

N-24 USMC H-1 UPGRADES

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: USMC H-1 Upgrades

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): USMC H-1 Upgrades

2. DoD Component: Navy

3. Responsible Office and Telephone Number:

PROGRAM EXECUTIVE OFFICER (PMA-276) CAPT TOM CURTIS  
 AIR ASW ASSAULT AND SPECIAL MISSION Assigned: August 20, 1997  
 PROGRAMS, 47123 BUSE ROAD UNIT#IPT DSN 757-5534; COMM 301 757-5534  
 PATUXENT RIVER, MD 20670-1547 CURTISJT@NAVAIR.NAVY.MIL

4. Program Elements/Procurement Line Items:

RDT&E:  
 PE 0603266N (Shared) (FY96) SUNK Project H2279  
 PE 0604245N Project H2279, H2419  
 PROCUREMENT:  
 APPN 1506 ICN 017800 (Navy)

5. References:

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline dated October 10, 1996, at the Milestone II decision.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated October 10, 1996.

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

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No Security Objection  
to Open Publication  
(AS AMENDED)

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**6. Mission and Description:**

The mission of the AH-1Z attack helicopter is to provide rotary wing close air support, anti-armor, armed escort, armed/visual reconnaissance and fire support coordination capabilities under day/night and adverse weather conditions. The mission of the UH-1Y utility helicopter is to provide command, control and assault support under day/night and adverse weather conditions. The USMC H-1 Upgrades effort involves conversion of the AH-1W and UH-1N to the AH-1Z and UH-1Y, respectively. Major modifications include: a new four-bladed rotor system with semiautomatic blade fold of the new composite rotor blades, new performance matched transmissions, a new four-bladed tail rotor and drive system, upgraded landing gear, and pylon structural modifications. The H-1 Upgrades aircraft will have increased maneuverability, speed, and payload capability. Both aircraft will have fully integrated common cockpits/avionics that will reduce operator workload and improve situational awareness, thus increasing safety.

**7. Executive Summary:**

An updated threat assessment has been completed. Details can be found in the V-22 Osprey/CH-60s Seahawk/H-1 Upgrades Joint Systems Threat Assessment (JSTAR) ONI-TA-024-98, January 1998. The USMC H-1 Upgrades Program was designated a Major Defense Acquisition Program on July 31, 1995.

Approval of the mission design series designation was issued by Commander, Naval Air Warfare Center Aircraft Division on Feb 19, 1998. The remanufactured H-1 Upgrades aircraft will be designated the AH-1Z and UH-1Y.

The analysis and review of the Estimate at Completion (EAC) for contract cost growth and other unfunded or underfunded program requirements resulted in projection of \$58.8M EMD program shortfall. The program office pursued funding sources for the \$58.8M EAC shortfall in FY00 and FY01. In FY00, Congress appropriated \$26.6M through an Above Threshold Reprogramming (ATR). In FY01, the Department of Navy budget provided an additional \$32.2M via the Acquisition Stability Reserve (ASR) fund.

First flight is scheduled for first quarter 2001; design of AH-1Z aircraft number one is 97% complete and assembly is approximately 45% complete.

A Bell Helicopter Textron Inc. (BHTI) rebaselining proposal was received February 2000, and is undergoing evaluation of updated pricing for the remainder of contract work, and incorporation of manufacturing and flight test efficiencies and a number of cost reduction initiatives.

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**8. Threshold Breaches:**

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

The Upgrades program is currently on schedule and the AH-1Z and UH-1Y designs are meeting all performance parameters. From Milestone II approval to the present, the program has increased RDT&E and procurement funding during the budget process. The Acquisition Program Breach (APB) for RDT&E and procurement funding are based on the following two factors: 1) Previously approved program changes such as the UH-1Y common cockpit; crashworthy AH-1Z crew seats; ground proximity warning system (GPWS); and Integrated Mechanical Diagnostic development and production. 2) Estimate at Completion (EAC) growth caused by increased contractor rates, less reused aircraft structure (than estimated), and underfunded logistics elements. A revised Acquisition Program Baseline is in process to support the new Acquisition Strategy and cost increases.

**9. Schedule:**

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
4BW (AH-1W)			
Milestone II	SEP 96	SEP 96	OCT 96
Preliminary Design Review Complete	JUL 97	JUL 97	JUN 97
Critical Design Review Complete	JUL 98	JUL 98	SEP 98
TECHEVAL Testing Complete	DEC 02	DEC 02	DEC 02
SAE LRIP Review	FEB 03	FEB 03	FEB 03
OPEVAL Testing Complete	SEP 03	SEP 03	SEP 03
Milestone III (SAE FRP Review - Navy)	FEB 04	FEB 04	FEB 04
IOC	SEP 06	SEP 06	SEP 06
Navy Support Date	SEP 08	SEP 08	SEP 08

9a. Schedule (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
4BN (UH-1N)			
Milestone II	SEP 96	SEP 96	OCT 96
Preliminary Design Review Complete	JUL 97	JUL 97	JUN 97
Critical Design Review Complete	JUL 98	JUL 98	SEP 98
DAB LRIP #1 Review	DEC 01	DEC 01	DEC 01
TECHEVAL Testing Complete	AUG 02	AUG 02	AUG 02
SAE LRIP #2 Review	FEB 03	FEB 03	FEB 03
OPEVAL Testing Complete	MAY 03	MAY 03	MAY 03
Milestone III (SAE FRP Review - Navy)	FEB 04	FEB 04	FEB 04
IOC	JUN 05	JUN 05	JUN 05
Navy Support Date	SEP 07	SEP 07	SEP 07

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
4BW (AH-1W)				
MFHBA (hrs)	35.0	35.0 / 24.0	TBD	35.0
MMH/FH (hrs)	3.6	3.6 / 4.3	TBD	2.5
Cruise Speed (kts)	165	165 / 140	TBD	143
Payload (Hot Day) (lbs)	3500	3500 / 2500	TBD	2716
Weapon Stations				
Universal Mounts	6	6 / 4	TBD	4
Precision Guided Munitions	16	16 / 12	TBD	16
Maneuverability/Agility (G's)	-0.5 to +2.5	-0.5 to +2.5 / -0.5 to +2.5	TBD	-0.5 to +2.8
Mission Radius (nm)	200nm x 1 (Aux)	200nm x 1 (Aux) / 50nm x 2	TBD	125nm x 1
		/ x 1		
4BN (UH-1N)				
MFHBA (hrs)	40.2	40.2 / 33.1	TBD	40.2
MMH/FH (hrs)	2.9	2.9 / 3.9	TBD	2.5
Cruise Speed (kts)	165	165 / 140	TBD	152
Payload (Hot Day) (lbs)	4500	4500 / 2800	TBD	3120
Weapon Stations	2 Univ. Mounts	2 Univ. / 2 Hard Mounts	TBD	2 Hard Mounts
Maneuverability/Agility (G's)	-0.5 to +2.5	-0.5 to +2.5 / -0.5 to +2.5	TBD	-0.5 to +2.8
Mission Radius (nm)	200nm x 1 (Aux)	200nm x 1 (Aux) / 50nm x 2	TBD	133nm x 1
		/ x 1		

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

b. Current Change Explanations --

(CH-1) The current estimate is based on the Critical Design Review held September 1-2, 1998. No further changes are anticipated until after first flight of both aircraft. The current estimate changes are:

4BW (AH-1W)	MMH/FM	from 3.6	to	2.5
	Cruise Speed	142		143
	Payload	2800		2716
	Precision Guided	14		16
	Maneuverability	-0.5 to +2.6		-0.5 to +2.8
	Mission Radius	130nm x 1		125nm to 1
4BN (AH-1N)	MMH/FM	2.9		2.5
	Cruise Speed	150		152
	Payload	3200		3120
	Maneuverability	-0.5 to +2.6		-0.5 to +2.8
	Mission Radius	121nm x 1		133nm x 1

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

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	537.8	537.8	633.5
Procurement	2254.7	2254.7	2536.1
Flyaway	(1892.2)		(2079.3)
Unknown			(0.0)
Total Flyaway	(1892.2)		(2079.3)
Other Wpn System Costs	(240.4)		(302.7)
Peculiar Support	(40.1)		(42.4)
Initial Spares	(82.0)		(111.7)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1996 Base-Year \$	2792.5	2792.5	3169.6
Escalation	755.0	755.0	561.4
Development (RDT&E)	(54.5)	(54.5)	(33.4)
Procurement	(700.5)	(700.5)	(528.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3547.5	3547.5	3731.0
b. Quantity --			
Development (RDT&E)	4	4	4
Procurement	280	280	280
Total	284	284	284

Note: The LRIP quantities approved at Milestone II are 5 (1st year) and 17 (2nd year). These LRIP quantities do not represent more than 10% of the total planned buy.

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

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (OCT 96 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	2792.5	3169.6	
(2) Quantity	284	284	
(3) Unit Cost	9.833	11.161	+13.51
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	2254.7	2536.1	
(2) Quantity	280	280	
(3) Unit Cost	8.052	9.057	+12.48

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13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	592.3	2955.2	-	3547.5
Previous Changes:				
Economic	-24.5	-188.0	-	-212.5
Quantity	-	-	-	-
Schedule	-5.1	-	-	-5.1
Engineering	+32.3	+236.7	-	+268.5
Estimating	+23.7	-4.8	-	+18.9
Other	-	-	-	-
Support	-	+26.4	-	+26.4
Subtotal	+26.4	+69.8	-	+96.2
Current Changes:				
Economic	-2.3	-34.2	-	-36.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+50.5	-2.5	-	+48.0
Other	-	-	-	-
Support	-	+75.8	-	+75.8
Subtotal	+48.2	+39.1	-	+87.3
Total Changes	+74.6	+108.9	-	+183.5
Current Estimate	666.9	3064.1	-	3731.0

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	537.8	2254.7	-	2792.5
Previous Changes:				
Quantity	-	-	-	-
Schedule	-4.8	-	-	-4.8
Engineering	+30.1	+190.7	-	+220.8
Estimating	+22.7	-1.7	-	+21.0
Other	-	-	-	-
Support	-	+27.9	-	+27.9
Subtotal	+48.0	+216.9	-	+264.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+47.7	-1.9	-	+45.8
Other	-	-	-	-
Support	-	+66.4	-	+66.4
Subtotal	+47.7	+64.5	-	+112.2
Total Changes	+95.7	+281.4	-	+377.1
Current Estimate	633.5	2536.1	-	3169.6

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

b. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-2.3
	Adjustment for Current and Prior Inflation. (Estimating)	+1.1	+1.1
	Congressional increase in FY00 added funds to Research and Development for contract EAC shortfall caused by increased contractor rates, less reused aircraft structure (than estimated), and underfunded logistics elements. (Estimating)	+25.3	+26.6
	Budget reduction for SBIR and other undistributed reductions requires reduction of planned ECPs. (Estimating)	-10.2	-11.0
	Transfer of Integrated Mechanical Diagnostics funds from Procurement funding. (Estimating)	+1.9	+2.5
	Increase in cost for technical engineering associated with cockpit modifications and training systems cost growth which has been funded by Acquisition Stability Reserve (ASR) in FY01. (Estimating)	+29.6	+31.3
	RDT&E Subtotal	<u>+47.7</u>	<u>+48.2</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-34.4
	Economic adjustment for negative program change. (Economic)	N/A	+0.2
	Transfer of Integrated Mechanical Diagnostic funds from to Research and Development funding. (Estimating)	-1.9	-2.5
	Increased funding for initial spares requirements. (Support)	+32.1	+38.0
	Administrative realignment of funds for Training systems as a part of other weapon systems cost. (Support)	+34.3	+37.8
	Procurement Subtotal	<u>+64.5</u>	<u>+39.1</u>



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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
12.49	-0.88	--	-0.02	+0.95	+0.24	--	+0.36	+0.65	13.14

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10.55	-0.79	+0.01	--	+0.84	-0.03	--	+0.36	+0.39	10.94

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	SEP 1996	N/A	OCT 1996
Milestone III	N/A	FEB 2004	N/A	FEB 2004
FUE/IOC	N/A	SEP 2006	N/A	SEP 2006
Total Cost	N/A	3547.5	N/A	3731
Total Quantity	N/A	284	N/A	284
Prog Acq Unit Cost	N/A	12.49	N/A	13.14

June 05 IOC date reflects UH-1Y IOC; SEP 06 IOC date for the AH-1Z.

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

a. MILCON --

EMD:  
Bell Helicopter Textron, Fort Worth TX  
N00019-96-C-0128, CPAF  
Award: November 15, 1996  
Definitized: November 15, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$498.0	N/A	4

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$524.8	N/A	4

Estimated Price At Completion

<u>Contractor</u>	<u>Program Manager</u>
\$587.3	\$546.2

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15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-11.5	\$-5.6
Cumulative Variances To Date (11/29/99)	<u>\$-42.5</u>	<u>\$-14.4</u>
Net Change	\$-31.0	\$-8.8

Explanation of Change:

The net changes are attributed to the contractor's performance from November 1998 through November 1999. The contract is 46.4 percent complete.

The negative cumulative cost variance -\$42.5M resulted from increased overhead rates and general and administrative (G&A) expenses, direct labor rate increases in the airframe design, wiring and rotor tooling and subcontractor Litton's increases for materials, direct expenses, overhead and G&A rate.

The negative cumulative schedule variance -\$14.4 was caused by continued late release of approved engineering drawings associated with Unigraphic system inefficiencies, which resulted in some component test and evaluation delays. Additional delays were experienced by the subcontractor Litton for software.

The program manager's estimated price to complete has decreased from \$555.3 to \$546.2 since the last report. Decreases are attributed to incorporation of Cost As an Independent Variable (CAIV) and Cost Reduction and Effectiveness Improvement (CREI) initiatives, and the total amount of expected available funding.

A Bell Helicopter Textron Inc. (BHTI) proposal was received February 2000, and is undergoing evaluation of updated pricing for the remainder of contract work, and incorporation of manufacturing and flight test efficiencies and a number of cost reduction initiatives.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY97-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-11)	<u>Total</u>
RDT&E	266.1	183.3	139.7	77.8	666.9
Procurement	-	-	-	3064.1	3064.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	266.1	183.3	139.7	3141.9	3731.0

b. Annual Summary -- USMC H-1 UPGRADES

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1996 Dollars Nonrec</u>	<u>Flyaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1997				66.6	68.1
1998				78.9	81.3
1999				112.2	116.7
2000				174.0	183.3
2001				130.7	139.7
2002				46.1	50.0
2003				16.6	18.3
2004				8.4	9.5
Subtotal	4			633.5	666.9

Excludes FY96 funds which were used for studies and analyses.

Appropriation: 1506 - Aircraft Procurement, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1996 Dollars Nonrec</u>	<u>Flyaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
2001					
2002	5		60.7	122.0	134.9
2003	17		161.5	223.1	251.3
2004	24		204.3	303.4	348.6
2005	36		278.6	364.2	426.9
2006	36		264.4	308.7	369.0
2007	36		255.1	285.6	348.3
2008	36		248.4	274.1	340.9
2009	36		243.1	265.9	337.4
2010	36		238.9	258.6	334.6
2011	18		124.3	130.5	172.2

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal	280		2079.3	2536.1	3064.1

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	284		2079.3	3169.6	3731.0

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 272.1

Percent Total Program Expended: 7.3%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --  
 Squadrons are composed of 18 AH-1Z's and 9 UH-1Y's.  
 Life Cycle is Phase-in + 20 years operation per aircraft.  
 Attrition rates are 1.24% for the AH-1Z and 1.05% for the UH-1Y.  
 Pipeline rates are 11% for the AH-1Z and 15% for the UH-1Y.  
 Manning (fleet squadron) estimated at 90 percent.  
 - 45 officers for the AH-1Z and 23 officers for the UH-1Y.  
 - 184/60 Squadron/Marine Air Logistics Squadron, Augmented (SQD/MALS AUG) enlisted for the AH-1Z; 108/30 for the UH-1Y, totaling 68 officers.  
 164 AH-1Z's are required; 82 UH-1Y's are required.  
 Each aircraft has a service life of 10,000 hours per aircraft.  
 Operating and support cost estimations are based on the organic three-levels of maintenance concept and have additional Total Ownership cost applied.  
 Aircraft will fly 23 flight hours per month.  
 The Operating and Support cost estimate is dated January 2000.  
 There is no antecedent system for the H-1 Upgrades Program.

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

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	USMC H-1 Upgrades	No Antecedent System
Mission Pay & Allowances	2528.0	N/A
Unit Level Consumption	2099.0	N/A
Intermediate Maintenance	101.0	N/A
Depot Maintenance	967.0	N/A
Contractor Support	0.0	N/A
Sustaining Support	388.0	N/A
Indirect Costs	630.0	N/A
Demil & Disposal	2.0	N/A
	N/A	N/A
Demil & Disposal	2.0	N/A
Demil & Disposal	2.0	N/A
Total	6719.0	N/A

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DoD-6 PATRIOT PAC-3

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)  
PROGRAM: PATRIOT PAC-3

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Guided Missile System, Air Defense (PATRIOT) PAC-3 Program

2. (U) DoD Component: BMDO

Joint Participants:

The Department of the Army is the Executing Agency

3. (U) Responsible Office and Telephone Number:

Project Manager	COL Jed A. Sheehan
Patriot Project Office	Assigned: September 2, 1999
PO Box 1500	DSN 645-3240; COMM (256) 955-3240
Huntsville, AL 35807-3801	jed.sheehan@patriot.redstone.army.mil

(U) Program Executive Officer	BG John M. Urias, USA
Air and Missile Defense	Assigned: September 10, 1999
PO Box 1500	DSN 897-3401; COMM (256)313-3401
Huntsville, AL 35807-3801	uriasjm@md.redstone.army.mil

Ballistic Missile Defense	Lt Gen Ronald T. Kadish, USAF
Organization, The Pentagon	Assigned: June 14, 1999
Washington, DC 20301-7100	DSN 223-3025 COMM (703)693-3025

~~Classified by: PATRIOT Security Classification Guide dated 27 Aug 97  
Downgrade instructions: Downgraded UNCLASS when separated from CLASS sections  
Declassify on originating Agency Determination Required (OADR)~~

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PATRIOT PAC-3, December 31, 1999

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

RDT&E:

(U) PE 0603216C (Shared)  
(U) PE 0604216C (Shared)  
(U) PE 0604225C (Shared)  
(U) PE 0604865C  
(U) PE 0604866C  
(U) PE 23801D036

PROCUREMENT:

(U) APPN 0300 ICN 0208060C (DCA/DNA) (Shared)  
(U) APPN 0300 ICN 0208865C (DCA/DNA)  
(U) APPN 2032 ICN C50700 (Army)  
(U) APPN 2032 ICN CA0267 (Army)

5. (U) References:

FIRE UNIT

SAR Baseline (Development Estimate):

(U) Milestone IV/II Acquisition Decision Memorandum, dated 7 July 1994, subject: "PAC-3 Acquisition Decision Memorandum," and the Defense Acquisition Executive (DAE) approved Acquisition Program Baseline (APB) dated February 22, 1995.

Approved Program:

(U) Approved Acquisition Program Baseline (APB) dated August 20, 1996.

MISSILE SEGMENT

SAR Baseline (Development Estimate):

(U) Milestone IV/II Acquisition Decision Memorandum, dated 7 July 1994, subject: "PAC-3 Acquisition Decision Memorandum," and the Defense Acquisition Executive (DAE) approved Acquisition Program Baseline (APB) dated February 22, 1995.

Approved Program:

(U) None.

6. (U) Mission and Description:

(U) PATRIOT, the centerpiece of the Army's echelon above corps and theater air defense forces, is an extremely capable high-to-medium altitude, long-range air defense missile system which provides air defense of ground combat forces and high-value assets. PATRIOT is designed to cope with enemy defense suppression tactics that may include tactical ballistic missiles (TBM), cruise missiles, anti-radiation missiles, advanced aircraft employing saturation, maneuver, sophisticated electronic countermeasures (ECM), and low radar cross-section. 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. The system can conduct multiple simultaneous engagements of high performance air breathing targets and TBMs with a high probability of target kill. The

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6. (U) Mission and Description (Cont'd):

system will provide air defense protection in all weather conditions and in hostile ECM environments. At the battery level or Fire Unit (FU) level, the PATRIOT missile system consists of an Engagement Control Station (ECS), one Radar Set (RS), an Electric Power Plant (EPP), eight Launching Stations (LS), and associated communications equipment. At the battalion level, command and control is exercised through the Information and Coordination Central (ICC) and associated communications equipment including Communications Relay Groups (CRG). The PATRIOT RS is a multifunction phased array radar which performs a variety of surveillance, acquisition, and guidance tasks. The only manned element of the FU during air battle, the ECS, provides the human interface for control of automated operations.

The PATRIOT Advanced Capability (PAC-3) program is the result of a series of integrated, phased system improvements fielded in combination with the PAC-3 missile (formerly ERINT). The PAC-3 missile is a high velocity hit-to-kill, surface-to-air missile capable of intercepting and destroying tactical missiles and air breathing threats. The PAC-3 missile provides the range, accuracy, and lethality to effectively defend against tactical missiles with conventional high explosive, biological, chemical, and nuclear warheads. The missile uses a solid propellant rocket motor, aerodynamic vane controls, and inertial guidance to navigate to an intercept point. Shortly before arrival at the intercept point, the missile's rate of spin is increased, the on-board radar homing seeker acquires the target, and terminal homing guidance is initiated to achieve hit-to-kill by high resolution maneuvers.

7. (U) Executive Summary:

(U) The PAC-3 Engineering and Manufacturing Development (EMD) program continues to achieve flight test successes. To date, the five planned PAC-3 missions have been successful. The first two PAC-3 developmental test missions in September and December 1997, consisted of missiles with special instrumentation packages in place of the seeker and were structured to verify missile performance prior to conducting target intercept flight tests. A seeker characterization flight (SCF) mission was conducted in March 1999, to test a PAC-3 missile carrying a seeker. Although not a primary objective of the SCF, an intercept of the target was achieved. In September 1999, a second intercept test was successful. The third intercept was achieved on February 5, 2000, at White Sands Missile Range, New Mexico, when a PAC-3 missile intercepted a Hera target missile. The flight test demonstrated the capability to engage a full-body tactical ballistic missile using the tactical software that allows the seeker to select the optimal aimpoint on the target.

The PAC-3 program fulfilled the Low Rate Initial Production (LRIP) exit criteria and the Congressional requirement for two intercepts. On October 26, 1999, the Under Secretary of Defense for Acquisition and Technology (USD(A&T)) approved the Acquisition Decision Memorandum (ADM) authorizing entry into LRIP and assembly of the first 20 LRIP missiles. The LRIP contract for assembly of 20 PAC-3 missiles was awarded on December 3, 1999 to Lockheed Martin Missiles and Fire Control (LMMFC), Dallas, TX, for \$48.4M. A contract was awarded to LMMFC on December 8, 1999, for Special Configuration Test Hardware for three



7. (U) Executive Summary (Cont'd):

additional Engineering and Manufacturing Development test missiles. On December 17, 1999, the Under Secretary of Defense for Acquisition, Technology, and Logistics, formerly USD(A&T), approved procurement of Long Lead Time Items (LLTI) materials for the next PAC-3 LRIP production buy. A contract for LLTI for the next LRIP production buy was awarded to LMMFC for \$78.0M, on December 20, 1999.

A revised PAC-3 Acquisition Program Baseline (APB) was approved by the Under Secretary of Defense for Acquisition, Technology, and Logistics, on March 14, 2000. The new APB is in accordance with the approved program from the October 1999, PAC-3 LRIP decision, amended for test plan and FY 01 President's Budget quantity changes. The new APB separates deliverable categories from one end item, Fire Units, to two end items, Fire Units and Missile Segment. The new APB is incorporated into this report.

8. (U) Threshold Breaches:

FIRE UNIT

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

8. (U) Threshold Breaches (Cont'd):

MISSILE SEGMENT

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

FIRE UNIT

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
OTHER UPGRADES			
Configuration 1 Production	MAR 1995	MAR 1995	MAY 1995
Confirmatory Test			
Configuration 1 First Unit Equipped	JUN 1995	JUN 1995	DEC 1995
Configuration 2 Follow On Test	DEC 1995	DEC 1995	MAY 1996
Configuration 2 First Unit Equipped	JUN 1996	JUN 1996	DEC 1996
Configuration 3 Follow On Test	JUN 1998	FEB 1999	APR 2000
Configuration 3 First Unit Equipped	SEP 1998	JUL 1999	JUN 2000

(U) Configuration 3 First Unit Equipped (FUE) for Ground Support Equipment will occur with Materiel Release approval.

9b. (U) Schedule (Cont'd):  
FIRE UNIT

b. Current Change Explanations -- None

MISSILE SEGMENT

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II (Missile) (DAB)	MAY 1994	N/A	MAY 1994
Development Contract Award	SEP 1994	N/A	OCT 1994
Preliminary Design Review Complete	SEP 1995	N/A	OCT 1995
Critical Design Review Complete	MAR 1996	N/A	MAR 1996
Service Final DT&E			
Start	JAN 1997	N/A	SEP 1997
Complete	DEC 1997	N/A	MAR 2001
Low Rate Initial Production	JUN 1997	N/A	OCT 1999
Decision			
Low Rate Initial Production	JUL 1997	N/A	DEC 1999 (Ch-1)
Contract Award			
Low Rate Production First	MAY 1998	N/A	MAY 2001
Delivery			
IOT&E			
Start	JAN 1998	N/A	MAY 2001
Complete	JUN 1998	N/A	JUL 2001
Milestone III Production Decision	AUG 1998	N/A	SEP 2001
Full Rate Production Contract	AUG 1998	N/A	OCT 2001
Award			
First Unit Equipped	SEP 1998	N/A	SEP 2001
Service Depot Support	SEP 2001	N/A	FEB 2003
Initial Operational Capability	NOV 1999	N/A	SEP 2005 (Ch-2)

(U) PAC-3 Missile First Unit Equipped (FUE) is considered achieved when the first Fire Unit is equipped with sixteen PAC-3 missiles with which to load four PAC-3 missiles on each of four PAC-3 capable launching stations.

PAC-3 Missile Initial Operational Capability (IOC) is considered achieved when a PATRIOT Battalion, consisting of five Fire Units (FU), is equipped with thirty-two PAC-3 missiles per FU.

b. Current Change Explanations --

(U) (Ch-1) Low Rate Initial Production Contract Award changed from NOV 1999 to DEC 1999 based on actual accomplishment.

(Ch-2) Initial Operational Capability changed from JAN 2006 to SEP 2005 based on replanning of missile procurement which resulted in earlier delivery of required missile quantities. The milestone classification rating for Initial Operational Capability is downgraded from ~~SECRET~~ to UNCLASSIFIED in accordance with PATRIOT PAC-3 Security Classification

9b. (U) Schedule (Cont'd):  
MISSILE SEGMENT

Guide, dated 27 August 1997, section 38.a(1)(a). This change was implemented in the March 14, 2000, approved Acquisition Program Baseline.

10. (U) Performance Characteristics:

FIRE UNIT

a. Performance --

Development	Approved Program (APB)	Demonstrated	Current
-------------	------------------------	--------------	---------

AS AMENDED

(b)(1)



AS AMENDED

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

AS AMENDED

Development	Approved Program (APB)	Demon- strated	Current
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(b)(1)



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AS AMENDED



10a. Performance Characteristics (Cont'd):

(b)(1) [REDACTED]

(U) System Effectiveness =  $P(\text{DET}) \times [1 - (1 - P(\text{SSK}))^n]$ , where n=number of shots, and SSK=Single Shot Kill

(U) Missile Reliability is based on the Reliability Growth Curve. This is a technical parameter which supports the key Joint Requirements Oversight Council (JROC) validated characteristics.

(U) The Fire Unit Mean Time Between Failure parameter supports the key JROC validated characteristics.

b. Current Change Explanations --

(U) (Ch-1) Performance parameter from PAC-3 Acquisition Program Baseline (APB) dated February 22, 1995, superseded by parameter in March 14, 2000, approved APB.

(Ch-2) Performance parameter from March 14, 2000, Acquisition Program Baseline in accordance with the Joint Requirements Oversight Council (JROC) validated PAC-3 Operational Requirements Document Key Performance Parameters approved July 7, 1999.

MISSILE SEGMENT

No data entered.

(U) All performance parameters for the PAC-3 program are associated with the Fire Unit end-item.

10b. (U) Performance Characteristics (Cont'd):  
 MISSILE SEGMENT

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):  
 FIRE UNIT

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	366.7	619.5	619.5
Procurement	1284.4	1656.8	1666.1
Recurring Flyaway	(803.3)		(662.1)
Nonrecurring Flyaway	(441.4)		(821.1)
Total Flyaway	(1244.7)		(1483.2)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(39.7)		(182.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1988 Base-Year \$	1651.1	2276.3	2285.6
Escalation	494.3	691.9	683.0
Development (RDT&E)	(86.0)	(151.7)	(151.7)
Procurement	(408.3)	(540.2)	(531.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2145.4	2968.2	2968.6
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>54</u>	<u>36</u>	<u>36</u>
Total	54	36	36

(U) A Fire Unit consists of a Radar Set, an Engagement Control Station, an Electric Power Plant, and up to eight Launching Stations.

The Fire Unit procurement quantity reflects the number of existing PATRIOT systems modified to PAC-3 capability, therefore, there is no Low Rate Initial Production quantity for this end item.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.



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

MISSILE SEGMENT

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	1648.9	2150.1	2150.1
Procurement	1498.8	3052.5	3052.5
Recurring Flyaway	(1459.2)		(2767.9)
Nonrecurring Flyaway	(39.6)		(284.6)
Total Flyaway	(1498.8)		(3052.5)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1988 Base-Year \$	3147.7	5202.6	5202.6
Escalation	1088.5	1968.7	1968.7
Development (RDT&E)	(334.2)	(502.6)	(502.6)
Procurement	(754.3)	(1466.1)	(1466.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	4236.2	7171.3	7171.3
b. (U) Quantity --			
Development (RDT&E)	N/A	N/A	0
Procurement	<u>1200</u>	<u>1012</u>	<u>1012</u>
Total	1200	1012	1012

(U) The Low Rate Initial Production (LRIP) quantity for the PAC-3 missile was 90 as established by the July 7, 1994, Milestone IV/II Acquisition Decision Memorandum. The current LRIP missile quantity of 92 is within the 10% limit of the total planned production quantity of 1012.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

FIRE UNIT

	UCR Baseline (MAR 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1988 BY\$)	2276.3	2285.6	
(2) Quantity	36	36	
(3) Unit Cost	63.231	63.489	+0.41
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1988 BY\$)	1656.8	1666.1	
(2) Quantity	36	36	
(3) Unit Cost	46.022	46.281	+0.56

MISSILE SEGMENT

	UCR Baseline (MAR 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1988 BY\$)	5202.6	5202.6	
(2) Quantity	1012	1012	
(3) Unit Cost	5.141	5.141	0.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1988 BY\$)	3052.5	3052.5	
(2) Quantity	1012	1012	
(3) Unit Cost	3.016	3.016	0.00

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13. (U) Cost Variance Analysis:

FIRE UNIT

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	452.7	1692.7	-	2145.4
Previous Changes:				
Economic	-27.9	-28.2	-	-56.1
Quantity	-	-294.0	-	-294.0
Schedule	-	+53.2	-	+53.2
Engineering	+93.4	+445.9	-	+539.3
Estimating	+252.8	+40.3	-	+293.1
Other	-	-	-	-
Support	-	+185.8	-	+185.8
Subtotal	+318.3	+403.0	-	+721.3
Current Changes:				
Economic	-0.1	-2.2	-	-2.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.3	+94.5	-	+94.8
Other	-	-	-	-
Support	-	+9.4	-	+9.4
Subtotal	+0.2	+101.7	-	+101.9
Total Changes	+318.5	+504.7	-	+823.2
Current Estimate	771.2	2197.4	-	2968.6

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	366.7	1284.4	-	1651.1
Previous Changes:				
Quantity	-	-167.0	-	-167.0
Schedule	-	-	-	-
Engineering	+65.4	+314.0	-	+379.4
Estimating	+186.6	-4.5	-	+182.1
Other	-	-	-	-
Support	-	+135.9	-	+135.9
Subtotal	+252.0	+278.4	-	+530.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.8	+96.0	-	+96.8
Other	-	-	-	-
Support	-	+7.3	-	+7.3
Subtotal	+0.8	+103.3	-	+104.1
Total Changes	+252.8	+381.7	-	+634.5
Current Estimate	619.5	1666.1	-	2285.6

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

FIRE UNIT

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-0.1
	Adjustment for current and prior inflation. (Estimating)	+1.4	+1.5
	Revised program estimate. (Estimating)	-0.6	-1.2
	RDT&E Subtotal	<u>+0.8</u>	<u>+0.2</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-2.2
	Adjustment for current and prior inflation. (Estimating)	+2.6	+1.0
	Revised estimate for Reliability, Availability, and Maintainability (RAM) modifications. (Estimating)	+93.4	+93.5
	Increase in Army modification spares funding. (Support)	+7.3	+9.4
	Procurement Subtotal	<u>+103.3</u>	<u>+101.7</u>

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

MISSILE SEGMENT

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1983.1	2253.1	-	4236.2
Previous Changes:				
Economic	-	-181.4	-	-181.4
Quantity	-	-811.7	-	-811.7
Schedule	+296.6	-378.1	-	-81.5
Engineering	+11.6	+31.7	-	+43.3
Estimating	+311.5	+1392.7	-	+1704.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+619.7	+53.2	-	+672.9
Current Changes:				
Economic	-2.2	-21.0	-	-23.2
Quantity	-	+1141.0	-	+1141.0
Schedule	-	+563.5	-	+563.5
Engineering	+3.3	+133.1	-	+136.4
Estimating	+48.8	+395.7	-	+444.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+49.9	+2212.3	-	+2262.2
Total Changes	+669.6	+2265.5	-	+2935.1
Current Estimate	2652.7	4518.6	-	7171.3

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

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1648.9	1498.8	-	3147.7
Previous Changes:				
Quantity	-	-552.8	-	-552.8
Schedule	+218.6	-375.3	-	-156.7
Engineering	+9.9	+3.0	-	+12.9
Estimating	+235.9	+1098.6	-	+1334.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+464.4	+173.5	-	+637.9
Current Changes:				
Quantity	-	+1075.3	-	+1075.3
Schedule	-	-85.8	-	-85.8
Engineering	+2.1	+86.9	-	+89.0
Estimating	+34.7	+303.8	-	+338.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+36.8	+1380.2	-	+1417.0
Total Changes	+501.2	+1553.7	-	+2054.9
Current Estimate	2150.1	3052.5	-	5202.6

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-2.2
Supplemental funding to demonstrate interoperability with Cooperative Engagement Capability. (Engineering)	+2.1	+3.3
Adjustment for current and prior inflation. (Estimating)	+0.2	+0.3
Additional funding to cover EMD contract cost growth. (Estimating)	+35.7	+50.0
Congressional reduction for Air Directed Surface-to-Air Missile (ADSAM). (Estimating)	-1.2	-1.5
RDT&E Subtotal	+36.8	+49.9
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-21.0
Increase of 452 missiles from 560 to 1012. (Quantity)	+1075.3	+1141.0
Allocation to Schedule variance resulting from Quantity change. (QR) (Schedule)	-85.8	-77.0
Allocation to Engineering variance resulting from Quantity change. (QR) (Engineering)	+72.4	+113.1

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Allocation to Estimating variance resulting from Quantity change. (QR) (Estimating)	+242.8	+330.1
Stretchout of annual procurement buy profile. (Schedule)	0.0	+640.5
Congressional supplement for Service Life Extension Program (SLEP). (Engineering)	+14.5	+20.0
Adjustment for current and prior inflation. (Estimating)	+25.3	+17.6
Congressional supplemental to restore funding from FY 99 reprogramming action. (Estimating)	+33.4	+45.0
Restoration of FY 99 funds. (Estimating)	+2.3	+3.0
Procurement Subtotal	<u>+1380.2</u>	<u>+2212.3</u>

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):  
 FIRE UNIT

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
39.73	-1.62	+11.69	+1.48	+14.98	+10.78	--	+5.42	+42.73	82.46

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
31.35	-0.84	+7.50	+1.48	+12.39	+3.74	--	+5.42	+29.69	61.04

14c. (U) Unit Cost and Other History (Cont'd):

FIRE UNIT

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	SEP 1998	N/A	JUN 2000
Total Cost	N/A	2145.4	N/A	2968.6
Total Quantity	N/A	54	N/A	36
Prog Acq Unit Cost	N/A	39.73	N/A	82.46

(U) The Current Estimate of June 2000 for FUE/IOC is the FUE date for the Configuration 3 Ground Support Equipment.

MISSILE SEGMENT

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
3.53	-0.20	+0.98	+0.48	+0.18	+2.12	--	--	+3.56	7.09

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.88	-0.20	+0.68	+0.18	+0.16	+1.77	--	--	+2.59	4.47



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PATRIOT PAC-3, December 31, 1999

14c. (U) Unit Cost and Other History (Cont'd):  
MISSILE SEGMENT

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAY 1994	N/A	MAY 1994
Milestone III	N/A	AUG 1998	N/A	SEP 2001
FUE/IOC	N/A	SEP 1998	N/A	SEP 2001
Total Cost	N/A	4236.2	N/A	7171.3
Total Quantity	N/A	1200	N/A	1012
Prog Acq Unit Cost	N/A	3.53	N/A	7.09

(U) The Current Estimate of September 2001 for IOC/FUE is the FUE date for the PAC-3 missile, defined as occurring when a Fire Unit is equipped with 16 missiles to load four missiles on each of four Launching Stations. The IOC milestone is scheduled for September 2005, when a PATRIOT battalion consisting of five Fire Units is equipped with 32 PAC-3 missiles per Fire Unit.

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

a. RDT&E --

(U) PAC-3 MISSILE EMD:  
LOCKHEED, DALLAS, TX  
DAAH01-95-C-0021, CPIF/AF  
Award: October 26, 1994  
Definitized: November 7, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$515.8	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$728.3	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$946.4	\$962.5

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-126.5	\$-40.7
Cumulative Variances To Date (12/31/99)	<u>\$-139.0</u>	<u>\$-44.3</u>
Net Change	\$-12.5	\$-3.6

Explanation of Change:

(U) The contractor and Program Manager Estimated Prices at Completion increased since the prior report based on revised assessments of the PAC-3 missile flight test schedule. The estimates increased \$9.8M and \$24.6M, respectively. Delays in flight testing continue to be the major cause for program cost growth. The delays in the Engineering and Manufacturing Development (EMD) effort are attributed primarily to missile seeker

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15. (U) Contract Information (Cont'd):

software development and integration complexity, missile simulation testing, and range and target availability.

Although cost and schedule performance trends remain unfavorable, flight testing has thus far been successful. Cost growth and behind schedule conditions have required additional funding in the program. The government and contractor continue to explore means to mitigate risk and contain cost.

(U) Contract Comments:

The initial Contract Price has increased from \$515.8M to the Current Price of \$728.3M due to several contract changes that have added scope or reduced schedule risk in the program. The major contract changes include: risk abatement/mitigation modifications of \$153.2M in 3rd Quarter FY 96, two additional flight tests for \$18.2M in 4th Quarter FY 96, Security Classification Guide update for \$3.4M in 4th Quarter FY 97, special inspection and test equipment for \$8.1M in 1st Quarter FY 98, engage-on-remote feasibility study and implementation for \$3.0M in 2nd Quarter FY 99, and seeker design verification testing for \$25.5M in 3rd Quarter FY 99. Several other smaller contract modifications have also been implemented for such efforts as canister stacking, missile assembly building, and enhanced launcher electronics system hardware.

(U) <u>PAC-3 MSL INTEGRATION:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
RAYTHEON CO., BEDFORD, MA			
DAAH01-95-C-0022, CPIF/AF	\$104.8	N/A	0
Award: October 31, 1994			
Definitized: October 23, 1995			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$182.5	N/A	0	\$182.5	\$182.5
<u>Previous Cumulative Variances</u>			<u>Cost Variance</u>	<u>Schedule Variance</u>
Cumulative Variances To Date (12/31/99)			\$-0.4	\$-0.1
Net Change			<u>\$0.9</u>	<u>\$-0.1</u>
			\$1.3	\$0.0

Explanation of Change:

(U) The decrease from \$186.0M to \$182.5M, in the Current Target Contract Price and the Contractor's and Project Manager's price is due to a definitization proposal for the extended contract effort.

