVENGER line. PMO salaries changed from OMA to MIPA. Refinement of fire unit estimate. Correction of miscategorization in prior SAR. Refinement of fire unit estimate incorporates MY contract data, MY strategy for FY 96-00. Dual source SVML strategy. Revised HMMWV estimate from TACOM. Revised procurement support estimate: change from a product

13b. **Cost Variance Analysis (Cont'd):**

office to a separate project office. Refined estimate for engineering support of production. Refined ECO estimate.

Support: TPF transferred to AVENGER line. Added initial spares, training equipment, GFE to support additional 572 fire units. Correction of miscategorization in previous SAR. Refined estimate for revised training/support equipment requirements. Refinement of TPF estimate, extension beyond FY 97. Revised initial spares requirement.

c. Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Total Changes	--	--
(2) PROCUREMENT		
Revised escalation indices. (Economic)		-57.3
25 fire units moved from FY 96 and 10 from FY 97 to FY 00 due to budget constraints. (Schedule)	3.7	9.0
Current and prior inflation offset. (Estimating)	6.5	7.2
Revised est. for MYP of 617 AUC TY). Future procurements projected from adjusted curve. (Estimating)	14.4	16.2
Refinement of initial spares estimate. (Support)	3.5	4.2
Change in procurement schedule for training devices. Addition of Interim Contract Support. (Support)	8.1	19.5
Total Changes	36.2	-1.2

14. **Program Acquisition Unit Cost (PAUC) History:** (Then-Year Dollars in Millions)

a. Initial SAR Estimate to Current Baseline Estimate - -

PAUC (Initial Est)	Changes								PAUC (Prod Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1.057	-0.002	--	0.021	--	-0.027	--	0.001	-0.007	1.050

b. Initial Baseline Estimate to Current Estimate - -

PAUC (Prod Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
1.049	0.015	-0.045	0.011	--	0.109	--	0.115	0.205	1.254

Table 14.b. PAUC PE 1.049 is rounding error by CARS and cannot be edited. The PAUC PE is 1.050.

15. **Contract Information:** (Then-Year Dollars in Millions)

a. Procurement --

FY 87-91 FUs:	Initial Contract Price Target	Ceiling	Qty
BOEING AEROSPACE COMPANY, HUNTSVILLE, AL			
DAAH01-86-C-A077, FFP	$42.6	N/A	59
Award: August 1, 1987			
Definitized: August 1, 1987			

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$246.2	N/A	325	$246.2	$246.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$0.0	$0.0
Cumulative Variances To Date	$0.0	$0.0
Net Change	$0.0	$0.0

Explanation of Change:

A Contract Performance Report (CPR) is not required for this Firm Fixed Price (FFP) contract.

16. **Program Funding Summary:** (Current Estimate in Millions of Dollars)

a. Program Status --

(1) Percent Program Completed: 41.2% (7 yrs/17 yrs)

(2) Percent Program Cost Appropriated: 28.6% ($639.3 / $2231.5)

b. Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY86-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete (FY94-2002)	Total
RDT&E	12.8	-	-	-	12.8
Procurement	442.9	183.6	160.1	1432.1	2218.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	455.7	183.6	160.1	1432.1	2231.5

c. Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1986				4.5	4.2	4.2	4.2	2.7
1987				2.8	2.7	1.8	1.6	3.4
1988				6.0	5.9	5.9	5.9	4.4
Subtot				13.3	12.8	11.9	11.7	

16c. Program Funding Summary (Cont'd):

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2032 Missile Procurement, Army								
1987	20	4.2	31.0	41.9	41.2	36.9	36.4	3.4
1988	39	1.3	39.4	62.9	64.1	45.3	44.8	4.4
1989	88	1.4	76.5	93.2	98.8	98.8	72.1	4.2
1990	106	1.9	87.6	109.7	121.2	118.7	60.3	4.0
1991	88		75.2	102.6	117.6	73.2	28.9	3.9
1992	144	0.3	119.7	154.4	183.6	0.9	0.3	3.1
1993	144		106.8	130.1	160.1			3.3
1994	144		104.0	91.0	116.5			3.3
1995	150		110.2	135.6	178.7			3.3
1996	143		106.9	142.6	191.7			3.2
1997	145		106.4	123.7	171.6			3.2
1998	227		158.1	182.6	261.3			3.2
1999	195		137.0	160.1	236.5			3.2
2000	146		106.1	144.2	219.8			3.2
2001			7.0	20.7	32.6			3.2
2002			3.5	14.4	23.4			3.2
Subtot	1779	9.1	1375.4	1709.7	2218.7	373.8	242.8	
Grand								

16c. **Program Funding Summary (Cont'd):**

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2032 Missile Procurement, Army (Cont'd)								
Total	1779	9.1	1375.4	1723.0	2231.5	385.7	254.5	

Flyaway cost adjusted for FY91-95 Multi Yr Proc (MYP) Adv Funding.