The cost and schedule variance changes are primarily due to the contractor rebaselining tasks in the program management office and engineering into the contract extension. Positive cost and schedule variance drivers include completion of the Remote Maintenance Monitor task, software validation tasks, and Flight Mission Simulator scripting tasks.

15. (U) Contract Information (Cont'd):

Although contract performance to date has not been significantly impacted, the delays in conducting missile flight testing have required extending the contract period of performance and adding funds.

(U) Contract Comments:

The initial Contract Price has increased from \$104.8M to the Current Price of \$182.5M due to contract changes that have added scope and/or reduced schedule risk in the program. The major contract changes include risk abatement/mitigation modification for \$31.3M in 4th Quarter FY 96 and extension of the program period-of-performance through 3rd Quarter FY 01 for \$46.2M in 1st Quarter FY 00.

(U) <u>REM LCH COMMO ENH UPGRAD:</u>			Initial Contract Price		
Raytheon Co., Bedford, MA	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
DAAH01-96-C-0018, CPIF	\$66.5	N/A	0		
Award: November 6, 1995					
Definitized: December 23, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$66.5	N/A	0	\$67.1	\$68.8	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$-1.0	\$-0.1	
Cumulative Variances To Date (12/31/99)			\$-1.1	\$0.0	
Net Change			\$-0.1	\$0.1	

Explanation of Change:

(U) The Current Contract Price, Contractor Estimated Price at Completion (EPAC), and Program Manager EPAC are unchanged.

There is no significant impact to the contract because of the net change in cost or schedule variance. The primary cost variance drivers are software development and system testing.

This contract is 98% complete and significant program effort has been completed, therefore this is the final submission for this contract.

b. Procurement --

15b. (U) Contract Information (Cont'd):

(U) <u>RADAR ENH PH3 MOD KITS:</u> Raytheon, Co., Bedford, MA DAAH01-95-C-0446, FFP Award: September 29, 1995 Definitized: December 6, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$201.3	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$428.8	N/A	0	\$428.8	\$428.8

Explanation of Change:

(U) The Radar Enhancement Phase 3 (REP-3) Modification Kits contract was initially awarded for modification kits and spares to retrofit PATRIOT Fire Unit radars. The contract was modified in June 1998, to include procurement of Classification, Discrimination, and Identification Phase 3 (CDI-3) modification kits and spares.

The Current Contract Price and Estimated Prices at Completion increased \$73.2M due to the FY 00 option for additional modification kits.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>PAC-3 LRIP:</u> LOCKHEED, DALLAS, TX DAAH01-98-C-0062, CPIF Award: December 12, 1997 Definitized: September 29, 1998	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$39.5	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$183.5	N/A	20	\$201.8	\$201.8

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (12/31/99)	<u>\$-2.2</u>	<u>\$-1.1</u>
Net Change	\$-2.2	\$-1.1

Explanation of Change:

(U) This is the initial report for the PAC-3 Low Rate Initial Production contract.

The PAC-3 Low Rate Initial Production (LRIP) contract was awarded as the PAC-3 Long Lead Time Item (LLTI) for LRIP contract in December 1997 to procure materials for the first 20 missiles. The PAC-3 LLTI contract was

15. (U) Contract Information (Cont'd):

awarded in December 1997 to Lockheed Martin, Dallas, TX, at a not-to-exceed (NTE) value of \$39.5M. The contractor's original proposal in October 1997, was for \$39.5M, but subsequent to the contract award, the contractor submitted a firm proposal in May 1997, for \$56.7M. The LLTI contract was modified in December 1999 for additional LRIP effort. The contract changes include: LRIP Basic, awarded December 3, 1999, for \$48.4M, for assembly of the first 20 PAC-3 missiles as authorized by the Under Secretary of Defense (Acquisition, Technology, and Logistics) in the October 26, 1999, Acquisition Decision Memorandum; Special Configuration Test Hardware, awarded December 8, 1999, for \$17.6M, for three additional EMD test missiles; and LLTI for LRIP-1, awarded December 20, 1999, for \$78.0M, for long lead components for the LRIP 1 procurement.

Because of the disparity between the contractor's firm proposal and the NTE value for the LLTI effort, the contractor proposed implementing an Over-Target Baseline (OTB). The program office approved the OTB plan and performance measurement was established at the firm proposal value. The difference between the Current Contract Price and the Estimated Prices at Completion is the projected overrun in the original LLTI effort.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY83-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-12)</u>	<u>Total</u>
RDT&E	3090.9	186.8	87.7	58.5	3423.9
Procurement	1840.2	397.1	391.1	4087.6	6716.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	4931.1	583.9	478.8	4146.1	10139.9

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

FIRE UNIT

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

<u>Appropriation</u>	<u>Prior Years (FY89-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-12)</u>	<u>Total</u>
RDT&E	698.3	7.7	6.7	58.5	771.2
Procurement	1502.0	127.6	105.7	462.1	2197.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	2200.3	135.3	112.4	520.6	2968.6

MISSILE SEGMENT

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

<u>Appropriation</u>	<u>Prior Years (FY83-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-12)</u>	<u>Total</u>
RDT&E	2392.6	179.1	81.0	-	2652.7
Procurement	338.2	269.5	285.4	3625.5	4518.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	2730.8	448.6	366.4	3625.5	7171.3

b. Annual Summary -- FIRE UNIT

Appropriation: 0400 - RDT&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1988 Dollars Nonrec</u>	<u>Flyaway FY 1988 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1991				16.5	19.0
1992				56.6	67.0
1993				24.2	29.3
1994				17.9	22.1
1995				55.0	69.3
1996				50.3	64.3
1997				42.2	54.7
1998				6.6	8.6
Subtotal				269.3	334.3

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PATRIOT PAC-3, December 31, 1999

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

FIRE UNIT

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1988 Dollars Nonrec	Flyaway FY 1988 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				21.8	23.4
1990				28.8	32.1
1991				39.6	45.9
1992				32.0	37.9
1993				37.8	45.8
1994				30.9	38.2
1995				18.2	22.9
1996				33.6	43.1
1997				34.6	44.9
1998				16.1	21.0
1999				6.7	8.8
2000				5.8	7.7
2001				4.9	6.7
2002				3.3	4.5
2003				3.4	4.7
2004				6.9	9.9
2005				5.5	8.0
2006				5.5	8.2
2007				5.4	8.2
2008				3.2	5.0
2009				1.9	3.0
2010				1.9	3.0
2011				1.2	2.0
2012				1.2	2.0
Subtotal				350.2	436.9

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1988 Dollars Nonrec	Flyaway FY 1988 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992		20.6		20.6	24.9
1993		60.9		60.9	75.2
1994		96.0		96.0	120.1
1995	6	16.6	180.3	196.9	251.1
1996	6		221.6	221.6	285.1
1997	6		67.6	87.5	113.9
1998	6		109.7	139.6	183.3
1999	6		42.4	66.1	87.8
2000	6		40.5	55.2	74.3
2001		47.0		58.6	80.1
2002		39.9		49.7	69.0

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PATRIOT PAC-3, December 31, 1999

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

FIRE UNIT

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1988 Dollars Nonrec	Flyaway FY 1988 Dollars Rec	Total Program Base Year \$	Total Program Then-Year \$
2003		34.7		44.7	63.2
2004				10.5	15.1
2005				4.9	7.2
Subtotal	36	315.7	662.1	1112.8	1450.3

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY 1988 Dollars Nonrec	Flyaway FY 1988 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990		16.5		16.5	19.1
1991		126.1		126.1	149.6
1992		39.8		39.8	48.3
1993		13.7		14.3	17.7
1994		14.9		20.2	25.4
1995		20.3		25.2	32.3
1996		5.3		7.9	10.2
1997		17.9		21.9	28.5
1998		5.9		7.9	10.4
1999		10.6		14.3	19.1
2000		36.7		39.4	53.3
2001		16.4		18.6	25.6
2002		18.6		19.1	26.7
2003		15.8		16.9	24.1
2004		28.3		31.0	45.1
2005		27.8		30.4	45.1
2006		15.6		18.6	28.1
2007		14.9		16.6	25.6
2008		12.7		14.3	22.6
2009		12.4		14.0	22.5
2010		9.1		10.7	17.6
2011		8.7		10.5	17.6
2012		17.4		19.1	32.6
Subtotal		505.4		553.3	747.1

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	36	315.7	662.1	1382.1	1784.6
Army		505.4		903.5	1184.0
Grand Total	36	821.1	662.1	2285.6	2968.6

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PATRIOT PAC-3, December 31, 1999

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

b. Annual Summary -- MISSILE SEGMENT

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1988 Dollars Nonrec	Flyaway FY 1988 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983				38.0	33.3
1984				26.5	24.1
1985				21.8	20.4
1986				15.7	15.1
1987				30.5	30.2
1988				17.6	18.0
1989				60.9	65.2
1990				34.5	38.3
1991				110.7	127.5
1992				201.9	239.0
1993				165.3	200.2
1994				157.2	194.1
1995				219.3	276.1
1996				243.5	311.6
1997				253.4	328.1
1998				179.3	234.1
1999				180.0	237.3
2000				134.2	179.1
2001				59.8	81.0
Subtotal				2150.1	2652.7

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1988 Dollars Nonrec	Flyaway FY 1988 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997		80.8		80.8	105.1
1998	20		101.7	101.7	133.5
1999		75.0		75.0	99.6
2000	32		200.2	200.2	269.5
2001	40		208.8	208.8	285.4
2002	28		193.4	193.4	268.7
2003	44		200.1	200.1	283.1
2004	76		271.1	271.1	391.3
2005	52		204.0	204.0	300.4
2006	144		310.9	310.9	466.9
2007	144		285.0	285.0	436.6
2008	144		272.4	272.4	425.6
2009	144		263.6	263.6	420.1
2010	144		256.7	256.7	417.2
2011		64.6		64.6	107.1

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PATRIOT PAC-3, December 31, 1999

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

MISSILE SEGMENT

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1988 Dollars Nonrec	Flyaway FY 1988 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2012		64.2		64.2	108.5
Subtotal	1012	284.6	2767.9	3052.5	4518.6

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1012	284.6	2767.9	5202.6	7171.3

17. (U) Delivery/Expenditure Information:

FIRE UNIT

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	10	10

(U) Percent Total Program Quantities Delivered: 27.8%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1224.8

(U) Percent Total Program Expended: 41.3%

(U) The Fire Unit delivery quantities represent the number of PATRIOT radar sets modified to PAC-3 capability.

MISSILE SEGMENT

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 3077.7

(U) Percent Total Program Expended: 42.9%

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

**FIRE UNIT**

a. (U) Assumptions and Ground Rules --

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 1999.

The concept of operation is 54 tactical Fire Units (FUs) of which 36 are being upgraded to PAC-3 capability. The costs are the direct cost to support the primary personnel and to operate the FUs. The O&S consumables are replenishment spares, repair parts, and petroleum, oil and lubricants (POL). The Direct Depot Maintenance costs are the labor, materials, and transportation for repair of major FU 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 costs, Quarters Maintenance and Utilities, Post Production Engineering, Central Supply, Unit Operations, Base Operations, and training activities. PAC-3 is an upgrade program to the fielded PATRIOT system, therefore, O&S costs remain unchanged. There is no antecedent system.

b. (U) Costs -- (FY 1988 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Patriot PAC-3 Fire Unit	Avg Annual Cost Per Antecedent System N/A
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	2.0	0.0
Intermediate Maintenance	0.9	0.0
Depot Maintenance	0.6	0.0
Contractor Support	0.2	0.0
Sustaining Support	0.1	0.0
Indirect Costs	1.2	0.0
Total	5.0	0.0

**MISSILE SEGMENT**

a. (U) Assumptions and Ground Rules --

Same assumptions and ground rules as Fire Unit.

b. (U) Costs -- (FY 1988 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Patriot PAC-3 Missile	Avg Annual Cost Per Antecedent System N/A
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.0	0.0

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PATRIOT PAC-3, December 31, 1999

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

b. (U) Costs -- (FY 1988 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Patriot PAC-3 Missile	Avg Annual Cost Per Antecedent System N/A
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.3	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.0	0.0
Indirect Costs	0.4	0.0
Total	0.7	0.0

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# A-5 BLACKHAWK (UH-60L)

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A) 823)  
PROGRAM: UH-60L BLACK HAWK

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name):

2. DoD Component: Army

3. Responsible Office and Telephone Number:

Utility Helicopters Project Mgr Off	COL Thomas M Harrison
ATTN: AMSAM-DSA-UH	Assigned: May 27, 1997
Building 5308	DSN 746-6821; COMM (205) 876-6821
Redstone Arsenal, AL 35898-5280	Tom.Harrison@uh.redstone.army.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 23744  
PE 64206  
PE 64217

PROCUREMENT:

APPN 0350 ICN ----- (NGRE)  
APPN 2031 ICN A05002 (Army)  
APPN 2031 ICN A09400 (Army)  
APPN 2031 ICN AA0005 (Army)  
APPN 2031 ICN AA0952 (Army)

MILCON:

PE 22483  
PE 22496  
PE 22696  
PE 85796

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

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UH-60L BLACK HAWK, December 31, 1999

**5. References:**

SAR Baseline (Production Estimate):

AAE approved Acquisition Program Baseline, dated February 26, 1990.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated July 13, 1993.

**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. Executive Summary:**

The FY00 Defense Appropriation bill added 11 aircraft to the procurement program, and the FY01 Budget submission added an additional aircraft to complete the funding for the National Guard's requirement for an additional 90 'dual mission' aircraft. The Army is requesting authorization of a joint service (Army/Navy) airframe multi year including H-60 requirements for FY02 through FY06.

Congress provided RDT&E funding in FY 2000 for the Development of a modernized UH-60 BLACK HAWK. The Army included funding in its FY01 Budget request to complete the development of this aircraft (tentatively designated as the UH-60M) and has scheduled an ASARC for June of FY 2000. With incorporation of these changes planned for the production line in FY 2004, Army deliveries of the UH-60L will be 90% of the planned production in April of FY 2000. This SAR will thus be the last submission for the UH-60L BLACK HAWK.

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8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Multiyear Airframe Contract Award (FY 88-91)	JAN 1988	JAN 1988	JAN 1988
Multiyear Engine Contract Award (FY 89-93)	NOV 1988	NOV 1988	NOV 1988
Approval of Revised UH-60 Procurement Objective (2253)	FEB 1989	FEB 1989	FEB 1989
DA IPR for Type Class of UH-60L	SEP 1989	SEP 1989	SEP 1989
Incorp of GE T701C Engine	OCT 1989	OCT 1989	OCT 1989
Multiyear Airframe Contract Award (FY90)	NOV 1989	NOV 1989	NOV 1989
Multiyear Engine Contract Award (FY90)	NOV 1989	NOV 1989	NOV 1989
Multiyear Airframe Contract Award (FY91)	NOV 1990	NOV 1990	DEC 1990
Multiyear Engine Contract Award (FY91)	NOV 1990	NOV 1990	DEC 1990
Deployment Plan			
TXNG -- Austin, TX	NOV 1989	NOV 1989	NOV 1989
2/229 Aslt -- Ft Rucker	JAN 1990	JAN 1990	JAN 1990
1/6th AHB -- Ft Hood	MAR 1990	MAR 1990	MAR 1990
4/6th AHB -- Ft Hood	MAR 1990	MAR 1990	MAR 1990
3rd ACR -- Ft Bliss	APR 1990	APR 1990	APR 1990
3/6 AHB -- Ft Hood	MAY 1990	MAY 1990	MAY 1990
1/3rd AHB -- Ft Hood	MAY 1990	MAY 1990	MAY 1990
C/25th Aslt -- Ft Drum	JUN 1990	JUN 1990	JUN 1990
E/3 Aslt -- Ft Hood	JUN 1990	JUN 1990	JUN 1990
1/4th AHB -- Ft Carson	JUL 1990	JUL 1990	JUL 1990
1/5th AHB -- Ft Polk	SEP 1990	SEP 1990	SEP 1990
SOCOM -- Ft Campbell, KY	N/A	AUG 1990	AUG 1990

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9a. Schedule (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
2-82nd Aslt -- Ft Bragg, NC	N/A	DEC 1990	DEC 1990
E-149th Aslt TX ARNG -- Austin, TX	N/A	FEB 1991	FEB 1991
1-151st AHB SC ARNG -- Eastover, SC	N/A	MAR 1991	MAR 1991
1-111th AHB FL ARNG--Jacksonville, FL	N/A	APR 1991	APR 1991
1-207th Aslt AK ARNG--Ft Richardson, AK	N/A	MAY 1991	MAY 1991
MDW -- Ft Belvoir, VA	N/A	MAY 1991	MAY 1991
1-149th AHB TX ARNG -- Houston, TX	N/A	MAY 1991	MAY 1991
SOCOM -- Ft Campbell, KY	N/A	JUL 1991	JUL 1991
E-130th AVIM NC ARNG -- Salisbury, NC	N/A	APR 1992	APR 1992
E-131st AVIM AL ARNG -- Birmingham, AL	N/A	JUN 1992	JUN 1992
SOCOM -- Ft Campbell, KY	N/A	SEP 1992	SEP 1992
1-17th Cav -- Ft Bragg, NC	N/A	NOV 1992	NOV 1992
F-149th AVIM TX ARNG -- Austin TX	N/A	NOV 1992	NOV 1992
101st Abn Div -- Ft Campbell, KY	N/A	DEC 1993	DEC 1993
MY III Engine Contract Award (FY 92)	N/A	JAN 1992	JAN 1992
MY IV Airframe Contract Award (FY 92)	N/A	APR 1992	APR 1992
Deliveries MYC 92-96 Start	N/A	APR 1992	APR 1992
MY III Engine Contract Award (FY 93)	N/A	NOV 1992	NOV 1992
MY IV Airframe Contract Award (FY 93)	N/A	NOV 1992	NOV 1992
MY III A/F Contract Deliveries Complete	N/A	SEP 1993	JAN 1994
MY IV Engine Contract Award (FY 94)	N/A	NOV 1993	APR 1994
MY IV Airframe Contract Award (FY 94)	N/A	NOV 1993	JAN 1994

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Payload (lbs)				
Troops	11	11 / 11	11	11
Pounds	2640	2640 / 2640	2640	2640
Air Transportability (qty)				
C-141	2	2 / 2	2	2
C-5	6	6 / 6	6	6
Flight Performance with Payload				
Vertical Rate of Climb (ft/min)	900	900 / 785	785	955
Cruise Speed (knots) (using max cont power)	152	152 / 150	150	153
Endurance (hrs)	2.3	2.3 / 2.1	2.1	2.26
Mission Reliability				
Probability of Success	.991	.991 / .987	.987	.987

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10a. Performance Characteristics (Cont'd):

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Mean Time Between Maintenance Actions (hrs)	106.0	106.0 / 75.9	75.9	75.9
System Mean Time Between Failures (hrs)	4.7	4.7 / 4.0	4.0	4.0
Maintenance Manhours per Flight Hours (MMH/FH)	3.0	3.0 / 3.8	3.8	3.8

Notes:

The UH-60L is a derivative of the UH-60A. Approval for production incorporation was granted by a DA IPR for type classification.

Vertical Rate of Climb (VROC) in FPM is predicated on using 95% of Intermediate Rated Power (IRP).

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, 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 Mission Aborts (MTBMA) in hours. The value shown is equivalent to the value for probability of success.

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10b. Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

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

a. Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	0.0	0.0	0.0
Procurement	2216.6	2257.8	1162.0
Airframe	(1449.6)		(770.8)
Engine	(304.4)		(153.5)
Avionics	(74.0)		(32.8)
Other recurring flyaway	(196.8)		(58.8)
Nonrecurring flyaway	(40.1)		(17.1)
Total Flyaway	(2064.9)		(1033.0)
OWS-Data	(25.7)		(16.6)
OWS-Training	(53.7)		(9.3)
Other	(0.0)		(56.4)
Total Other Wpn Sys	(79.4)		(82.3)
Peculiar Support	(23.6)		(2.4)
Initial Spares	(48.7)		(44.3)
Construction (MILCON)	0.0	2.7	2.9
Acquisition O&M	0.0	0.0	0.0
Total FY 1971 Base-Year \$	<u>2216.6</u>	<u>2260.5</u>	<u>1164.9</u>
Escalation	8498.6	8610.3	3657.6
Development (RDT&E)	(0.0)	(0.0)	(0.0)
Procurement	(8498.6)	(8607.5)	(3650.0)
Construction (MILCON)	(0.0)	(2.8)	(7.6)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	<u>10715.2</u>	<u>10870.8</u>	<u>4822.5</u>

The Production Estimate shown above reflects what should have been the Initial SAR Baseline at the time this program started reporting.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>1277</u>	<u>1268</u>	<u>634</u>
Total	1277	1268	634

There was no Low Rate Initial Production (LRIP) on the UH-60L; The LRIP portion of the UH-60 Production program was completed in 1979 on the UH-60A program.

c. Foreign Military Sales --				
Country/Case	Designator	Item	Qty	Value
Korea	(KS-B-YHM)	UH-60L BLACK HAWK	3	24.1M
Bahrain	(BA-B-VED)	UH-60L BLACK HAWK VIP	1	9.9M

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

Saudi Arabia (SR-B-VNK)	UH-60L BLACK HAWK MEDEVAC	8	133.0M
Colombia (CO-B-UKZ)	UH-60L BLACK HAWK	2	33.3M
Colombia (CO-B-USI)	UH-60L BLACK HAWK	2	37.3M
Egypt (EG-B-UQB)	UH-60L BLACK HAWK VIP	2	31.1M
Colombia (CO-B-UTN)	UH-60L BLACK HAWK	12	120.1M
Israel (IS-B-YPR)	UH-60L BLACK HAWK	15	134.4M
Egypt (EG-B-USP)	UH-60L BLACK HAWK VIP	2	37.2M

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (JUL 1993 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1971 BY\$)	2260.5	1164.9	
(2) Quantity	1268	634	
(3) Unit Cost	1.783	1.837	+3.03
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1971 BY\$)	2257.8	1162.0	
(2) Quantity	1268	634	
(3) Unit Cost	1.781	1.833	+2.92

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13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	10715.2	-	10715.2
Previous Changes:				
Economic	-	-495.8	+0.6	-495.2
Quantity	-	-2297.9	-	-2297.9
Schedule	-	+216.9	-	+216.9
Engineering	-	-62.1	+27.5	-34.6
Estimating	-	-2950.1	-17.6	-2967.7
Other	-	+1.4	-	+1.4
Support	-	-127.3	-	-127.3
Subtotal	-	-5714.9	+10.5	-5704.4
Current Changes:				
Economic	-	+17.7	-	+17.7
Quantity	-	-137.4	-	-137.4
Schedule	-	-9.4	-	-9.4
Engineering	-	+49.4	-	+49.4
Estimating	-	-118.7	-	-118.7
Other	-	-	-	-
Support	-	+10.1	-	+10.1
Subtotal	-	-188.3	-	-188.3
Total Changes	-	-5903.2	+10.5	-5892.7
Current Estimate	-	4812.0	10.5	4822.5

Summary (FY 1971 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	2216.6	-	2216.6
Previous Changes:				
Quantity	-	-431.7	-	-431.7
Schedule	-	-0.2	-	-0.2
Engineering	-	-5.4	+7.8	+2.4
Estimating	-	-558.0	-4.9	-562.9
Other	-	-	-	-
Support	-	-25.7	-	-25.7
Subtotal	-	-1021.0	+2.9	-1018.1
Current Changes:				
Quantity	-	-24.1	-	-24.1
Schedule	-	-	-	-
Engineering	-	+11.1	-	+11.1
Estimating	-	-23.6	-	-23.6
Other	-	-	-	-
Support	-	+3.0	-	+3.0
Subtotal	-	-33.6	-	-33.6
Total Changes	-	-1054.6	+2.9	-1051.7
Current Estimate	-	1162.0	2.9	1164.9

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>Procurement</u>		
Revised Escalation Indices. (Economic)	N/A	-9.9
Economic adjustment for negative program change. (Economic)	N/A	+27.6
Reduced quantity by 12 aircraft, from 646 to 634 due to; model changeover to UH-60M in FY04, a Congressional plus up in FY00 including four previously unreported National Guard aircraft. (Quantity)	-24.1	-137.4
Acceleration of annual procurement buy profile. (QR) (Schedule)	0.0	-9.4
Additional effort to develop and incorporate needed changes to produce the MEDEVAC version of the BLACK HAWK (UH-60Q) on the production line (HH-60L), as directed by Congress. (QR) (Engineering)	+10.2	+45.4
Added cost to produce two aircraft equipped with fire fighting apparatus (PIREHAWK), as directed by Congress. (QR) (Engineering)	+0.9	+4.0
Adjustment for current and prior inflation. (Estimating)	+0.6	+3.1
Reduced estimates for airframe hardware and associated system/project management due to increased FMS and other DoD component sales. (Estimating)	-16.7	-85.3
Reduced mission flexibility kit requirement due to quantity reduction. (QR) (Estimating)	-6.6	-31.8
Reduced estimate for engines and other GFE items. (Estimating)	-0.9	-4.7
Adjustment for current and prior year inflation. (Support)	0.0	+0.5
Increased requirement for Other Weapon System (OWS)-Initial Spares. (Support)	+0.2	+0.8
Reduced requirement for OWS-Data. (Support)	-0.4	-2.3
Increased requirement for OWS-Other (PM Administration/Fielding). (Support)	+3.2	+11.1
Procurement Subtotal	<u>-33.6</u>	<u>-188.3</u>

QR = Quantity related changes.

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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.39	-0.75	+4.67	+0.33	+0.02	-4.87	--	-0.18	-0.78	7.61

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.39	-0.75	+4.66	+0.33	-0.02	-4.94	--	-0.18	-0.80	7.59

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	OCT 1989	OCT 1989
Total Cost	N/A	N/A	10715.2	4822.5
Total Quantity	N/A	N/A	1277	634
Prog Acq Unit Cost	N/A	N/A	8.39	7.61

Milestones I, II, and III were previously reported on the UH-60A BLACK HAWK program.

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

a. Procurement --  
 Airframe MYC V:  
 United Technologies, Stratford, CT  
 DAAJ09-97-C-0005, FFP  
 Award: July 18, 1997  
 Definitized: July 18, 1997

Current Contract Price			Estimated Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager	
\$1163.1	\$	144	N/A	\$1251.2	

Explanation of Change:

None.

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15. Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

This contract is a multiservice multiyear contract. It provides for the procurement of firm (base) quantities, while containing an option clause allowing for the procurement of additional aircraft a prenegotiated prices. The difference in the 'Current Contract Price' and the 'Estimated Price at Completion' reflects the PM's assessment that the option clause will be utilized to procure additional aircraft not included in the base for the Army, Navy, and future FMS cases.

<u>Engine IDIQ:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Electric, Lynn, MA			
DAAJ09-97-D-0196, FFP	\$21.4	\$	36
Award: September 4, 1997			
Definitized: September 4, 1997			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$155.6	N/A	258	N/A	\$292.8

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

This is an Indefinite Delivery, Indefinite Quantity (IDIQ) contract. Initial contract priced options for engines delivered in calendar years 1998 through 2000. The contract has been modified to add option prices for deliveries in calendar years 2001 through 2003. Customers on this contract, in addition to the UH-60 BLACK HAWK, include the AH-64 APACHE, the Navy CH-60S, as well as Foreign Military Sales.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY87-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-03)	<u>Total</u>
RDT&E	-	-	-	-	-
Procurement	4187.1	215.8	86.8	322.3	4812.0
MILCON	10.5	-	-	-	10.5
O&M	-	-	-	-	-
Total	4197.6	215.8	86.8	322.3	4822.5

b. Annual Summary -- UH-60L BLACK HAWK

Appropriation: 0350 - National Guard & Reserve Equipm, Defense

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1971 Dollars Nonrec</u>	<u>Flyaway FY 1971 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990	4		5.4	5.5	20.9
1991	24		39.5	39.6	156.0
1993	8		13.6	13.6	56.0
1994	5		7.6	7.6	31.8
1995	8		12.1	12.1	51.6
Subtotal	49		78.2	78.4	316.3

Appropriation: 2031 - Aircraft Procurement, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1971 Dollars Nonrec</u>	<u>Flyaway FY 1971 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1987				2.4	7.3
1988				34.7	115.8
1989	23	2.2	39.8	91.6	337.4
1990	72	0.3	98.8	107.2	409.0
1991	48	3.6	67.9	40.7	160.2
1992	60	1.5	97.2	124.5	502.3
1993	52	2.3	71.6	86.5	355.8
1994	63	0.1	92.5	101.4	424.9
1995	60	1.3	88.7	74.1	315.7
1996	60	1.1	92.1	93.0	401.3
1997	34	0.8	60.6	65.5	285.8
1998	28	0.1	65.3	64.1	282.0
1999	29	3.8	53.8	61.8	273.3
2000	19		37.3	48.1	215.8
2001	6		11.0	19.1	86.8
2002	9		17.8	28.4	131.2

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

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1971 Dollars Nonrec	Flyaway FY 1971 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2003	22		43.3	40.5	191.1
<b>Subtotal</b>	<b>585</b>	<b>17.1</b>	<b>937.7</b>	<b>1083.6</b>	<b>4495.7</b>

Recurring flyaway cost may exceed total base year dollars in years when the advance procurement credits inherent in multiyear contracting are significantly greater than the advance procurement funding for future years.

Funding for the 28 aircraft budgeted for procurement in FY 2004 and FY 2005 is excluded from this report, since they will be produced as an upgraded aircraft--not a UH-60L.

Appropriation: 2050 - Military Construction, Army

Fiscal Year	Qty	Flyaway FY 1971 Dollars Nonrec	Flyaway FY 1971 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				1.0	3.5
1996				1.9	7.0
<b>Subtotal</b>				<b>2.9</b>	<b>10.5</b>

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	49		78.2	78.4	316.3
Army	585	17.1	937.7	1086.5	4506.2
<b>Grand Total</b>	<b>634</b>	<b>17.1</b>	<b>1015.9</b>	<b>1164.9</b>	<b>4822.5</b>

17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	571	571

Percent Total Program Quantities Delivered: 90.1%

b. Total Expenditures To Date (In Millions of Dollars): \$ 3963.2

Percent Total Program Expended: 82.2%

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17. Delivery/Expenditure Information (Cont'd):

Based on the scheduled delivery of one aircraft per month in calendar year 2000, the percentage of aircraft delivered will be 90% with the April delivery. A contract modification signed after the 'as of' date of this report will accelerate the delivery of two aircraft into March, thereby advancing the attainment of this metric by one month.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

UH-60L 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 above listed 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 application of 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.

b. Costs -- (FY 1971 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per 1,000 Flying Hours UH-60L BLACK HAWK	Avg Annual Cost Per 1,000 Flying Hours UH-1 Iroquois
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	24.9	135.5
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Consumption	240.6	130.2
Personnel	463.5	355.7

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

b. Costs -- (FY 1971 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per 1,000 Flying Hours UH-60L BLACK HAWK	Avg Annual Cost Per 1,000 Flying Hours UH-1 Iroquois
Modifications--Material	25.2	19.4
Other Direct Cost	80.1	0.0
Other Indirect Cost	95.7	153.9
Total	930.0	794.7

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CVN-68 Class, December 31, 1999

5. (U) References:

CVN-76

SAR Baseline (Production Estimate):

(U) The FY 1992 President's Budget.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated October 2, 1992.

CVN-77

SAR Baseline (Production Estimate):

(U) FY 1994 President's Budget dated April 08, 1993.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated April 28, 1999.

6. (U) Mission and Description:

(U) 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 20 years of normal carrier operations, the equivalent of 11 million barrels of propulsion fuel oil. Speeds of over 30 knots were achieved during trials of each CVN-68 Class carrier. 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.

7. (U) Executive Summary:

(U) Construction of the CVN 68 Class aircraft carriers began in October 1967 with the start of the NIMITZ (CVN 68). To date eight 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), USS ABRAHAM LINCOLN (CVN 72), USS GEORGE WASHINGTON (CVN 73), USS JOHN C. STENNIS (CVN 74), and USS HARRY S. TRUMAN (CVN 75) were delivered in 1975, 1977, 1982, 1986, 1989, 1992, 1995, and 1998 respectively.

Newport News Shipbuilding (NNS) experienced a 17-week labor strike which ended 30 July 1999. The NNS/United Steelworkers of America labor agreement resulted in revised labor rates which will impact costs.

There is one ship currently under construction at Newport News Shipbuilding, the RONALD REAGAN (CVN 76). CVN 76 is scheduled for delivery in March 2003. CVN 77 construction is to begin in FY 01.

Economic adjustments reported for 1999 do not reflect actual shipbuilding

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7. (U) Executive Summary (Cont'd):

experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

8. (U) Threshold Breaches:

CVN-76

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

8. (U) Threshold Breaches (Cont'd):

CVN-77

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

CVN-76

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
CVN-76			
Contract Award	JUN 1995	JUN 1995	DEC 1994
Start Production	NOV 1995	NOV 1995	MAY 1995
Lay Keel	DEC 1997	DEC 1997	FEB 1998
Launch	DEC 2000	DEC 2000	SEP 2000
Delivery	DEC 2002	DEC 2002	MAR 2003 (Ch-1)

b. Current Change Explanations --

(U) Ch-1 The delivery date was changed from Dec 2002 to Mar 2003 due to the 17-week United Steelworkers of America strike against Newport News Shipbuilding.

9a. (U) Schedule (Cont'd):  
CVN-77

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
CVN 77			
Definitization of Contracts	DEC 2000	JUN 2001	JAN 2001
Start Production	NOV 2001	NOV 2001	MAR 2001
Lay Keel	DEC 2003	DEC 2003	FEB 2002
Launch	DEC 2006	DEC 2006	MAR 2006
Delivery	DEC 2008	DEC 2008	JAN 2008

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

CVN-76

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
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
Displacement (tons)	96300	99000 / 102500	102500 1/	97337
Propulsion	NUCLEAR	NUCLEAR / NUCLEAR	NUCLEAR	NUCLEAR
Shaft Horsepower	(b)(1)			
Trial Speed (kts)				
Endurance (at 20 kts)				
Stores (days)	75	75 / 75	75	75
Close In Weapon Systems	4	4 / 4	4	4
NATO Sea Sparrow Missile Systems	3	3 / 3	3	3
Aviation Strike Ordnance (long tons)	2400	2400 / 2400	2451	2451
Ave. fuel (gals)	(b)(1)			
Operational Number of Aircraft (deck multiple in A4 Equivalents)	151	151 / 151	151 3/	151
Core Life (yrs)	13	N/A / N/A	-- 2/	20
Number of Reactors	2	N/A / N/A	2	2
Crew (Including Air Wing)	6280	N/A / N/A	6040	6048



10a. (U) Performance Characteristics (Cont'd):  
CVN-76

- (U) 1/ Actual based on CVN 68 Class standardization trials.
- 2/ Requires extensive operational data and is dependent on actual core life. The USS NIMITZ, the first CVN 68 class ship, was delivered in 1975 and is currently undergoing a Refueling Complex Overhaul (RCOH). Contract award was April 98.
- 3/ The operational number of aircraft (deck multiple) in A7 equivalents is 156. The CVN 76 is a modified repeat of the CVN 74/75. RDT&E funding became available in FY 1991 to begin contract design for CVN 76 which continued through to FY 95.

b. Current Change Explanations -- None

(U) CVN 76 projected crew size at delivery was reduced from 6,280 to 6,048 to reflect 122 accommodations which have been converted to training spaces and 110 accommodations were deleted to accommodate the Versatile Avionics System Test (VAST) equipment. The draft was changed from 38.4 to 38.9 and the displacement was changed from 96,300 to 97,337 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. Based on demonstrated performance on CVN-68 the core life was increased from 15 years to 20 years.

CVN-77

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated 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)	40.4	39.0 / 40.4	40.4	40.4
Displacement (tons)	97337	99000 / 102500	102500 1/	97337
Propulsion	Nuclear	Nuclear / Nuclear	Nuclear	Nuclear
Shaft Horsepower	(b)(1)			
Trial Speed (kts)				
Endurance (at 20 kts)				
Store (days)	75	75 / 75	75	75
Close in Weapons Systems	4	4 / 4	4	4
NATO Sea Sparrow Missile Systems	3	3 / 3	3	3
Aviation Strike Ordnance (Long Tons)	2451	2400 / 2400	2451	2451
Average Fuel (gals)	(b)(1)			

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CVN-68 Class, December 31, 1999

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

CVN-77

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Operational Number of Aircraft (Deck Multiple in A4 Equivalents)	151	151 / 151	151 3/	151
Core Life (yrs)	15	N/A / N/A	-- 2/	20
Number of Reactors	2	N/A / N/A	2	2
Crew (Including Air Wing)	6048	N/A / N/A	6040	6048

(U) 1/ Actual based on CVN 68 Class standardization trials.

2/ Requires extensive operational data and is dependent on actual core life. The USS NIMITZ, the first CVN 68 class ship, was delivered in 1975 and is currently undergoing a Refueling Complex Overhaul (RCOH). Contract award was April 98.

3/ The operational number of aircraft (deck multiple) in A7 equivalents is 156.

b. Current Change Explanations -- None

(U) Based on demonstrated performance on CVN-68 the core life was increased from 15 years to 20 years.

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CVN-68 Class, December 31, 1999

11. (U) Total Program Cost and Quantity (Dollars in Millions):  
CVN-76

a. (U) Cost --	Production <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	48.1	48.1	38.2
Procurement	3862.7	4488.6	4452.2
Basic	(2458.7)		(3078.7)
Government Furnished Eq	(1311.7)		(1224.3)
Other	(18.6)		(56.2)
OF/PD	(73.7)		(93.0)
Total Sailaway	(3862.7)		(4452.2)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1995 Base-Year \$	3910.8	4536.7	4490.4
Escalation	386.4	433.2	100.2
Development (RDT&E)	(-1.1)	(-1.1)	(-0.8)
Procurement	(387.5)	(434.3)	(101.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	4297.2	4969.9	4590.6

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>1</u>	<u>1</u>	<u>1</u>
Total	1	1	1

c. Foreign Military Sales -- None.

d. (U) Nuclear Costs --  
\$851.9M

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

CVN-77

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	0.0	215.5	179.6
Procurement	4557.1	4719.2	4612.5
Basic	(2901.1)		(3438.2)
Government Furnished Eq	(1547.8)		(1032.3)
Other Costs	(21.9)		(39.3)
OF/PD	(86.3)		(102.7)
Total Sailaway	(4557.1)		(4612.5)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1995 Base-Year \$	4557.1	4934.7	4792.1
Escalation	983.7	1039.0	507.8
Development (RDT&E)	(0.0)	(19.3)	(15.7)
Procurement	(983.7)	(1019.7)	(492.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	5540.8	5973.7	5299.9
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>1</u>	<u>1</u>	<u>1</u>
Total	1	1	1

c. Foreign Military Sales -- None.

d. (U) Nuclear Costs --  
\$695.4M

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CVN-68 Class, December 31, 1999

12. (U) Unit Cost Summary:

CVN-76

	UCR Baseline (OCT 1992 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	4536.7	4490.4	
(2) Quantity	1	1	
(3) Unit Cost	4536.700	4490.400	-1.02
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	4488.6	4452.2	
(2) Quantity	1	1	
(3) Unit Cost	4488.600	4452.200	-0.81

CVN-77

	UCR Baseline (APR 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	4934.7	4792.1	
(2) Quantity	1	1	
(3) Unit Cost	4934.700	4792.100	-2.89
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	4719.2	4612.5	
(2) Quantity	1	1	
(3) Unit Cost	4719.200	4612.500	-2.26

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CVN-68 Class, December 31, 1999

13. (U) Cost Variance Analysis:

CVN-76

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	47.0	4250.2	-	4297.2
Previous Changes:				
Economic	+0.8	-279.1	-	-278.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+35.6	-	+35.6
Estimating	-10.4	+494.8	-	+484.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-9.6	+251.3	-	+241.7
Current Changes:				
Economic	-	-28.6	-	-28.6
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-6.8	-	-6.8
Other	-	+87.1	-	+87.1
Support	-	-	-	-
Subtotal	-	+51.7	-	+51.7
Total Changes	-9.6	+303.0	-	+293.4
Current Estimate	37.4	4553.2	-	4590.6

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	48.1	3862.7	-	3910.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+34.5	-	+34.5
Estimating	-9.9	+477.8	-	+467.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-9.9	+512.3	-	+502.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-7.7	-	-7.7
Other	-	+84.9	-	+84.9
Support	-	-	-	-
Subtotal	-	+77.2	-	+77.2
Total Changes	-9.9	+589.5	-	+579.6
Current Estimate	38.2	4452.2	-	4490.4

(U) Economic adjustments reported for 1999 do not reflect actual shipbuilding

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

CVN-76

experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-28.6
	Adjustment for Current and Prior Inflation. (Estimating)	+25.5	+26.1
	Nuclear material contract savings (Estimating)	-30.4	-30.3
	Correction to Budget Controls (Estimating)	-4.6	-4.7
	Revised Outfitting Costs (Estimating)	+2.3	+2.4
	Revised Post Delivery Costs (Estimating)	-0.5	-0.3
	Strike Costs (Other)	+84.9	+87.1
	Procurement Subtotal	+77.2	+51.7

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CVN-68 Class, December 31, 1999

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

CVN-77

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	5540.8	-	5540.8
Previous Changes:				
Economic	-6.9	-382.7	-	-389.6
Quantity	-	-	-	-
Schedule	-	-141.4	-	-141.4
Engineering	+157.3	-223.0	-	-65.7
Estimating	+55.7	+210.5	-	+266.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+206.1	-536.6	-	-330.5
Current Changes:				
Economic	-0.9	-114.1	-	-115.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-9.9	+87.5	-	+77.6
Other	-	+127.0	-	+127.0
Support	-	-	-	-
Subtotal	-10.8	+100.4	-	+89.6
Total Changes	+195.3	-436.2	-	-240.9
Current Estimate	195.3	5104.6	-	5299.9

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13a. (U) Cost Variance Analysis (Cont'd):  
CVN-77

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	4557.1	-	4557.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-138.9	-	-138.9
Engineering	+141.2	-146.5	-	-5.3
Estimating	+47.4	+147.2	-	+194.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+188.6	-138.2	-	+50.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-9.0	+78.9	-	+69.9
Other	-	+114.7	-	+114.7
Support	-	-	-	-
Subtotal	-9.0	+193.6	-	+184.6
Total Changes	+179.6	+55.4	-	+235.0
Current Estimate	179.6	4612.5	-	4792.1

(U) Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-1.2
Economic adjustment for negative program change. (Economic)	N/A	+0.3
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
Revised program estimate to reflect adjustments due to inflation and small business innovative research. (Estimating)	-2.3	-2.6

13b. (U) Cost Variance Analysis (Cont'd):  
CVN-77

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment due to Below Threshold Reprogramming (Estimating)	-4.9	-5.3
Adjustment due to Newport News MOU savings (Estimating)	-2.1	-2.3
RDT&E Subtotal	<u>-9.0</u>	<u>-10.8</u>

(2) Procurement

Revised escalation indices. (Economic)	N/A	-114.1
Adjustment for Current and Prior Inflation. (Estimating)	+18.6	+20.1
Revised Program estimate to reflect changes in inflation and adjustments for Navy Working Capital Fund (NWCF). (Estimating)	+54.9	+61.4
Adjustment to reflect refined construction estimates. (Estimating)	+5.4	+6.0
Adjustment to reflect renegotiated labor rates due to strike against shipbuilder. (Other)	+114.7	+127.0
Procurement Subtotal	<u>+193.6</u>	<u>+100.4</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):  
CVN-76

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4297.20	-306.90	--	--	+35.60	+477.60	+87.10	--	+293.40	4590.60

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4250.20	-307.70	--	--	+35.60	+488.00	+87.10	--	+303.00	4553.20

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14c. (U) Unit Cost and Other History (Cont'd):  
CVN-76

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	DEC 2002	MAR 2003
Total Cost	N/A	N/A	4297.2	4590.6
Total Quantity	N/A	N/A	1	1
Prog Acq Unit Cost	N/A	N/A	4297.2	4590.6

CVN-77

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5540.80	-504.60	--	-141.40	-65.70	+343.80	+127.00	--	-240.90	5299.90

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5540.80	-496.80	--	-141.40	-223.00	+298.00	+127.00	--	-436.20	5104.60

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	DEC 2008	JAN 2008
Total Cost	N/A	N/A	5540.8	5299.9
Total Quantity	N/A	N/A	1	1
Prog Acq Unit Cost	N/A	N/A	5540.8	5299.9

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

a. Procurement --

(U) CVN-76 Construction:  
 Newport News Shipbuilding, Newport News VA  
 N00024-95-C-2106, FPIF  
 Award: December 8, 1994  
 Definitized: December 8, 1994

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$2718.1	\$2951.0	1	\$2785.3	\$2789.2
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>
Cumulative Variances To Date (10/24/99)			\$-55.8	\$-9.6
Net Change			<u>\$-65.6</u>	<u>\$-74.4</u>
			\$-9.8	\$-64.8

Explanation of Change:

(U) The deterioration of the schedule variance is due largely to the recent United Steel Workers of America strike. NNS is in the process of adjusting planned schedule to reflect the change in delivery date from Dec 2002 to Mar 2003. Schedule performance will improve upon completion of schedule revision.

(U) Nuclear Components:  
 DEPARTMENT OF ENERGY, WASHINGTON DC  
 N00024-67-F-5110, FFP/CPFF  
 Award: February 1, 1988  
 Definitized: February 1, 1988

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$859.2	N/A	0	\$859.2	\$859.2
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>
Cumulative Variances To Date			N/A	N/A
Net Change			<u>N/A</u>	<u>N/A</u>
			N/A	N/A

Explanation of Change:

(U) The contract amounts include funding for CVN 74/75 and CVN 76. Cost performance reporting is not required on this FFP contract.

15. (U) Contract Information (Cont'd):

(U) <u>Nuclear Components:</u>			Initial Contract Price		
Westinghouse Electric Co., Schenectady NY			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00024-88-C-4008, FFP/CPFF			\$354.6	N/A	0
Award: February 28, 1988					
Definitized: February 28, 1988					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$354.6	N/A	0	\$354.6	\$354.6	

Explanation of Change:

(U) The contract amounts include funding for CVN 74/75 and CVN 76.

Cost and Schedule variance reporting is not required on this FFP/CPFF contract.

(U) Contract Comments:

Contract is over 90% expended and will not be reported in future SARs.

(U) <u>Nuclear Components:</u>			Initial Contract Price		
Westinghouse Electric Co., Monroeville PA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00024-88-C-4007, FFP/CPFF			\$814.0	N/A	0
Award: February 1, 1988					
Definitized: February 1, 1988					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$853.1	N/A	0	\$853.1	\$853.1	

Explanation of Change:

(U) The contract amounts include funding for CVN 74/75 and CVN 76.

Cost and Schedule variance reporting is not required on this FFP/CPFF contract.

(U) Contract Comments:

Contract is over 90% expended and will not be reported in future SARs.

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CVN-68 Class, December 31, 1999

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years</u> (FY82-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	101.3	35.3	38.3	57.8	232.7
Procurement	4619.4	751.7	4076.6	210.1	9657.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	4720.7	787.0	4114.9	267.9	9890.5

CVN-76

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

<u>Appropriation</u>	<u>Prior Years</u> (FY91-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-03)	<u>Total</u>
RDT&E	37.4	-	-	-	37.4
Procurement	4447.8	2.1	22.9	80.4	4553.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	4485.2	2.1	22.9	80.4	4590.6

CVN-77

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

<u>Appropriation</u>	<u>Prior Years</u> (FY98-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	63.9	35.3	38.3	57.8	195.3
Procurement	171.6	749.6	4053.7	129.7	5104.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	235.5	784.9	4092.0	187.5	5299.9

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CVN-68 Class, December 31, 1999

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

b. Annual Summary -- CVN-76

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Sailaway FY 1995 Dollars Nonrec	Sailaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				1.9	1.8
1992				8.6	8.2
1993				12.3	12.0
1994				10.6	10.5
1995				4.8	4.9
Subtotal				38.2	37.4

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1995 Dollars Nonrec	Sailaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				803.0	799.1
1994					
1995	1		4452.2	3556.2	3648.7
1999					
2000				1.9	2.1
2001				20.7	22.9
2002				29.3	33.1
2003				41.1	47.3
2004					
Subtotal	1		4452.2	4452.2	4553.2

	Qty	Sailaway Dollars Nonrec	Sailaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1		4452.2	4490.4	4590.6

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CVN-68 Class, December 31, 1999

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

b. Annual Summary -- CVN-77

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Sailaway FY 1995 Dollars Nonrec	Sailaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				31.3	32.9
1999				29.2	31.0
2000				32.9	35.3
2001				35.1	38.3
2002				22.9	25.4
2003				8.1	9.1
2004				9.4	10.8
2005				10.7	12.5
Subtotal				179.6	195.3

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1995 Dollars Nonrec	Sailaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				46.2	48.7
1999				114.8	122.9
2000				688.9	749.6
2001	1		4612.5	3659.9	4053.7
2002					
2005				16.0	19.1
2006				10.6	12.9
2007				10.0	12.4
2008				15.8	20.1
2009				50.3	65.2
Subtotal	1		4612.5	4612.5	5104.6

	Qty	Sailaway Dollars Nonrec	Sailaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1		4612.5	4792.1	5299.9

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17. (U) Delivery/Expenditure Information:

CVN-76

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 2751

(U) Percent Total Program Expended: 59.9%

CVN-77

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 151.3

(U) Percent Total Program Expended: 2.9%

18. (U) Operating and Support Costs:

CVN-76

a. (U) Assumptions and Ground Rules --

These costs are based on the operating costs for supplies, equipage, and pier side support when deployed. This O&S estimate assumes carrier life cycle is 50 years vice the 48 years in previous estimates. The personnel indirect support costs have been included as part of the Indirect Costs. These assumptions are carried over from the CVN 74/75.

Date of cost estimate: Feb 2000.

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

Cost Element	Avg Annual Cost Per CVN	N/A
Mission Pay & Allowances	134.5	N/A
Unit Level Consumption	30.1	N/A
Intermediate Maintenance	1.2	N/A
Depot Maintenance	106.7	N/A
Contractor Support	0.0	N/A
Sustaining Support	14.1	N/A

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CVN-68 Class, December 31, 1999

18b. (U) Operating and Support Costs (Cont'd):  
CVN-76

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

Cost Element	Avg Annual Cost Per CVN	N/A
Indirect Costs	111.9	N/A
Total	398.5	N/A

CVN-77

a. (U) Assumptions and Ground Rules --  
Same as CVN 76 above.

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

Cost Element	Avg Annual Cost Per CVN	N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

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# AF-19 NAVSTAR GPS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
**PROGRAM:** Navstar GPS

**AS OF DATE:** December 31, 1999

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

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

**Joint Participants:**

United States Army (USA), United States Navy (USN), United States Marine Corps (USMC)

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

NAVSTAR GPS Joint Program Office	COL DOUGLAS L. LOVERRO
Space and Missile Systems Center	Assigned: November 1, 1999
2435 Vela Way, Suite 1613	DSN 833-1526; COMM (310) 363-1526
El Segundo, CA 90245-5500	DOUGLAS.LOVERRO@LOSANGELES.AF.MIL

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

RDT&E:

(U)	PE 0206626M
(U)	PE 0305164A
(U)	PE 0305164F
(U)	PE 0305164M
(U)	PE 0305164N
(U)	PE 0305165F
(U)	PE 0603421F
(U)	PE 0604478F
(U)	PE 0604480F
(U)	PE 0604777N

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AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

~~Classified by: NAVSTAR GPS System Protection Guide June 1997  
Downgrade instructions: Subject to Automatic Downgrade  
Declassify on: Originating Agency's Determination Required~~

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Navstar GPS, December 31, 1999

4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) PE 0604778A

(U) PE 0604778F

PROCUREMENT:

(U) APPN 3010 ICN 000000 (Air Force)

(U) APPN 3080 ICN 836730 (Air Force)

(U) APPN 3080 ICN 836790 (Air Force)

(U) APPN 3080 ICN 86190A (Air Force)

(U) APPN 1810 ICN BLI265700 (Navy)

(U) APPN 2035 ICN K47800 (Army)

(U) APPN 3020 ICN MGPS00 (Air Force)

(U) APPN 1611 ICN N/A (Navy)

(U) APPN 1506 ICN OSIP 17-88 (Navy)

MILCON:

(U) PE 0305165F

O&M:

(U) PE 0305164F

(U) PE 0305164N

(U) PE 0305165F

5. (U) References:

NAVSTAR GPS Satellite

SAR Baseline (Development Estimate):

(U) Decision Coordinating Paper (DCP) #133, Revision B, February 1, 1980.

Approved Program:

(U) AFAE Approved Acquisition Program Baseline (APB) dated May 3, 1996.

NAVSTAR GPS User Equip

SAR Baseline (Development Estimate):

(U) Decision Coordinating Paper (DCP) #133, Revision B, February 1, 1980.

Approved Program:

(U) Approved Acquisition Program Baseline (APB) dated May 3, 1996.

6. (U) Mission and Description:

(U) The NAVSTAR Global Positioning System (GPS) is a space-based radio positioning, navigation, and time distribution system. GPS provides precise, continuous, all-weather, common-grid positioning, velocity, navigation, and time reference capability to civil, commercial, and military users worldwide. Military 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, precision munition guidance, and ground/sea warfare. GPS carries a suite of nuclear detonation detection system sensors as

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6. (U) Mission and Description (Cont'd):

a secondary payload. These sensors provide worldwide, near realtime, 3-dimensional location of nuclear detonations. NAVSTAR GPS does not replace any United States Air Force weapon system; however, it provides the capability to replace the following support systems: Very High Frequency (VHF) Omnidirectional Range (VOR), Tactical Air Navigation (TACAN), and Distance Measurement Equipment (DME). Many of these systems are planned to be retired over the next decade, as OMEGA was on 30 Sep 97.

7. (U) Executive Summary:

(U) Satellite:

Full scale development of the NAVSTAR Global Positioning System (GPS) satellite program began in June 1979, with approval of Milestone II. Between this date and October 1985, the Joint Program Office (JPO) launched 10 Block I satellites and developed the associated ground control system software to support system testing. Twelve developmental Block I satellites were built, one satellite was lost as a result of an Atlas-Centaur launch vehicle failure, and one satellite was modified to become the qualification model for the production satellite program.

In 1983, the NAVSTAR GPS JPO awarded a production contract for 28 Block II satellites. The JPO successfully launched the first production satellite in February 1989. Initial Operational Capability (IOC) of the Global Positioning System was declared on December 8, 1993 in a joint announcement by the Department of Defense (DoD) and Department of Transportation (DOT). The Air Force Space Command (AFSPC) declared Full Operational Capability (FOC) in July 1995 after the deployment of 24 Block II/IIA satellites and completion of operational testing. The last Block IIA satellite was launched on November 5, 1997.

In June 1989, the NAVSTAR GPS JPO awarded a production contract for a block change of 20 additional replenishment satellites (Block IIR) to the approved program with priced options for six more. Of the six satellites covered by the options, one of these was exercised in 1995 bringing the total to 21 IIRs. On January 17, 1997, a Delta II launch vehicle carrying the first Block IIR satellite exploded after launch from Cape Canaveral Air Station, FL. The second Block IIR satellite was successfully launched on July 22, 1997 and on-orbit testing continued through January 1998. On-orbit testing identified a problem with the satellite's UHF Crosslink receiver. Radio signal interference affects the satellite's ability to exchange data with other GPS satellites to support a secondary payload, but this problem has no adverse effect on the navigation signal. A crosslink receiver modification known as the Quick Reaction Retrofit (QRR) was performed on the 3rd Block IIR satellite and was launched in October 1999. The QRR is being tested on-orbit. Results will be known prior to the next IIR launch. Further modifications known as the Interim Retrofit (IR) are being incorporated for the April 2000 launch. There are 18 remaining Block IIR launches.

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7. (U) Executive Summary (Cont'd):

In April 1996, the JPO awarded a contract for six production satellites (Block IIF), with priced options for 27 additional satellites. Preliminary satellite design was completed on February 21, 1997. The satellite Final Design Complete (FDC) milestone was attained on April 30, 1998. The next satellite program milestone, Functional Design Verification (FDV), is scheduled for July 2000.

The JPO's current analysis of constellation health indicates the predicted life of the Block IIA satellites should be increased from 8.6 to 10.6 years. Given current constellation performance and recent analyses of satellite longevity, we are now projecting an IIF first launch date of March 2005.

Air Force Space Command (AFSPC) assumed management responsibility for the ground control segment in April 1990. This segment consists of ground antennas, monitor stations, and a master control station necessary to command and control GPS satellites. In 1995 the program office awarded a contract to Lockheed Martin Mission Systems (LM-MS) to replace the Operational Control Segment (OCS) mainframe computers with a new distributed architecture. The GPS OCS Support Contract (GOSC) and IIF OCS development are on the critical path to the first IIF launch. As awarded, the GOSC and Block IIF contracts would have eventually led to the consolidation of Control Segment development and sustainment under Boeing as the single prime contractor. Based on direction from SAF/AQ, the JPO accelerated consolidation of the GOSC and Block IIF contract efforts. We now have the Single Prime Initiative in place which places the total control segment development and sustainment on the Boeing contract via an Undefined Contractual Action (UCA) effective October 1, 1999. The JPO and contractors are working the technical, contractual and programmatic activities to implement and definitize the change by the end of May 2000.

Vice President Gore announced on January 25, 1999 an initiative to modernize the GPS, including the addition of two new civil signals to the next generation of GPS satellites scheduled for launch beginning in 2005. In June 1999, the Joint Requirements Oversight Council (JROC) approved the Air Force Space Command (AFSPC) and Air Combat Command (ACC) Operational Requirements Document (ORD) validating three GPS Key Performance Parameters (KPP): Jam Resistance from Space, Backward Compatibility, and System-level Time Transfer. These parameters will better support the warfighter in today's evolving threat environment and provide better support to civil GPS customers worldwide. During the 2001 President's Budget build, the Department of Defense (DoD) reviewed the implementation plan to support the National Initiative and JROC Requirements. The Defense Review Board approved a plan to modify up to 12 Block IIRs with a second civil signal and an earth coverage military signal with the 1st launch no earlier than FY03. Also approved was the modernization of the 1st 6 Block IIFs with a second and third civil signal and earth coverage military signal with the 1st launch no earlier than FY05. Full modernized capability consisting of 3 civil signals, earth coverage military code, and an increased power military signal will be introduced on subsequent GPS satellites. Funding to support this approach was directed in FY01 President's Budget.

A revised modernization strategy was developed and approved by the DEPSECDEF along with recommended FY01 President's Budget (PB) adjustments on 9 Feb 00.

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7. (U) Executive Summary (Cont'd):

The strategy was subsequently approved by the Acquisition Strategy Panel (ASP), chaired by SAF/AQ on 29 Feb 00. The modernization strategy calls for implementing a Civil course acquisition (C/A) code on L2 and a military earth coverage M-Code signal on L1 and L2 on the last 12 Block IIR satellites. In addition, a Block IIF "Lite" program will add earth coverage M-code, C/A on L2, and a new civil signal on L5 to the 6 Block IIF satellites already procured. Additionally, procurement of the next block of satellites, designated GPS III, will be accomplished under a full and open competition. The revised strategy will be the basis for the "New Start" acquisition strategy papers given to Congress in Spring of 2000, and the draft Acquisition Decision Memorandum (ADM) language.

User Equipment:

GPS User Equipment (UE) development began in June 1979 with receiver testing (using Block I satellites) in a variety of land, sea, and air vehicles. Since then, the JPO has awarded contracts for the research, development, and production of airborne, shipboard, and handheld receivers. GPS user equipment successfully completed the Defense Acquisition Board (DAB) Milestone IIIB in January 1992 and achieved depot IOC in March 1993. Miniaturized Airborne GPS Receiver (MAGR) depot FOC was declared by Tobyhanna Army Depot on November 22, 1996. This completed the full depot capability milestone seven months ahead of the objective date.

September 1999 saw the completion of the very successful Navigation Warfare (NAVWAR) Advanced Concept Technology Demonstration (ACTD), which began in 1995. The GPS JPO in order to build on the work of the ACTD program is in the process of staffing the next NAVWAR ACTD program. The second NAVWAR ACTD objectives include: 1) formulating a Concept of Operations for joint forces using GPS in an electronic warfare environment; 2) developing, fielding, and demonstrating new protection capabilities for airborne and ground-based platforms; and 3) providing the basis for a program to implement these new capabilities into DoD and Allied forces.

Increased program content from the NAVWAR and GPS Modernization programs caused increases in program funding that led to the User Equipment RDT&E cost breach to the approved May 1996 Acquisition Program Baseline (APB). In March 1999, the program office submitted a Program Deviation Report (PDR) through the AFPEO/SP and AFAE to Office of the Secretary of Defense (OSD). The draft APB reflected cost objectives and thresholds consistent with User Equipment (UE) Research, Development, Test & Evaluation (RDT&E), NAVWAR, and GPS Modernization requirements and funding as of March 1999.

Directed changes to the GPS program, to include increased funding to minimize the Operational Control Segment (OCS) development and implementation risk, and implement GPS Modernization, make the May 1996 APB outdated. In light of the longer predicted lifetimes of the IIA satellites, options to buy six Block IIF satellites have not been exercised, decreasing the overall GPS satellite buy.

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7. (U) Executive Summary (Cont'd):

Consequently, this increased development and procurement funding in the FY01 PB and reduction in the total satellite buy, produces several APB and Nunn-McCurdy breaches for NAVSTAR GPS Satellite unit costs. The JPO is in the process of revising the APB to address all aspects of the GPS Modernization program and estimates completion by September 2000.

8. (U) Threshold Breaches:

NAVSTAR GPS Satellite

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	Yes
Average Procurement Unit Cost	Yes

c. (U) Explanation of Breach:

Directed changes to the GPS program, to include increased funding to minimize the Operational Control Segment (OCS) development and implementation risk, and implement GPS Modernization, make the May 1996 APB outdated. In light of the longer predicted lifetimes of the IIA satellites, options to buy six Block IIF satellites have not been exercised, decreasing the overall GPS satellite buy. Consequently, this increased development and procurement funding in the FY01 PB and reduction in the total satellite buy, produces several APB and Nunn-McCurdy breaches for NAVSTAR GPS Satellite unit costs. The JPO is in the process of revising the APB to address all aspects of the GPS Modernization program and estimates completion by September 2000.



8c. (U) Threshold Breaches (Cont'd):

NAVSTAR GPS User Equip

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Increased program content from the NAVWAR and GPS Modernization programs caused increases in program funding that led to the User Equipment RDT&E cost breach to the approved May 1996 Acquisition Program Baseline (APB). In March 1999, the program office submitted a Program Deviation Report (PDR) through the AFPEO/SP and AFAE to Office of the Secretary of Defense (OSD). The draft APB reflected cost objectives and thresholds consistent with User Equipment (UE) Research, Development, Test & Evaluation (RDT&E), NAVWAR, and GPS Modernization requirements and funding as of March 1999.

9. (U) Schedule:

NAVSTAR GPS Satellite

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I (DSARC)	DEC 1973	DEC 1973	DEC 1973
Milestone II (DSARC)	JUN 1979	JUN 1979	JUN 1979
First Production Satellite Launch	JAN 1987	FEB 1989	FEB 1989
Block IIR Contract Award	N/A	JUN 1989	JUN 1989
Control Segment Turnover to AFSPACECOM	N/A	APR 1990	APR 1990
Last Block IIA Satellite Delivery	N/A	NOV 1992	MAY 1993
21 Satellites on-orbit	N/A	MAR 1993	JUN 1993
First Block IIR Contract Delivery	N/A	AUG 1996	AUG 1996
Second Block IIR Contract Delivery	N/A	NOV 1996	NOV 1996

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

NAVSTAR GPS Satellite

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Availability of First Block IIR Satellite for Launch	N/A	JAN 1997	JAN 1997

b. Current Change Explanations -- None

NAVSTAR GPS User Equip

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I (DSARC)	DEC 1973	N/A	DEC 1973
Milestone II (DSARC)	JUN 1979	N/A	JUN 1979
Milestone III (DSARC)	SEP 1983	N/A	SEP 1983
Milestone IIIA (JRMB) Award	N/A	JUN 1986	JUN 1986
AF DT User Equipment (UE)			
Begin	N/A	JUL 1988	JUL 1988
Complete	N/A	MAY 1989	AUG 1989
User Equipment OT&E			
Begin	N/A	JUN 1989	JUN 1989
Complete	N/A	JUL 1991	JUL 1991
Milestone IIIB (DAB) UE	MAR 1989	SEP 1991	JAN 1992
Initial Depot Capability	N/A	SEP 1992	MAR 1993
First Full-Rate UE Production Delivery	N/A	NOV 1993	NOV 1993
Full Depot Capability	N/A	JUN 1997	NOV 1996

b. Current Change Explanations --  
(U) None

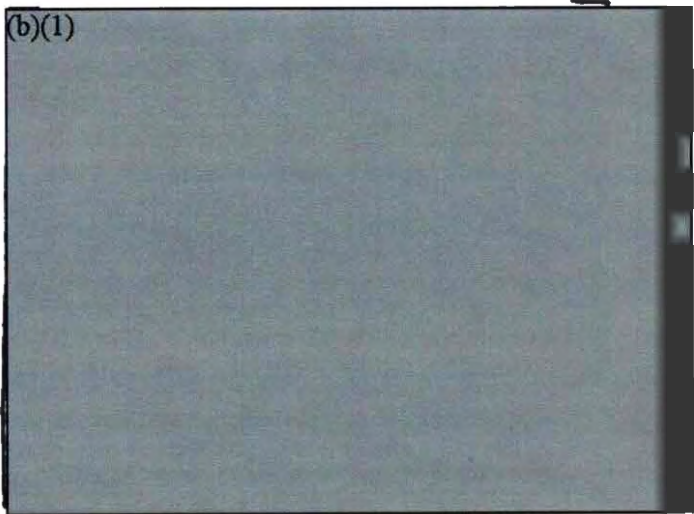
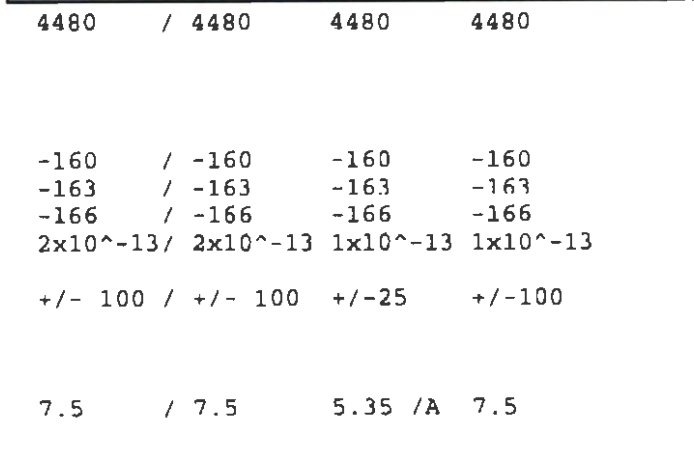
10. (U) Performance Characteristics:

NAVSTAR GPS Satellite

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
3-D System Positioning Accuracy (meters) (Spherical Error Probable (SEP))	16	16 / 16	10	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

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

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Block II Satellite	6	6 / 6	5.35 /A	8.45
Mean Mission Duration (MMD) (yrs)				
System Availability % (minimum of 21 satellites are operational at any time)	98	98 / 98	99.49 /B	98
Satellite: (Block II) 13-49 - Survivability	N/A	N/A / N/A	TBD	
Gamma Dose Rate (rad (Silicon))	N/A			
X-ray Fluence (cal/cm2)	N/A			
Neutron (n/cm2)	N/A			
Satellite: (Block IIR) 41-50 - Survivability	N/A			
Gamma Dose Rate (rad (Silicon))	N/A			
X-ray Fluence (cal/cm2)	N/A			
Neutron (n/cm2)	N/A			
Total Dose (mega rad (Silicon))	N/A			
Spaced Based Laser Threat (w/cm2)	N/A	4480 / 4480	4480	4480
Satellite Maximum Weight (lbs) (Delta II)	N/A			
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 <sup>-13</sup>	2x10 <sup>-13</sup> / 2x10 <sup>-13</sup>	1x10 <sup>-13</sup>	1x10 <sup>-13</sup>
Time Transfer (Universal Coordinated Time) (nsec)	+/-100	+/- 100 / +/- 100	+/-25	+/-100
Block II Satellite Design Life (yrs)	N/A	7.5 / 7.5	5.35 /A	7.5

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

NAVSTAR GPS Satellite

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>		Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Block I Satellite	N/A	N/A	/ N/A	TBD	
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 <sup>-13</sup> -13	N/A	/ N/A	2x10 <sup>-13</sup>	2x10 <sup>-13</sup>

(U) A/ Current demonstrated performance reflects Block II only. Reliability model projections incorporating actual on-orbit experience averaged over the constellation, as of October 1997 indicate an expected Mean Mission Duration (MMD) of 8.45 years versus the required MMD of 6.0 years and Demonstrated Performance of 5.35 years versus 4.69 years in the last report. The additional MMD is due mostly to longer solar array life. The reliability model will be updated to reflect changes in the constellation. The Air Force Space Command (AFSPC) and the Joint Program Office (JPO) are currently working on an approval and update plan for reliability modeling. Demonstrated performance will continue to change based on experience with on-orbit satellites.

(U) B/ Requirement is 98% probability of 21 satellites operational. Demonstrated performance is based upon actual availability of the satellites in the constellation.

(U) C/ Gamma dose rate parameters listed in the approved program column are derived from the approved system operation requirements documents and technical requirements documents.

b. Current Change Explanations -- None

NAVSTAR GPS User Equip

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>		Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Reliability Mean Time Between Operational Mission Failures (hours)					
Airborne					
5-Channel	550	590	/ 500	2130.2	2130.2
2-Channel	550	929	/ 500	722.8	722.8
Ground (hrs)	850	2000	/ 500	1653.2	1653.2
Sea (hrs)	900	680	/ 680	2880.8	2880.8

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10a. (U) Performance Characteristics (Cont'd):  
NAVSTAR GPS User Equip

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Maintainability				
Mean Time to Repair (hours)				
Airborne				
5-Channel	1.3	1 / 1	.75	.75
2-Channel	1.3	.75 / .75	.27	.27
Ground (hrs)	1.2	.75 / .75	.18	.18
Sea (hrs)	1.3	1.5 / 1.5	.77	.77

(U) Note: The mean time to repair reflects intermediate-level repair of the sets, not operational-level.

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):  
NAVSTAR GPS Satellite

	Development <u>Estimate (SAR)</u>	Approved Program (APB)	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	967.6	1563.3	1906.7
Procurement	623.4	3026.9	3248.6
Flyaway	(583.6)		(3222.2)
Other Weapon Systems	(39.8)		(26.4)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	8.4	4.7	4.7
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1979 Base-Year \$	1599.4	4594.9	5160.0
Escalation	707.3	6798.0	6389.5
Development (RDT&E)	(204.9)	(1389.2)	(1620.1)
Procurement	(496.1)	(5406.2)	(4766.8)
Construction (MILCON)	(6.3)	(2.6)	(2.6)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2306.7	11392.9	11549.5

b. (U) Quantity --

Development (RDT&E)	12	12	12
Procurement	<u>28</u>	<u>106</u>	<u>97</u>
Total	40	118	109

(U) Note: All Research Development Test and Evaluation (RDT&E) prototypes are considered fully configured.

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

NAVSTAR GPS Satellite

Note: The above table shows Department of Defense (DoD) funding only. Beginning in FY01, the Department of Transportation (DOT) will fund the civil share of the GPS Modernization.

Note: No Low Rate Initial Production (LRIP) is approved for the satellite portion of the program.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

NAVSTAR GPS User Equip

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	941.8	1005.3	1287.4
Procurement	1613.1	2143.3	1986.3
Flyaway	(1115.9)		(1470.3)
Other Weapon Systems	(497.2)		(441.8)
Peculiar Support	(0.0)		(32.0)
Initial Spares	(0.0)		(42.2)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>56.2</u>
Total FY 1979 Base-Year \$	2554.9	3148.6	3329.9
 Escalation	 2320.9	 3492.9	 3544.8
Development (RDT&E)	(441.9)	(593.7)	(923.0)
Procurement	(1879.0)	(2899.2)	(2559.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(62.4)</u>
Total Then Year \$	4875.8	6641.5	6874.7
 b. (U) Quantity --			
Development (RDT&E)	129	248	159
Procurement	<u>27210</u>	<u>119695</u>	<u>253464</u>
Total	27339	119943	253623

(U) Notes: The family of NAVSTAR GPS user equipment consists of over 25 different end items or line replaceable units (LRU's). These LRU's are grouped into six broad categories: receivers, antenna electronics, antennas, control display units, mounts, and support equipment. A user equipment set consists of one or more of these LRU's, depending upon the host vehicle. All Research Development Test and Evaluation (RDT&E) units are considered fully configured end items.

On September 1990, the Defense Acquisition Board approved the low rate initial production (LRIP) quantities for Receivers 3A and 3S of 900 units (FY90) and

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

NAVSTAR GPS User Equip

1,000 units (FY91).

Country	Dollars	Quantities Ancillary/Receivers/Security Devices
Australia	\$ 1.9M	0/38/5133
Belgium	\$ .7M	12/12/1634
Canada	\$ 2.9M	1788/268/9590
Denmark	\$ .9M	0/0/3539
Finland	\$ .1M	90/10/350
France	\$ 2.6M	12/1207/8489
Germany	\$ 11.7M	59/100/9705
Greece	\$ 1.9M	47/45/266
Israel	\$ 1.8M	392/43/2275
Italy	\$ 1.3M	440/154/2275
Japan	\$ 8.1M	25/117/2275
Korea	\$ 6.6M	135/166/1362
Kuwait	\$ .0M	74/37/0
Luxembourg	\$ .1M	225/37/0
NATO	\$ .1M	7/0/23
Netherlands	\$ 1.2M	8/0/4359
New Zealand	\$ .1M	0/0/323
Norway	\$ 1.0M	14/50/1381
Portugal	\$ .0M	4/0/53
Singapore	\$ 1.9M	64/52/170
Spain	\$ 2.1M	2335/262/265
Saudi Arabia	\$ 1.0M	464/212/0
Switzerland	\$ .1M	0/0/279
Turkey	\$ 0.0M	80/30/0
Taiwan	\$ 6.5M	6809/816/1245
United Kingdom	\$ 6.1M	17/0/20422
Mid-Life Update	\$ 12.7M	322/325/1625

Notes: 1) Security devices refer to one of many types of auxiliary output chips or security modules. 2) The mid-life update is the program for F-16

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

NAVSTAR GPS User Equip

sales to Belgium, Norway, Denmark, and the Netherlands. 3) Sales to Kuwait, New Zealand, and Portugal have a dollar value which rounds to less than \$.1M.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

NAVSTAR GPS Satellite

	UCR Baseline (MAY 1996 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1979 BY\$)	4594.9	5160.0	
(2) Quantity	118	109	
(3) Unit Cost	38.940	47.339	+21.57
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1979 BY\$)	3026.9	3248.6	
(2) Quantity	106	97	
(3) Unit Cost	28.556	33.491	+17.28
	UCR Baseline (MAY 1996 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
c. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (TY\$)	11392.9	11549.5	
(2) Unit Cost	96.550	105.959	+9.75
d. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (TY\$)	8433.1	8015.4	
(2) Unit Cost	79.558	82.633	+3.87
e. (U) Changes from Previous SAR (DEC 1998)	Dollars/Qty	Percent	
(1) PAUC (BY\$)	7.700	+19.43	
(2) APUC (BY\$)	4.600	+15.92	
(3) PAUC Quantity	-6	-5.22	
(4) PAUC (TY\$)	17.700	+20.05	
(5) APUC (TY\$)	11.200	+15.68	
f. (U) Initial SAR Information			
Initial SAR Date (DEC 1980):			
(1) Program Acquisition Cost (BY\$)	1558.1		
(2) Program Acquisition Cost (TY\$)	2306.7		
g. (U) Unit Cost PAUC Changes --			
Directed changes to the GPS program, to include increased funding to minimize the Operational Control Segment (OCS) development and			

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**12g. (U) Unit Cost Summary (Cont'd):**  
NAVSTAR GPS Satellite

implementation risk, and implement GPS Modernization, make the May 1996 APB outdated. In light of the longer predicted lifetimes of the IIA satellites, options to buy six Block IIF satellites have not been exercised, decreasing the overall GPS satellite buy. Consequently, this increased development and procurement funding in the FY01 PB and reduction in the total satellite buy, produces several APB and Nunn-McCurdy breaches for NAVSTAR GPS Satellite unit costs. The JPO is in the process of revising the APB to address all aspects of the GPS Modernization program and estimates completion by September 2000.

(U) Unit Cost APUC Changes --  
See explanation for PAUC.

h. Impact of Perf or Sched Changes -- None.

i. (U) Program Management & Control --  
Navstar GPS Joint Program Manager:  
Col. Douglas L. Loverro  
Ph: 310-363-1526  
Email: douglas.loverro@losangeles.af.mil

j. (U) Cost Control Actions --  
The primary reason for this breach is the approval of GPS Modernization by the DEPSECDEF, and increased funding provided by the FY01 PB that minimizes the OCS development and facilitates the implementation of GPS Modernization. Moreover, this breach was not caused by program cost growth, but instead by increased content and funding to the overall GPS program. In addition, the JPO controls and monitors cost growth by receiving monthly Cost Performance Reports (CPR) and Cost Fund Status Reports (CFSR), which enables the JPO to perform an Earned Value Analysis to track cost, schedule, and performance. The JPO also meets with the contractor monthly to discuss the content of the CPR and CFSR, with particular emphasis on any cost, schedule or performance deviations.

k. (U) Contract Information (In Millions of Then-Year Dollars) --

- (U) (1) Contractor(s): BOEING NORTH AMERICAN
- (2) Contract Title: BLKIIF SAT DEV/PROD/MOSC
- (3) Contract Number: F04701-96-C-0025
- (4) Actual Cost of Work Performed (ACWP) to date: 38.4
- (5) Percent contract completed (BCWP/target cost): 15.00

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12k. (U) Unit Cost Summary (Cont'd):

NAVSTAR GPS Satellite

(6) Variances:

	Cost Variance		Schedule Variance	
	(\$/%)		(\$/%)	
	N/A		N/A	
Baseline Report				
Previous SAR	\$0.2/	+2.00	\$-0.7/	-5.00
Current Values	\$0.4/	+1.00	\$-0.4/	-1.00
Change from the Baseline Report	\$0.4/	+1.00	\$-0.4/	-1.00
Change from the Previous SAR	\$0.2/	-1.00	\$0.3/	+4.00

Explanation of Variances -- None.

Impact of Variances on Contract -- None.

Impact of Variances on Unit Costs -- None.

1. (U) Contracts exceeding Contract Cost Baseline Thresholds -- None.

m. General Comments -- None.