Flyaway beyond last year of procurement is for annualized in-house costs to support production.

17. **Production Rate Data:**

a. Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1987	0	20	20	20
1988	0	39	39	39
1989	0	100	88	88
1990	0	122	106	106
1991	0	132	88	88
1992	0	132	144	204
1993	0	132	144	204
1994	0	132	144	204
1995	0	132	150	204

17a. **Production Rate Data (Cont'd):**

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1996	0	133	143	204
1997	0	133	145	204
1998	0	0	227	214
1999	0	0	195	
2000	0	0	146	

b. Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	1103.1	+619.9	1723.0	+86.5	1636.5
(TY $)	1266.7	+964.8	2231.5	+134.0	2097.5
PAUC Cost (BY $)	0.914	0.055	0.969	0.049	0.920
(TY $)	1.049	0.205	1.254	0.075	1.179

c. Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	AUG 87	0	AUG 87	N/A	AUG 87
Duration (in MON)	140	31	171	21	150
End Date(MON YY)	APR 99	31	NOV 01	N/A	FEB 00

17d. **Production Rate Data (Cont'd):**

d. Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	173/190

e. Approved Design-to-Cost Objective -- N/A.

Since AVENGER consists primarily of off-the-shelf Non-Developmental Items (NDI), Design-to-Cost Goals are not applicable.

18. **Operating and Support Costs:**

a. Assumptions and Ground Rules --

Operating and support costs are included for 1207 AVENGER (LOS-R) fire units including training base, floats and spares. OTEMP is 1481 kilometers per year. Twenty full-up years, plus ramp up are costed for the fire units. Military personnel costs included two crew members per fire unit, maintenance personnel, and support personnel. O&M costs include all fielding costs, replenishment and replacement parts, petroleum, oil and lubricants, ammunition, depot maintenance material and labor, field maintenance labor, transportation, personnel replacement training, military personnel direct charges, project management and modification kits. Avenger has no antecedent system.

Note: The latest BCE for Operating & Support (O&S) was developed in accordance with the new streamlining policy per DA. This excluded certain O&S cost elements; therefore the O&S represents the cost from the last full BCE (Qty 1207) in lieu of 1779.
Source: BCE excursion dated December 1989.

18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per AVENGER Fire Unit	Avg Annual Cost Per (Antecedent)
Personnel	0.2	N/A
O&S Consumables	0.0	N/A
Direct Depot Maint.	0.0	N/A
Sustaining Investment	0.0	N/A
Other Direct Costs	0.0	N/A
Indirect Costs	0.0	N/A
Total	0.2	N/A

c. Contractor Support Costs -- (Current (Then-Year) Dollars in Millions)

Funding	FY1991 & Prior	FY1992	FY1993	Balance To Complete	Total
Depot Maintenance	2.4	---	0.2	---	2.6
Other	3.0	---	---	---	3.0
Total	5.4	---	0.2	---	5.6

Depot Maintenance: Provides for repair and overhaul of system.
Other: Provides new equipment training team (NETT) training for operator and maintenance courses. If NETT is not conducted in sufficient quantities and at the appropriate times, the AVENGER system will not meet its initial operating capability.