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	UCR	Current	Percent
	Baseline	Estimate	Change
	(MAY 1996 APB)	(Dec 1999 SAR)	
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1979 BY\$)	3148.6	3329.6	
(2) Quantity	119943	253623	
(3) Unit Cost	0.026	0.013	-50.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1979 BY\$)	2143.3	1986.3	
(2) Quantity	119695	253464	
(3) Unit Cost	0.018	0.008	-55.56

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**13. (U) Cost Variance Analysis:**  
NAVSTAR GPS Satellite

a. (U) 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	-247.3	-958.6	-1.4	-1207.3
Quantity	-	+5084.7	-	+5084.7
Schedule	+37.9	+580.1	-	+618.0
Engineering	+531.9	+681.1	-	+1213.0
Estimating	+956.7	+850.8	+0.5	+1808.0
Other	-	-	-	-
Support	+339.6	-4.8	-6.5	+328.3
Subtotal	+1618.8	+6233.3	-7.4	+7844.7
Current Changes:				
Economic	-15.9	-54.9	-	-70.8
Quantity	-	-131.7	-	-131.7
Schedule	-	-	-	-
Engineering	+513.7	+675.3	-	+1189.0
Estimating	+237.7	+142.6	-	+380.3
Other	-	-	-	-
Support	-	+31.3	-	+31.3
Subtotal	+735.5	+662.6	-	+1398.1
Total Changes	+2354.3	+6895.9	-7.4	+9242.8
Current Estimate	3526.8	8015.4	7.3	11549.5

(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	-	+1614.8	-	+1614.8
Schedule	+18.1	-18.4	-	-0.3
Engineering	+268.3	+369.5	-	+637.8
Estimating	+205.2	+414.0	+0.4	+619.6
Other	-	-	-	-
Support	+122.6	-26.0	-4.1	+92.5
Subtotal	+614.2	+2353.9	-3.7	+2964.4
Current Changes:				
Quantity	-	-50.2	-	-50.2
Schedule	-	-	-	-
Engineering	+225.1	+261.8	-	+486.9
Estimating	+99.8	+47.1	-	+146.9
Other	-	-	-	-
Support	-	+12.6	-	+12.6
Subtotal	+324.9	+271.3	-	+596.2
Total Changes	+939.1	+2625.2	-3.7	+3560.6
Current Estimate	1906.7	3248.6	4.7	5160.0

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices (Economic)	N/A	-15.9
	GPS Modernization (FY01-FY12) (Engineering)	+220.5	+503.8
	IIF Satellite redesign for Direct Inject into orbit on EELV (FY00) (Engineering)	+4.6	+9.9
	Adjustment for current and prior year escalation (FY98-FY00) (Estimating)	+0.4	+0.4
	Revised estimate for operational control system based on a better understanding of complexity of effort (FY98-FY07) (Estimating)	+100.0	+236.4
	Congressional undistributed reduction (FY99-FY00) (Estimating)	-2.1	-4.6
	Higher Air Force priorities (FY98-FY99) (Estimating)	-0.6	-1.3
	Revised economic assumptions (FY99-FY16) (Estimating)	+2.1	+6.8
	RDT&E Subtotal	<u>+324.9</u>	<u>+735.5</u>
(2)	<u>Procurement</u>		
	Economic adjustment for negative program change (Economic)	N/A	+15.7
	Revised escalation indices (Economic)	N/A	-70.6
	Cancellation of 6 Block IIF satellites including pricing impacts (FY01-FY05) (Quantity)	-50.2	-131.7
	Block IIR Crosslink fix (FY93-FY96) (Engineering)	+16.8	+38.5
	Control system change impacts to satellite (FY01-FY05) (Engineering)	+8.6	+21.6
	GPS Modernization (FY01-FY14) (Engineering)	+236.4	+615.2
	Congressional reductions (FY00) (Estimating)	-5.7	-13.6
	Higher Air Force priorities (FY92-FY01) (Estimating)	-7.9	-18.3
	Change in satellite acquisition strategy from MYP to annual buy (FY04-FY08) (Estimating)	+43.4	+121.9
	Revised economic assumptions (FY01-FY16) (Estimating)	+16.3	+50.3
	Adjustment for current and prior escalation (Estimating)	+1.0	+2.3
	GPS Modernization (FY01-FY07) (Support)	+12.7	+31.7
	Higher Air Force Priorities (FY00-FY04) (Support)	-0.1	-0.4
	Procurement Subtotal	<u>+271.3</u>	<u>+662.6</u>

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

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	1383.7	3492.1	-	-	4875.8
Previous Changes:					
Economic	-57.7	-339.2	-	-10.8	-407.7
Quantity	-	+1426.5	-	-20.0	+1406.5
Schedule	+20.7	+810.3	-	-	+831.0
Engineering	+83.2	-46.8	-	-	+36.4
Estimating	+502.3	-1060.1	-	+107.0	-450.8
Other	-	-	-	-	-
Support	-17.8	+396.2	-	+44.7	+423.1
Subtotal	+530.7	+1186.9	-	+120.9	+1838.5
Current Changes:					
Economic	-2.8	-6.7	-	-0.5	-10.0
Quantity	-	+180.4	-	-	+180.4
Schedule	-	+174.1	-	-	+174.1
Engineering	+274.7	-	-	-	+274.7
Estimating	+24.1	-147.4	-	+0.1	-123.2
Other	-	-	-	-	-
Support	-	-333.7	-	-1.9	-335.6
Subtotal	+296.0	-133.3	-	-2.3	+160.4
Total Changes	+826.7	+1053.6	-	+118.6	+1998.9
Current Estimate	2210.4	4545.7	-	118.6	6874.7

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

NAVSTAR GPS User Equip

(U) Summary (FY 1979 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	941.8	1613.1	-	-	2554.9
Previous Changes:					
Quantity	-	+544.7	-	-10.0	+534.7
Schedule	+10.6	+202.6	-	-	+213.2
Engineering	+38.1	-21.3	-	-	+16.8
Estimating	+176.1	-447.7	-	+49.1	-222.5
Other	-	-	-	-	-
Support	-5.1	+137.9	-	+17.8	+150.6
Subtotal	+219.7	+416.2	-	+56.9	+692.8
Current Changes:					
Quantity	-	+78.7	-	-	+78.7
Schedule	-	+61.9	-	-	+61.9
Engineering	+115.6	-	-	-	+115.6
Estimating	+10.3	-64.5	-	-	-54.2
Other	-	-	-	-	-
Support	-	-119.1	-	-0.7	-119.8
Subtotal	+125.9	-43.0	-	-0.7	+82.2
Total Changes	+345.6	+373.2	-	+56.2	+775.0
Current Estimate	1287.4	1986.3	-	56.2	3329.9

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices (Economic)	N/A	-2.8
NAVWAR Technology enhancements (FY01-FY07)-Air Force (Engineering)	+115.6	+274.7
Adjustment for current and prior year escalation (FY97)- Army (Estimating)	0.0	+0.1
Increased estimate for GPS Enhancements (FY99-FY05) (Estimating)	+9.3	+22.0
Increase estimate for GPS Enhancements (FY01) (Estimating)	+1.0	+2.0
RDT&E Subtotal	+125.9	+296.0
(2) <u>Procurement</u>		
Revised escalation indices (Economic)	N/A	-6.7
Revised Army UE requirements increasing hand-held sets by 17,650 from 195,960 to 213,610 (FY02-FY10)-Army (Quantity)	+22.5	+51.7
Quantity decrease of 256 Navy aircraft sets from 4959 to 4703 (FY98-FY05)-Navy (Quantity)	-4.7	-11.2

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**13b. (U) Cost Variance Analysis (Cont'd):**  
**NAVSTAR GPS User Equip**

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Quantity increase of 2,716 handheld sets from 15,961 to 18,677 (FY02-FY08)-Air Force (Quantity)	+6.0	+11.9
Quantity increase of 482 aircraft sets from 8,277 to 8,759(FY05-FY08)-Air Force (Quantity)	+54.9	+128.0
Increase to recurring unit cost of handheld sets due to a shift in schedule to later years-Army (Schedule)	+19.7	+55.1
Increase to recurring unit cost of aircraft sets due to a shift in schedule to later years (FY99-FY08)-Air Force (Schedule)	+49.7	+139.1
Decrease to recurring unit cost of aircraft sets due to a shift in schedule to earlier years (FY98-FY01)-Navy (Schedule)	-7.5	-20.2
Increase to recurring unit cost of handheld sets due to a shift in schedule to later years (FY02 FY08) Air Force (Schedule)	0.0	+0.1
Revised estimates for Line Replaceable Units (LRU) average unit costs for ground sets (FY00-FY12)-Army (Estimating)	-10.1	-16.4
Adjustment for current and prior year escalation (FY97)-Army (Estimating)		+0.1
Revised estimates for LRUs average unit costs (FY98-FY05)-Navy (Estimating)	+10.5	+27.3
Adjustment for current and prior year escalation (FY95-FY99)-Air Force (Estimating)	+1.2	+2.7
Revised estimates for Line Replacements Units (LRU) average unit costs- Air Force (Estimating)	-66.7	-162.5
Adjustment to reconcile flyaway and support costs.		
Estimating adjustment (Estimating)	+0.6	+1.4
Support adjustment (Support)	-0.6	-1.4
Adjustment for current and prior year escalation (FY98)-Navy (Support)	0.0	+0.1
Revised estimate for program support (FY98-FY05)-Navy (Support)	-4.0	-10.4
Revised estimate for Program Support of ground sets (FY03-FY12)-Army (Support)	-8.4	-28.5
Revised estimate for program support(FY99-FY03)-Air Force (Support)	-106.1	-293.5
Procurement Subtotal	<u>-43.0</u>	<u>-133.3</u>

13b. (U) Cost Variance Analysis (Cont'd):  
NAVSTAR GPS User Equip

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(3)	<u>O&amp;M</u>		
	Revised escalation indices (Economic)	N/A	-0.5
	Adjustment for current and prior year escalation (FY99)-Navy (Estimating)	0.0	+0.1
	Decreased estimate for UE support (FY01-FY05)-Navy (Support)	-0.7	-2.0
	Increased estimate for UE support (FY98-FY03) Air Force (Support)	0.0	+0.1
	O&M Subtotal	<u>-0.7</u>	<u>-2.3</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):  
NAVSTAR GPS Satellite

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
57.67	-11.73	+8.93	+5.67	+22.04	+20.08	--	+3.30	+48.29	105.96

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
39.98	-10.45	+22.63	+5.98	+13.98	+10.24	--	+0.27	+42.65	82.63



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14c. (U) Unit Cost and Other History (Cont'd):

NAVSTAR GPS Satellite

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	N/A	DEC 1973	N/A	DEC 1973
Milestone II	N/A	JUN 1979	N/A	JUN 1979
Milestone III	N/A	N/A	N/A	JUN 1989
FUE/IOC	N/A	N/A	N/A	APR 1990
Total Cost	N/A	2306.7	N/A	11549.5
Total Quantity	N/A	40	N/A	109
Prog Acq Unit Cost	N/A	57.67	N/A	105.96

NAVSTAR GPS User Equip

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.18	--	-0.15	--	--	--	--	--	-0.15	0.03

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.13	--	-0.11	--	--	--	--	--	-0.11	0.02

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	N/A	DEC 1973	N/A	DEC 1973
Milestone II	N/A	JUN 1979	N/A	JUN 1979
Milestone III	N/A	N/A	N/A	JUN 1986
FUE/IOC	N/A	N/A	N/A	MAR 1993
Total Cost	N/A	4875.8	N/A	6874.7
Total Quantity	N/A	27339	N/A	253623
Prog Acq Unit Cost	N/A	0.18	N/A	0.03

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

a. RDT&E --	Initial Contract Price		
(U) <u>BLKIIF SAT DEV/PROD/MOSC:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
BOEING NORTH AMERICAN, SEAL BEACH CA			
F04701-96-C-0025, FFP/AF/EPA/CPAF	\$382.4	N/A	6
Award: April 22, 1996			
Definitized: April 22, 1996			
Current Contract Price		Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>
\$400.8	N/A	\$680.9	\$746.8
		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		\$0.2	\$-0.7
Cumulative Variances To Date (12/31/99)		<u>\$0.4</u>	<u>\$-0.4</u>
Net Change		\$0.2	\$0.3

Explanation of Change:

(U) NOTE: CPR submittal was been suspended from the month-end Apr 99 data till month-end Sep 99, and has resumed starting in Oct 99.

Cost Variance (CV):

As of 31 Dec 99, the GPS Block IIF Operational Control Segment (OCS) Mission Operations Support Center (MOSC) Development effort has a positive cumulative CV of \$403K. CLIN 0060 System Engineering & Program Management (SE/PM) and CLIN 0062 Version Development contribute the most to the CV. The CV in CLIN 0060 was a result of lower than anticipated costs in the SE/PM areas. The CV in CLIN 0062 was due to subcontractor billing lag. CLIN 0062 is currently overrunning. The overall Phase integration complexities have caused actuals to be higher than budgeted.

Schedule Variance (SV):

Boeing continues to experience negative SV since Jan 97. As of 31 Dec 99, the OCS/MOSC development effort has a cumulative SV of -\$374K. CLIN 0062 Phase which is being developed by Boeing's subcontractor, Lockheed, contributes the most to the SV. The main causes of the SV were: (1) the requirement for Estimation and Upload testing to be done in classified lab which is less efficient than testing done in unclassified lab. (2) Lockheed is behind in some up front Requirements Verification Test Planning. Lockheed expects to close the variance by March 2000.

Program Manager's (PM's) Estimated Cost:

Based on performance to date, the PM's current and best estimate is \$680.91M (includes both the Cost Plus and the Fixed Price) which is based on the assumption that the Contractor will maintain cost and make up schedule variance upon definitization of current contract modifications. The PM's worst case estimate of \$746.81M includes an additional \$39.6M FFP

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**15. (U) Contract Information (Cont'd):**

for production fixes for the crosslink anomaly, \$22.8M FFP for Cryptographic Equipment (KI-17) fixes, and \$3.5M FFP to fund the Crosslink Transponder Data Unit REA claim in development.

**Note:**

Contract F04606-95-D-0239, GPS OPERATIONAL CONTROL SYSTEM SUPPORT, which was previously reported in the 1998 SAR, is now under the F04701-96-C-0025 contract and will no longer be reported.

Contract F04701-89-C-0073, LOCKHEED BLOCK IIR SATELLITE PRODUCTION, which was previously reported in the 1998 SAR, is over 90% complete and will no longer be reported separately.

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

**Total Program**

**a. Appropriation Summary (Then-Year Dollars in Millions)**

<u>Appropriation</u>	<u>Prior Years</u> (FY74-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-16)	<u>Total</u>
RDT&E	3209.5	167.3	333.3	2027.1	5737.2
Procurement	5709.9	372.1	375.9	6103.2	12561.1
MILCON	7.3	-	-	-	7.3
O&M	64.2	5.4	4.2	44.8	118.6
<b>Total</b>	<b>8990.9</b>	<b>544.8</b>	<b>713.4</b>	<b>8175.1</b>	<b>18424.2</b>

**NAVSTAR GPS Satellite**

**a. Appropriation Summary (Then-Year Dollars in Millions)**

<u>Appropriation</u>	<u>Prior Years</u> (FY74-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-16)	<u>Total</u>
RDT&E	1602.4	107.5	250.2	1566.7	3526.8
Procurement	2795.6	136.1	217.8	4865.9	8015.4
MILCON	7.3	-	-	-	7.3
O&M	-	-	-	-	-
<b>Total</b>	<b>4405.3</b>	<b>243.6</b>	<b>468.0</b>	<b>6432.6</b>	<b>11549.5</b>

(U) Note: Tables do not include Department of Transportation (DOT) funding.

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

NAVSTAR GPS User Equip

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

<u>Appropriation</u>	<u>Prior Years (FY74-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-12)</u>	<u>Total</u>
RDT&E	1607.1	59.8	83.1	460.4	2210.4
Procurement	2914.3	236.0	158.1	1237.3	4545.7
MILCON	-	-	-	-	-
O&M	64.2	5.4	4.2	44.8	118.6
Total	4585.6	301.2	245.4	1742.5	6874.7

(U) Note: Tables do not include DOT funding.

b. Annual Summary -- NAVSTAR GPS Satellite

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1979 Dollars Nonrec</u>	<u>Flyaway FY 1979 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1974				9.4	6.4
1975				25.5	19.1
1976				72.2	58.9
1977				12.0	10.6
1977				56.3	50.2
1978				56.0	53.3
1979				53.9	56.0
1980				88.3	101.9
1981				78.8	100.7
1982				100.6	137.4
1983				67.3	96.2
1984				67.8	100.7
1985				49.0	75.2
1986				28.7	45.1
1987				21.3	35.0
1988				15.3	25.9
1989				25.7	45.4
1990				18.0	32.9
1991				24.8	46.9
1992				26.3	51.3
1993				28.3	56.2
1994				18.2	36.7
1995				17.1	35.2
1996				20.8	43.6
1997				39.2	83.2
1998				45.3	96.8

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Navstar GPS, December 31, 1999

**16b. (U) Program Funding Summary (Cont'd):**  
NAVSTAR GPS Satellite

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				47.1	101.6
2000				49.2	107.5
2001				112.8	250.2
2002				92.9	209.1
2003				79.1	181.3
2004				56.8	132.7
2005				42.8	102.0
2006				58.1	141.2
2007				46.4	115.0
2008				47.9	121.1
2009				42.7	110.2
2010				36.8	96.9
2011				36.6	98.2
2012				29.7	81.3
2013				17.2	47.9
2014				12.9	36.8
2015				12.4	36.0
2016				19.2	57.0
Subtotal	12			1906.7	3526.8

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1982		0.7		13.2	20.1
1983				69.3	111.5
1984	1	0.6	25.2	152.7	256.0
1985	6	0.1	132.3	192.1	331.4
1986	9	2.0	203.4	112.6	203.4
1987	8		145.4	37.8	71.2
1988	4	2.4	119.1	53.5	104.5
1989		2.5	30.6	33.1	67.5
1990		5.5	14.8	20.3	42.1
1991		8.8	26.5	73.7	157.5
1992	4	8.4	77.3	90.4	195.6
1993	4	9.3	79.9	86.6	191.2
1994	4	8.4	83.7	87.3	196.4
1995	5	9.2	97.0	100.4	228.2
1996	4	8.5	78.6	71.3	164.1
1997	3	7.4	78.9	84.8	197.8
1998	3	9.0	71.2	68.6	161.6

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999		10.7	24.9	35.5	84.6
2000		11.8	41.2	51.9	125.4
2001		11.9	68.4	85.7	210.3
2002		11.4	71.4	94.3	235.4
2003	3	11.4	151.7	161.4	410.2
2004	3	11.8	130.5	140.0	362.9
2005	3	11.5	108.1	119.2	315.2
2006	3	11.4	105.3	116.0	313.1
2007	3	11.3	98.7	109.4	301.2
2008	3	11.2	106.3	141.8	398.1
2009	3	11.0	155.8	148.3	424.5
2010	3	11.0	103.9	112.4	328.2
2011	3	10.8	104.7	102.1	304.1
2012	3	10.7	84.6	95.3	289.4
2013	3	10.6	47.7	93.5	289.8
2014	3	10.5	105.2	89.0	281.3
2015	3	10.4	80.7	89.3	287.9
2016	3	10.3	87.0	89.4	294.2
Subtotal	97	282.5	2940.0	3222.2	7955.9

(U) Note: Recurring dollars that are reflected in FYs 89, 90, 91, 99, 00, and 01 are due to Launch and On-Orbit support that cannot be identified to specific satellites.

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				1.5	2.6
1988				4.7	8.3
1989					
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					

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**16b. (U) Program Funding Summary (Cont'd):**  
**NAVSTAR GPS Satellite**

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000				4.8	10.7
2001				3.3	7.5
2002					
2003				1.4	3.4
2004					
2005					
2006				2.7	6.7
2007				8.0	20.3
Subtotal				26.4	59.5

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984				4.7	7.3
Subtotal				4.7	7.3

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	109	282.5	2940.0	5160.0	11549.5

b. Annual Summary -- NAVSTAR GPS User Equip

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				0.1	0.2
1990				1.2	2.1
1991				0.2	0.4
1992				0.1	0.1
1993				0.2	0.3
1994				0.2	0.4
1995					
1996				3.2	6.7
1997				2.0	4.2
1998				1.8	3.9

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

NAVSTAR GPS User Equip

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				0.1	0.3
Subtotal				9.1	18.6

(U) Note: Appropriation 0400 Research Development Test and Evaluation (RDT&E), Defense Agencies is Marine Corps RDT&E - Program Element (PE) 0206626M-1319 Appropriation for fiscal years FY89-FY94 and Department of Defense 0400 Research Development and Test for FY96-FY99.

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1974				6.0	4.1
1975				8.7	6.5
1976				13.5	11.0
1977				1.8	1.6
1977				7.4	6.6
1978				3.8	3.6
1979				9.5	9.9
1980				8.7	10.1
1981				13.4	17.1
1982				22.0	30.0
1983				19.7	28.1
1984				39.9	59.3
1985				38.3	58.8
1986				35.7	56.2
1987				39.1	64.3
1988				29.3	49.4
1989				22.4	39.6
1990				23.1	42.2
1991				25.8	48.8
1992				25.3	49.2
1993				24.7	49.2
1994				24.3	49.2
1995				15.7	32.4
1996				14.1	29.5
1997				13.4	28.4

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**16b. (U) Program Funding Summary (Cont'd):**  
NAVSTAR GPS User Equip

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				10.5	22.5
1999				12.4	26.7
2000				4.7	10.2
2001				6.2	13.7
2002				5.4	12.2
2003				10.4	23.8
2004				11.4	26.7
2005				10.1	24.0
Subtotal				556.7	944.9

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1974				1.8	1.2
1975				4.4	3.3
1976				7.8	6.4
1977				1.8	1.6
1977				8.4	7.5
1978				7.4	7.0
1979				9.3	9.7
1980				11.7	13.5
1981				13.9	17.7
1982				5.1	7.0
1983				7.5	10.7
1984				3.9	5.8
1985				7.6	11.6
1986				6.7	10.5
1987				2.7	4.5
1988				5.9	10.0
1989				5.0	8.9
1990				2.7	5.0
1991				3.3	6.3
1992					
1993					
1994				0.2	0.5
1995				0.2	0.5
1996				0.2	0.4
1997				0.2	0.4
1998				0.2	0.4
1999				0.2	0.4

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**16b. (U) Program Funding Summary (Cont'd):**  
**NAVSTAR GPS User Equip**

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000				0.2	0.4
2001				1.1	2.4
Subtotal	13			119.4	153.6

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1974				1.5	1.0
1975				6.4	4.8
1976				19.5	15.9
1977				3.1	2.7
1977				15.5	13.8
1978				14.4	13.7
1979				18.9	19.6
1980				29.8	34.4
1981				19.2	24.5
1982				20.5	28.0
1983				18.1	25.9
1984				13.3	19.8
1985				13.5	20.7
1986				16.4	25.8
1987				17.2	28.3
1988				22.4	37.8
1989				21.6	38.3
1990				18.0	32.8
1991				6.7	12.6
1992				7.5	14.7
1993				10.2	20.3
1994				9.7	19.7
1995				7.2	14.9
1996				9.1	19.0
1997				16.2	34.4
1998				20.1	43.1
1999				17.1	36.9
2000				22.5	49.2
2001				30.2	67.0
2002				22.4	50.4
2003				22.0	50.5
2004				21.6	50.5
2005				21.3	50.7

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

NAVSTAR GPS User Equip

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2006				22.0	53.6
2007				23.4	58.0
2008				23.7	60.0
Subtotal	146			602.2	1093.3

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989	456		1.0	2.2	4.1
1990	504		0.7	0.8	1.6
1991					
1992					
1993	3304	0.1	2.7	2.9	5.8
1994	557		0.4	0.4	0.8
Subtotal	4821	0.1	4.8	6.3	12.3

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988	42		2.0	2.2	4.3
1989	108		4.4	5.0	10.0
1990	121		3.9	4.6	9.6
1991	24		0.7	1.9	4.0
1992	215		10.8	17.3	38.0
1993	200		11.3	7.0	15.5
1994	537	0.5	10.7	17.5	39.5
1995	352	0.3	6.1	19.0	43.5
1996	522	0.3	8.8	18.9	43.8
1997	495	0.3	7.5	16.1	37.6
1998	458	0.3	6.6	24.8	58.5
1999	288	0.3	1.8	12.8	30.5
2000	274	0.3	1.8	5.6	13.6
2001	227	0.3	1.1	8.0	19.7
2002	157	0.4	0.6	6.5	16.2
2003	216	0.3	1.6	5.4	13.8
2004	312	2.3	3.0	5.8	15.1
2005	155	0.1	2.0	3.8	10.1

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Navstar GPS, December 31, 1999

**16b. (U) Program Funding Summary (Cont'd):**  
NAVSTAR GPS User Equip

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal	4703	5.7	84.7	182.2	423.3

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987	11		0.8	0.8	1.4
1988	6		0.5	0.5	1.0
1989	11		0.7	0.7	1.5
1990	17		0.8	1.1	2.3
1991	11		0.4	0.4	0.8
1992	11		0.5	0.8	1.8
1993	9		0.2	0.2	0.4
1994				0.1	0.3
1995				0.5	1.2
1996				1.3	3.1
1997				1.2	2.7
1998				2.3	5.5
1999				1.8	4.2
2000				1.6	3.8
2001				1.1	2.6
Subtotal	76		3.9	14.4	32.6

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986	62	5.7	5.8	12.1	20.0
1987	148	8.1	5.4	13.8	23.6
1988	188	1.3	5.8	7.4	13.2
1989	133	0.4	5.2	6.1	11.2
1990	79	0.6	2.8	3.8	7.2
1991	38	0.1	2.0	3.8	7.3
1992	130	0.1	6.6	8.5	16.9
1993	1840	0.1	4.1	4.4	8.9
1994				2.3	4.8
1995				7.2	15.1
1996				0.6	1.3
1997				1.9	4.1

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Navstar GPS, December 31, 1999

**16b. (U) Program Funding Summary (Cont'd):**  
NAVSTAR GPS User Equip

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				2.2	4.8
1999				4.3	9.4
2000				3.8	8.5
2001				4.2	9.6
2002				3.9	9.0
2003				3.9	9.1
2004				4.5	10.7
2005				4.8	11.8
Subtotal	2618	16.4	37.7	103.5	206.5

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986	67	3.6	4.0	7.7	13.7
1987	133	1.3	3.8	6.3	11.6
Subtotal	200	4.9	7.8	14.0	25.3

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986	70	3.8	1.6	5.6	9.2
1987	60	1.3	1.2	3.1	5.3
1988	147	7.6	4.0	11.9	21.1
1989	175	4.3	3.1	7.6	13.9
1990	1092	5.0	5.2	10.6	20.0
1991	74	3.1	3.0	6.1	11.8
1992	37	9.3	1.3	14.2	28.3
1993	11014	4.3	8.2	13.5	27.4
1994	14318	0.3	12.5	15.6	32.3
1995	15317	0.1	9.7	15.3	32.0
1996	21777	1.3	15.3	22.8	48.5
1997	15074		6.1	12.1	26.1
1998				2.7	5.8
1999				3.6	8.0
2000				2.6	5.9
2001				9.4	21.4
2002	9893	1.7	11.2	14.1	32.7

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Navstar GPS, December 31, 1999

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

NAVSTAR GPS User Equip

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2003	15252	0.6	17.3	21.1	49.8
2004	13828	0.3	15.7	20.0	48.1
2005	12176	0.3	13.8	18.2	44.7
2006	6713	0.5	7.6	12.8	32.0
2007	5030	0.8	5.7	12.5	32.0
2008	16095	0.8	18.3	20.0	52.0
2009	17784		19.6	19.6	52.0
2010	17684		19.2	19.2	52.0
2011	10000		20.1	11.6	32.0
2012	10000		17.0	11.4	32.0
Subtotal	213610	45.4	236.7	337.2	776.3

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985		3.2		4.7	8.0
1986	70	5.5	7.7	23.8	42.4
1987	299	4.5	20.6	40.3	74.8
1988	351	6.9	19.3	53.8	104.8
1989	327	23.3	15.8	58.6	117.8
1990	207	5.1	9.0	28.3	58.6
1991	36	4.1	8.0	12.8	27.6
1992	65	20.5	9.1	47.4	103.9
1993	207	16.3	4.6	41.8	92.9
1994	194	36.8	15.2	70.2	158.5
1995	262	33.3	28.9	78.7	180.2
1996	571	52.8	64.1	120.5	279.4
1997	714	20.9	98.1	123.4	288.9
1998	748	13.9	97.1	115.6	272.3
1999	349	16.3	58.5	75.7	180.0
2000	391	5.4	76.1	83.6	201.7
2001	153	1.6	39.3	42.1	103.1
2002	89	0.2	9.6	24.1	60.0
2003	294		16.8	33.9	86.0
2004	523		21.5	35.4	91.6
2005	552		20.8	44.3	117.1
2006	659		26.0	38.1	102.7
2007	826		24.0	34.4	94.7
2008	872		23.1	35.0	98.0
Subtotal	8759	270.6	713.2	1266.5	2945.0

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Navstar GPS, December 31, 1999

**16b. (U) Program Funding Summary (Cont'd):**  
 NAVSTAR GPS User Equip

(U) Note: Air Force aircraft procurement funding and quantities reflect requirements for aircraft installs (funds controlled within the Global Positioning System (GPS) program element, 0305164F), as well as planned GPS modifications to existing aircraft (funds controlled within each aircraft system program director's program element).

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986	87	1.1	2.3	6.2	10.3
1987	121	0.6	2.2	6.4	11.0
1988	757	0.1	3.8	8.3	14.7
1989	445	0.1	5.7	7.1	13.1
1990	179	0.1	4.3	5.7	10.7
1991					
1992	101		0.1	2.1	4.2
1993	2512		2.2	2.7	5.5
1994	1702		1.4	2.2	4.6
1995	795		0.7	1.8	3.7
1996	812		2.0	2.0	4.2
1997	800		0.4	0.6	1.3
1998	650		0.3	0.7	1.5
1999				1.5	3.3
2000				1.1	2.5
2001				0.7	1.7
2002	1080		1.2	1.9	4.4
2003	1324		1.5	1.9	4.4
2004	1440		1.6	2.0	4.8
2005	1560		1.8	1.8	4.4
2006	1472		1.7	1.9	4.7
2007	1400		1.6	1.8	4.6
2008	1440		1.6	1.8	4.8
Subtotal	18677	2.0	36.4	62.2	124.4

Appropriation: 1804 - Operation and Maintenance, Navy

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				1.7	2.8
1989				2.6	4.6
1990				6.8	12.5
1991				3.3	6.2
1992				3.4	6.7

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Navstar GPS, December 31, 1999

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

NAVSTAR GPS User Equip

Appropriation: 1804 - Operation and Maintenance, Navy

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				2.3	4.6
1994				1.6	3.3
1995				1.4	2.8
1996				1.7	3.5
1997				1.2	2.6
1998				1.3	2.8
1999				0.9	1.9
2000				1.0	2.2
2001				0.9	2.0
2002				0.9	2.0
2003				0.9	2.0
2004				0.9	2.1
2005				0.9	2.2
Subtotal				33.7	66.8

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY 1979 Dollars Nonrec	Flyaway FY 1979 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				0.3	0.5
1993				1.2	2.3
1994				0.6	1.3
1995				0.5	1.0
1996				0.5	1.0
1997				0.4	0.9
1998				0.4	0.8
1999				1.0	2.1
2000				1.5	3.2
2001				1.0	2.2
2002				0.9	2.1
2003				1.0	2.2
2004				2.9	6.8
2005				2.8	6.7
2006				2.5	6.1
2007				2.5	6.2
2008				2.5	6.4
Subtotal				22.5	51.8

(U) Note: Tables do not include DOT funding.

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Navstar GPS, December 31, 1999

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

NAVSTAR GPS User Equip

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD				9.1	18.6
Navy	12218	22.2	131.1	896.8	1686.4
Army	213823	50.3	244.5	470.6	955.2
USAF	27582	272.6	749.6	1953.4	4214.5
Grand Total	253623	345.1	1125.2	3329.9	6874.7

17. (U) Delivery/Expenditure Information:

NAVSTAR GPS Satellite

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	12	12
Procurement	43	46

(U) Percent Total Program Quantities Delivered: 53.2%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 4040.2

(U) Percent Total Program Expended: 35.0%

NAVSTAR GPS User Equip

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	248	248
Procurement	124674	124674

(U) Percent Total Program Quantities Delivered: 49.3%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 3053

(U) Percent Total Program Expended: 44.4%

18. (U) Operating and Support Costs:

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

NAVSTAR GPS Satellite

a. (U) Assumptions and Ground Rules --

Operations and support costs include all costs of operating, maintaining, and supporting the NAVSTAR Global Positioning System (GPS) spacecraft from the dedicated Master Control Station (MCS) located at Schriever Air Force Base (AFB) CO. Also included are the costs for operating, maintaining, and supporting four dedicated GPS Ground Antennas (GAs) (located at Cape Canaveral Air Force Station (AFS) FL, Kwajalein Atoll, the Ascension Islands, and Diego Garcia); and five monitor stations (located at Schriever 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 transfer this data to the MCS to ensure spacecraft are operating as desired. 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. The Sustaining Support cost includes the Material Support Division (MSD) Direct Costs. Costs reflect updates for the fiscal year FY00 President's Budget.

There is no applicable antecedent program.

b. (U) Costs -- (FY 1979 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per NAVSTAR GPS Sat	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.8	0.0
Unit Level Consumption	0.0	N/A
Intermediate Maintenance	0.0	N/A
Depot Maintenance	0.7	N/A
Contractor Support	0.1	N/A
Sustaining Support	0.1	N/A
Indirect Costs	N/A	N/A
Total	1.7	0.0

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

NAVSTAR GPS User Equip

a. (U) Assumptions and Ground Rules --

(1) The operations and support costs are the direct costs to repair, replenish and support the Global Positioning System (GPS) user equipment. The maintenance cost includes the material and labor costs at the organizational and 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 user equipment. 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, including their respective batteries and support equipment. Costs reflect updates for the fiscal year FY00 President's Budget.

There is no applicable antecedent program.

Note: Current estimates for intermediate maintenance is less than \$50,000 and rounded down to zero (0.0).

b. (U) Costs -- (FY 1979 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per NAVSTAR GPS User	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	1.5	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.0	0.0
Indirect Costs	0.0	0.0
SUSTAINING INVESTMENT	35.3	0.0
SYSTEM/PROJECT MGT	5.9	0.0
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Indirect Costs	N/A	N/A
Total	42.7	0.0

AF-8 EELV

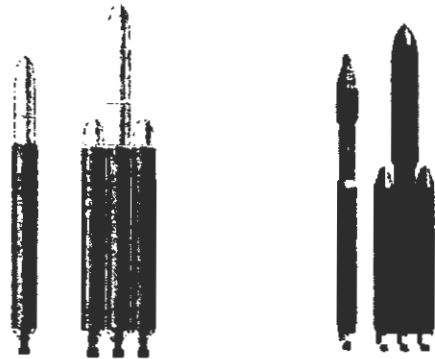
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: EELV

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Evolved Expendable Launch Vehicle (EELV)

2. DoD Component: USAF

3. Responsible Office and Telephone Number:

SMC/MV  
2420 Vela Way, Suite 1467  
El Segundo, CA 90245-4659

Col Robert K. Saxer  
Assigned: May 7, 1999  
DSN 833-4613; COMM (310) 336-4613  
robert.saxer@losangeles.af.mil

4. Program Elements/Procurement Line Items:

RDT&E:  
PE 0603011F  
PE 0603226E  
PE 0603853F  
PE 0604853F

PROCUREMENT:  
APPN 3020 ICN 23EELV (Air Force)

PE 0603853F, 0603226E, and 0603011F reflect sunk funding for FY94-FY98. These Program Elements are no longer reflected in the President's budget. All RDT&E funding is represented by PE 0604853F in the current President's Budget.

SAF/PAS

00-0297

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AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

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00-C-0740

EELV, December 31, 1999

**5. References:**

**SAR Baseline (Development Estimate):**

DAE Approved Acquisition Program Baseline (APB) dated October 15, 1998.

**Approved Program:**

DAE Approved Acquisition Program Baseline (APB) dated October 15, 1998.

**6. Mission and Description:**

The mission of the Evolved Expendable Launch Vehicle (EELV) is to partner with industry to develop a national launch capability that satisfies the Government's national mission model requirements and reduces the cost of space launch by at least 25% over existing systems. The EELV system includes the launch vehicles, infrastructure, support systems, and payload interfaces. EELV will be a family of launch vehicles evolved from current expendable launch systems or components thereof. EELV will support military, intelligence, and civil mission requirements in the National Mission Model (NMM) through 2020 (currently serviced by Titan II, Delta II, Atlas II, and Titan IV).

**7. Executive Summary:**

The EELV Program made significant progress during calendar year 1999 and remains on track for a first commercial MLV launch in calendar year 2001. Launch base leases for Launch Complex 41 at Cape Canaveral Air Station and Space Launch Complex 6 at Vandenberg AFB were signed by Lockheed Martin Astronautics (LMA) on March 31, 1999. LMA is continuing to remove the old tower at Launch Complex 41 at CCAFB, FL they had toppled in October 1999 to make way for the new tower they will erect for Atlas V. Construction continues on the Vertical Integration Facility (VIF), the last level of the structural steel will be in place mid-January 2000. In addition, LMA has successfully rolled out the first stretched Centaur tank for the Atlas V program. This new tank allows for missions requiring longer duration and/or heavier lift. The tank will be flown and flight certified on an upcoming Atlas IIIB mission. LMA also delivered three new production RD-180s to Denver in December 1999 and now has over 17,000 seconds of RD-180 test time.

The first Atlas IIIA commercial vehicle with a Russian built RD-180 engine continues to prepare for a launch in the March-April 2000 time frame. Issues with State Department approval of co-production of the RD-180 engine continue to pace the co-production program with LMA now more than one year behind schedule. The State Department did approve LMA's RD-180 engine brokering license request on September 20, 1999. LMA has informally stated they believe a co-production capability will now take approximately 5 years to complete from time of EMD award (October 1998). SAF/AQ visited Russia in November 1999 to discuss the RD-180 engine program with Energomash and the Russian Government to reinforce the need to move forward on the remaining issues of co-production.

Launch base leases for Launch Complex 37 at Cape Canaveral Air Station and

EELV, December 31, 1999

7. Executive Summary (Cont'd):

Space Launch Complex 3 West at Vandenberg AFB were signed by the Boeing Company on April 30, 1999. Launch site construction continues at SLC-37 at CCAFS FL where Boeing has completed steel framing on the mobile services tower and horizontal integration facility (HIF).

The Boeing Company (TBC) completed their first Common Booster Core (CBC) and production operations continue with excellent progress at their new manufacturing facility in Decatur, Alabama. This facility reached its Initial Operating Capability (IOC) on October 15, 1999. Boeing continues to make progress in testing their RS-68 engine, however, development problems have slowed their test schedules. Over 1300 seconds of test time have been accumulated, but technical issues during full power tests in October and November 1999 were discovered. Design modifications are now defined and full power testing is expected to resume in early February 2000. In the interim, limited testing continues to characterize engine performance and control systems. While limited schedule margin remains to their first commercial launch in April 2001, there is still a year of schedule margin remaining to meet the first Government launch in FY02. On December 16, 1999, Boeing successfully launched the EELV/Delta IV factory transport vessel (Delta Mariner) from Moss Point MS.

In accordance with the EELV Acquisition Program Baseline (APB), Acquisition Strategy, and the Other Transaction (OT) development agreements, Lockheed and Boeing completed system level Tailored Critical Design Reviews (TCDRs) meeting the APB threshold date of December 1999. LMA completed their TCDR in August 1999 and TBC completed their TCDR in October 1999. The EELV TCDR milestone was defined in the OT development agreements as follows: "The CDR shall be conducted at the system level when each configuration item's detail design is essentially complete. This review will focus on the determination of the acceptability of the design solution to meet requirements of Attachment 1" (Attachment 1 is the EELV Systems Performance Requirements Document). The TCDR milestone is considered closed upon the completion of a formal TCDR meeting, approval by the Delta IV and Atlas V Chief Engineers, and the establishment of approved action item closure plans." Each contractor used MIL-STD-1521 as a guide; setting their own internal component, subsystem, and system level CDR schedules. TBC completed 41 incremental CDR reviews leading up to their October 1999 TCDR. LMA held 10 incremental element reviews prior to their August 1999 TCDR. Both contractors received payments for the completion of the TCDR milestone.

The SPO and the Air Force Operational Test and Evaluation Center (AFOTEC) are working to place a full-time AFOTEC member in the SPO to improve AFOTEC's insight into the program. Until this occurs, AFOTEC personnel are supporting the SPO on a TDY basis.

A Request For Proposal (RFP) for the Navy's Ultra High Frequency Follow-On (UHF) program satellite F11 was released on July 20, 1999. Contractor responses were received on August 11, 1999 and an initial evaluation was completed on August 17, 1999. The Initial Mission Determination briefing was delivered to SAF/AQ on September 15, 1999. Final EELV launch service proposal

EELV, December 31, 1999

7. Executive Summary (Cont'd):

actions were placed on hold pending the Navy award of the UFO F/O F11 satellite option on November 9, 1999 to Hughes Space and Communications Division. The Air Force plans to request final launch service proposal revisions in early calendar year 2000 pending the completion of several UFO communication payload alternative studies related to the loss of the Milstar 3 satellite.

A Supplemental Environmental Impact Statement (SEIS) task order addressing the use of solid rocket motors was placed on contract through the Air Force Center for Environmental Excellence (AFCEE) on March 29, 1999. A Record of Decision (ROD) is required prior to government procurement of any solid rocket motor augmented EELVs. On November 5, 1999, the draft SEIS was released for public comment. Public hearings were held on December 7, 1999 at CCAFS and on December 9, 1999 at Vandenberg AFB. A final SEIS incorporating responses to all remaining open issues is expected to enter final coordination in March 2000. A ROD is expected in May 2000.