A-15 FAADS NLOS

9-029

*** [redacted] ***

SELECTED ACQUISITION REPORT (RCS:DD-COMP(Q&A)823)
PROGRAM: FAAD NLOS (FOG-M)

AS OF DATE: December 31, 1991

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1. (U) **Designation and Nomenclature (Popular Name):**
   Forward Area Air Defense System (FAADS)
   Non-Line of Sight (NLOS)

2. (U) **DoD Component:** Army

3. (U) **Responsible Office and Telephone Number:**
   NON-LINE OF SIGHT PROJECT OFFICE
   ATTN: AMSMI-NL
   REDSTONE ARS, AL 35898-5793

   COL LOUIS KRONENBERGER
   Assigned: April 11, 1991
   AV 746-7725 COMM (205) 876-7725

4. (U) **Program Elements/Procurement Line Items:**

   RDT&E:
   PE 63757A Project D465
   PE 64810A Project DC26

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AS AMENDED
MAR 24 1992
DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW (OFFICE OF THE DEPARTMENT OF DEFENSE)

Concur in Classification as marked
23 MAR 1992
SECURITY REVIEW, COSSINT, HQCA

~~Classified by: NLOS FOG-M Security Classification Guide, 3 June 91~~
~~Declassify on: OADR~~
~~Downgrade Instructions: Regrade UNCLASS when separated from CLASS encl/pages~~

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92-T-0607

4. (U) **Program Elements/Procurement Line Items (Cont'd):**

PROCUREMENT:
APPN 2032 ICN CA0263 (Army)
APPN 2032 ICN HO3100 (Army)
APPN 2032 ICN HO3600 (Army)

5. (U) **Related Programs:**
Combined Arms; Line of Sight-Forward-Heavy; Line of Sight-Rear; and Forward Area Air Defense Command, Control, and Intelligence.

6. (U) **Mission and Description:**
The Fiber Optic Guided-Missile (FOG-M) system is a Non-Line of Sight (NLOS) system which consists of a multiple missile launcher and fire control ground station mounted on a high mobility multi-purpose wheeled vehicle (HMMWV) fully compatible with both light or heavy divisions. The missile is guided by the gunner on the ground via a battle field picture captured by a TV camera located in the nose of the missile and transmitted by fiber optic datalink to the gunner's station in the fire unit. The light system is transportable by C-130, C-141, or CH-47D. The NLOS system will provide fully adequate anti-armor capability against threat armor well beyond the maximum range of tank main guns or direct fire anti-tank missiles. Other potential uses include hard point targets, fortifications and surgical strikes against bridges and buildings, as well as air defense protection to the manuever force against masked, stand-off rotary-wing aircraft. The system will have a night/adverse weather capability and utilize an on-board passive sensor which will allow the fire unit to autonomously acquire targets. The NLOS system will be fielded as a defensive weapon system, and thus will not be counted in the Conventional Forces Europe (CFE) totals.

The NLOS system will permit a safely concealed and protected gunner to engage both fixed and moving targets to extended ranges, even when the targets are in defilade or concealed positions. NLOS survivability is enhanced due to stand off targeting, the non-ballistic missile flight path, and the ability to launch from hidden positions. The gunner locates targets by viewing on a video screen what the missile imaging seeker (either television [TV] or imaging infrared [IIR]) sees as the missile cruises at low altitudes below cloud ceilings. The image is transmitted from the missile through a fiber optic datalink to a gunner located on the ground. Simultaneously, guidance commands are transmitted to the missile on the same optical fiber from the ground computer located in the gunner station.

The NLOS system is a combined arms weapon system with Anti-Tank and Air Defense capability.

7. (U) Program Highlights:

a. (U) Significant Historical Developments --
On 29 July 1986, the Joint Requirements and Management Board (JRMB) approved the concept for execution of the overall FAAD program as a system of systems. A draft Request for Proposal (RFP) for Full Scale Development of NLOS (FOG-M) was released to industry in December 1986. After a review by the Conventional Systems Committee of the Defense Acquisition Board (DAB) in October 1987, the final RFP was released in November 1987. The Army provided a detailed briefing to the DAB on 4 August 1988, which was a Milestone II Decision Review. An Acquisition Decision Memorandum (ADM) approving the Acquisition Strategy (AS), to include Advanced Procurement, as well as authority to proceed into Full Scale Development (FSD) was approved on 23 September 1988. The FSD contract was awarded to the Boeing Company on 14 December 1988. The December 1988 SAR rebaselined NLOS from a Planning Estimate to a Development Estimate. The Initial Operational Evaluation (IOE) missile firing program for the 10 kilometer semi-tactical prototype, at White Sands Missile Range (WSMR), was successfully completed on 16 September 1989. The Extended User Employment (EUE) test program was successfully completed in July 1990.