On February 1, 1999, the DOD/IG began an audit of the EELV program in response to a fiscal 1999 House Appropriations Committee request to certify the EELV program's use of "Other Transactions Authority" (OTA) was appropriate for the program and that adequate safeguards exist to monitor program performance and protect the Government's interest. On December 30, 1999, a final report was published, which confirmed the use of an OTA was appropriate.

At the request of Secretary of the Air Force (SECAF), a Joint Assessment Team (JAT) was established in October 1999 to review the current EELV acquisition and business strategy, evaluate the development status of the EELV program, and complement the ongoing Broad Area Review (BAR) of heritage launch systems. An outbrief to the SECAF of the JAT's findings and recommendations was completed in January 2000. Action plans addressing the JAT team findings and BAR recommendations are in work; completion of these action plans is scheduled for July 2000.

As of December 28, 1999, total FY99 and FY00 RDT&E obligations and expenditures for the EELV program have exceeded goals. Currently, FY00 RDT&E obligations are 76.1% and expenditures are 58.4% of total budget authority. FY99 RDT&E obligations are 99.4% and expenditures are 94.5% of total budget authority. FY00 missile procurement funding to support the FY02 DSCS-01 launch will not be obligated until later this year. All EELV Launch Services are fully funded and fixed price.

The total program quantities reported in this SAR are based on an AFSPC EELV National Mission Model (dated May 24, 1998) covering the period FY02-FY20 and including 117 USAF and 64 NRO missions for a total program quantity of 181 missions.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	DEC 1996	DEC 1996	DEC 1996
Milestone II	JUN 1998	JUN 1998	OCT 1998
Tailored CDR	JUL 1999	JUL 1999	OCT 1999 (Ch-1)
MLV First Operational Flight	DEC 2001	DEC 2001	DEC 2001
Milestone III	JUN 2003	JUN 2003	JUN 2003
Initial Operational Capability	TBD	TBD	TBD
HLV First Operational Flight	JUL 2003	JUL 2003	JUL 2003

Notes:

MLV First Operational Flight - MLV and HLV Operational Flight dates are based on operational satellite need dates. If satellite need dates are postponed - MLV and HLV objective and threshold dates will also move.

Milestone III - The DAE approved OIPT reviews for FY00 and FY02 as briefed at the DAB Readiness Meeting.

Initial Operational Capability - IOC dates are event-driven based on ORD definitions. The DAE approved APB reflects an IOC objective date sometime in FY03 and a IOC threshold date sometime in FY04.

HLV First Operational Flight - MLV and HLV Operational Flight dates are based on operational satellite need dates. If satellite need dates are postponed - MLV and HLV objective and threshold dates will also move.



9a. Schedule (Cont'd):

Acronym List:

CDR Critical Design Review  
 MLV Medium Launch Vehicle  
 HLV Heavy Launch Vehicle  
 DAE Defense Acquisition Executive  
 OIPT Overarching Integrated Product Team  
 DAB Defense Acquisition Board  
 IOC Initial Operational Capability  
 ORD Operational Requirements Document  
 APB Acquisition Program Baseline

b. Current Change Explanations --

(Ch-1) Tailored CDR from JUL 1999 to OCT 1999. The Tailored Critical Design Review (TCDR) milestone was moved from July 1999 to October 1999 (the threshold for this milestone is December 1999). The System Program Director (SPD) postponed TCDR milestone completion until October 1999 to ensure each contractor's system level design was complete.

10. Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Performance Mass to Orbit				
LEO: 100nm X 100nm 63.4 deg (lbs)	19,550 (15%)	19,550 / 17,000 (15%) /	TBD	17,000
POLAR 1: 450nm x 450nm, 98.2 deg (lbs)	5,060- 8,050	5,060- / 4,400- 8,050 / 7,000	TBD	4,400- 7,000
POLAR 2: 100nm x 100nm, 90 deg (lbs)	43,050 (5%)	43,050 / 41,000 (5%) /	TBD	41,000
SEMI-SYNC: 10,998nm x 100nm, 38.8 deg (lbs)	2,875- 5,152	2,875- / 2,500- 5,152 / 4,725	TBD	2,500- 4,725
GTO: 19,324nm x 90nm, 27 deg (lbs)	7,015- 9,775	7,015- / 6,100- 9,775 / 8,500	TBD	6,100- 8,500
MOLNIYA: 21,150nm x 650nm, 63.4 deg (lbs)	8,050 (15%)	8,050 / 7,000 (15%) /	TBD	7,000
GEO: 19,323nm x 19,323nm, 0 deg (lbs)	14,175 (5%)	14,175 / 13,500 (5%) /	TBD	13,500
Vehicle Design Reliability (%) Standardization	>98	>98 / 98	TBD	98

10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Launch Pads	Standard ized and able to launch all configs of EELV for that site	Standard/ ized and/ able to / able to launch / all / all configs / of EELV for/ that / site	TBD	Standard ized and able to launch all configs of EELV for that site
Payload interfaces	One std payload inter- face	One std / payload / inter- / face / for each / vehicle / class / (add'l / inter- / face / rqmts / met / by / payload / adapter)	TBD	Std payload interfac e for each vehicle class (add'l inter- face rqmts met by payload adapter)

Acronym List:

LEO Low Earth Orbit  
 POLAR Polar Orbit  
 SEMI-SYNC Semi-Synchronous Orbit  
 GTO Geosynchronous Transfer Orbit  
 MOLNIYA MOLNIYA Highly Inclined Highly Elliptical Orbit  
 GEO Geosynchronous Orbit

b. Current Change Explanations -- None

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

a. Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	1344.0	1344.0	1352.8
Procurement	11772.6	11772.6	11874.6
Flyaway Cost	(11772.6)		(11874.6)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1995 Base-Year \$	13116.6	13116.6	13227.4
 Escalation	 4231.2	 4231.2	 4017.2
Development (RDT&E)	(107.1)	(107.1)	(102.3)
Procurement	(4124.1)	(4124.1)	(3914.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	17347.8	17347.8	17244.6

Notes:

The current estimate is based on an AFSPC EELV National Mission Model (dated May 24, 1998) covering the period FY02-FY20 and including 181 USAF and NRO missions. 117 of the 181 missions are USAF and 64 are NRO. AFSPC EELV National Mission Model updates will require annual revisions to the total EELV procurement cost estimate.

On October 15, 1998, the MDA authorized the Air Force to award Initial Launch Services (ILS) through FY06. On October 16, 1998, the Air Force awarded ILS contracts for 24 of the 34 USAF missions in the FYDP, and for four (4) NRO missions. Since the December 1998 SAR submission, four of the awarded Air Force launch services have been rescheduled outside of the FYDP (FY00-FY05). The remaining 10 USAF FYDP missions currently in the President's Budget include two (2) FY06 missions and eight (8) FY07 missions (funded in FY04-FY05). These missions will be awarded in a Follow On Launch Services (FOLS) contract(s).

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>181</u>	<u>181</u>	<u>181</u>
Total	181	181	181

Notes:

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

There is no Low Rate Initial Production (LRIP) for this program.

All EELV Launch Services are fully funded and fixed price. Any reductions to procurement funding will result in launch cancellation(s), or delay(s) of at least one year.

Because the program is an ongoing commercial competition, the actual launch service prices remain competition sensitive.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (OCT 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	13116.6	13227.4	
(2) Quantity	181	181	
(3) Unit Cost	72.467	73.080	+0.85
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	11772.6	11874.6	
(2) Quantity	181	181	
(3) Unit Cost	65.042	65.606	+0.87

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1451.1	15896.7	-	17347.8
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-6.3	-271.3	-	-277.6
Quantity	-	-	-	-
Schedule	-	+105.8	-	+105.8
Engineering	-	-	-	-
Estimating	+10.3	+58.3	-	+68.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+4.0	-107.2	-	-103.2
Total Changes	+4.0	-107.2	-	-103.2
Current Estimate	1455.1	15789.5	-	17244.6

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1344.0	11772.6	-	13116.6
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+8.8	+102.0	-	+110.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+8.8	+102.0	-	+110.8
Total Changes	+8.8	+102.0	-	+110.8
Current Estimate	1352.8	11874.6	-	13227.4

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

b. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-6.3
	Adjustment for Current and Prior Inflation. (Estimating)	+2.3	+2.4
	Program funding reduced in support of congressional rescissions, assessments and other funding documents (Estimating)	-22.4	-24.0
	Development agreements to be reimbursed \$20M in FY01 to offset prior funding reduction (Estimating)	+18.3	+20.0
	Outyear funding reduction for inflation reimbursed to prevent government default on development agreements (Estimating)	+9.6	+10.5
	Program funding reduced in support of projected FFRDC reductions (Estimating)	-2.3	-2.6
	Revised estimate to reflect changes in economic assumptions (Estimating)	+3.3	+4.0
	RDT&E Subtotal	+8.8	+4.0
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-271.3
	Rephase of annual procurement buy profile. (Schedule)	0.0	+105.8
	Adjustment for Current and Prior Inflation. (Estimating)	+0.5	+0.5
	Congressional Assessments/Adjustments (Estimating)	-2.5	-2.7
	Launch Services Adjustment (Estimating)	-418.7	-475.6
	Programmatic Adjustment (Estimating)	+43.2	+49.8
	Adjustment to estimate to reflect FY00 Presidents Budget (Estimating)	-296.3	-345.2
	Market Reassessment - These potential cost increases are the direct result of reductions in the number of commercial launches forecasted to occur during the 20 year EELV life cycle. These potential cost increases will fluctuate year to year and be affected by competition, market conditions, and estimating methodology. (Estimating)	+775.8	+831.5
	Procurement Subtotal	+102.0	-107.2

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
95.84	-1.53	--	+0.58	--	+0.38	--	--	-0.57	95.27

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
87.83	-1.50	--	+0.58	--	+0.32	--	--	-0.60	87.23

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	DEC 1996	DEC 1996	N/A	DEC 1996
Milestone II	JUN 1998	JUN 1998	N/A	OCT 1998
Milestone III	JUL 2003	JUN 2003	N/A	JUN 2003
FUE/IOC	TBD	TBD	N/A	TBD
Total Cost	2000	17347.8	N/A	17244.6
Total Quantity	N/A	181	N/A	181
Prog Acq Unit Cost	N/A	95.84	N/A	95.27

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

There is no Low Rate Initial Production (LRIP) for this program.

All EELV Launch Services are fully funded and fixed price. Any reductions to procurement funding will result in launch cancellation(s), or delay(s) of at least one year.

Because the program is an ongoing commercial competition, the actual launch service prices remain competition sensitive.

15a. Contract Information (Cont'd):

a. RDT&E --			Initial Contract Price		
<u>Prototype Dev. Agreement:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Lockheed Martin Corp., Denver, CO			\$500.0	N/A	0
F04701-98-9-0004, Other Trans Agr					
Award: October 16, 1998					
Definitized: October 16, 1998					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$500.0	N/A	0	\$500.0	\$500.0	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this Other Trans Agr contract.

<u>Prototype Dev. Agreement:</u>			Initial Contract Price		
McDonnell Douglas Corp., Huntington Beach CA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F04701-98-9-0005, Other Trans Agr			\$500.0	N/A	0
Award: October 16, 1998					
Definitized: October 16, 1998					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$500.0	N/A	0	\$500.0	\$500.0	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this Other Trans Agr contract.

Contract Comments:

McDonnell Douglas Corporation is a wholly-owned subsidiary of the Boeing Company.



15b. Contract Information (Cont'd):

b. Procurement --  
Initial Launch Services:  
 Lockheed Martin Corp., Denver, CO  
 F04701-98-D-0001, Firm Fixed Price  
 Award: October 16, 1998  
 Definitized: October 16, 1998

			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$649.0	N/A	9		

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$649.0	N/A	9	\$649.0	\$649.0	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this Firm Fixed Price contract.

Initial Launch Services:  
 McDonnell Douglas Comm., Huntington Beach CA  
 F04701-98-D-0002, Firm Fixed Price  
 Award: October 16, 1998  
 Definitized: October 16, 1998

			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$1378.0	N/A	19		

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1378.0	N/A	19	\$1378.0	\$1378.0	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this Firm Fixed Price contract.

Contract Comments:

•McDonnell Douglas Corporation is a wholly-owned subsidiary of the Boeing Company.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-20)	<u>Total</u>
RDT&E	547.7	318.0	333.0	256.4	1455.1
Procurement	-	68.1	359.6	15361.8	15789.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	547.7	386.1	692.6	15618.2	17244.6

b. Annual Summary -- EELV

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1995 Dollars Nonrec</u>	<u>Flyaway FY 1995 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				9.8	9.8
1995				29.6	30.0
1996				107.1	110.7
1997				60.1	62.9
1998				87.6	92.3
1999				227.6	242.0
2000				295.4	318.0
2001				304.7	333.0
2002				219.9	244.0
2003				11.0	12.4
Subtotal				1352.8	1455.1

National User Funding Breakout (TY\$M) (Included in above)

FY96: 72.3  
 FY97: 18.6  
 FY98: 5.1

ARPA Funding (TY\$M) (Included in above)

FY94: 9.8

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	1		62.3	62.3	68.1
2001	4		323.7	323.7	359.6
2002	5		397.1	397.1	448.7
2003	7		472.7	472.7	544.1
2004	7		438.7	438.7	515.1
2005	6		362.4	362.4	434.0
2006	12		1033.5	1033.5	1262.4
2007	11		708.7	708.7	883.1
2008	13		950.9	950.9	1208.5
2009	13		808.3	808.3	1047.8
2010	13		809.2	809.2	1069.9
2011	13		808.3	808.3	1090.1
2012	14		793.9	793.9	1092.2
2013	12		762.1	762.1	1069.4
2014	8		481.5	481.5	689.1
2015	12		761.2	761.2	1111.3
2016	11		632.7	632.7	942.1
2017	7		424.4	424.4	644.6
2018	12		772.1	772.1	1196.2
2019			35.4	35.4	56.0
2020			35.5	35.5	57.2
Subtotal	181		11874.6	11874.6	15789.5

Notes:

Recurring Flyaway Dollars in any given year are not associated with or a reflection of all the dollars related to the quantities in that year.

PE 0603853F, 0603226E, and 0603011F reflect sunk funding for FY94-FY98. These Program Elements are no longer reflected in the President's budget. All RDT&E funding is represented by PE 0604853F in the current President's Budget.

The current estimate is based on an AFSPC EELV National Mission Model (dated May 24, 1998) covering the period FY02-FY20 and including 181 USAF and NRO missions. 117 of the 181 missions are USAF and 64 are NRO. AFSPC EELV National Mission Model updates will require annual revisions to the total EELV procurement cost estimate.

On October 15, 1998, the MDA authorized the Air Force to award Initial Launch Services (ILS) through FY06. On October 16, 1998, the Air Force awarded ILS contracts for 24 of the 34 USAF missions in the FYDP, and for four (4) NRO missions. Since the 1998 SAR submission, four of the awarded Air Force launch services have been rescheduled outside of the FYDP

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

(FY00-FY05). The remaining 10 USAF FYDP missions currently in the President's Budget include two (2) FY06 missions and eight (8) FY07 missions (funded in FY04-FY05). These missions will be awarded in a Follow On Launch Services (FOLS) contract(s).

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	181		11874.6	13227.4	17244.6

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 714.9

Percent Total Program Expended: 4.1%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

All O&S costs are funded by Air Force Space Command (AFSPC) and reflect the September 1, 1998 Milestone II OSD CAIG approved baseline.

Notes:

O&S costs are allocated across all 181 EELV missions. Actual O&S cost per launch is dependent upon configuration and/or mission.

No comparable O&S data for the antecedent systems is available.

b. Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	EELV O&S Cost per Launch	Delta/Atlas/Titan
Mission Pay & Allowances	1.1	N/A
Unit Level Consumption	0.6	N/A
Intermediate Maintenance	0.0	N/A
Depot Maintenance	0.0	N/A
Contractor Support	0.0	N/A

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EELV, December 31, 1999

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

b. Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	EELV O&S Cost per Launch	Delta/Atlas/Titan
Sustaining Support	4.5	N/A
Indirect Costs	0.0	N/A
Total	6.2	N/A

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: TRIDENT II MISSILE

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Sea Launched Ballistic Missile-UGM 133A TRIDENT II (D-5) Missile
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:  
 STRATEGIC SYSTEMS PROGRAMS                      RADM JOHN F. SHIPWAY  
 NEBRASKA AVENUE COMPLEX                      Assigned: April 28, 1998  
 287 SOMERS COURT NW SUITE 10041              DSN 764-1609; COMM (202) 764-1609  
 WASHINGTON, DC 20393-5446                      SP00@SSP.NAVY.MIL
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
     (U) PE 0603371N Project J0951  
     (U) PE 0604363N Project J0951  
 PROCUREMENT:  
     (U) APPN 1507 ICN 1150 (Navy)

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TRIDENT II MISSILE, December 31, 1999

5. (U) References:

SAR Baseline (Production Estimate):

(U) 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.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated May 25, 1995.

6. (U) Mission and Description:

(U) The TRIDENT II (D-5) Strategic Weapons System (SWS) 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. (U) Executive Summary:

(U) In March 1980 the Secretary of Defense described a Sea Launched Ballistic Missile Modernization Advanced Development Program to Congress. Subsequently, a FY 1983 Defense System Acquisition Review Council Milestone II decision selected a weapon system option to achieve specific performance objectives with an Initial Operational Capability (IOC) of CY 1989. In October 1983, the Deputy Secretary of Defense 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. Flight testing from the flat pad at Cape Canaveral was completed in January 1989 with fifteen flight tests fully successful, one flight partially successful, two flights failing to meet test objectives, and one flight terminated by the range safety officer as a "no test." The first TRIDENT II (D-5) Performance Evaluation Missile (PEM) was launched from the SSBN 734 (USS TENNESSEE) on March 21, 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 August 2, 1989 was fully successful while the third PEM launched on August 15, 1989 experienced a control loss early in first stage flight. After corrective actions were completed, PEM flight tests resumed in December 1989 with six fully successful tests and the PEM flight test program was completed in February 1990. The system achieved IOC in March of 1990 with the outload and deployment of the SSBN 734.

Beginning with the FY 1994 President's Budget, both the annual procurement rate of missiles and the missile inventory objective were reduced. The maximum facilitated rate was reduced from 72 missiles per year to 24 per year. The annual procurement quantities have been reduced over time from a high of 66 per

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7. (U) Executive Summary (Cont'd):

year in FY 1988 and FY 1989 to the new facilitized rate of 24 missiles per year in FY 1994, to 12 per year in FY 1998 and thereafter. The inventory objective of TRIDENT II (D-5) missiles has changed as a result of reductions in flight test program requirements and force structure. The current force structure is based on the outcome of the Department of Defense's Nuclear Posture Review and is in accordance with Presidential Decision Directive/NSC-30 of September 21, 1994. Four TRIDENT I (C-4) configured submarines will be backfit to the TRIDENT II (D-5) configuration for a total force structure of 14 TRIDENT II (D-5) SSBNs.

Because of the low annual procurement quantities the Navy began looking at ways to preserve the industrial base in a cost-effective manner. The acquisition strategy adopted for FY 1996 and subsequent years is based on affordable low rate production augmented by critical component production continuity quantities as required to ensure quality, reliability and safety. This approach minimizes both annual funding requirements and program risk associated with supplier base instability.

In 1998 the Navy reduced the inventory objective for the 14 SSBN program from 434 missiles to 425 missiles by reducing the number of TRIDENT test flights. This reduction in test flights resulted from a reevaluation of the test flight data needed to ensure the TRIDENT weapon system's reliability and safety. The Director, Strategic Systems Programs concluded that some of the Demonstration and Shakedown Operation (DASO) flight test data, previously not used to calculate system reliability and safety, can be used to complement Follow-on Commander-in-Chief (CINC) Evaluation Test (FCET) data. Use of the DASO data reduces the number of FCET tests required to ensure weapon system reliability and safety. This change assumes appropriate adjustments to DASO procedures to make DASO flight tests more representative of tactical conditions and the continued success of flight tests.

Also during 1998, the Department determined that the planned service life of the TRIDENT SSBNs could be extended by 12 years from 30 to 42 years. This extension delays the need for funds to replace these platforms, effectively delaying the expenditure of up to \$25 Billion in new construction costs. It also creates the need to extend the service life of the TRIDENT II (D-5) missile to match the extended SSBN service life. The Navy is currently examining alternatives to extend the service life of the D-5 missile.

All TRIDENT II (D-5) submarines have completed strategic loadout and deployed. The dates submarines completed strategic loadout and deployed are: the SSBN 734 in March 1990, the SSBN 735 in October 1990, the SSBN 736 in September 1991, the SSBN 737 in June 1992, the SSBN 738 in May 1993, the SSBN 739 in May 1994, the SSBN 740 in June 1995, the SSBN 741 in July 1996, the SSBN 742 in August 1997 and the SSBN 743 in October 1998.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	NO
Performance	NO
Cost -- RDT&E	NO
-- Procurement	NO
-- MILCON	NO
-- O&M	NO
-- Program Acquisition Unit Cost (PAUC)	NO
-- Average Procurement Unit Cost (APUC)	NO

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	NO
Average Procurement Unit Cost	NO

9. (U) Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I (Initiate Concept Definition)	OCT 1977	OCT 1977	OCT 1977
Commence Advanced Dev Phase	OCT 1980	OCT 1980	OCT 1980
Milestone II (Commence FSD)	OCT 1983	OCT 1983	OCT 1983
First Development Flight Test	JAN 1987	JAN 1987	JAN 1987
Milestone III (Production Approval)/ Award Initial Missile Production	APR 1987	APR 1987	APR 1987
IOC (may be less than full msl outload)	DEC 1989	DEC 1989	MAR 1990

b. Current Change Explanations -- None

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10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
(b)(1) Max Range Full Payload (nm)	(b)(1)	(b)(1)	(b)(1)	(b)(1)
(b)(1) System Circular Error Probable (CEP) (ft)	(b)(1)	(b)(1)	(b)(1)	(b)(1)
(b)(1) System Reliability	(b)(1)	(b)(1)	(b)(1)	(b)(1)
(b)(1) Max Payload - Yield	(b)(1)	(b)(1)	(b)(1)	(b)(1)

(Ch-1)

b. Current Change Explanations --

(b)(1)	(b)(1)	(b)(1)
(b)(1)	(b)(1)	(b)(1)

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	8434.9	8420.5	8414.8
Procurement	17588.5	12098.9	11931.6
Flyaway	(14471.2)		(8526.4)
Other weapon systems	(3082.9)		(3381.5)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(34.4)		(23.7)
Construction (MILCON)	532.9	363.2	371.2
Acquisition O&M	0.0	0.0	0.0
Total FY 1983 Base-Year \$	26556.3	20882.6	20717.6
Escalation	8962.2	7286.9	6466.2
Development (RDT&E)	(1018.3)	(998.9)	(996.5)
Procurement	(7808.4)	(6221.4)	(5396.7)
Construction (MILCON)	(135.5)	(66.6)	(73.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	35518.5	28169.5	27183.8

b. (U) Quantity --

Development (RDT&E)	30	28	28
Procurement	815	434	425
Total	845	462	453

c. Foreign Military Sales -- None.

d. (U) Nuclear Costs -- (b)(1) Department of Energy cost (b)(1) Million (Then-Year \$).

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12. (U) Unit Cost Summary:

	UCR Baseline (MAY 1995 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1983 BY\$)	20882.6	20717.6	
(2) Quantity	462	453	
(3) Unit Cost	45.200	45.734	+1.18
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1983 BY\$)	12098.9	11931.6	
(2) Quantity	434	425	
(3) Unit Cost	27.878	28.074	+0.70.

13. (U) Cost Variance Analysis:

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

	RDTEE	PROC	MILCON	TOTAL
Production Estimate	9453.2	25396.9	668.4	35518.5
Previous Changes:				
Economic	-21.5	-364.1	-11.3	-396.9
Quantity	-48.0	-10049.3	-	-10097.3
Schedule	-	+1555.3	+25.6	+1580.9
Engineering	-	-	-	-
Estimating	+27.6	+305.7	-234.1	+99.2
Other	-	-	-	-
Support	-	+651.2	-	+651.2
Subtotal	-41.9	-7901.2	-219.8	-8162.9
Current Changes:				
Economic	-	-24.8	0.0	-24.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-236.4	-4.4	-240.8
Other	-	-	-	-
Support	-	+93.8	-	+93.8
Subtotal	-	-167.4	-4.4	-171.8
Total Changes	-41.9	-8068.6	-224.2	-8334.7
Current Estimate	9411.3	17328.3	444.2	27183.8

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

(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	-5630.9	-	-5670.9
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+19.9	-180.3	-159.3	-319.7
Other	-	-	-	-
Support	-	+233.7	-	+233.7
Subtotal	-20.1	-5577.5	-159.3	-5756.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-133.6	-2.4	-136.0
Other	-	-	-	-
Support	-	+54.2	-	+54.2
Subtotal	-	-79.4	-2.4	-81.8
Total Changes	-20.1	-5656.9	-161.7	-5838.7
Current Estimate	8414.8	11931.6	371.2	20717.6

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-31.8
Economic adjustment for negative program change. (Economic)	N/A	+7.0
Adjustment for Current and Prior Inflation. (Estimating)	+2.2	+3.6
Revised Estimates based on contract experience. (Estimating)	-3.0	-5.2
Revised estimate for required guidance systems. (Estimating)	-132.8	-234.8
Adjustment for Current and Prior Inflation. (Support)	+1.1	+1.8
Revised estimate for initial spares. (Support)	+0.1	+0.2
Revised estimate for warhead components. (Support)	-6.9	-12.9
Revised estimates for end of production costs. (Support)	+15.4	+29.1
Revised estimates for age-driven replacement of the Mk-4 Arming, Fuzing and Firing System. (Support)	+4.4	+7.4
Revised estimates for production support. (Support)	+10.7	+14.7

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised estimates for costs associated with outfitting the Strategic Weapons Facility, Pacific to support D-5. (Support)	+10.7	+18.1
Revised estimates for test flight instrumentation hardware. (Support)	+18.7	+35.4
Procurement Subtotal	<u>-79.4</u>	<u>-167.4</u>
(2) <u>MILCON</u>		
Revised escalation indices. (Economic)	N/A	-0.3
Economic adjustment for negative program change. (Economic)	N/A	+0.3
Elimination of project to modify a wharf at Kings Bay. (Estimating)	-2.4	-4.3
Revised estimates for Bangor Washington TRIDENT II backfit projects. (Estimating)	0.0	-0.1
MILCON Subtotal	<u>-2.4</u>	<u>-4.4</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
42.03	-0.93	+14.09	+3.49	--	-0.31	--	+1.64	+17.98	60.01

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
31.16	-0.92	+4.96	+3.66	--	+0.16	--	+1.75	+9.61	40.77

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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	OCT 1977	OCT 1977	OCT 1977
Milestone II	N/A	OCT 1983	OCT 1983	OCT 1983
Milestone III	N/A	MAR 1987	APR 1987	APR 1987
FUE/IOC	N/A	DEC 1989	DEC 1989	MAR 1990
Total Cost	N/A	37645.1	35518.5	27183.8
Total Quantity	N/A	740	845	453
Prog Acq Unit Cost	N/A	50.87	42.03	60.01

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

a. Procurement --

(U) MISSILE FOLLOW-ON PRODUC:  
 LOCKHEED MARTIN, SUNNYVALE, CA  
 N00030-96-C-0096, CPIF/FF  
 Award: October 1, 1995  
 Definitized: November 30, 1995

Target	Initial Contract Price		Qty
	Target	Ceiling	
\$634.0	N/A		6

Current Contract Price		
Target	Ceiling	Qty
\$642.6	N/A	6

Estimated Price At Completion	
Contractor	Program Manager
\$639.2	\$640.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$7.3	\$-3.0
Cumulative Variances To Date (01/31/99)	\$6.2	\$-4.1
Net Change	\$-0.4	\$-1.1

Explanation of Change:

(U) The (\$0.4) million unfavorable change in cost variance is the result of the motor supplier's additional costs for monitoring casting operations.

The (\$1.1) million unfavorable change in schedule variance is due to casting delays on the production of first stage motors.

(U) Contract Comments:

This contract is completed and will no longer be reported.

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15. (U) Contract Information (Cont'd):

			Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
(U) <u>MISSILE FOLLOW- ON PROD:</u> LOCKHEED MARTIN, SUNNYVALE, CA N00030-96-C-0097, CPIF/FF Award: October 1, 1996 Definitized: November 1, 1996	\$588.1	N/A	14	
Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$594.0	N/A	14	\$593.7	\$593.0
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>
			\$0.0	\$-0.3
Cumulative Variances To Date (10/31/99)			<u>\$1.5</u>	<u>\$-1.3</u>
Net Change			\$1.5	\$-1.0

Explanation of Change:

(U) The \$1.5 million favorable cost variance change is a result of labor efficiencies at the the motor supplier.

The (\$1.0) million unfavorable schedule variance change is the result of subcontract billings not occurring as planned.

			Initial Contract Price	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
(U) <u>MISSILE FOLLOW-ON-PROD::</u> LOCKHEED MARTIN, SUNNYVALE, CA N00030-97-C-0100, CPIF/FF Award: October 1, 1997 Definitized: May 29, 1998	\$536.0	N/A	12	
Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$547.2	N/A	12	\$546.9	\$545.0
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>
			\$-3.2	\$0.3
Cumulative Variances To Date (10/31/99)			<u>\$-2.9</u>	<u>\$1.1</u>
Net Change			\$0.3	\$0.8

Explanation of Change:

(U) The \$0.3 million favorable cost variance change is primarily due to adjustments made to reflect performance data in the first CSSR report from the motor supplier.

The \$0.8 million favorable schedule variance change is a result of earlier

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15. (U) Contract Information (Cont'd):

than planned delivery of Atlantic Research Corporation gas generators.

(U) <u>MISSILE FOLLOW-ON PROD:</u> LOCKHEED MARTIN, SUNNYVALE, CA N00030-98-C-0100, CPIF/FF Award: October 1, 1998 Definitized: November 16, 1998	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$530.0	N/A	5

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$546.0	N/A	5	\$546.0	\$544.4

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (10/31/99)	\$0.5	\$0.3
Net Change	\$0.5	\$0.3

Explanation of Change:

(U) Cost and schedule variance changes are insignificant.

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

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

<u>Appropriation</u>	<u>Prior Years (FY78-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-07)</u>	<u>Total</u>
RDT&E	9411.3	-	-	-	9411.3
Procurement	14054.5	487.1	462.7	2324.0	17328.3
MILCON	420.6	6.0	1.4	16.2	444.2
O&M	-	-	-	-	-
Total	23886.4	493.1	464.1	2340.2	27183.8

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

b. Annual Summary -- TRIDENT II (D-5) MISSILE

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1983 Dollars Nonrec	Flyaway FY 1983 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1978				5.0	5.0
1979				5.0	5.0
1980				25.6	25.6
1981				96.7	96.7
1982				198.4	198.4
1983				343.9	351.0
1984				1368.5	1447.3
1985				1818.1	1982.6
1986				1731.3	1942.3
1987				1355.1	1565.3
1988				862.5	1029.7
1989				439.3	546.5
1990				130.9	169.5
1991				32.1	43.0
1992				1.6	2.2
1993				0.3	0.4
1994					
1995				0.3	0.5
1996				0.2	0.3
Subtotal	28			8414.8	9411.3

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1983 Dollars Nonrec	Flyaway FY 1983 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985				137.7	160.8
1986				420.7	508.4
1987	21		839.8	1075.6	1346.9
1988	66		1314.1	1562.7	2033.5
1989	66		1173.2	1359.8	1839.0
1990	41		796.4	1001.1	1400.6
1991	52		866.4	1054.4	1512.6
1992	28		555.9	745.8	1096.9
1993	21		480.5	653.1	978.1
1994	24		647.8	720.8	1100.7
1995	18		391.0	429.0	665.4
1996	6		118.7	325.3	510.7
1997	7		132.0	199.9	316.9
1998	5		94.3	167.5	268.3
1999	5		107.1	194.6	315.7

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

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1983 Dollars Nonrec	Flyaway FY 1983 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	12		203.6	296.0	487.1
2001	12		197.1	276.8	462.7
2002	12		189.2	277.5	472.1
2003	12		172.6	258.5	448.2
2004	12		172.6	239.0	422.7
2005	5		74.1	295.7	533.3
2006				82.3	151.5
2007				157.8	296.2
Subtotal	425		8526.4	11931.6	17328.3

(U) Procurement costs in FY 2007 include cost to complete funding through FY 2027.

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY 1983 Dollars Nonrec	Flyaway FY 1983 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984				72.8	79.3
1985				73.4	82.4
1986				109.3	126.3
1987				17.6	21.0
1988				14.6	18.1
1989				12.0	15.4
1990				5.7	7.6
1991				51.3	70.5
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000				3.8	6.0
2001				0.9	1.4
2002				2.4	3.9
2003				6.1	10.2
2004				0.4	0.6
2005				0.9	1.5
Subtotal				371.2	444.2

(U) MILCON costs in FY 2000 through FY 2005 are necessary to upgrade facilities

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

at Bangor, Washington in order to support limited TRIDENT II missile processing capability.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	453		8526.4	20717.6	27183.8

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	28	28
Procurement	355	354

(U) Percent Total Program Quantities Delivered: 84.3%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 23120.9

(U) Percent Total Program Expended: 85.1%

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 through FY 2027. The source of the costs displayed is the Program Manager's estimate as reflected in the FY 2001 President's Budget through FY 2005 and extended through FY 2027. The intermediate maintenance costs are for operating the Strategic Weapons Facilities. Depot maintenance costs are for repair of SWS equipments at contractors facilities. Sustaining support costs are for sustaining engineering and acquisition of replacement support equipment, modification kits and spare parts for shipboard systems. Indirect costs are for base operating support. Operating and Support costs and assumptions for the antecedent system TRIDENT I (C-4) have not previously been developed.

Date of estimate: December 31, 1999

b. (U) Costs -- (FY 1983 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost for TRIDENT II Weapon System	N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	0.0	0.0

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

b. (U) Costs -- (FY 1983 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost for TRIDENT II Weapon System	N/A
Intermediate Maintenance	67.2	0.0
Depot Maintenance	74.0	0.0
Contractor Support	N/A	N/A
Sustaining Support	383.5	N/A
Indirect Costs	14.7	N/A
Total	539.4	0.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)  
PROGRAM: DDG 51 DESTROYER

AS OF DATE: December 31, 1999

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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:

PEO TSC	RADM W.W. COBB, JR. USN
2531 JEFFERSON DAVIS HIGHWAY	Assigned: December 3, 1998
ARLINGTON, VA 22242-5165	DSN 332-7396; COMM (703) 602-7396
	cobbww@navsea.navy.mil

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

RDT&E:  
 (U) PE 0604307N  
 PROCUREMENT:  
 (U) APPN 1611 ICN 24222N (Navy)  
 MILCON:  
 (U) PE P-261  
 (U) PE P-263

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FOR OPEN PUBLICATION

AS AMENDED MAR 29 2000 6 AS AMENDED

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

No Security Objection to Open Publication (AS AMENDED)

MAR 28 2000

Office of the Chief of Operations  
Dept. of the Navy

Derived from: OPRINST 55513 38(100)  
Downgrade instructions not subject to automatic downgrade operations  
Declassify on: X4

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**5. (U) References:**

SAR Baseline (Production Estimate):

(U) DCP #1337 Rev 1, Change 1 of August 22, 1986.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated November 10, 1999.

**6. (U) Mission and Description:**

(U) - The DDG 51 is a multi-mission guided missile destroyer designed to operate offensively and defensively, independently, or 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. These ships will respond to Low Intensity Conflict/Coastal and Littoral Offshore Warfare (LIC/CALOW) scenarios as well as open ocean conflict providing or augmenting power projection and forward presence requirements. These ships will bring new capabilities (TBMD, CEC, and Extended Range Guided Munitions) into the fleet, providing improved air and anti-missile defense and improved land attack.

- The DDG 51 Class ships provide outstanding combat capability and survivability characteristics while considering procurement and lifetime support costs. They feature extraordinary seakeeping and low observability characteristics.

- The DDG 51 features the AEGIS Weapon System (AWS), which has quick reaction time, high firepower, and improved Electronic Countermeasures (ECM) capability in Anti-Air Warfare (AAW). The ships' Anti-Submarine Warfare (ASW) System provides superior long range multi-target detection and engagement capability with two embarked LAMPS MK-III helicopters (Flight IIA, DDG 79 and follow). Their Tomahawk and MK-45 gun weapon systems provide excellent strike and surface warfare capability. The AWS is the heart of an integrated combat system that provides area coverage and command/control focus in all dimensions of Naval Warfighting and Joint Military Operations: AAW; ASW; ASU; Command, Control, Communications & Intelligence (C3I); and Strike Warfare (STW).

- Structural features are an all steel hull and deckhouse with vital spaces protected and located within the hull. The ship employs a gas turbine propulsion system with Controllable Pitch propellers similar to the CG 47 class.

- The DDG 51 Destroyer is being produced to fulfill a surface combatant requirement to provide air dominance, maritime dominance and land attack capability including future Theater Ballistic Missile Defense (TBMD).

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7. (U) Executive Summary:

(U) The DDG 51 Class ships incorporate the best warfighting capability U.S. technology can provide. The Navy plans to bring new capabilities into the fleet that will provide the DDG 51 Class Destroyers with improved air and anti-missile defense. These improvements include Theater Missile Defense improvements, Cooperative Engagement Capability to improve air defense, new ship self-defense and command and control systems, long range surface fire and precision land attack, and improvements to the AEGIS radar system to boost its effectiveness in a littoral environment. The capabilities are designed to provide the Navy with its 21st Century fighting edge.

Funding for the lead ship, ARLEIGH BURKE, was provided in FY85 with the lead ship construction contract awarded, as the result of full and open competition, to Bath Iron Works (BIW), Bath, Maine in April 1985. The Navy established Ingalls Shipbuilding Incorporated (ISI) as the second source, by awarding the DDG 52 construction contract in May 1987 in a full and open competition. The FY 2001 President's Budget Submission provided an additional ship and extended the DDG 51 Destroyer Program two additional years. The six ships programmed in FY02/03 in last year's President's Budget Submission, which were to complete the 57 ship Program, have been re-aligned to FY02-FY04 (two ships per year), with the additional (58th) ship programmed for FY05. To date, shipbuilding contracts for 51 ships have been awarded, with 28 delivered and in the fleet meeting mission requirements.

On March 6, 1998, the Navy awarded DDG 51 Class multiyear procurement (MYP) contracts for 12 ships, 3 per year (FY98-01), plus an option for an additional ship in FY98. BIW was awarded six ships and ISI was awarded seven. On December 16, 1999, contract modifications to fund the FY00 portion of the ship construction MYP contracts to BIW and ISI were signed. This MYP acquisition strategy for the DDG 51 Class Destroyer Program is projected to save the Navy \$1.4B.

Based upon the effectiveness and savings associated with the FY98-FY01 MYP, the Navy's budget for the the FY02-FY05 ships is premised upon continuing the MYP acquisition strategy. In order to achieve the savings afforded through the new MYP, the FY 2001 President's Budget Submission includes \$357M of advanced procurement funding required in FY01 to continue the MYP acquisition strategy through completion of the last ship. However, current Congressional Authorizations and Appropriations language does not specifically provide MYP authority for the FY02-FY05 ships. The Navy's approach will require amended legislative language.

On February 2, 1994, the Milestone IV Acquisition Decision Memorandum approved the introduction of Flight IIA Upgrades on the last FY94 ship. The DDG 79 (OSCAR AUSTIN), the first Flight IIA ship, completed Trial Alpha on February 3, 2000. During this trial, the DDG 79 successfully completed the objective to demonstrate her Flight IIA aviation capabilities, and H,M&E and AEGIS Weapon System improvements. The Seahawk (SH-60B) helicopter made 38 clear deck landings and traversed into both helo hangers effectively. The main propulsion plant operated exceptionally well. The stern flap addition may have contributed to the fastest observed speed to date during a DDG 51 Class new

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7. (U) Executive Summary (Cont'd):

construction sea trial. The introduction of the AEGIS Weapon System Baseline 6 Phase I computer program successfully completed demonstrations.

Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

DDG 51 Class ship construction has achieved numerous production milestones since the last (September 30, 1999) report. The more significant are the following:

- DDG 82 (LASSEN) launched October 15, 1999
- USS O'KANE (DDG 77) commissioned October 23, 1999
- DDG 82 (LASSEN) christened November 6, 1999
- DDG 83 (HOWARD) launched and christened November 20, 1999
- DDG 89 (MUSTIN) fabrication started on January 31, 2000
- DDG 79 (OSCAR AUSTIN), the first Flight IIA ship, completed Trial Alpha on February 3, 2000

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No



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9. (U) Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Complete Concept Design	N/A	DEC 1980	DEC 1980
DNSARC I	JUN 1981	JUN 1981	JUN 1981
Complete Preliminary Design	N/A	MAR 1983	MAR 1983
DSARC II	DEC 1983	DEC 1983	DEC 1983
Complete Contract Design	N/A	JUN 1984	JUN 1984
DDG 51 Contract Award	APR 1985	APR 1985	APR 1985
Milestone IIIA	OCT 1986	OCT 1986	OCT 1986
DDG 52 Contract Award	JAN 1987	MAY 1987	MAY 1987
DDG 53 Contract Award	N/A	SEP 1987	SEP 1987
Lay Keel DDG 51	N/A	DEC 1988	DEC 1988
Launch DDG 51	N/A	SEP 1989	SEP 1989
DDG 51 Delivery	N/A	APR 1991	APR 1991
Launch DDG 52	N/A	MAR 1991	MAY 1991
Organic Support Available	N/A	JUL 1991	JUL 1991
Depot Support Available	N/A	JUL 1991	JUL 1991
OPEVAL	N/A	FEB 1992	FEB 1992
DDG 52 Delivery	N/A	MAY 1992	OCT 1992
DDG 51 IOC	OCT 1990	FEB 1993	FEB 1993
DDG 53 Delivery	N/A	FEB 1993	AUG 1993
Milestone IV	N/A	APR 1993	OCT 1993
DDG 51 Flight IIA Contract Award	N/A	MAR 1994	JUL 1994
Complete ESSM COEA	N/A	NOV 1994	NOV 1994
ESSM Milestone IV	N/A	NOV 1994	NOV 1994
SH-60B Hellfire IOC	N/A	DEC 1997	DEC 1997
DDG 51 Flight IIA Delivery	N/A	MAY 2000	MAY 2000
DDG 51 Flight IIA IOC	N/A	OCT 2001	OCT 2001
ESSM IOC	N/A	AUG 2002	AUG 2002

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
<b>SHIP:</b>				
Length (ft)	466	N/A / N/A	471	471
Beam (ft)	59	N/A / N/A	59	59
Navigational Draft (ft)	30.6	N/A / N/A	TBD	31.7
Displacement (long tons)	8300	N/A / N/A	TBD	9300
Propulsion IM (Gas Turbine)	2500	N/A / N/A	2500	2500
Accommodations	341	N/A / N/A	380	380
<b>MOBILITY:</b>				
Speed (knots)	30	30 / 30	TBD	30

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

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Endurance (@ 20 Knots) (nm)	(b)(1)			
ANTI-AIR WARFARE: CONDUCT SUCCESSFUL AAW ENGAGEMENT: Probability of Successful Engagement-ESSM	N/A	TBD / 0.75	TBD	0.75
ANTI-SURFACE WARFARE: CONDUCT SUCCESSFUL ASUW ENGAGEMENT: Probability of Successful Engagement HELO	(b)(1)			
NAVAL SURFACE FIRE SUPPORT Probability of Successful Engagement HELO	(b)(1)			
ANTI-SUBMARINE WARFARE: CONDUCT SUCCESSFUL ASW ENGAGEMENT: Figure of Merit: Probability of Achieving Attack Criteria	(b)(1)			
Number VLS Missiles	(b)(1)			
MINE WARFARE: Detection Range of Moored/Floating Mine (YDS)	(b)(1)			
SIGNATURE: Radar Cross section (dbsm)	(b)(1)			
SURVIVABILITY/ VULNERABILITY: Nuclear Airblast Overpressure (psi)	(b)(1)			
Armament Anti-Submarine Warfare ASW System	AN/SQQ-89	N/A / N/A	TBD	AN/SQQ-89(V)10
ASROC	VLA	N/A / N/A	TBD	VLA

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Helo	SEAHAWK; LAMPS	2	/ 2	TBD	2
		EMBARKED/ HELOS	EMBARKED / HELOS		EMBARKED HELOS
Anti-Air Warfare Launchers	MK 41 VLS	N/A	/ N/A	TBD	MK 41 VLS
Missiles	SM-2 MR	N/A	/ N/A	TBD	SM-2 MR
Missile Fire Control System	3 MK 99	N/A	/ N/A	TBD	3 MK 99
Guns	2 PHALANX	N/A	/ N/A	TBD	2 PHALANX/
Anti-Surface/Strike Warfare					
Guns	1 5"/54	N/A	/ N/A	TBD	1 5"54
Gunfire Control System	MK 160	N/A	/ N/A	TBD	MK 160
Anti-Ship Cruise Missile	HARPOON	N/A	/ N/A	TBD	N/A
Cruise Missile	TOMAHAWK	N/A	/ N/A	TBD	TOMAHAWK
Electronic Warfare	SLQ-32 SRBOC	N/A	/ N/A	TBD	SLQ-32 (V) 3, SRBOC, Combat DF
Radars					
Surface	SPS-67	N/A	/ N/A	TBD	SPS-67
3D	SPY-1D	N/A	/ N/A	TBD	SPY-1D

(U) \*/ General Note: Approved Program, Demonstrated Performance, and Current Estimate are for the Flight IIA configuration. Production Estimates are for the Flight I configuration.

- 1/ There are three types of missiles (SM-2, TOMAHAWK, and VLA) which are shot from 96 tubes.
- 2/ DBSM reduction from conventionally constructed ships of similar displacement, e.g. CG 47 Class ship.
- 3/ For structure and developmental systems.

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

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	979.8	2242.9	2224.7
Procurement	15948.3	39092.2	40599.3
Basic Ship Costs	(5383.6)		(16503.8)
HM&E and Combat Systems	(9427.9)		(21636.2)
Other Costs	(621.9)		(805.2)
OF/PD	(514.9)		(1654.1)
Total Sailaway	(15948.3)		(40599.3)
Other Weapon System			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	25.6	34.8	37.6
Acquisition O&M	0.0	0.0	0.0
Total FY 1987 Base-Year \$	16953.7	41369.9	42861.6
Escalation	3163.8	15842.0	12946.0
Development (RDT&E)	(-63.2)	(397.1)	(391.7)
Procurement	(3224.8)	(15438.7)	(12547.4)
Construction (MILCON)	(2.2)	(6.2)	(6.9)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	20117.5	57211.9	55807.6

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	23	57	58
Total	23	57	58

c. (U) Foreign Military Sales --

There are 40 Japanese AEGIS Weapon System FMS cases totaling \$2.0B. There is also one Spanish AEGIS Weapon System FMS case totaling \$0.7B.

d. (U) Nuclear Costs --

None.

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12. (U) Unit Cost Summary:

	UCR Baseline (NOV 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1987 BY\$)	41369.9	42861.6	
(2) Quantity	57	58	
(3) Unit Cost	725.788	738.993	+1.82
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1987 BY\$)	39092.2	40599.3	
(2) Quantity	57	58	
(3) Unit Cost	685.828	699.988	+2.06

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	-113.7	-4492.2	-	-4605.9
Quantity	-	+31714.7	-	+31714.7
Schedule	+44.8	+926.4	-	+971.2
Engineering	+15.5	+1965.7	+16.7	+1997.9
Estimating	+1764.3	+2005.5	-	+3769.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1710.9	+32120.1	+16.7	+33847.7
Current Changes:				
Economic	-5.1	-525.8	-	-530.9
Quantity	-	+1003.5	-	+1003.5
Schedule	+14.9	+53.4	-	+68.3
Engineering	-	-	-	-
Estimating	-20.9	+1322.4	-	+1301.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-11.1	+1853.5	-	+1842.4
Total Changes	+1699.8	+33973.6	+16.7	+35690.1
Current Estimate	2616.4	53146.7	44.5	55807.6

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

(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	-	+21363.6	-	+21363.6
Schedule	+27.3	-	-	+27.3
Engineering	+11.1	+1293.2	+11.9	+1316.2
Estimating	+1229.5	+400.7	+0.2	+1630.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1267.9	+23057.5	+12.1	+24337.5
Current Changes:				
Quantity	-	+671.4	-	+671.4
Schedule	+9.1	-	-	+9.1
Engineering	-	-	-	-
Estimating	-32.1	+922.1	-0.1	+889.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-23.0	+1593.5	-0.1	+1570.4
Total Changes	+1244.9	+24651.0	+12.0	+25907.9
Current Estimate	2224.7	40599.3	37.6	42861.6

(U) Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year    Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation rates (Economic)	N/A	-5.1
Revised program funding estimates resulting from procurement profile change (Schedule)	+9.1	+14.9
Revised program estimates primarily as a result of removal of Baseline 7 Phase I follow on effort (Estimating)	-32.1	-20.9
RDT&E Subtotal	<u>-23.0</u>	<u>-11.1</u>
(2) <u>Procurement</u>		
Revised escalation rates (Economic)	N/A	-525.8

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	Base-Year	Then-Year
Quantity increase from 57 to 58 (Quantity)	+631.9	+943.3
Outfitting/Post Delivery for additional ship (Quantity)	+39.5	+60.2
Change in profile for the 57 ships previously submitted from 3,3 (FY02/03) to 2,2,2 (FY02-04) (Schedule)	0.0	+53.4
Post Delivery Test and Trial Requirements budgeted in FY 01/02 (Estimating)	+46.4	+61.1
Cost to procure high priority Navy requirements identified in the 1999 SCA and funded in the FY00 Appropriations Act (Transfer Authority) (Estimating)	+26.6	+35.6
Cost to procure high priority Navy requirements identified in the 1999 SCA and funded in the "Completion of Prior Year Shipbuilding Programs" funding line (Estimating)	+109.7	+157.0
Inflation rate impact on FY99 and Prior Years ships (Estimating)	+177.1	+231.4
Revised cost estimates for ship construction, GFE, Outfitting, and Post Delivery (Estimating)	+562.3	+837.3
Procurement Subtotal	+1593.5	+1853.5
(3) MILCON		
Correction of previous SAR (Estimating)	-0.1	0.0
MILCON Subtotal	-0.1	0.0

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1217.10	-233.23	-263.20	+15.10	-25.10	+145.80	--	+18.20	-342.43	874.67

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14a. (U) Unit Cost and Other History (Cont'd):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
874.67	-88.57	+36.29	+17.92	+34.45	+87.44	--	--	+87.53	962.20

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1119.26	-205.16	-197.71	+13.94	+61.66	+27.38	--	+14.24	-285.65	833.61

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
833.61	-86.52	+61.07	+16.89	+33.89	+57.38	--	--	+82.71	916.32

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR	SAR	SAR	Current Estimate
	Planning Estimate (PE)	Development Estimate (DE)	Production Estimate (PdE)	
Milestone I	JUN 1981	JUN 1981	JUN 1981	JUN 1981
Milestone II	MAY 1983	DEC 1983	DEC 1983	DEC 1983
Milestone III	AUG 1986	AUG 1986	OCT 1986	OCT 1986
FUE/IOC	N/A	N/A	OCT 1990	FEB 1993
Total Cost	10953.5	14910.6	20117.5	55807.6
Total Quantity	9	14	23	58
Prog Acq Unit Cost	1217.06	1065.04	874.67	962.2

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

a. Procurement --

(U) DDG 77,79,81 CONSTRUCTIO:

BATH IRON WORKS, BATH, ME  
N00024-94-C-2808, FPI  
Award: July 20, 1994  
Definitized: January 4, 1995

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1039.0	\$1156.9	3	\$1108.3	\$1124.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-137.0	\$-7.1
Cumulative Variances To Date (11/30/99)	\$-129.0	\$-3.9
Net Change	\$8.0	\$3.2

Explanation of Change:

(U) Cost variance improvement is driven by material and overhead. The improvement in the schedule variance is driven by labor and overhead hours.

(U) Contract Comments:

DDG 77 (USS O'KANE) delivered in May 99. DDGs 79/81, the 1st Flight IIA ships at BIW are planned to deliver within contract schedules. DDG 79 completed Trial Alpha on February 3, 2000, successfully demonstrating Flight IIA H,M&E and Combat System improvements. Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements, future changes estimates, nor escalation compensation commitments (\$149.4M).

(U) DDG 78,80,82 CONSTRUCTIO:

INGALLS SHIPBUILDING, INC., PASCAGOULA MS  
N00024-94-C-2800, FPI  
Award: July 20, 1994  
Definitized: January 4, 1995

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1070.3	\$1193.1	3	\$1116.1	\$1111.5

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15. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-55.5	\$-40.4
Cumulative Variances To Date (11/30/99)	\$-70.7	\$-40.0
Net Change	\$-15.2	\$0.4

Explanation of Change:

(U) Cost variance is driven by labor and overhead hours on the DDGs 80 and 82. A highly competitive labor market has impacted Ingalls' skill mix. The Ingalls Journeyman to Apprentice ratio has been unfavorable for some time. Currently, this new skill mix results in lower efficiency than in the past. The schedule variance is driven by labor and overhead hours.

(U) Contract Comments:

This contract introduces the Flight IIA ships (DDGs 80 and 82) at ISI. Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements, future change estimates, nor escalation compensation commitments (\$100.5M). All ships are planned to deliver within contract schedules.

(U) DDG 84,86,88 CONSTRUCTION: INGALLS SHIPBUILDING, INC, PASCAGOULA MS N00024-96-C-2304, FPI Award: June 20, 1996 Definitized: December 13, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1034.9	\$1165.8	3

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1058.3	\$1192.0	3	\$1066.3	\$1103.9

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$1.9	\$-8.0
Cumulative Variances To Date (11/30/99)	\$5.8	\$0.6
Net Change	\$3.9	\$8.6

Explanation of Change:

(U) Improved cost and schedule variances are driven by material. At this stage of contract performance variances are commonly driven by material.

(U) Contract Comments:

Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements nor future changes estimates (\$54.8M). This contract is forward priced, incorporating escalation compensation in the basic contract. All ships are projected to deliver within contract schedules.

15. (U) Contract Information (Cont'd):

(U) DDG 83,85,87 CONSTRU:  
 BATH IRON WORKS, BATH, ME  
 N00024-96-C-2305, FPI  
 Award: June 20, 1996  
 Definitized: December 13, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$1071.3	\$1219.7	3

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$1109.8	\$1259.7	3

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$1109.8	\$1132.9

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$1.7	\$-5.4
Cumulative Variances To Date (11/30/99)	\$-7.2	\$-1.3
Net Change	\$-8.9	\$4.1

Explanation of Change:

(U) Cost variance change is due to performance in Pre-outfit. BIW is constructing an expansion (the Land Level Facility) to its shipyard which will change their entire process of building ships. In preparation for this upcoming change, BIW is readying employees and equipment and altering sub-processes to integrate with the Land Level Facility. The impact of these changes to the Pre-Outfit construction process is driving the cost variance. The improved schedule variance is driven by material timephasing, labor, and overhead.

(U) Contract Comments:

Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements nor future changes estimates (\$38.4M). This contract is forward priced, incorporating escalation compensation in the basic contract. All ships are projected to deliver within contract schedules.

(U) DDG 89,91,93,95,97,98 CO:  
 Ingalls Shipbuilding, Inc, Pascagoula MS  
 N00024-98-C-2307, FPI  
 Award: March 6, 1998  
 Definitized: December 16, 1999

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$2166.5	\$2473.2	6

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$2194.2	\$2504.6	6

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$2185.3	\$2201.5

15. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-1.4	\$4.1
Cumulative Variances To Date (11/30/99)	<u>\$-11.7</u>	<u>\$-7.7</u>
Net Change	\$-10.3	\$-11.8

Explanation of Change:

(U) This contract is very early in the pre-production stage. Cost variance and schedule variances are driven by material on DDGs 89 and 91. Labor activity is minimal at this stage of production and variances are commonly driven by material.

(U) Contract Comments:

This contract reflects 7 MYP ships awarded, to date 6 ships have been funded. Initial Target and Ceiling Prices were increased to reflect the funding of the two FY00 MYP ships in December 1999. Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements nor future changes estimates (\$113.6M).

(U) <u>DDG 90,92,94,96 CONSTRU:</u> Bath Iron Works, Bath, ME N00024-98-C-2306, FPI Award: March 6, 1998 Definitized: December 16, 1999	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1440.5	\$1633.9	4

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1447.4	\$1641.7	4	\$1449.1	\$1492.4

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (11/30/99)	<u>\$-0.3</u>	<u>\$1.0</u>
Net Change	\$-0.3	\$1.0

Explanation of Change:

(U) This contract is very early in the pre-production stage. Cost variance and schedule variances are driven by material. Labor activity is minimal at this stage of production and variances are commonly driven by material.

(U) Contract Comments:

This contract reflects 6 MYP ships awarded, to date 4 have been funded. Initial Target and Ceiling Prices were increased to reflect the funding of the FY00 MYP ship in December 1999. Target Price, Ceiling Price, and Estimated Price at Completion do not include performance incentive arrangements nor future changes estimates (\$87.1M).

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DDG 51 DESTROYER, December 31, 1999

15. (U) Contract Information (Cont'd):

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

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

<u>Appropriation</u>	<u>Prior Years (FY80-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	1820.3	232.6	132.1	431.4	2616.4
Procurement	38756.4	2749.3	3273.7	8367.3	53146.7
MILCON	41.0	-	3.5	-	44.5
O&M	-	-	-	-	-
Total	40617.7	2981.9	3409.3	8798.7	55807.6

b. Annual Summary -- DDG 51 Program

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Sailaway FY 1987 Dollars Nonrec</u>	<u>Sailaway FY 1987 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1980				14.0	10.5
1981				43.1	35.3
1982				118.3	102.0
1983				167.3	150.7
1984				129.8	121.1
1985				144.2	138.8
1986				94.4	93.5
1987				98.5	100.4
1988				88.7	93.4
1989				47.6	52.3
1990				36.1	41.2
1991				73.9	87.5
1992				71.6	87.2
1993				88.7	110.6
1994				80.9	102.7
1995				69.2	89.6
1996				66.3	87.3
1997				61.9	82.5
1998				58.3	78.3
1999				114.7	155.4
2000				169.5	232.6
2001				94.8	132.1
2002				87.2	123.4

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DDG 51 DESTROYER, December 31, 1999

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Sailaway FY 1987 Dollars Nonrec	Sailaway FY 1987 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2003				53.2	76.6
2004				43.9	64.5
2005				39.8	59.6
2006				31.2	47.7
2007				19.1	29.8
2008				9.4	14.9
2009				5.5	8.9
2010				3.6	6.0
Subtotal				2224.7	2616.4

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1987 Dollars Nonrec	Sailaway FY 1987 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984					78.5
1985	1	307.6	898.9	1177.8	1145.8
1986					98.1
1987	3	143.6	2187.5	2255.0	2484.8
1988				4.1	9.7
1989	4		2570.6	2477.4	2876.4
1990	5	11.2	3107.4	3016.9	3626.4
1991	4	2.9	2575.8	2536.1	3173.6
1992	5	29.7	3184.9	3144.1	4057.6
1993	4	6.1	2574.6	2637.8	3401.4
1994	3	65.2	2109.0	2180.9	2797.3
1995	3	28.6	2104.0	2134.1	2795.4
1996	2	42.6	1540.0	1615.1	2333.7
1997	4	27.9	2629.4	2589.6	3625.5
1998	4	105.7	2720.6	2720.5	3528.7
1999	3	46.9	2106.9	2101.2	2723.5
2000	3	29.3	2099.0	2061.5	2749.3
2001	3		2092.3	2118.2	3273.7
2002	2		1446.6	1471.8	2078.7
2003	2		1477.5	1516.9	2135.3
2004	2		1474.7	1495.6	2157.1
2005	1		852.3	950.4	1417.0
2006				118.5	169.4
2007				108.8	158.7
2008				95.8	142.5
2009				52.2	79.2
2010				19.0	29.4
Subtotal	58	847.3	39752.0	40599.3	53146.7

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DDG 51 DESTROYER, December 31, 1999

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

(U) FY 84 and FY 86 Then Year figures are for advanced procurement for FY 85 and FY 87, respectively. The associated Base Year amounts are reflected in the year of the end item procurement.

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Sailaway FY 1987 Dollars Nonrec	Sailaway FY 1987 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986				4.5	4.6
1987					
1988				13.4	14.7
1989				7.5	8.5
1990					
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998				9.7	13.2
1999					
2000					
2001				2.5	3.5
Subtotal				37.6	44.5

	Qty	Sailaway Dollars Nonrec	Sailaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	58	847.3	39752.0	42861.6	55807.6

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	28	28

(U) Percent Total Program Quantities Delivered: 48.3%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 31193.7

(U) Percent Total Program Expended: 55.9%

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18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The O&S estimate projects costs for a 58 ship buy and encompasses eight different baselines and three variants, the Flight I, II, and IIA designs. The Flight IIA design begins with the last ship in fiscal year 1994. Estimates are based almost exclusively on DDG 51 Class actual operating experience cost information from the Visibility and Management of Operating and Support Cost (VAMOSC) database collected through 1998. The average annual cost per ship for Operating and Support costs is estimated at \$38.6M in FY87 dollars.

Manning levels are based on a "peace-time" operating tempo, with direct and indirect manpower rates obtained from the Naval Center for Cost Analysis (NCCA) and Cost of Manpower Estimating Tool (COMET). These estimates were made in accordance with DoD 5000.4M "Department of Defense Cost Analysis Guidance and Procedures" (Dec 92) and the Office of the Secretary of Defense "Cost Analysis Improvement Group, Operating and Support Cost Estimating Guide" (May 92).

b. (U) Costs -- (FY 1987 Constant (Base-Year) Dollars in Millions)

Cost Element	DDG 51 Class Average Annual Cost Per Ship (FY87\$)	Average Annual Cost Per Ship
Mission Pay & Allowances	10.8	0.0
Unit Level Consumption	4.5	0.0
Intermediate Maintenance	0.2	0.0
Depot Maintenance	9.6	0.0
Contractor Support	0.5	0.0
Sustaining Support	3.4	0.0
Indirect Costs	9.6	0.0
Total	38.6	0.0



AF-3 AMRAAM

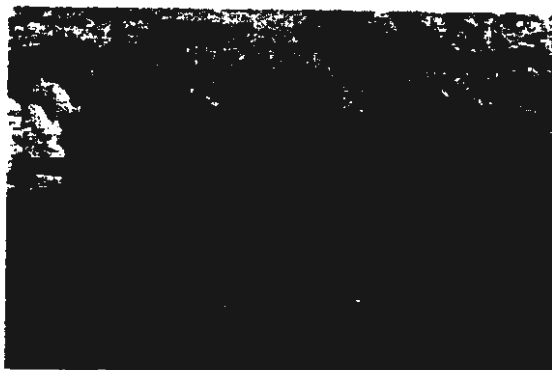
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: AMRAAM (AIM-120)

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM)

2. (U) DoD Component: USAF

Joint Participants:  
USAF/USN

3. (U) Responsible Office and Telephone Number:

Air-to-Air Joint Systems Program Office (JSPO)	SES JUDY A. STOKLEY
AAC/YA	Assigned: June 10, 1997
Eglin AFB, FL 32542-6844	DSN 872-3531; COMM (850) 882-3531 stokley@eglin.af.mil

(U) Navy Program Director	RICHARD T. CALANO
Air-to-Air Joint Systems Program Office (AAC/YA)	Assigned: October 26, 1997
EGLIN AFB, FL 32542-6844	AV 872-2412 COMM (904) 882-2412 calanor@eglin.af.mil

4. (U) Program Elements/Procurement Line Items:  
RDT&E:

(U)	PE 0207163F	
(U)	PE 0207163N	Project E0981 (Shared)
(U)	PE 0603316F	
(U)	PE 0603370F	
(U)	PE 0603370N	Project W0981

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AMRAAM (AIM-120), December 31, 1999

4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) PE 0604314F  
(U) PE 0604314N Project E0981 (Shared)  
(U) PE 063370F

PROCUREMENT:

(U) APPN 1507 ICN 2206 (Navy)  
(U) APPN 3020 ICN MAMRAO (Air Force)

5. (U) References:

SAR Baseline (Production Estimate):

(U) DAE Approved Acquisition Program Baseline dated January 17, 1992.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated September 27, 1996.

6. (U) Mission and Description:

(U) The AMRAAM program provides for the acquisition of the most advanced all-weather, all-environment medium range air-to-air missile system in response to USAF, USN, NATO, and other allied operational requirements for the 1989-2007 time period. The system is an active radar guided intercept missile with inherent Electronic Protection (EP) capabilities for air-to-air applications against massed penetration aircraft and is designed to augment the AIM-7 Sparrow.

7. (U) Executive Summary:

(U) In January 1979 Defense Systems Acquisition Review Council (DSARC) Milestone I validated the requirement for AMRAAM. In January 1989 Full Scale Development flight testing was completed by the Hughes Aircraft Company and the Raytheon Company completed second-source qualification. AMRAAM Initial Operational Capability on the F-15 occurred in September 1991, and the first F-16 unit established Full Operational Capability in January 1992. In April 1992 a follow-up to the Defense Acquisition Board (DAB) Milestone IIIB review authorized full-rate production for the FY93 procurement. Successful completion of the Navy Operational Evaluation occurred in March 1994. The first missile incorporating the Phase 1 Pre-Planned Product Improvement (P3I) missile design was delivered in November 1995, providing increased Electronic Protection capability and a compressed airframe for F-22 internal carriage. Under the P3I program, a new software tape was fielded in June 1997 to substantially improve weapon effectiveness in the presence of Electronic Counter Measures (ECM). In December 1997 Raytheon and Hughes merged into the Raytheon Systems Company. The Lot 12 production contract was awarded on 13 April 1998 with priced options for Lots 13, 14, and 15. This contract included a long term pricing agreement with the single producer and the contractor assumption of Total Systems Performance Responsibility (TSPR). The merger and the new acquisition strategy decreased FY98 and later costs. The AMRAAM Massachusetts missile production transition to Tucson AZ was accomplished in May 1998. Twelve countries have AMRAAM operational capability: Belgium,

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AMRAAM (AIM-120), December 31, 1999

7. (U) Executive Summary (Cont'd):

Denmark, Finland, Germany, Greece, Netherlands, Norway, South Korea, Sweden, Switzerland, Turkey, and the United Kingdom.

The 10,000th production missile was delivered on September 9, 1999. The 10,000 missiles consisted of the following deliveries: 6,296 USAF, 1,109 USN, and 2,595 Foreign Military Sales (FMS). Missile usage and tests left the following inventories as of September: 5,096 USAF and 883 USN.

The Lot 13 production option was awarded on 31 March 1999 for 507 missiles, 280 U.S. and 227 FMS. The low quantity of FMS missile sales resulted in a 21% increase in missile price; however, the Total Acquisition Unit Price decreased 9% as a result of acquisition reform. Foreign Military Sales play an important role in maintaining an affordable missile price. New software releases and other improvements in FMS support have been offered to encourage future sales.

The Pre-Planned Improvement (P3I) Phase 2 program was completed in March 1999. Missile improvements are being phased into production: Missiles with improved software and a more lethal warhead designated "AIM-120 C-4" began deliveries in August 1999. Missiles with those changes plus an improved kinematic +5 inch rocket motor designated "AIM-120 C-5" are scheduled for delivery beginning in May 2000.

A P3I Phase 3 contract completed its first year of a five year development. This phase will provide an upgraded missile (AIM-120 C-7) with substantial improvements in the guidance section hardware and software to counter advanced threats. Production cut-in will be in Lot 16 with deliveries in 2004. The System Design Review was successfully held in March 1999 and the Software Specification Reviews were successfully completed in September 1999. Component-level Preliminary Design Reviews (PDR's) are ongoing in preparation for the system level PDR in April 2000. Future missile production cost is a key element in the missile specification. Costs are being managed under the Cost as an Independent Variable (CAIV) process with 30% of the contract award fee tied to the success of meeting future production cost requirements. In September 1999, Raytheon committed to a production price that is \$2000 below the threshold value. Continued CAIV efforts will hopefully further reduce this price. The P3I Phase 3 contract was on cost and on schedule as of the end of 1999.

The combat capability of AMRAAM was proven again this year with 6 kills recorded in Kosovo. In addition, The AMRAAM program accomplished 117 AIM-120 launches during 1999. The launches demonstrated 88% missile success and 77% system success.

A long-term sustainment contract was awarded to the Raytheon Systems Company on 31 March 1999. This contract consolidates all maintenance at the Tucson facility and adds a new Service Life Prediction Program (SLPP). The SLPP is a predictive program to determine the life of the AMRAAM configurations. This program will pin point any missile degradation that may occur as a result of age, storage environment, or high flight hours. Information gained from this analysis will be used to develop inventory management techniques for the AMRAAM

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7. (U) Executive Summary (Cont'd):

program.

As part of their Complementary Low Altitude Weapon System (CLAWS), a USMC Operational Requirements Document (ORD) has been approved to use the AMRAAM missile in a surface-to-air role to protect Marine Expeditionary Forces. USMC plans are for development to begin in 2000, integrating existing hardware into a surface-to-air system. The USMC has programmed missile production buys in the 2004 and 2005 time frame.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I (DSARC)	NOV 1978	NOV 1978	NOV 1978
Milestone II (DSARC)	SEP 1982	SEP 1982	SEP 1982
Start DT&E/IOT&E	OCT 1983	N/A	OCT 1983
Certification	FEB 1986	FEB 1986	FEB 1986
Milestone IIIA (DAB)	JUN 1987	JUN 1987	JUN 1987
DAE Program Review	MAY 1988	MAY 1988	MAY 1988
Start Production Deliveries	SEP 1988	SEP 1988	SEP 1988
Complete D/IOT&E (Air Force)	JAN 1989	JAN 1989	JAN 1989
Complete IOT&E/Captive Carry	JUN 1990	JUN 1990	JUN 1990
Reliability Program w/Lot 1 Assets (Air Force)			

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Initial Equippage	DEC 1990	DEC 1990	DEC 1990
Initial Operational Capability (IOC) Air Force	MAR 1991	MAR 1991	SEP 1991
Milestone IIIB (DAB) (Lot IV Full Go-Ahead Rate Production)	APR 1991	APR 1991	MAY 1991
DAB Program Review Full Rate Production Approval	MAR 1992	MAR 1992	APR 1992
Full Operational Capability (FOC) 1st F-16 Unit Fully Operational w/AMRAAMs	MAR 1992	MAR 1992	JAN 1992
Complete FOT&E (OPEVAL) (Navy)	MAR 1992	JAN 1994	MAR 1994
Complete AF FOT&E Phase I	MAR 1992	FEB 1993	APR 1993
P3I Phase 1 CDR Complete	OCT 1992	OCT 1992	JAN 1993
Initial Operational Capability (IOC) (Navy)	SEP 1992	SEP 1993	SEP 1993
Joint Depot Activated	SEP 1994	JUL 1999	JUL 1999
P3I Phase 1 Flight Test Completed	DEC 1994	DEC 1994	APR 1995
Last Delivery	SEP 2001	N/A	NOV 2009

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Weight (lbs)	327	327 / 350	344	345
F-Pole at 25NM Range	(b)(1)			
A-Pole at 25NM Range				
Probability of Kill				
Look-Down Shoot-Down Target alt (ft) over:				
Land				
Water				
Reliability				
Ready Storage (hrs) (mature msl - 90K operational flight hours)				
Availability (%)	86	86 / 82	N/A	96
Captive-Carry (MTBM-Type I) (hrs)	600	600 / 450	1152	1270 (Ch-1)
On Alert Storage MTBM	30000	30000 / 22500	N/A	30000
Aircraft Configure/Load - 3 Man Load Crew				
Install 4 Rail Launchers (mins)				

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Load 4 Missiles from trailer (mins)	15	15 / 20	18	18
Load 4 Missiles from container (mins)	20	20 / 30	22	22
Missile checks (mins)	1	1 / 5	1	1
All Weather Capability	Day, Night, Rain, Clouds	Day, Night, Rain, Clouds	Day, Night, Rain, Clouds	Day, Night, Rain, Clouds
<del>(S)</del> All-Aspect Launch & Track	(b)(1)			
Aircraft Compatibility	F-15, F-16, F-14, F/A-18	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, F-22 (Ch-2)
All-Up Round	Control Surfaces field in-stalled	Control Surfaces field in-stalled	Control Surfaces field in-stalled	Control Surfaces field in-stalled
<del>(S)</del> ECCM Capability	(b)(1)			
<del>(S)</del> Terminal Mode Acquisition & Launch	(b)(1)			

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Target				
Discrimination (cluster target):				
Attack Multiple				
Targets which are unresolved by friendly fighter				
A/C radars				
1) Range (ft)				
2) Range Rate (ft/sec)				
3) Angle (deg)				



(U) F-Pole - The distance between the shooter and the target when the missile intercepts the target.

A-Pole - The distance between the shooter and the target when the missile goes active.

b. Current Change Explanations --

(U) (Ch-1): Captive-carry (MTBM - Type I) changed from 1152 to 1270 hours. Reflects increased reliability of AIM 120-C in the field.

(Ch-2): F-22 has been added to the performance spec as a threshold aircraft.

(U) 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. Availability or operational reliability increased from 93% to 96% because of increase in MTBM. Captive Carry Reliability measured in ACC-conducted tests exceeded 2255 hrs MTBM on the F-16 and exceeded 1333 MTBM on the F-15. Production reliability exceeds 750 hrs MTBM for both Hughes and Raytheon.

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	1725.7	2097.2	2198.6
Procurement	10552.5	10205.7	8043.8
Flyaway	(10038.5)		(7567.7)
Other Weapon Cost	(378.0)		(0.0)
Peculiar Support	(0.0)		(390.7)
Initial Spares	(136.0)		(85.4)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1992 Base-Year \$	12278.2	12302.9	10242.4
 Escalation	 834.2	 1025.0	 94.5
Development (RDT&E)	(-375.1)	(-275.7)	(-279.3)
Procurement	(1209.3)	(1300.7)	(373.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	13112.4	13327.9	10336.9

(U) Note: Other Weapon Cost has been recategorized as Peculiar Support to track to the program office estimate.

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>15450</u>	<u>13038</u>	<u>10917</u>
Total	15450	13038	10917

(U) Excludes 169 non-fully configured RDT&E missiles in the development estimate and 111 in the current estimate. The original plan was to procure 810 LRIP missiles or 3.3% of the total planned quantity of 24,320. However, LRIP was extended from FY87 through FY92 with a quantity of 4,159 missiles (27% of the production estimate total quantity). This resulted from two actions: (1) the planned total procurement decreased from 24,320 missile at Milestone IIIA to 15,450 missiles at Milestone IIIB, and (2) Milestone IIIB authorized the program to continue LRIP through FY92, adding 3,349 missiles to the LRIP quantities.

c. ~~(U)~~ Foreign Military Sales --

- (U) NATO EF2000 and Tornado Development, Production, and Logistics Management Agency (NETMA)(M1-D-YAA) Case signed 5 November 1991  
\$8.7M PURPOSE: 6 AMRAAMs (Lot VII)
- (U) UNITED KINGDOM (UK-D-YDR) Case signed 13 March 1992  
\$104.9M PURPOSE: 210 AMRAAMs (Lots VII,VIII) and support
- (U) SWEDEN (SW-D-YCD) Case signed 1 September 1994



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

- \$54.1M PURPOSE: 103 AMRAAMs (Lots X,XII) and support. Missile procurement is FMS administered direct commercial sales
- (U) FINLAND (FI-D-YAA) Case signed 4 November 1994  
\$116.8M PURPOSE: 312 AMRAAMs (Lots X,XI,XII,XIII). Missile procurement is FMS administered direct commercial sales
- (U) NETHERLANDS (NE-D-YME) Case signed 29 September 1995  
\$87.1M PURPOSE: 200 AMRAAMs (Lots X,XI) and support
- (U) BELGIUM (BE-D-YCD) Case signed 22 December 1995  
\$30.6M PURPOSE: 72 AMRAAMs (Lot XI)
- (U) NORWAY (NO-D-YDA) Case signed 1 April 1996  
\$224.0M PURPOSE: 250 AMRAAMs and 228 MRLs(Lots XI)
- (U) SPAIN (SP-D-YDH) Case signed 11 July 1996  
\$13.0M PURPOSE: 32 AMRAAMs (Lot XI) and support
- (U) GREECE (GR-D-SBD) Case amended 26 September 1996  
\$52.5M PURPOSE: 140 AMRAAMs (Lot XI,XII)
- (U) ISRAEL (IS-D-YEO) Case signed 6 February 1997  
\$54.9M PURPOSE: 125 AMRAAMs (Lot X,XI,XII,XIII) and support
- (U) SOUTH KOREA (KS-D-YGQ) Case signed 13 March 1997  
\$41.5M PURPOSE: 100 AMRAAMs (Lot XII). Missile procurement is FMS administered direct commercial sales
- (U) TURKEY (TK-D-YDV) Case signed 24 November 1997  
\$58.5M PURPOSE: 138 AMRAAMs (Lot XII) and support
- (U) ITALY (IT-D-YAC) Case signed 1 December 1997  
\$40.6M PURPOSE: 93 AMRAAMs (Lot XII-XV) and support
- ~~(U)~~ Australia (AT-D-YKX) Case signed 29 November 1998  
\$31.5M PURPOSE: 60 AMRAAMs (Lot XIII) and support
- (U) Japan (JA-D-YCJ) Case signed 19 February 1999  
\$ 20.4M PURPOSE: 40 AMRAAMs (Lot XIII) and support
- (U) Spain (SP-D-YAF) Case signed 5 March 1999  
\$ 43.6M PURPOSE: 100 AMRAAMs (Lot XIII) and support
- (U) Bahrain (BA-D-YBI) Case signed 13 November 1999  
\$ 66.9M PURPOSE: 26 AMRAAMs (Lot XIV) and support
- (U) Korea (KS-D-YGY) Case signed 27 December 1999  
\$ 68.7M PURPOSE: 159 AMRAAMs (Lot XIV) and support

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

d. (U) Nuclear Costs --  
None

12. (U) Unit Cost Summary:

	UCR Baseline (SEP 1996 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1992 BY\$)	12302.9	10242.4	
(2) Quantity	13038	10917	
(3) Unit Cost	0.944	0.938	-0.64
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1992 BY\$)	10205.7	8043.8	
(2) Quantity	13038	10917	
(3) Unit Cost	0.783	0.737	-5.87

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AMRAAM (AIM-120), December 31, 1999

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	1350.6	11761.8	-	13112.4
Previous Changes:				
Economic	-51.1	-309.9	-	-361.0
Quantity	-	-2977.1	-	-2977.1
Schedule	-7.3	+1758.3	-	+1751.0
Engineering	+460.1	+107.4	-	+567.5
Estimating	+169.2	-1942.3	-	-1773.1
Other	-	-	-	-
Support	-	+39.5	-	+39.5
Subtotal	+570.9	-3324.1	-	-2753.2
Current Changes:				
Economic	-3.8	-11.6	-	-15.4
Quantity	-	-	-	-
Schedule	-	+5.1	-	+5.1
Engineering	-	+4.4	-	+4.4
Estimating	+1.6	+32.4	-	+34.0
Other	-	-	-	-
Support	-	-50.4	-	-50.4
Subtotal	-2.2	-20.1	-	-22.3
Total Changes	+568.7	-3344.2	-	-2775.5
Current Estimate	1919.3	8417.6	-	10336.9

(U) Summary (FY 1992 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	1725.7	10552.5	-	12278.2
Previous Changes:				
Quantity	-	-1965.1	-	-1965.1
Schedule	-8.1	+791.9	-	+783.8
Engineering	+373.3	+74.7	-	+448.0
Estimating	+106.9	-1401.4	-	-1294.5
Other	-	-	-	-
Support	-	-2.6	-	-2.6
Subtotal	+472.1	-2502.5	-	-2030.4
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+3.4	-	+3.4
Estimating	+0.8	+25.7	-	+26.5
Other	-	-	-	-
Support	-	-35.3	-	-35.3
Subtotal	+0.8	-6.2	-	-5.4
Total Changes	+472.9	-2508.7	-	-2035.8
Current Estimate	2198.6	8043.8	-	10242.4

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AMRAAM (AIM-120), December 31, 1999

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-3.8
Change in P3I Phase 3. (Estimating)	+0.7	+1.1
Adjustment for current and prior inflation. (Estimating)	-0.4	-0.5
Change in P3I kinematic upgrades. (Estimating)	+0.5	+1.0
RDT&E Subtotal	+0.8	-2.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-16.4
Economic adjustment for negative program change. (Economic)	N/A	+4.8
Stretchout of annual procurement buy profile. (Schedule)	0.0	+5.1
Changes in telemetry unit requirements. (Engineering)	+3.4	+4.4
Adjustment for current and prior inflation. (Estimating)	+0.8	+0.8
Increase in Navy production/fleet support. (Estimating)	+23.7	+30.1
Revisions to reflect actual costs. (Estimating)	-0.7	-0.9
Unit cost increase due to decreased FMS sales. (Estimating)	+4.2	+4.9
Change in P3I implementation. (Estimating)	-0.3	-0.4
Change in classified project. (Estimating)	-2.0	-2.1
Change in initial spares. (Support)	-2.9	-3.6
Reduction of Navy fleet support requirements. (Support)	-32.4	-46.8
Procurement Subtotal	-6.2	-20.1

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AMRAAM (AIM-120), December 31, 1999

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.48	-0.06	+0.14	+0.12	+0.02	+0.19	--	-0.04	+0.37	0.85

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.85	-0.03	+0.08	+0.16	+0.05	-0.16	--	--	+0.10	0.95

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.43	-0.06	+0.12	+0.12	+0.01	+0.18	--	-0.04	+0.33	0.76

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.76	-0.03	+0.04	+0.16	+0.01	-0.17	--	--	+0.01	0.77

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	NOV 1978	NOV 1978
Milestone II	N/A	NOV 1982	SEP 1982	SEP 1982
Milestone III	N/A	N/A	JUN 1987	JUN 1987
FUE/IOC	N/A	SEP 1986	MAR 1991	SEP 1991
Total Cost	N/A	11591.6	13112.4	10337
Total Quantity	N/A	24335	15450	10917
Prog Acq Unit Cost	N/A	0.48	0.85	0.95

(U) The SAR Development Estimate data is for the Air Force only and does not

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14. (U) Unit Cost and Other History (Cont'd):

include Navy data.