On 14 December 1990, the Army Acquisition Executive (AAE) directed termination of the NLOS FSD contract with Boeing due to the contract cost overrun.

b. (U) Significant Developments Since Last Report --
Major reductions were made to FY91 funding and all activity on the FSD contract was stopped in January 1991. Subsequent to the FSD contract termination, the AAE directed that a review of the requirements for a non-line of sight capability be conducted, that system alternatives be developed to meet the requirements, and that acquisition strategies for system development and procurement be formulated. User briefings were held with the AAE on 15 March 1991. COL Louis Kronenberger was appointed Program Manager (PM) of the NLOS Project Office on 11 April 1991. A review of alternative acquisition system strategies with the AAE was held on 2 May 1991. On 5 June 1991, the AAE designated NLOS as an Acquisition Category (ACAT) 1C program, with the PM reporting via an Army internal streamlining process through the Commanding General MICOM to the AAE. The NLOS system was designated as a combined arms weapon system with Anti-tank and Air Defense capability. The AAE approved a consolidated MICOM acquisition strategy on 12 July 1991. Approved (FY92 President's Budget) NLOS budget guidance did not restore funding beyond FY91 which was deleted during the FY91 recision. Expenditures are above the 90% SAR deletion criteria and the official accounting records are in the process of being adjusted. It is expected that this will be the final SAR.

7c. (U) **Program Highlights (Cont'd)**:

c. (U) Changes Since As Of Date --
On 27 January 1992, a NLOS Demonstration/Validation Prototype strategy was approved at a Chief of Staff of the Army (CSA) "Off Site" Review. On 29 January 1992, the AAE requested DAE approval to remove NLOS from the Major Defense Systems List and from Acquisition Category 1C.

8. (U) **Threshold Breaches**:
There are currently no breaches to the approved Acquisition Program Baseline (APB), dated February 26, 1990. There are no Nunn-McCurdy unit cost breaches.

9. (U) **Schedule**:

a. (U) Milestones --	Development Estimate	Approved Program	Current Estimate
RFP Release	NOV 87	NOV 87	NOV 87
Milestone II DAB	AUG 88	AUG 88	AUG 88
Initial Operational Evaluation (IOE)			
Start	NOV 88	NOV 88	NOV 88
Complete	AUG 89	SEP 89	SEP 89
FSD Contract Award	DEC 88	DEC 88	DEC 88
Extended User Employment (EUE)			
Start	SEP 89	SEP 89	SEP 89
Complete	SEP 91	JUN 91	JUL 90
Advance Procurement LRIP (LLI)	MAY 90	N/A	N/A
Engineering Development Test-Contractor(EDT-C)			
Start	NOV 90	N/A	OCT 90
Complete	JUL 91	N/A	N/A
EDT-C			
Start		NOV 90	N/A
Complete	JUL 91	JUL 91	N/A
Milestone IIIA DAB	JUL 91	N/A	N/A
Contract Award LRIP Buy 1	JUL 91	N/A	N/A
Force Development Test and Experimentation (FDT&E)			
Start	SEP 91	SEP 91	N/A
Complete	OCT 91	OCT 91	N/A
Early User Test and Evaluation (EUT&E)			
Start	JAN 92	JAN 92	N/A
Complete	MAR 92	MAR 92	N/A
First Unit Equipped (FUE)	AUG 93	N/A	N/A

9a. (U) Schedule (Cont'd):

(U) Milestones (Cont'd) --	Development Estimate	Approved Program	Current Estimate
FDT&E II			
Start	JUL 93	JUL 93	N/A
Complete	SEP 93	SEP 93	N/A
Live Fire Vulnerability/Lethality (VUL/LETH)			
Start	SEP 93	SEP 93	N/A
Complete	NOV 93	NOV 93	N/A
Initial Operational Test & Evaluation (IOT&E)			
Start	OCT 93	OCT 93	N/A
Complete	DEC 93	DEC 93	N/A
Milestone III DAB	JAN 94	N/A	N/A
Full Scale Production (FSP) Contract Award	MAR 94	N/A	N/A

(b)(1) [redacted]

b. (U) Previous Change Explanations --

Completion of IOE was delayed one month due to range priorities at White Sands Missile Range (WSMR). Completion of EUE was accelerated thirteen months due to accomplishment of technical objectives. Program testing was restructured to be consistent with budget changes and all production related milestones were changed to "N/A" to reflect the unfunded procurement in the FY90 President's Budget. R&D milestones subsequent to AAE's decision to terminate FSD contract were reported as "N/A".

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
Draft APB; FY90-91 President's Budget, dated January 1989.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 26 February 1990.

10. (U) **Performance Characteristics:**

a. (U) Performance --

	DE	Approved Program Objective/Threshold	Demon-strated Perf	Current Estimate
PSSK				

(b)(1)

[redacted]

[U] NOTE: Missile Storage Reliability - The preflight reliability shall not degrade below 95% for the first 5 years of storage and shall not degrade more that 0.5% per year for the next 5 years of storage.

[U] NOTE: Probabilities Single Shot Kill (PSSK) values were to be met based on target description in MICOM system specification number

10a. (U) Performance Characteristics (Cont'd):
40920, amendment 01, 11 October 1987.

[U] NOTE: It was planned that ROC requirement will be met at IOC plus two years. At that time adequate testing and correction of deficiencies would occur in order to achieve these requirements. Progressive growth through the development program is stated via separate documents (i.e., TEMP & Performance Growth Plan).

[U] NOTE: As noted in the 27 July 1988 Decision Coordinating Paper (DCP), the FOG-M would have no effect on energy resources, land use, ecology, cultural quality or preservation activities.

b. (U) Previous Change Explanations --

Missile speed values were changed from a range value of 150-200 mps to 150 mps to align with the APB thresold approved Feb 1990.

c. (U) Current Change Explanations -- None.

d. (U) References --

(U) Development Estimate:
Draft APB; FY90-91 President's Budget, dated January 1989.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 26 February 1990.

11. (U) Total Program Cost and Quantity: (Current Estimate in Millions of Dollars)

a. (U) Cost --	Development Estimate	Approved Program	Current Estimate
Development (RDT&E)	535.7	409.1	380.9
Procurement	1984.0	0.0	0.0
Flyaway	(1794.4)		(0.0)
Total Flyaway	(1794.4)		(0.0)
Other Weapon Systems	(138.3)		(0.0)
Total Other Wpn Sys	(138.3)		(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(51.3)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Ops. and Maint. (O&M)	0.0	N/A	0.0
Total FY 89 Base-Year $	2519.7	409.1	380.9

11a. (U) Total Program Cost and Quantity (Cont'd):

	Development Estimate	Approved Program	Current Estimate
Escalation	400.7	14.0	8.8
Development (RDT&E)	(20.2)	(14.0)	(8.8)
Procurement	(380.5)	(0.0)	(0.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Ops. and Maint. (O&M)	(0.0)	(N/A)	(0.0)
Total Then-Year $	2920.4	423.1	389.7

b. (U) Quantity --

Development (RDT&E)	0	N/A	0
Procurement	403	0	0
Total	403	0	0

c. (U) Foreign Military Sales -- None.

d. (U) Nuclear Costs -- None.

e. (U) References --

(U) Development Estimate:
Draft APB; FY90-91 President's Budget, dated January 1989.

(U) Approved Program:
AAE Approved Acquisition Program Baseline dated 26 February 1990.

12. (U) Program Acquisition/Current Procurement Unit Cost Summary:

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
a. (U) Program Acquisition	(Dec 91 SAR)	(DEC 90 SAR)	(DEC 91 SAR)
(1) Cost (TY$)	389.7	434.3	389.7
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

Note: Unit Cost for Current Est is only calculated for fully configured items.

12. (U) **Program Acquisition/Current Procurement Unit Cost Summary (Cont'd):**

	Current Estimate	Current Year UCR Baseline	Budget Year UCR Baseline
b. (U) Current Procurement --	(FY 1992)	(FY 1992 APPN)	(FY 1993)
(1) Cost (TY$)	0.0	0.0	0.0
Less CY Adv Proc	0.0	0.0	0.0
Plus PY Adv Proc	0.0	0.0	0.0
Net Total	0.0	0.0	0.0
(2) Quantity	0	0	0
(3) Unit Cost	N/A	N/A	N/A