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

a. RDT&E --  
 (U) Raytheon P3I Phase 3:  
 Raytheon Systems Company, Tucson AZ  
 F08626-98-C-0027, CPAF  
 Award: October 29, 1998  
 Definitized: October 29, 1998

			Initial Contract Price			
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$150.5	N/A	0			

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$185.8	N/A	0	\$185.8	\$185.8	

Previous Cumulative Variances  
 Cumulative Variances To Date  
 Net Change

<u>Cost Variance</u>	<u>Schedule Variance</u>
N/A	N/A
\$0.7	\$-0.4
\$0.7	\$-0.4

Explanation of Change:

(U) The net change in the current target price from the initial contract price is due to the award of the "Return to Baseline" effort and award fee. The cost and schedule variance data is from the Cost Performance Report (CPR) dated 24 Dec 99. The contract is on cost and schedule.

b. Procurement --  
 (U) HUGHES LOT XI:  
 HUGHES AIRCRAFT COMPANY, TUCSON AZ  
 F08626-97-C-0001, FFP  
 Award: January 28, 1997  
 Definitized: January 28, 1997

			Initial Contract Price			
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$134.3	N/A	439			

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$173.0	N/A	439	\$173.0	\$173.0	

Explanation of Change:

(U) The net change in current target price from initial contract target price is due to the addition of contract modifications and the award of an option for an FMS case.

15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

The original contract was identified as HUGHES LOT XI/XII with LOT XII being an option. This option was never exercised. Instead a new contract F08626-98-C-0018 was awarded to the merged company. Therefore, this contract is listed only as LOT XI.

(U) <u>RAYTHEON LOT XI:</u> RAYTHEON SYSTEMS COMPANY, BEDFORD MA F08626-97-C-0002, FFP Award: January 28, 1997 Definitized: January 28, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$124.3	N/A	390

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$121.9	N/A	390	\$121.9	\$121.9

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

The original contract was identified as RAYTHEON LOT XI/XII with LOT XII being an option. This option was never exercised. Instead a new contract F08626-98-C-0018 was awarded to the merged company. Therefore, this contract is listed only as LOT XI.

(U) <u>Raytheon Lot XII/XIII:</u> Raytheon Systems Company, Tucson AZ F08626-98-C-0018, FFP Award: April 13, 1998 Definitized: April 13, 1998	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$187.5	N/A	618

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$401.2	N/A	877	\$401.2	\$401.2

15. (U) Contract Information (Cont'd):

Explanation of Change:

(U) The net change in current target price from initial contract target price is due to the addition of contract modifications and exercising the Lot XIII option.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY77-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-07)	<u>Total</u>
RDT&E	1523.7	65.6	65.8	264.2	1919.3
Procurement	7017.2	136.2	137.3	1126.9	8417.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	8540.9	201.8	203.1	1391.1	10336.9

b. Annual Summary -- AMRAAM (AIM-120)

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1992 Dollars Nonrec</u>	<u>Flyaway FY 1992 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1978				11.9	6.0
1979				33.5	18.3
1980				45.0	27.3
1981				36.0	24.2
1982				4.6	3.3
1983				5.7	4.3
1984				9.3	7.3
1985				9.7	7.8
1986				5.1	4.2
1987				5.8	5.0
1988				25.1	22.3
1989				13.3	12.4
1990				7.2	6.9
1991				3.5	3.5
1992				2.4	2.5



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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				3.0	3.1
1994					
1995				7.2	7.8
1996				3.9	4.3
1997				1.9	2.1
1998				4.9	5.5
1999				4.0	4.5
2000				11.7	13.5
2001				10.4	12.1
2002				9.1	10.8
2003				6.8	8.2
2004				7.8	9.6
2005				7.9	9.9
Subtotal				296.7	246.7

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1977				10.3	4.8
1978				13.2	6.7
1979				29.5	16.1
1980				43.2	26.2
1981				34.1	22.9
1982				192.0	137.9
1983				283.2	212.9
1984				252.7	197.3
1985				255.9	206.6
1986				110.2	91.1
1987				43.6	37.7
1988				30.1	26.7
1989					
1990				12.4	11.9
1991				18.0	17.9
1992				29.6	30.3
1993				37.2	38.9
1994				60.9	64.8
1995				58.9	63.8
1996				40.1	44.2
1997				8.7	9.7
1998				34.9	39.2
1999				29.5	33.5

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000				45.3	52.1
2001				46.0	53.7
2002				43.0	50.9
2003				27.9	33.6
2004				27.0	33.2
2005				27.2	34.1
2006				28.5	36.4
2007				28.8	37.5
Subtotal				1901.9	1672.6

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989	26	2.8	26.4	31.7	31.2
1990	85	18.6	61.3	84.8	85.1
1991	300	51.2	185.4	253.5	261.9
1992	191	36.3	110.1	186.1	194.5
1993	165	19.1	68.0	98.7	105.2
1994	75	19.8	24.5	52.2	56.8
1995	106	22.4	36.9	68.3	75.0
1996	115	25.6	31.7	66.3	73.7
1997	100	14.5	27.0	46.8	52.7
1998	120	8.9	33.6	47.9	54.5
1999	100	7.8	31.8	44.2	50.9
2000	100	9.7	26.0	39.7	46.3
2001	75	11.1	18.7	33.0	39.1
2002	75	13.2	21.1	38.2	46.1
2003	75	13.7	20.6	37.7	46.3
2004	75	11.4	20.3	35.1	44.0
2005	75	11.2	19.9	35.1	44.9
2006	280	8.0	73.4	85.6	111.6
2007	281	23.4	72.5	107.6	143.1
Subtotal	2419	328.7	909.2	1392.5	1562.9

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984		36.0		36.0	29.2
1985		88.9		88.9	74.1
1986		222.1		226.8	197.9
1987	180	187.1	445.0	654.7	596.1
1988	400	170.2	567.6	753.9	711.3
1989	874	104.1	677.2	797.9	786.2
1990	803	88.1	574.4	680.3	682.6
1991	600	184.2	384.9	592.5	611.9
1992	700	70.0	419.5	506.8	529.8
1993	1000	131.8	395.9	556.4	593.3
1994	983	74.9	319.1	411.0	447.0
1995	412	68.8	112.3	210.0	230.5
1996	291	19.5	131.4	161.6	179.8
1997	133	9.6	83.0	99.9	112.6
1998	173	39.3	47.2	90.5	103.0
1999	180	19.5	58.3	78.6	90.4
2000	187	14.9	52.0	77.0	89.9
2001	204	18.4	54.0	82.8	98.2
2002	222	17.3	65.3	95.8	115.5
2003	222	13.2	63.7	89.3	109.7
2004	221	11.3	62.9	88.6	111.0
2005	221	9.0	63.1	88.0	112.5
2006	246	8.9	68.8	92.9	121.1
2007	246	8.8	68.3	91.1	121.1
Subtotal	8498	1615.9	4713.9	6651.3	6854.7

(U) Summary does not include funding or quantities for Seek Eagle procurements of 12 AMRAAMs in FY90, 24 AMRAAMs in FY94, and 2 Separation Test Vehicles in FY01. The SEEK Eagle funding for FY01 is \$0.6M.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	2419	328.7	909.2	1689.2	1809.6
USAF	8498	1615.9	4713.9	8553.2	8527.3
Grand Total	10917	1944.6	5623.1	10242.4	10336.9

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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	7265	7265

(U) Percent Total Program Quantities Delivered: 66.5%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 8242.8

(U) Percent Total Program Expended: 79.7%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The AMRAAM will augment 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 will be returned to the contractor AMRAAM depot for repair.

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 20 year deployment phase starting in FY91 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 (seven year ICS), supply/item management, transportation, replenishment spares, and field software updates. The Navy estimate includes AMRAAM fleet operations and support, depot rework (five 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 was updated December 1997.

There are no antecedent systems; the AMRAAM is designed to augment the AIM-7 Sparrow.

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

Cost Element	AMRAAM Average Annual Cost Per Year	Antecedent Average Annual Cost Per Year
Mission Pay & Allowances	1.9	N/A
Unit Level Consumption	12.1	0.0
Intermediate Maintenance	0.3	0.0

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AMRAAM (AIM-120), December 31, 1999

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

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

Cost Element	AMRAAM Average Annual Cost Per Year	Antecedent Average Annual Cost Per Year
Depot Maintenance	9.6	0.0
Contractor Support	0.3	0.0
Sustaining Support	10.5	0.0
Indirect Costs	0.1	0.0
Total	34.8	0.0

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N-16 SH-60R

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: SH-60R

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): SH-60R Multi-Mission Helicopter Upgrade
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:  
 Air ASW, and Special Mission Program CAPT Dale Milton  
 (PMA-299) 47123 Buse Rd Assigned: June 1, 1999  
 Unit IPT, Suite 156 DSN 757-5409; COMM 301-757-5409  
 Patuxent River, MD 20670-1547 miltonda@navair.navy.mil
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
 (U) PE 0604212N Project H2412  
 (U) PE 0604216N Project H1707  
 PROCUREMENT:  
 (U) APPN 1506 ICN 018200 (Navy)

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00-C-0858

SH-60R, December 31, 1999

5. (U) References:

SAR Baseline (Development Estimate):

(U) FY 1996/1997 President's Budget  
ASN(RD&A) Acquisition Decision Memorandum dated August 1993.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated May 9, 1997.

6. (U) Mission and Description:

(U) The Multi-Mission Helicopter Upgrade (formally called LAMPS MK III Upgrade) is a development program which brings critical capability improvements to the SH-60B/F helicopters. The capability improvements are essential to future tactical rotary-wing effectiveness in providing battlegroup protection while achieving coastal littoral battlespace dominance. The Upgrade entered Engineering and Manufacturing Development (EMD) in FY93 and represents a major avionics modification to the SH-60B, greatly enhancing both primary mission areas of Anti-Submarine Warfare (ASW) and Anti-Surface Warfare (ASuW). The Airborne Low Frequency Sonar (ALFS) will be added to enhance the existing acoustic suite. ASuW effectiveness will be improved with the addition of a multi-mode radar which includes an inverse synthetic aperture imaging radar mode to permit stand-off classification of hostile threats. An improved Electronic Surveillance Measures (ESM) system will enable passive detection and targeting of radar sources not detectable with the current system. Aircrew and aircraft survivability in hostile environments will be significantly improved through software integration of the self-defense equipments. Provisions for a tactical data transfer system to improve platform interoperability by rapid, secure transfer of mission information between multiple air and surface units is included in the upgrade.

7. (U) Executive Summary:

(U) A Tentative Operational Requirement (TOR) for the Block II Upgrade was received in the Naval Air Systems Command (NAVAIRSYSCOM) in May 1986. NAVAIRSYSCOM responded with a Development Options Paper in September of 1986 which listed options for meeting the established requirements and outlined the associated costs. A formal Operational Requirement (OR) for the LAMPS MK III Block II Upgrade was initiated. In April 1987 the Block II OR was revised to include the requirement for dipping sonar. The "Operational Requirements for SH-60B Block II Upgrade" (OR# 209-05-90) was approved in April 1988. The OR was again rewritten to respond to the format and requirements of DODINST 5000.2 and include Congressionally directed Electronic Surveillance Measures (ESM) improvements in 1991. The latest Operational Requirements Document (ORD# 314-03-92) was approved August 3, 1992. The program achieved a MSII decision for entry into Engineering, Manufacturing, and Development (EMD) in July 1993.

Since December 1990, IBM Federal Sector Division of Owego, NY has been under contract to define air vehicle and mission avionics systems required to meet the Navy's requirements. A structured systems engineering process has been

7. (U) Executive Summary (Cont'd):

implemented to identify requirements, flow them down into systems, subsystem, prime item and critical item specifications, allocate the requirements to hardware and software critical items, perform industry surveys, trade studies, performance analysis, identification of promising technologies, risk identification and mitigation, and cost-benefit analysis of performance criteria. IBM was awarded an EMD contract on August 23, 1993. IBM Federal Sector Division was subsequently acquired by Loral Federal Systems in March 1994, and Lockheed Martin in April 1996.

An SH-60R Program Review was presented to the Service Acquisition Executive for the purpose of formal documentation and approval of exit criteria. As a result, an Acquisition Decision Memorandum (ADM) was signed on May 14, 1999. This ADM approved the exit criteria for the first three SH-60R Low Rate Initial Production (LRIP) lots (FY00, FY01, and FY02) and the Full Rate Production (FY03) exit criteria.

An 845 Other Transaction Authority was provided to Lockheed Martin Federal Systems (June 1998) for the development of a Common Cockpit. This effort developed a cockpit that is common to the SH-60R and the CH-60S platforms and was jointly funded by both programs. The first flight of an SH-60R occurred on December 11, 1999 and CH-60S first flight occurred January 27, 2000. These events close out the 845 agreement.

The total procurement quantities of the SH-60R were increased (beyond the Future Years Defense Program) from 185 to 241 to properly align the funded program with the Navy's Helicopter Master Plan.

In July 1999, Sikorsky Aircraft Corporation was awarded a \$38.7M contract to fund the air vehicle remanufacture efforts on the first two test articles.

The Airborne Low Frequency Sonar (ALFS) Operational Assessment began on October 25, 1999 and completed on December 22, 1999. Final operational assessment report is expected in March 2000.



8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The PM's current estimate reflects the approved FY01 President's Budget which includes an increase of 56 aircraft (from 185 to 241). This increase properly aligns the funded program with the Navy's Helicopter Master Plan. The quantity increase causes the procurement funding to exceed the threshold. An Program Deviation Report will be prepared to incorporate the additional 56 aircraft and associated procurement funding.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II	JUL 1993	JUL 1993	JUL 1993
EMD Contract Award	JUL 1993	JUL 1993	AUG 1993
Preliminary Design Review	JUL 1995	JUL 1995	NOV 1995
Critical Design Review	OCT 1996	MAR 1999	SEP 1999 (Ch-1)
LRIP Contract Award	NOV 1998	NOV 1999	MAR 2000
LRIP First Delivery	JUL 2000	JUL 2001	JAN 2002
TECHEVAL			
Start	JAN 2000	MAR 2001	JUN 2001
Complete	JUN 2000	MAR 2002	JUN 2002
OPEVAL			
Start	SEP 2000	MAR 2001	JUN 2001
Complete	MAR 2001	MAR 2002	JUN 2002
Milestone III	OCT 2001	OCT 2002	OCT 2002
Airborne Low Frequency Sonar			
EMD Contract Award	JAN 1992	JAN 1992	JAN 1992

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

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Preliminary Design Review	OCT 1992	OCT 1992	OCT 1992
Critical Design Review	APR 1993	APR 1993	AUG 1993
TECHEVAL			
Start	FEB 1998	MAR 2001	JUN 2001
Complete	JUN 1998	MAR 2002	JUN 2002
OPEVAL			
Start	JUL 1998	MAR 2001	JUN 2001
Complete	SEP 1998	MAR 2002	JUN 2002
Milestone III	JAN 1999	OCT 2002	OCT 2002
Production Contract Award	MAR 1999	JAN 2003	JAN 2003
Initial Operating Capability	MAR 2001	MAR 2002	SEP 2002

b. Current Change Explanations --

(U) (Ch-1): Critical Design Review (CDR) changed from JUL 99 to SEP 99. This is the result of a later than planned contract award of the EMD Phase II contract. This slip did not impact the overall program schedule.

10. (U) Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Maximum Operating Sea State	5	5 / 5	TBD	5
Mission Duration (ASW) (hrs)	3.3	3.3 / 2.3	TBD	2.3
Mission Duration (ASUW) (hrs)	3.5	3.5 / 3.0	TBD	3.0

Multi-Mode Radar

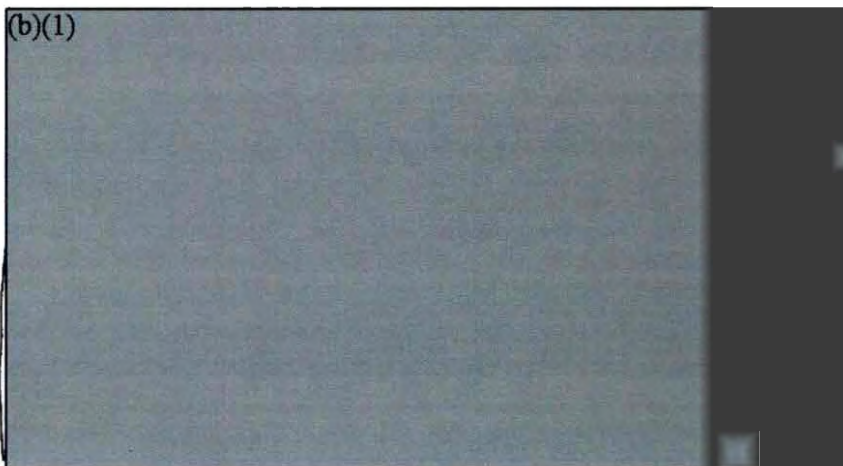
7 / Range to Detect a 10000 Sq Meter Target

7 / Range to Detect a 0.5 Sq Meter Target

7 / Using ISAR Classify a Surface Combatant at a percentage of the Target's Maximum Detectable Range

Electronic Support Measures

7 / Detectable Frequency Bandwidth (GHz)



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

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Ability to Detect a Threat Emitter X times Detection Range of the Threat Radar	(b)(1)			
Reliability and Maintainability				
MFHBCF (ASW) (hrs)	35.7	35.7 / 14.8	TBD	14.8
MFHBCF (ASUW) (hrs)	43.9	43.9 / 21.8	TBD	21.8
Acoustic System				
Sonobuoys: Maximum AOU with a 75% Probability of Detection for a Nuclear Subsurface Target (sqnm)	(b)(1)			
ALFS: Maximum AOU with a 90% Probability of Detection for a Subsurface Target (sqnm)	(b)(1)			
Airborne Low Frequency Sonar				
Operating Frequency (Khz)	<5	<5 / <5	TBD	<5
Maximum System Weight	550	550 / 550	TBD	550
Source Level (db)	(b)(1)			
Minimum Long Pulse Length (sec) (minimum duty cycle 6.7%)	(b)(1)			
Reeling Machine MCBCF (cycles)	1000	1000 / 150	TBD	150
Avionics MTBMCF (hrs) (excluding cable and reeling machine)	78	78 / 53	TBD	53
MTBF (hrs)	58	58 / 39	TBD	39
MTTR, O Level (hrs)	2.0	2.0 / 3.8	TBD	3.8
Availability (%)	0.98	0.98 / 0.90	TBD	.90

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

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	508.4	814.2	861.3
Procurement	3512.1	3512.1	3881.8
Airframe/CFE	(2119.0)		(2473.5)
GFE	(435.7)		(696.3)
Nonrecurring flyaway	(150.6)		(87.3)
ECOs			(56.8)
Total Flyaway	(2705.3)		(3313.9)
Pubs	(40.0)		(24.1)
Weapon System	(5.6)		(32.4)
Field Activities	(165.5)		(75.5)
ILS/LSA/MES	(79.2)		(55.8)
Total Other Wpn Sys	(290.3)		(187.8)
Peculiar Support	(238.9)		(291.5)
Initial Spares	(277.6)		(88.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1993 Base-Year \$	4020.5	4326.3	4743.1
Escalation	1615.9	1651.7	1080.8
Development (RDT&E)	(40.3)	(76.1)	(62.2)
Procurement	(1575.6)	(1575.6)	(1018.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	5636.4	5978.0	5823.9

b. (U) Quantity --

Development (RDT&E)	0	4	2
Procurement	<u>188</u>	<u>184</u>	<u>241</u>
Total	188	188	243

Note: Excludes 2 RDT&E prototypes from the SAR Baseline and 0 from the Current Estimate that are not considered fully configured.

(U) The Low Rate Initial Production quantity is 19 which is less than 10% of the total program quantity of 243.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (MAY 1997 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1993 BY\$)	4326.3	4743.1	
(2) Quantity	188	243	
(3) Unit Cost	23.012	19.519	-15.18
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1993 BY\$)	3512.1	3881.8	
(2) Quantity	184	241	
(3) Unit Cost	19.087	16.107	-15.61

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	548.7	5087.7	-	5636.4
Previous Changes:				
Economic	-25.7	-556.7	-	-582.4
Quantity	+171.2	-162.3	-	+8.9
Schedule	-	-138.1	-	-138.1
Engineering	+50.0	-519.6	-	-469.6
Estimating	+95.3	+699.6	-	+794.9
Other	-	-	-	-
Support	+70.2	-356.6	-	-286.4
Subtotal	+361.0	-1033.7	-	-672.7
Current Changes:				
Economic	-0.5	-23.3	-	-23.8
Quantity	-18.2	+952.5	-	+934.3
Schedule	-	+27.6	-	+27.6
Engineering	-	-	-	-
Estimating	+32.5	-72.3	-	-39.8
Other	-	-	-	-
Support	-	-38.1	-	-38.1
Subtotal	+13.8	+846.4	-	+860.2
Total Changes	+374.8	-187.3	-	+187.5
Current Estimate	923.5	4900.4	-	5823.9

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

(U) Summary (FY 1993 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	508.4	3512.1	-	4020.5
Previous Changes:				
Quantity	+149.2	-141.7	-	+7.5
Schedule	-	-117.7	-	-117.7
Engineering	+45.4	-354.5	-	-309.1
Estimating	+85.1	+564.8	-	+649.9
Other	-	-	-	-
Support	+60.4	-195.4	-	-135.0
Subtotal	+340.1	-244.5	-	+95.6
Current Changes:				
Quantity	-15.9	+697.5	-	+681.6
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+28.7	-39.8	-	-11.1
Other	-	-	-	-
Support	-	-43.5	-	-43.5
Subtotal	+12.8	+614.2	-	+627.0
Total Changes	+352.9	+369.7	-	+722.6
Current Estimate	861.3	3881.8	-	4743.1

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-1.2
Economic adjustment for negative program change. (Economic)	N/A	+0.7
Decrease (from 3 to 2) in fully Configured RDT/E Test Article (Quantity)	-15.9	-18.2
Adjustment for Current and Prior Inflation. (Estimating)	+0.9	+1.0
Budget Increase due to revised EMD I & II estimates. (Estimating)	+34.6	+39.3
Decrease due to Small Business Innovative Research reduction (Estimating)	-5.4	-6.0
Refinement of estimates and rounding. (Estimating)	-1.4	-1.8
RDT&E Subtotal	+12.8	+13.8
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-37.7
Economic adjustment for negative program change. (Economic)	N/A	+14.4

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Total Quantity Variance associated with increase of 56 units which properly aligns the funded program with the Navy's Helicopter Master Plan. (Quantity)	+697.5	+952.5
Stretchout of annual procurement buy profile. (Schedule)	0.0	+27.6
Adjustment for Current and Prior Inflation. (Estimating)	+0.9	+1.3
Refinement of estimate for non-recurring costs associated with remanufacture. (Estimating)	+20.1	+29.2
Refinement of estimate associated with revised contractor rates and subcomponent estimates. (Estimating)	-60.8	-102.8
Adjustment for Current and Prior Inflation. (Support)	+0.2	+0.2
Decrease Initial Spares requirement associated with the LRIP quantity reduction. (Support)	-9.6	-11.0
Refinement of estimate for Peculiar Support equipment associated with the current program. (Support)	-56.2	-61.2
Refinement of estimate for Pubs associated with the current program. (Support)	-1.0	-0.8
Refinement of estimate for other weapon system support. (Support)	+2.8	+5.2
Refinement of estimate for Field Activities costs associated with the current platform. (Support)	+23.9	+31.8
Refinement of estimate for ILS/LAS/MES associated with the current program. (Support)	-3.6	-2.3
Procurement Subtotal	<u>+614.2</u>	<u>+846.4</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
29.98	-2.49	-2.91	-0.45	-1.93	+3.11	--	-1.34	-6.01	23.97

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
27.06	-2.41	-2.66	-0.46	-2.16	+2.60	--	-1.64	-6.73	20.33

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	JUL 1993	N/A	JUL 1993
Milestone III	N/A	OCT 2001	N/A	OCT 2002
FUE/IOC	N/A	MAR 2001	N/A	SEP 2002
Total Cost	N/A	5636.4	N/A	5823.9
Total Quantity	N/A	188	N/A	243
Prog Acq Unit Cost	N/A	29.98	N/A	23.97

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

a. RDT&E -- Initial Contract Price  
 (U) Development (Block II): Target Ceiling Qty  
 Lockheed Martin, Owego, NY \$242.0 N/A 2  
 N00019-93-C-0196, CPFF  
 Award: August 23, 1993  
 Definitized: December 22, 1994

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$266.5	N/A	2	\$306.4	\$306.4



15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-18.3	\$-2.4
Cumulative Variances To Date (11/02/99)	<u>\$-24.1</u>	<u>\$-3.4</u>
Net Change	\$-5.8	\$-1.0

Explanation of Change:

(U) Net changes to cost variance (-\$5.8M) and schedule variance (-\$1.0M) were caused by Multi-Mode Radar and Integrated Mission Processor efforts taking longer than planned.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY90-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-13)	<u>Total</u>
RDT&E	721.0	118.0	69.9	14.6	923.5
Procurement	-	230.9	177.0	4492.5	4900.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	721.0	348.9	246.9	4507.1	5823.9

b. Annual Summary -- Multi-Mission Helicopter

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1993 Dollars Nonrec</u>	<u>Flyaway FY 1993 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				11.1	10.3
1991				29.6	28.5
1992				53.7	53.2
1993				72.1	73.1
1994				68.5	70.8
1995				66.6	70.1
1996				60.9	65.2
1997				50.9	55.2
1998				78.1	85.3
1999				189.8	209.3
2000				105.7	118.0
2001				61.7	69.9
2002				6.9	7.9
2003				5.7	6.7
Subtotal	2			861.3	923.5

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1993 Dollars Nonrec	Flyaway FY 1993 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	7	3.8	159.7	203.6	230.9
2001	4	23.8	100.1	153.7	177.0
2002	8	3.5	131.7	200.3	234.7
2003	25		349.1	482.2	575.9
2004	27	28.3	366.7	466.6	568.5
2005	27	27.9	361.0	447.4	555.9
2006	27		331.6	357.6	453.2
2007	27		328.5	354.3	458.0
2008	27		326.0	351.9	464.1
2009	27		324.0	349.6	470.3
2010	27		322.2	347.4	476.7
2011	8		126.0	140.4	196.5
2012				13.5	19.3
2013				13.3	19.4
Subtotal	241	87.3	3226.6	3881.8	4900.4

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	243	87.3	3226.6	4743.1	5823.9

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 638.4

(U) Percent Total Program Expended: 11.0%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The basis for this estimate, dated October 16, 1996, was demonstrated current systems Operating and Support costs adjusted for anticipated improvements in reliability (primarily based on an analogy with the SH-60B aircraft). Personnel costs are based on a 90% manning estimate to reflect the fact that operational squadrons are not always fully manned.

b. (U) Costs -- (FY 1993 Constant (Base-Year) Dollars in Millions)

Cost Element	Average Annual Cost per Squadron	Avg Annual Cost per SH-60B Squadron
Mission Pay & Allowances	8.7	6.3
Unit Level Consumption	9.3	1.4
Intermediate Maintenance	0.0	N/A
Depot Maintenance	3.1	2.3
Contractor Support	N/A	N/A
Sustaining Support	1.6	0.8
Indirect Costs	0.5	0.2
Total	23.2	11.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: DD 21 Destroyer

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): DD 21 LAND ATTACK DESTROYER

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

PEO SURFACE STRIKE (PMS 500)	CAPT C. T. BUSH
2531 JEFFERSON DAVIS HIGHWAY	Assigned: July 11, 1997
ARLINGTON, VA 22242-5165	DSN 323-6453; COMM (703) 602-6453 x100
	bushCT@Navsea.Navy.mil

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

RDT&E:

(U)	PE 0603513N	Project 32467, 32468, 32469, 32470, 32471
(U)	PE 0604300N	Project 32464, 32465, 32466, 32735
(U)	PE 0604755N	Project 32735

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**DEPARTMENT OF DEFENSE**

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**00-C-0836**  
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**Dept. of the Navy**

Derived from: Multiple Sources  
 Downgrade instructions: Not subject to automatic downgrade  
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DD 21 Destroyer, December 31, 1999

5. (U) References:

SAR Baseline (Planning Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated January 12, 1998.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated March 11, 1999.

6. (U) Mission and Description:

(U) Twenty-First Century Surface Combatants must support National Military Strategy, Joint Vision 2010, Navy Operational Concept, Operational Maneuver From The Sea and the evolving Surface Warfare Vision. The mission of the ship is to provide credible independent forward presence / deterrence and operate as an integral part of Naval, Joint or Combined Maritime Forces. DD 21 will provide an advanced level of land attack in support of the ground campaign and contribute to Naval, Joint and Combined battlespace dominance in littoral operations. It will establish and maintain surface and subsurface superiority, and provide local air defense. DD 21 will incorporate signature reduction to operate in all threat environments. The Twenty-First Century Land Attack Destroyer will have seamless Joint interoperability to integrate all source Land Attack information for battlespace awareness and weapons direction.

7. (U) Executive Summary:

(U) PEO DD 21 was established on April 6, 1998 and assigned the responsibility for the development of the DD 21 class of surface combatants and the major technology development and risk reduction efforts that are critical for DD 21 to meet its required mission capabilities.

In August 1998 the Navy awarded a \$70 million Agreement under Section 845/804 (Other Transaction Authority established by the National Defense Authorization Act of FY94/FY97, P.L. 103-160/P.L. 104-201) to begin Agreement Phase I, DD 21 System Concept Development. The two competing DD 21 industry teams are Ingalls Shipbuilding Inc. (ISI)/Raytheon Systems Corp. (Gold Team) and Bath Iron Works (BIW)/Lockheed Martin Corp. (Blue Team). In Contract Phase I the teams proposed total DD 21 system concept designs to meet the Navy's stated operational requirements, as well as cost, schedule and performance objectives. In November 1999 the Navy awarded Phase II of the 845/804 Agreement to the DD 21 industry teams for \$238M. This includes \$133M for FY00 and \$105M for FY01.

On June 2, 1999 the Navy awarded the Multi-Function Radar (MFR) 845/804 Agreement to Raytheon Systems Corp. for development and construction of an Engineering Development Model (EDM) prototype.

At the conclusion of Agreement Phase I, DD 21 industry teams narrowed their designs to a single concept. At the October 1999 System Requirements Review (SRR), the DD 21 industry teams provided their initial cost estimates based on their designs. The cost estimates presented by each team at the SRRs were greater than the DD 21 RDT&E funding in the Future Years Defense Plan (FYDF). This data was thoroughly reviewed by the DD 21 cost and technical engineering

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7. (U) Executive Summary (Cont'd):

team in November, and presented to the Program Sponsor. As a result, the FY 2001 President's Budget submission reflects a \$2.0B increase to DD 21 RDT&E funding. Of the \$2.0B, \$231M is specifically identified for development of Integrated Electric Drive for DD 21. Funding was also added for the Advanced Gun System/Munitions, Volume Search Radar (VSR), Software Development, Multi-Function Apertures, and Optimized Manning. The FY2001 President's Budget Submission also reflects a rescheduling of the DD 21 first ship award from FY2004 to FY2005, as part of the Navy's overall shipbuilding plan. These changes, as reflected in the FY2001 President's Budget Submission, created cost and schedule breaches to the DD 21 APB.

On January 20, 2000 PEO DD 21 was renamed PEO Surface Strike (PEO(S)) and was expanded to include Naval Surface Fire Support (NSFS) and Advanced Land Attack Missile (ALAM).

RADM J. A. Carnevale transitioned authority of PEO(S) to Mr. R. S. Lisiewski on February 4, 2000. On February 28, 2000, CAPT C. S. Hamilton assumed duty as interim PEO(S).

Limited SAR reporting is permitted for pre-Milestone II programs in accordance with Title 10, United States Code, Section 2432, "SARs."

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

8c. (U) Threshold Breaches (Cont'd):

At the conclusion of Agreement Phase I, DD 21 industry teams narrowed their designs to a single concept. At the October 1999 System Requirements Review (SRR), the DD 21 industry teams provided their initial cost estimates based on their designs. The cost estimates presented by each team at the SRRs were greater than the DD 21 RDT&E funding in the Future Years Defense Plan (FYDP). This data was thoroughly reviewed by the DD 21 cost and technical engineering team in November, and presented to the Program Sponsor. As a result, the FY 2001 President's Budget submission reflects a \$2.0B increase to DD 21 RDT&E funding. Of the \$2.0B, \$231M is specifically identified for development of Integrated Electric Drive for DD 21. Funding was also added for the Advanced Gun System/Munitions, Volume Search Radar (VSR), Software Development, Multi-Function Apertures, and Optimized Manning. The FY2001 President's Budget Submission also reflects a rescheduling of the DD 21 first ship award from FY2004 to FY2005, as part of the Navy's overall shipbuilding plan. These changes, as reflected in the FY2001 President's Budget Submission, created cost and schedule breaches to the DD 21 APB.

9. (U) Schedule:

a. Milestones --

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone 0	JAN 1995	JAN 1995	JAN 1995
Milestone I	DEC 1997	DEC 1997	JAN 1998
System Concepts Contracts Award	JAN 1998	JAN 1998	JUN 1998
Milestone II	JUL 2003	JUL 2003	JUL 2004 (Ch-1)
Lead Ship Award	OCT 2003	OCT 2003	DEC 2004 (Ch-1)
First Ship Delivery	AUG 2007	AUG 2007	DEC 2009 (Ch-1)
Initial Operational Capability	AUG 2008	AUG 2008	DEC 2010 (Ch-1)
Milestone III	AUG 2011	AUG 2011	AUG 2012 (Ch-1)
Milestone III	AUG 2011	AUG 2011	AUG 2012 (Ch-1)

b. Current Change Explanations --

(U) (Ch-1) Changes to these Current Estimate Milestone dates resulted from the Navy's decision to delay the award of the DD 21 first ship.

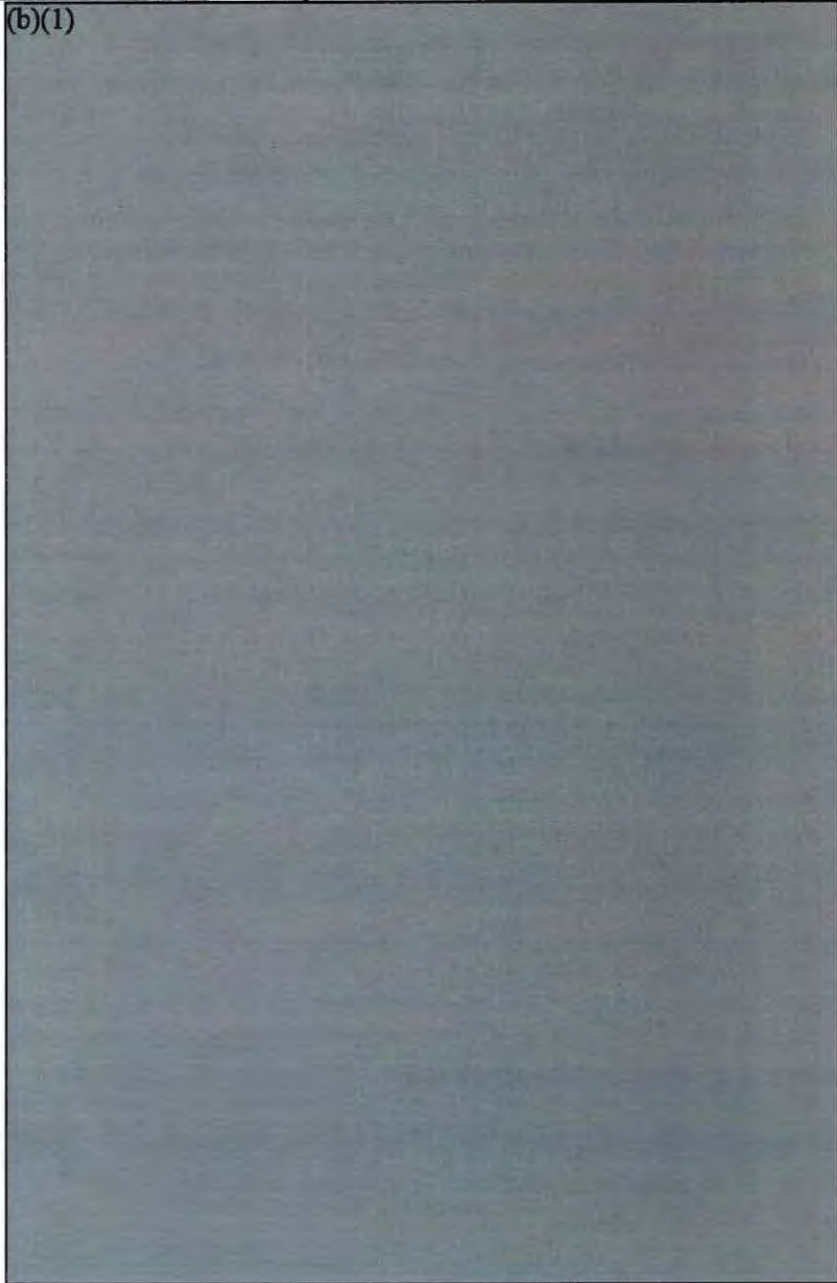
	<u>FROM</u>	<u>TO</u>
Milestone II	Jul 03	Jul 04
Lead Ship Award	Dec 03	Dec 04
First Ship Delivery	Dec 07	Dec 09
Initial Operational Capability	Dec 08	Dec 10
Milestone III	Aug 11	Aug 12

10. (U) Performance Characteristics:

a. Performance --

Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
-------------------------	--------------------------------------	-------------------	------------------

Land Attack:  
 A minimum of two separate gun systems with a total of 155 mm artillery battery equivalency  
 (b)(1) MK 198 Towed howitzers)  
 NSFS Gun range (nm)  
 Gun system accuracy (m CEP)  
 Ship C4ISR architecture accommodates Joint Interoperability for the following types of information and data:  
 Strategic (National sensor downlink of equivalents)  
 Theater (UAV and JSTARS Direct Down Link or equivalents)  
 Force Coordination (BGIXS or equivalent)  
 Force Control (JTIDS and AFATIDS or equivalents)  
 Weapons Control (CEC or equivalent)  
 Signature Reduction:  
 Radar Cross Section (dBsm median)  
 0-360 degrees azimuth  
 0-10 degrees elevation  
 2-4 and 8-18Ghz RCS smoothly distributed over length of ship  
 Minimize wake contribution  
 Infrared





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

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
1 Contrast Radiance for non-stack areas (sr=steradians) (μW/cm <sup>2</sup> /sr) (3-5 μm band) / (8-12 μm band) 0-10 degrees elevation. Minimize wake contribution	(b)(1)			
2 Contrast Radiant Intensity for stack and plume (W/sr) (3-5 μm band) / (8-12 μm band) 0-10 degrees elevation				
3 Magnetic (nanoTeslas) Acoustic =< 15kts Sustained speed (kts)				
4 Endurance (nm radius at 20 kts)				
Vertical launch cell capacity (#)	256	256 / 128	TBD	256
Magazine capacity per tube system	750	750 / 600	TBD	750
Manning: Number of ship's company personnel (helo det included)	95	95 / 150	TBD	95
Logistics and Readiness:				
Operational Availability (Ao) for mission critical systems	0.95	0.95 / 0.90	TBD	.95

(U) Charts depicting the acoustics Objective / Threshold can be found in the DD 21 Operational Requirements Document (ORD) dated November 3, 1997.