13. (U) **Cost Variance Analysis:**

a. (U) Summary -- (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	555.9	2364.5	0.0	2920.4
Previous Changes:				
Economic	+8.2	+189.6	-	+197.8
Quantity	+19.4	-2263.0	-	-2243.6
Schedule	-49.8	-	-	-49.8
Engineering	-	-	-	-
Estimating	+47.3	-48.5	-	-1.2
Other	-146.7	-	-	-146.7
Support	-	-242.6	-	-242.6
Subtotal	-121.6	-2364.5	-	-2486.1
Current Changes:				
Economic	-0.9	-	-	-0.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-43.7	-	-	-43.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-44.6	-	-	-44.6
Total Changes	-166.2	-2364.5	-	-2530.7
Current Estimate	389.7	-	-	389.7

13a. (U) Cost Variance Analysis (Cont'd):

a. (U) Summary -- (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	535.7	1984.0	0.0	2519.7
Previous Changes:				
Quantity	+16.4	-1755.4	-	-1739.0
Schedule	-45.4	-	-	-45.4
Engineering	-	-	-	-
Estimating	+37.4	-39.0	-	-1.6
Other	-123.6	-	-	-123.6
Support	-	-189.6	-	-189.6
Subtotal	-115.2	-1984.0	-	-2099.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-39.6	-	-	-39.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-39.6	-	-	-39.6
Total Changes	-154.8	-1984.0	-	-2138.8
Current Estimate	380.9	-	-	380.9

b. (U) Previous Change Explanations --

RDT&E

Economic: Revised escalation indices

Quantity: Additional test quantities to comply with Title 10 USC

Schedule: Restructure of FSD effort due to funding reductions

Estimating: Revised test estimates and reallocation of funds
Current and prior year inflation offset

Other: Reduction in FY92-94 R&D funds due to program termination

PROCUREMENT

Economic: Revised escalation indices

Quantity: Procurement deletion via 1991 President's Budget

13b. (U) **Cost Variance Analysis (Cont'd)**:

and revised test quantities.
Recategorization of variance (in December 1989 SAR) from support to quantity per Office of the Under Secretary of Defense for Acquisition [OUSD(A)] direction.

Estimating: Revised testing methodology and schedule to comply with Title 10 USC

Support: Procurement deletion via 1990 President's Budget

c. (U) Current Change Explanations --

	(Dollars in Millions) Base-Year	Then-Year
(1) RDT&E		
Revised Escalation Indices (Economic)	N/A	-0.9
Current and Prior Inflation Offset (Estimating)	0.9	0.9
Funding Recision and Reprogramming (Estimating)	-40.5	-44.6
Total Changes	-39.6	-44.6

14. (U) **Program Acquisition Unit Cost (PAUC) History**: (Then-Year Dollars in Millions)

(U) Initial Baseline Estimate to Current Estimate - -

PAUC (Initial Est)	Changes								PAUC (Current Est)
	Econ	Qty	Sch	Eng	Est	Other	Spt	Total	
7.247	--	--	--	--	--	--	--	--	N/A

15. (U) **Contract Information**: (Then-Year Dollars in Millions)

a.(U) RDT&E --

(U) FAAD NLOS (FOG-M):	Initial Contract Price Target	Ceiling	Qty
THE BOEING COMPANY, HUNTSVILLE, AL DAAH01-89-C-0066, CPIF/AF Award: December 14, 1988 Definitized: December 14, 1988	$131.3	N/A	8

Current Contract Price Target	Ceiling	Qty	Estimated Price At Completion Contractor	Program Manager
$137.2	$0.0	0	$211.9	$252.0

15. (U) Contract Information: Cont'd (Then-Year Dollars in Millions)

	Cost Variance	Schedule Variance
Previous Cumulative Variances	$-18.2	$-4.5
Cumulative Variances To Date (09/27/90)	$-83.7	$-24.0
Net Change	$-65.5	$-19.5

Explanation of Change:

Contractor grossly underestimated development costs. Actual labor costs exceeded the original contractor budget estimates due to over optimistic planning of workload required to complete development. Labor rates for required technical/engineering effort were also underestimated.

A notice of complete contract termination was sent to the Boeing Company on 22 January 1991. The Termination Contracting Officer has $10M obligated for costs associated with termination expenses in addition to those obligated for performance of the scope of work.

NOTE: The date of the last submitted Cost Performance Report (CPR) was 27 September 1990. After this date, CPR submissions were suspended while contractor rebaselined for restructured (descoped) program.

NOTE: The $252M Program Manager estimate is based on the descoped program presented at the 27 September 1990 DA IPR which deleted and/or deferred items including the Heavy Fire Unit, the Unit Conduct of Fire Trainer, certain Test Program Sets, the NLOS Maintenance Trainer, and reduced documentation requirements.

16. (U) Program Funding Summary: (Current Estimate in Millions of Dollars)

a. (U) Program Status --

(1) Percent Program Completed: 100.0% (5 yrs/5 yrs)

(2) Percent Program Cost Appropriated: 100.0% ($389.7 / $389.7)

16b. (U) Program Funding Summary (Cont'd):

b. (U) Appropriation Summary --

(Then-Year Dollars in Millions)

Appropriation	Prior Years (FY87-91)	Budget Year (FY92)	Budget Year (FY93)	Balance To Complete	Total
RDT&E	389.7	-	-	-	389.7
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	389.7	-	-	-	389.7

c. (U) Annual Summary --

Fiscal Year	Qty	Flyaway FY89 Dollars		Total Base Year$	Total Then-Year $			Escl Rate (%)
		Nonrec	Rec		Program	Obligated	Expended	
Appropriation: 2040 Research Development Test + Eval, Army								
1987				63.2	60.2	60.2	60.2	2.7
1988				59.7	58.9	58.9	58.9	3.0
1989				135.2	138.7	138.7	138.7	4.2
1990				98.1	104.5	104.5	104.5	4.0
1991				24.7	27.4	27.4	27.4	3.9
Subtot				380.9	389.7	389.7	389.7	
Grand Total				380.9	389.7	389.7	389.7	

17. (U) **Production Rate Data**:

a. (U) Annual Production Rates --

Fiscal Year Buy	Production Rates (Quantity/Year)			
	Development Decision	Production Decision	Current Estimate	Maximum Economic
1991	9	N/A	0	N/A
1992	13	N/A	0	N/A
1993	67	N/A	0	N/A
1994	102	N/A	0	N/A
1995	90	N/A	0	N/A
1996	91	N/A	0	N/A
1997	31	N/A	0	N/A

b. (U) Cost Variance -- Dollars in Millions

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Acq. Cost (BY $)	N/A	N/A	380.9	N/A	N/A
(TY $)	N/A	N/A	389.7	N/A	N/A
PAUC Cost (BY $)	N/A	N/A	N/A	N/A	N/A
(TY $)	N/A	N/A	N/A	N/A	N/A

17c. (U) **Production Rate Data (Cont'd)**:

c. (U) Schedule Variance

Item	Production Decision	Variance (CE less PdE)	Current Estimate	Variance (CE less Max)	Maximum Economic
Start Date(MON YY)	N/A	N/A	N/A	N/A	N/A
Duration (in MON)	N/A	N/A	N/A	N/A	N/A
End Date(MON YY)	N/A	N/A	N/A	N/A	N/A

d. (U) Deliveries (Plan/Actual) --

	To Date
RDT&E	0/0
Procurement	0/0

e. (U) Approved Design-to-Cost Objective -- N/A.

18. (U) **Operating and Support Costs**:

a. (U) Assumptions and Ground Rules --

Assumptions and Ground Rules -- Operating and support costs are included for 502 light fire units including training base, floats, and spares. The operational tempo (OP TEMPO) is specified as 1022 miles per/yr. Twenty full-up years, plus ramp up and ramp down are costed for the fire units. Two crew members per light fire unit have been costed. The personnel costs included the military personnel required (crew, maintenance, and support) and civilian personnel for project management. The O&S consumables cost includes repair parts, POL, and ammunition. The depot cost is a summary which includes civilian labor for depot support, depot materiel and maintenance support. The sustaining investment consists primarily of fielding sustainment and modification kits. The other direct cost category includes costs for transportation and special training equipment. The indirect costs are for permanent change of station costs. 16828 missiles will be fielded and a missile recertification is costed for every ten years of sustainment. This information is based on the NLOS Baseline Cost Estimate dated August 1990. There is no antecedent.

18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1989 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per NLOS Fire Unit	Avg Annual Cost Per (Antecedent)
Personnel	0.2	N/A
O&S Consumables	0.0	N/A
Direct/Depot Maint	0.0	N/A
Sustaining Investments	0.0	N/A
Other Direct Cost	0.0	N/A
Indirect Cost	0.0	N/A
Total	0.2	N/A

c. (U) Contractor Support Costs -- None.