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

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	1754.0	2764.2	4658.7
Procurement	0.0	N/A	0.0
Total Sailaway			(0.0)
Other Weapon System			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	<u>0.0</u>	<u>N/A</u>	<u>0.0</u>
Total FY 1996 Base-Year \$	1754.0	2764.2	4658.7
Escalation	335.0	428.0	560.8
Development (RDT&E)	(335.0)	(428.0)	(560.8)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(N/A)</u>	<u>(0.0)</u>
Total Then Year \$	2089.0	3192.2	5219.5
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>N/A</u>	<u>N/A</u>	<u>0</u>
Total	0	0	0

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2089.0	-	-	2089.0
Previous Changes:				
Economic	-97.5	-	-	-97.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+1022.0	-	-	+1022.0
Estimating	+177.6	-	-	+177.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1102.1	-	-	+1102.1
Current Changes:				
Economic	-27.0	-	-	-27.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+650.3	-	-	+650.3
Estimating	+1405.1	-	-	+1405.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2028.4	-	-	+2028.4
Total Changes	+3130.5	-	-	+3130.5
Current Estimate	5219.5	-	-	5219.5

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

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1754.0	-	-	1754.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+927.9	-	-	+927.9
Estimating	+138.0	-	-	+138.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1065.9	-	-	+1065.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+596.5	-	-	+596.5
Estimating	+1242.3	-	-	+1242.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1838.8	-	-	+1838.8
Total Changes	+2904.7	-	-	+2904.7
Current Estimate	4658.7	-	-	4658.7

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation rates (Economic)	N/A	-27.0
Ship functional characteristic changes to include: Integrated Electric Drive, Volume Search Radar (VSR), and Advanced Gun System/Munitions (Engineering)	+596.5	+650.3
Initial RDT&E cost estimates for Initial System Design (Estimating)	+1241.8	+1404.6
Revised Program funding estimates and adjustments for Current and Prior Year Inflation (Estimating)	+0.5	+0.5
RDT&E Subtotal	+1838.8	+2028.4

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	DEC 1997	N/A	N/A	JAN 1998
Milestone II	JUL 2003	N/A	N/A	JUL 2004
Milestone III	AUG 2011	N/A	N/A	AUG 2012
FUE/IOC	AUG 2008	N/A	N/A	DEC 2010
Total Cost	2089	N/A	N/A	5219.5
Total Quantity	0	N/A	N/A	0
Prog Acq Unit Cost	0	N/A	N/A	0

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

a. RDT&E --

(U) EDM FOR MFR:

Raytheon Systems Corp., Sudbury MA  
 N3999799-3754, OTA  
 Award: June 9, 1999  
 Definitized: June 9, 1999

	Initial Contract Price		
	Target	Ceiling	Qty
	\$140.4	N/A	1

Current Contract Price		
Target	Ceiling	Qty
\$140.4	N/A	1

Estimated Price At Completion	
Contractor	Program Manager
\$140.6	\$140.4

Previous Cumulative Variances	Cost Variance		Schedule Variance	
Cumulative Variances To Date (12/31/99)		N/A		N/A
Net Change		\$-0.3		\$0.8

Explanation of Change:

(U) This agreement incrementally funds the Multi-Function Radar (MFR) for development and construction of an Engineering Development Model (EDM) Prototype.

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15. (U) Contract Information (Cont'd):

(U) <u>DD 21 Svs Concept Design:</u> Bath Iron Works, Bath, ME N000249892300, OTA Award: November 23, 1999 Definitized: November 23, 1999	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$238.0	N/A	

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$238.0	N/A		\$238.0	\$238.0	

Explanation of Change:

(U) This reflects funding for Agreement Phase II, Initial System Design, for the DD 21 industry team.

Cost and Schedule variance reporting is not required on this OTA contract.

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

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-15)</u>	<u>Total</u>
RDT&E	297.6	281.6	549.7	4090.6	5219.5
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>297.6</b>	<b>281.6</b>	<b>549.7</b>	<b>4090.6</b>	<b>5219.5</b>

b. Annual Summary -- DD 21 Destroyer

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				7.0	7.0
1996				9.9	10.0
1997				11.7	12.0
1998				51.9	53.5
1999				206.8	215.1

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000				267.4	281.6
2001				514.2	549.7
2002				572.2	621.1
2003				776.5	857.4
2004				799.3	900.3
2005				847.6	973.7
2006				155.9	182.7
2007				112.9	134.9
2008				92.3	112.5
2009				33.0	41.0
2010				33.1	42.0
2011				33.2	43.0
2012				33.3	44.0
2013				33.4	45.0
2014				33.5	46.0
2015				33.6	47.0
Subtotal				4658.7	5219.5

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				4658.7	5219.5

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 261.5

(U) Percent Total Program Expended: 5.0%

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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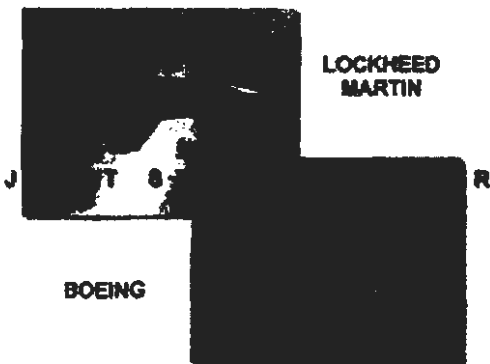
SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)

PROGRAM: Joint Strike Fighter

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): JSF

2. DoD Component: OSD

Joint Participants:

USAF, USN, USMC, DARPA, United Kingdom, Norway, Denmark, The Netherlands, Canada, Italy, Singapore, Israel, & Turkey

3. Responsible Office and Telephone Number:

Joint Strike Fighter Program Office	MajGen Michael Hough
1213 Jefferson Davis Hwy	Assigned: May 10, 1999
Suite 600	DSN 332.7640; COMM 703.602.7640
Arlington, VA 22202-3402	houghma@jast.mil

The JSF Program is a joint DoD program with no executive service. Service Acquisition Executive (SAE) Authority alternates between the Department of the Navy and the Department of the Air Force, and currently resides with the Air Force.

4. Program Elements/Procurement Line Items:

RDT&E:

- PE 0603800E
- PE 0603800F
- PE 0603800N
- PE 0604800F
- PE 0604800N

The United Kingdom, The Netherlands, Denmark, Norway, Canada and Italy are contributing funding for current JSF development efforts under the terms of formal agreements. Foreign participation in the Engineering and

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**4. Program Elements/Procurement Line Items (Cont'd):**

Manufacturing Development (E&MD) Phase commencing in 2001 is anticipated. This SAR includes funding from foreign sources as reflected in Section 16.

**5. References:**

**SAR Baseline (Planning Estimate):**

Defense Acquisition Executive (DAE) Approved Program Baseline (APB) dated November 15, 1996.

**Approved Program:**

DAE Approved Acquisition Program Baseline (APB) dated November 15, 1996.

**6. Mission and Description:**

The Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next-generation strike aircraft for the United States Navy, Air Force, Marine Corps and allies. The carrier suitable variant of the JSF will provide the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F. The Air Force variant will be a multi-role aircraft, primary-air-to-ground, to replace the F-16 and A-10 (Service intent) and complement the F-22. The Short Takeoff and Vertical Landing (STOVL) variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18A/C/D for the Marine Corps, and replace the Sea Harrier and GR-7 for the United Kingdom Royal Navy and Royal Air Force. The cornerstone of the JSF Program is affordability -- reducing the development cost, production cost, and cost of ownership of the JSF family of aircraft. The program was structured from the beginning to be a model of acquisition reform, with an emphasis on jointness, technology maturation and concept demonstrations, and early cost and performance trades integral to the weapon system requirements definition process.

**7. Executive Summary:**

The Department of Defense established the Joint Strike Fighter Program, originally named Joint Advanced Strike Technology (JAST) Program, as an outcome of the 1993 Secretary of Defense Bottom-Up Review. The program was created as the focal point for defining affordable next-generation strike weapon systems to replace aging Navy and Air Force tactical assets. Program emphasis is on affordability -- reducing the Total Ownership Cost of the JSF family of aircraft. This demands a new way of doing business, and JSF is accomplishing that through an innovative acquisition approach that uses this phase of the program to define an affordable weapon system for the warfighter, explore technological innovations, and reduce risk. Program activities to accomplish these objectives center on evolving affordable requirements, maturing/demonstrating technology, and flying concept demonstrator aircraft.

Fiscal Year 1995 legislation merged the Defense Advanced Research Projects Agency (DARPA) Advanced Short Take-Off and Landing (ASTOVL) program with the

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7. Executive Summary (Cont'd):

then-JAST Program. The United Kingdom became a Collaborative Partner in 1995, extending a collaboration begun under the DARPA ASTOVL program, at an investment level of \$200M. Denmark, Norway, the Netherlands, Canada, and Italy became partners, with investments of \$10M each. Turkey, Singapore, and Israel subsequently joined the current phase of the program as Foreign Military Sales customers.

Facilitated by the JSF Program Office, the Services produced the Joint Initial Requirements Document (JIRD) in 1995, with updates in 1997 and 1998. The requirements evolution process, based on extensive cost and performance trades emphasizing Cost As An Independent Variable (CAIV), will culminate in the Services' Joint Operational Requirements Document in FY 2000.

The Concept Exploration and Concept Development Phases of the JSF Program are completed. On-going Concept Demonstration efforts commenced in November 1996 with competitive contract awards to Boeing and Lockheed Martin for Concept Demonstration Programs (CDP), with Pratt and Whitney providing propulsion hardware and engineering support. The competing contractors are conducting concept-unique ground demonstrations; continuing refinement of the weapon system concepts that will be proposed for Engineering and Manufacturing Development (E&MD) and Production; and building concept demonstrator aircraft for flight demonstrations in 2000. These demonstrators are not full prototypes (i.e., production representative) but basic airframe, propulsion, minimal avionics, and many off-the-shelf subsystems necessary for flight. Specifically, the Boeing and Lockheed Martin concept demonstrator aircraft will demonstrate commonality and modularity, STOVL hover and transition, and low speed handling qualities of their respective concepts.

In 1998 Pratt and Whitney successfully commenced engine testing. Boeing and Lockheed Martin completed Final Design Reviews and continued build of their respective Concept Demonstrator Aircraft. The Services completed the third iteration of their requirements document based on Cost and Operational Performance Trades (COPT). Technology maturation demonstrations continued as well. Both COPT and technology maturation demonstrations are essential to achieving JSF affordability goals and lowering risk prior to E&MD entry in 2001. Funding stability is also essential for the remainder of the program.

General Electric is continuing technical efforts related to development of an alternate engine source for production. Specifically, they are developing a core for an alternate engine which will be followed with a fan and turbine development after the winning aircraft design is selected. Funding for the alternate engine program is programmed through the current FYDP, which ends in FY 2007. The Navy and Air Force are committed to funding the program in the outyears as well, and this SAR reflects outyear funding to support production Lot VII availability.

The program experienced cost growth issues in 1999 that resulted in replans from both CDP contractors. Details of those issues cannot be provided in this report due to the proprietary and competition sensitive nature of the information. The Program Director or other Department officials will provide

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**7. Executive Summary (Cont'd):**

additional information upon request. DEPSECDEF approved the replans, and the Services committed to exempting JSF from further Service-unique "taxes" for the remainder of CDP in order to assure program stability. The EMD estimate is currently being revised. Any changes will be reflected in the December 2000 SAR.

The Under Secretary of Defense for Acquisition, Technology and Logistics designated the JSF Program a joint, DoD Acquisition Category ID Program in May 1996.

This is an RDT&E-only SAR, since JSF is a pre-Milestone II program. Limited reporting is permitted for pre-Milestone II programs in accordance with Title 10, United States Code, Section 2432, "SARs."

**8. Threshold Breaches:**

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

Nunn-McCurdy unit cost is not applicable for pre-Milestone II programs.

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Joint Strike Fighter, December 31, 1999

9. Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Concept Demonstration	NOV 1996	NOV 1996	NOV 1996
Contract Award			
Milestone II	MAR 2001	MAR 2001	MAR 2001
Milestone III	TBD	TBD	TBD
IOC	TBD	TBD	TBD

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

Jt Init Rqmts Document	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(JIRD) 1 Desired Operational Characteristics				
CTOL Capability	Yes	Yes / Yes	TBD	Yes
STOVL Capability (STOVL Variant)	Yes	Yes / Yes	TBD	Yes
Aircraft Carrier Suitable (CV Variant and STOVL Variant)	Yes	Yes / Yes	TBD	Yes
Range Radius NM - CTOL Variant	450-600	450-600 / N/A	TBD	500-600
Range Radius NM - STOVL Variant	450-550	450-550 / N/A	TBD	450-550
Range Radius NM - CV Variant	>600	>600 / N/A	TBD	500-600
Internal Weapons Carriage - CTOL Variant	2 X 1000# class A-G, 2 X AIM-120, Internal Gun	2 X / N/A 1000# / class / A-G, 2 X/ AIM-120,/ Internal/ Gun /	TBD	2X 2000# class A-G, 2X AIM-120, internal advanced gun
Internal Weapons Carriage - STOVL Variant	2 X 1000# class A-G, 2X AIM-120	2 X / N/A 1000# / class / A-G, 2X / AIM-120 /	TBD	2X 1000 # class A-G, 2X AIM-120, mission- ized advanced gun

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10a. Performance Characteristics (Cont'd):

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Internal Weapons Carriage - CV Variant	2 X 2000# class A-G, 2 X AIM-120	2 X / N/A 2000# / class / A-G, / 2 X / AIM-120 /	TBD	2X 2000# class A-G, 2X AIM-120, mission- ized advanced gun
Speed & Maneuverability	compa- rable to F-16 / F/A-18	Compa- / N/A rable to/ F-16 / / F/A-18 /	TBD	compa- rable to F-16/ F/A-18
Strike and Destroy Targets Day or Night in Adverse Weather Conditions	Yes	Yes / N/A	TBD	Yes
Integration of Offboard Sensors and Data Fusion	Yes	Yes / N/A	TBD	Yes
Signature Reduction /Low Observables	Yes	Yes / N/A	TBD	Yes
Logistic Footprint	5-8 C-141B equiva- lent loads	5-8 / N/A C-141B / equiva- / lent / loads /	TBD	no more than 6 C-17 equiva- lent loads
Sortie Generation Rate - CTOL Variant	3-4/day sus- tained; 4-5/day surge	3-4/day / N/A sus- / tained; / 4-5/day / surge /	TBD	4/day initial surge; 3/day sustain- ed surge; 1- 2/day sustain- ed wartime
Sortie Generation Rate - CV Variant	3/day sus- tained; 4/day	3/day / N/A sus- / tained; / 4/day /	TBD	4/day initial surge; 3/day

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Joint Strike Fighter, December 31, 1999

10a. Performance Characteristics (Cont'd):

	<u>Planning Estimate (SAR)</u> surge	<u>Approved Program (APB) Obj/Threshold</u> surge /	<u>Demonstrated Perf</u>	<u>Current Estimate</u> sustained surge; 1-2/day sustained wartime 6/day initial surge; 4/day sustained surge; 1-2/day sustained wartime \$28M
Sortie Generation Rate - STOVL Variant	4/day sustained; 6/day surge	4/day / N/A sus- / tained; / 6/day / surge /	TBD	
Unit Flyaway Cost - CTOL Variant	\$28M	\$28M / N/A	TBD	\$28M
Unit Flyaway Cost - STOVL Variant	\$30-35M	\$30-35M / N/A	TBD	\$30M-35M
Unit Flyaway Cost - CV Variant	\$31-38M	\$31-38M / N/A	TBD	\$31M-38M

NOTES:

The above Desired Operational Characteristics are documented in the Services' Joint Interim Requirements Document (JIRD). The Approved Program (APB) column reflects the Services' Joint Interim Requirements Document (JIRD) I. The "Current Estimate" column reflects the October 1998 update, JIRD III, which is the last approved APB. The Services update the JIRD annually with the Joint Requirements Oversight Council (JROC) based on results of cost and operational trades using cost as an independent variable; consequently, the Desired Operational Characteristics are subject to change. Objectives and additional thresholds will be established for Key Performance Parameters upon signature of the Joint Operational Requirements Document (JORD), which is anticipated to be in March 2000.

JSF Variants:

- USAF - Conventional Take-Off and Landing (CTOL)
- USN - Aircraft Carrier Suitable (CV)
- USMC - Short Take-Off and Vertical Landing (STOVL)

Unit flyaway costs above are constant base year FY94 dollars.

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Joint Strike Fighter, December 31, 1999

10a. Performance Characteristics (Cont'd):

The Unit Recurring Flyaway Cost (URF) for CTOL is under reassessment as the draft JORD matures.

b. Current Change Explanations -- None

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

a. Cost --	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	19000.0	19000.0	20008.4
Procurement	0.0	N/A	0.0
Total Sailaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	N/A	0.0
Total FY 1994 Base-Year \$	19000.0	19000.0	20008.4
Escalation	5800.0	5800.0	3171.3
Development (RDT&E)	(5800.0)	(5800.0)	(3171.3)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(N/A)	(0.0)
Total Then Year \$	24800.0	24800.0	23179.7
b. Quantity --			
Development (RDT&E)	N/A	N/A	0
Procurement	N/A	N/A	0
Total	N/A	N/A	0
c. Foreign Military Sales --	None.		
d. Nuclear Costs --	None.		

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12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	24800.0	-	-	24800.0
Previous Changes:				
Economic	-2403.8	-	-	-2403.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+1420.0	-	-	+1420.0
Estimating	-453.7	-	-	-453.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1437.5	-	-	-1437.5
Current Changes:				
Economic	-185.0	-	-	-185.0
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+2.2	-	-	+2.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-182.8	-	-	-182.8
Total Changes	-1620.3	-	-	-1620.3
Current Estimate	23179.7	-	-	23179.7

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Joint Strike Fighter, December 31, 1999

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

Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	19000.0	-	-	19000.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+1120.8	-	-	+1120.8
Estimating	-105.3	-	-	-105.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1015.5	-	-	+1015.5
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-7.1	-	-	-7.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-7.1	-	-	-7.1
Total Changes	+1008.4	-	-	+1008.4
Current Estimate	20008.4	-	-	20008.4

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) RDT&E		
Revised escalation indices (Economic)	N/A	-185.0
Revised phasing of estimate (Estimating)	-7.1	+2.2
RDT&E Subtotal	-7.1	-182.8

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

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14c. Unit Cost and Other History (Cont'd):

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	MAR 2001	N/A	N/A	MAR 2001
Milestone III	TBD	N/A	N/A	TBD
FUE/IOC	TBD	N/A	N/A	TBD
Total Cost	24800	N/A	N/A	23179.7
Total Quantity	0	0	0	0
Prog Acq Unit Cost	0	N/A	N/A	0

Note: This is an RDT&E-only SAR, since JSF is a pre-Milestone II program. Limited reporting is permitted for pre-Milestone II programs in accordance with Title 10, United States Code, Section 2432, "SARs".

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

a. RDT&E --		Initial Contract Price		
<u>Propulsion CDP:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Pratt and Whitney, West Palm Beach FL		\$832.0	\$	
N00019-97-C-0050, CPAF/FF				
Award: January 23, 1997				
Definitized: January 23, 1997				
Current Contract Price		Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$	\$	\$	\$	
Previous Cumulative Variances		<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date		\$	\$	
Net Change		\$	\$	

Explanation of Change:

Further contract data is not provided here due to the competitive nature of the contract. Data is available from the Program Office on request.

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15. Contract Information (Cont'd):

<u>Weapon System CDP:</u>			Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Lockheed Martin Corp., Ft. Worth TX			\$718.8	\$	
N00019-97-C-0038, CPFF					
Award: November 16, 1996					
Definitized: November 16, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$	\$		\$	\$	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date			\$	\$	
Net Change			<u>\$</u>	<u>\$</u>	

Explanation of Change:

Further contract data is not provided here due to the competitive nature of the contract. Data is available from the Program Office on request.

<u>Weapon System CDP:</u>			Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Boeing Defense and Space, Seattle WA			\$661.8	\$	
N00019-97-C-0037, CPFF					
Award: November 16, 1996					
Definitized: November 16, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$	\$		\$	\$	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date			\$	\$	
Net Change			<u>\$</u>	<u>\$</u>	

Explanation of Change:

Further contract data is not provided here due to the competitive nature of the contract. Data is available from the Program Office on request.

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Joint Strike Fighter, December 31, 1999

15. Contract Information (Cont'd):

<u>Alternate Engine:</u> General Electric, Cincinnati, OH N00019-96-C-0176, CPFF Award: February 13, 1997 Definitized: February 13, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$96.0	\$	

Current Contract Price	Estimated Price At Completion			
	<u>Target</u>	<u>Contractor</u>	<u>Program Manager</u>	<u>Qty</u>
	\$	\$	\$	
Previous Cumulative Variances				
Cumulative Variances To Date				
Net Change				

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$	\$
Cumulative Variances To Date	\$	\$
Net Change	\$	\$

Explanation of Change:

Further contract data is not provided here due to the competitive nature of the contract. Data is available from the Program Office on request.

<u>J/IST:</u> McDonnell Douglas Corp., St. Louis MO F33615-95-K-3801, CPFF Award: September 22, 1995 Definitized: September 22, 1995	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$64.8	\$	

Current Contract Price	Estimated Price At Completion			
	<u>Target</u>	<u>Contractor</u>	<u>Program Manager</u>	<u>Qty</u>
	\$64.8	\$64.8	\$66.4	
Previous Cumulative Variances				
Cumulative Variances To Date (12/31/99)				
Net Change				

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-1.4	\$-0.8
Cumulative Variances To Date (12/31/99)	\$-2.7	\$-1.2
Net Change	\$-1.3	\$-0.4

Explanation of Change:

**JSF INTEGRATED SUBSYSTEMS TECHNOLOGY [J/IST] DEMONSTRATION PROGRAM:**  
Variance due to hardware issues is presently (February 2000) improved, is not considered significant, and is covered by existing funding. Contract is anticipated to complete on time.

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15. Contract Information (Cont'd):

<u>MIRFS:</u>			Initial Contract Price		
Raytheon Company, Los Angeles, CA	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
N00019-96-C-0074, CPFF	\$54.6	\$		\$45.2	\$45.2
Award: February 12, 1996					
Definitized: February 12, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$53.4	\$		\$45.2	\$45.2	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (12/25/99)			\$0.7	\$-1.2	
Net Change			\$1.3	\$0.0	
			\$0.6	\$1.2	

Explanation of Change:

MULTI-FUNCTION INTEGRATED RADIO FREQUENCY SYSTEM (MIRFS): Positive variances are reported as contract nears completion, ahead of schedule and below estimate. It is over 90% complete and will not be reported in future SARs.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-11)	<u>Total</u>
RDT&E	3022.7	522.8	922.8	18711.4	23179.7
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3022.7	522.8	922.8	18711.4	23179.7

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Joint Strike Fighter, December 31, 1999

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

b. Annual Summary -- JSF

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				27.5	28.9
1997				64.2	68.2
1998				19.5	20.9
Subtotal				111.2	118.0

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				29.1	29.5
1995				95.2	98.3
1996				76.6	80.4
1997				229.0	243.3
1998				418.4	448.2
1999				435.9	471.3
2000				216.2	239.9
2001				384.8	427.5
2002				1173.6	1324.0
2003				1683.8	1932.5
2004				1588.8	1859.9
2005				1372.7	1639.1
2006				875.2	1065.9
2007				416.5	517.4
2008				242.1	306.8
2009				90.8	117.4
2010				48.5	64.0
2011				19.8	26.6
Subtotal				9397.0	10892.0

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				81.2	83.8
1996				77.4	81.3
1997				236.8	251.6
1998				414.8	444.3
1999				421.9	456.1

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Joint Strike Fighter, December 31, 1999

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000				227.6	249.1
2001				386.2	429.1
2002				1171.5	1321.7
2003				1679.2	1927.2
2004				1583.1	1853.3
2005				1366.7	1631.9
2006				875.2	1065.9
2007				416.5	517.4
2008				242.1	306.8
2009				90.8	117.4
2010				48.5	64.0
2011				19.8	26.6
Subtotal				9339.3	10827.5

Appropriation: 9991 - Other RDT&E Funding

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				13.3	14.0
1997				66.8	71.0
1998				72.0	77.1
1999				50.4	54.5
2000				30.9	33.8
2001				59.6	66.2
2002				140.6	158.6
2003				194.0	222.7
2004				115.9	135.7
2005				167.6	200.1
2006				105.6	128.6
2007				114.5	142.3
2008				29.7	37.6
Subtotal				1160.9	1342.2

Note: (1) "Other RDT&E Funding" reflects current and anticipated foreign funding.

(2) USN and USAF appropriation data include funding for the alternate engine program to support Lot VII production availability.

(3) The EMD estimate is currently being revised. Any changes will be reflected in the December 2000 SAR.

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Joint Strike Fighter, December 31, 1999

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

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD				111.2	118.0
Navy				9397.0	10892.0
USAF				9339.3	10827.5
Other Funding				1160.9	1342.2
Grand Total				20008.4	23179.7

17. Delivery/Expenditure Information:

a. Deliveries To Date - None.

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 3130.8

Percent Total Program Expended: 13.5%

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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AF-6 C-17A

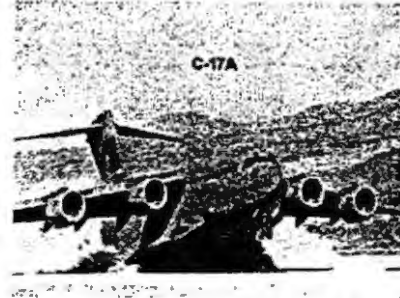
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: C-17

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): C-17 Globemaster III
2. DoD Component: USAF
3. Responsible Office and Telephone Number:  
 C-17 SYSTEM PROGRAM OFFICE                      COL TED F. BOWLDS  
 AERONAUTICAL SYSTEMS CENTER                      Assigned: March 4, 1999  
 2590 LOOP ROAD WEST                                      DSN 785-1545; COMM 937-255-1545  
 WPAFB, OH 45433-7142                                      Ted.Bowlds@wpafb.af.mil
4. Program Elements/Procurement Line Items:  
 RDT&E:  
     PE 0401130F  
     PE 0604227F (Shared)    Project 663282  
     PE 0604231F  
     PE 0604609F (Shared)    Project 663263 (Shared)  
 PROCUREMENT:  
     APPN 3010 ICN C017AD (Air Force)  
 MILCON:  
     PE 0401130F

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DD-C-0710

C-17, December 31, 1999

**5. References:**

SAR Baseline (Production Estimate):

Program Management Directive 0020(22), dated May 10, 1989. Amended FY91 President's Budget.

Approved Program:

SAE Approved Acquisition Program Baseline (APB) dated February 25, 1999.

**6. Mission and Description:**

The C-17 is a multi-engine, turbofan, wide-body, strategic airlift aircraft which improves the overall capability of the United States Air Force to rapidly project, reinforce, and sustain combat forces worldwide. The aircraft augments the C-5 and C-141 in intertheater deployment and the C-130 with intratheater operations. The C-17 is capable of carrying oversized cargo over intertheater ranges into austere airfields and introduces a direct deployment capability that significantly improves airlift responsiveness. The C-17 provides needed total force structure modernization and responsiveness to dramatically improve the mobility of our general purpose forces.

Significant features of the multi-engine C-17 include: super critical wing design and winglets reduce drag and increase fuel efficiency and range; receiving inflight refueling capability increases range; externally blown flap configuration, direct lift control spoilers, and a high impact landing gear system contribute to the aircraft capability to operate into and out of small austere airfields; a forward and upward directed thrust reverser system provides backup capability, reduces the aircraft ramp space requirements, and minimizes interference of dust and debris with the activities of ground personnel; cargo door, ramp airdrop, and cargo restraint systems are operable by a single loadmaster and permit immediate equipment offload without special handling equipment; two-man cockpit, with multi function displays, reduces complexity and improves reliability; built-in test features reduce maintenance and troubleshooting times; and walk-in avionics bays improve accessibility. This aircraft was designed to have lower maintenance manhours per flight hour than predecessors.

**7. Executive Summary:**

The C-17 research and development contract was awarded in July 1982, and initial production began in January 1988. The Milestone IIIB decision authorized the full rate production of 120 total aircraft in November 1995.

On May 31, 1996, The Secretary of the Air Force signed letters of transmittal to McDonnell Douglas Aircraft (now Boeing Airlift and Tankers) and Pratt & Whitney for procurement of 80 C-17 aircraft and the associated engines. The contracts are valued at \$16.2B. These long-term commitments are the longest and largest multiyear contracts ever entered into by the Department of Defense. Execution of the multiyear procurement strategy will save the U.S. taxpayers more than \$1B over a seven year period. This \$1B savings is in addition to the previously negotiated annual savings of more than \$4.4B realized from

C-17, December 31, 1999

7. Executive Summary (Cont'd):

production efficiencies, streamlining, and reform initiatives.

To replace several of Air Mobility Command's (AMC's) aging C-141 aircraft, fourteen C-17s will be procured to support AMC's Special Operations Low Level mission. Total aircraft to be procured has now increased from 120 to 134. The additional aircraft were first reflected in the FY 00 President's Budget.

The following significant accomplishments have occurred since the Dec 1998 SAR:

McCHORD SITE ACTIVATION: The first two deliveries of C-17 aircraft for McChord AFB occurred in Jul 99. Both P-51 and P-52 were delivered to McChord AFB on 30 Jul 99. Lt Gen John B. Sams, 15 AF/CC, flew P-51, while Gen Charles T. Robertson, AMC/CC piloted P-52.

COMPOSITE HORIZONTAL TAIL (CHT): This effort replaced the metal C-17 horizontal tail with a hybrid composite/metal structure that is 20 percent lighter, eliminates 90 percent of the parts, 81 percent of the fasteners and 70 percent of the tools needed to produce the airlifter's tail. The primary benefit to the C-17 program was the weight savings of 581 pounds per aircraft. The first production Composite Horizontal Tail (CHT) successfully completed flight test on C-17 aircraft T-1 at Edwards AFB on 1 Mar 99. T-1 flew to Long Beach on 2 Mar 99, where the CHT was removed and installed on aircraft P-52 on schedule. The second production CHT was installed on aircraft P-51. Subsequent aircraft have CHTs installed.

COMMUNICATIONS OPEN SYSTEM ARCHITECTURE (COSA): A \$2.4M contract for a menu driven Intercommunications System Control Panel redesign was awarded on 27 Sep 99 to Telephonics Corp. This project is an integral portion of our Communication Open Systems Architecture (COSA) initiative and provides for the ready accommodation of future capabilities such as Global Air Traffic Management (GATM).

C-17 AIRCRAFT DELIVERIES: Fifty seven C-17 aircraft have been delivered to date. P-57 was accepted on 11 Dec 99, 172 days early to contract and was delivered to McChord AFB on 21 Dec 99. The C-17 program delivered 11 aircraft during calendar year 1999 at an average of 118.3 days ahead of contract. P-57 is the last of the nine Lot X aircraft.

C-17 BUY SCHEDULE: The FY01 President's Budget reduced the FY01 USAF C-17 buy from 15 to 12 aircraft, but increased the FY03 buy from 5 to 8 aircraft. This will allow the AF to direct approximately \$500M to other needs while preserving the multiyear contract. The USAF C-17s will continue to deliver ahead of the multiyear contract delivery schedule.

STATION KEEPING EQUIPMENT (SKE): A \$27M contract was awarded in Aug 99 to develop the follow-on to Station Keeping Equipment (SKE). This follow-on will improve the current C-17 formation capability from 18 aircraft over a 10 nautical mile range to at least 100 aircraft over a 100 nautical mile range. Production cut-in is targeted for P-86.

C-17, December 31, 1999

7. Executive Summary (Cont'd):

TERRAIN AWARENESS AND WARNING SYSTEM (TAWS): The TAWS project completed two major design reviews of hardware components in Oct 99: Graphics Processor Module System Design Review and Video Integrated Processor (VIP) Preliminary Design Review. Also completed Critical Design Review for firmware algorithm (subcontracted to British Aerospace and Systems Equipment). Production cut-in is targeted for P-86.

C-17 SERVICE IN KOSOVO: As of the end of May, 33 C-17 aircraft had flown 1,234 sorties over 43 days as part of Phoenix Duke II. These aircraft achieved a logistics departure reliability (DR) rate of 97.6% and a mission capable (MC) rate of 90.0%. The DR rate exceeds the command standard of 94.5%, and the MC rate meets the 90% standard.

PUBLIC-PRIVATE PARTNERSHIP: On 27 Sep 99, Warner Robins ALC and Boeing entered into the first public-private partnership between a DoD prime contractor and an Air Force depot. Under the C-17 Flexible Sustainment contract, Boeing, as the prime, subcontracted to WR-ALC the requirement to perform C-17 fleet analytical condition inspections (ACI). Three of these inspections will be done during the FY00 contract period.

LARGE AIRCRAFT INFRARED COUNTERMEASURE (LAIRCM): LAIRCM is a laser based defensive countermeasure designed to defeat incoming infrared missiles. The President's Budget allows for installation of the system on twelve C-17s.

EXTENDED RANGE: The Extended Range Fuel Containment System (ERFCS) provides the C-17 weapon system with additional payload/range capability by adding fuel capacity in the current aircraft. This program is SAF/AQ's pilot for the commercial acquisition approach. The Extended Range program completed long lead critical design review (CDR) in Aug 99 using an incremental review process to reduce concurrency and schedule risk. On 15 Dec 99, the C-17 System Program Director (SPD) briefed the ERFCS to key House Armed Services Committee staff to answer their questions on the new start, funding constraints and the effect on the multiyear contract. The ERFCS held a successful CDR in Dec 99. Production cut-in is on target for P-71.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Source Selection Decision	AUG 1981	N/A	AUG 1981
Contract Award	JUL 1982	N/A	JUL 1982
Start FSED	FEB 1985	N/A	FEB 1985
Milestone II (DSARC)	NOV 1987	FEB 1985	FEB 1985
First Full Funded Production Lot	JAN 1988	JAN 1988	JAN 1988
Milestone IIIA (DAB)	NOV 1987	JAN 1989	JAN 1989
Low-Rate Initial Production	N/A	JAN 1989	JAN 1989
First Flight	JUN 1991	N/A	SEP 1991
T-1 First Flight	N/A	JUN 1991	SEP 1991
IOC (Delivery of 12 A/C to sqdn)	JUN 1993	JAN 1995	JAN 1995
Complete DT&E/IOT&E	JUN 1993	N/A	N/A
DT&E			
Start	N/A	JUN 1991	SEP 1991
Complete	N/A	DEC 1994	DEC 1994
IOT&E			
Start	N/A	DEC 1994	DEC 1994
Complete	N/A	JUN 1995	JUN 1995
Full Rate Production Contract Award	N/A	FEB 1996	FEB 1996
RM&AE (Formerly ORE)	N/A	JUL 1995	AUG 1995
Milestone IIIB	SEP 1993	NOV 1995	NOV 1995
FOC	SEP 2001	TBD	TBD
Depot Support Date	N/A	TBD	TBD

FOC and Depot Support Dates are TBD because of pending ICS logistic

9a. Schedule (Cont'd):

decision.

b. Current Change Explanations --  
None.

10. Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Maintenance Manhours Per Flying Hour (Air Vehicle)	14.6	N/A	/ N/A	N/A	N/A
Mean Time Between Maintenance Inherent (hrs) (MTBMI)	1.69	N/A	/ N/A	N/A	N/A
Mean Time Between Maintenance Corrective (hrs) (MTBMC)	.83	.78	/ .75	1.56	0.88
Mean Time Between Removal (hrs) (MTBR)	5.37	2.8	/ 2.5	7.45	4.67
Mean Manhours to Repair (hrs)	4.51	7.35	/ 7.35	2.7	6.67
Maximum Take-off Gross Weight (lbs) (TOGW)	580000	N/A	/ N/A	N/A	N/A
Maximum Payload (lbs)	172200	N/A	/ N/A	N/A	N/A
Payload at Range (lbs @ 2400 nm)	167006	N/A	/ N/A	N/A	N/A
Range Unrefueled (nm)	2372	N/A	/ N/A	N/A	N/A
Landing Field Length (ft)	2541	3,000	/ 3,000	2,500	2,900
Takeoff Field Length (ft)	7370	N/A	/ N/A	N/A	N/A
Cruise Speed (Mach) (450 KTAS)	.77	N/A	/ N/A	N/A	N/A
Backup Capability (% grade)	2	2	/ 1.5	3.8	3.8
Mission Completion Success Probability (%)	94	N/A	/ N/A	N/A	N/A
Payload Range at 3200 nm (lbs)	N/A	130,000	/ 110,000	113,000	130,000
Turning Capability (ft for 180 degree turn)	N/A	96	/ 90	96/80	96/80

10a. Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Vehicles/Rolling Stock/Outsize Cargo (no of vehicle load configurations)	N/A	15 / 15	15	15
Airdrop				
No. of persons	N/A	102 / 102	102	102
Lbs of heavy eqmt	N/A	110,000 / 60,000	110,000/ 60,000	110,000/ 60,000
No. of CDS bundles	N/A	40 / 30	40	40

PERFORMANCE CHARACTERISTICS: Reliability, Maintainability and Availability estimates for Mean Time Between Maintenance Corrective (hrs) (MTBMC), Mean Time Between Removal (hrs) (MTBR) and Mean Manhours to Repair were estimated through 100,000 fleet flying hours. 100,000 fleet flying hours was achieved in August 1998. Therefore, the Program Manager's current estimate for MTBMC, MTBR and Mean Manhours to Repair (hrs) are no longer applicable beyond 100,000 hours. Growth curve projections beyond 100,000 hours have not been calculated or specified. These performance characteristics are no longer Key Performance Parameters in the June 10, 1998, Air Mobility Command Operational Requirements Document.

b. Current Change Explanations --

There are no current changes. While the Extended Range Fuel Containment System (ERFCS), which will be introduced in P-71, will have increased weight, range, and landing field length, this enhancement is not planned for retrofit on the first seventy C-17 aircraft. The performance characteristics listed in this SAR reflect the lower range and weight characteristics of the delivered aircraft.

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

a. Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	6463.2	7763.9	7840.6
Procurement	34419.2	36787.4	36055.2
Airframe	(22158.8)		(25791.0)
Engines	(5478.3)		(2632.4)
Avionics	(1168.8)		(1039.2)
ECO			(0.0)
Product Improvement			(463.2)
Non Recurring			(1040.1)
Total Flyaway	(28805.9)		(30965.9)
Total Other Wpn Sys			(0.0)
Peculiar Support	(2267.0)		(3722.2)
Initial Spares	(3346.3)		(1367.1)
Construction (MILCON)	368.5	357.9	364.1
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1996 Base-Year \$	41250.9	44909.2	44259.9
 Escalation	 561.0	 951.4	 600.2
Development (RDT&E)	(-1122.3)	(-925.1)	(-923.3)
Procurement	(1673.7)	(1873.1)	(1520.8)
Construction (MILCON)	(9.6)	(3.4)	(2.7)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	41811.9	45860.6	44860.1
 b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>210</u>	<u>134</u>	<u>134</u>
Total	210	134	134

NOTES:

The quantity excludes one aircraft (T-1) which is fully configured as a test article. It is not maintained in the current production configuration.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.



12. Unit Cost Summary:

	UCR Baseline (FEB 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	44909.2	44259.9	
(2) Quantity	134	134	
(3) Unit Cost	335.143	330.298	-1.45
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	36787.4	36055.2	
(2) Quantity	134	134	
(3) Unit Cost	274.533	269.069	-1.99

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	+61.5	-1375.5	-14.8	-1328.8
Quantity	-	-9536.0	-	-9536.0
Schedule	-	+3264.1	+10.1	+3274.2
Engineering	+74.1	+96.0	-	+170.1
Estimating	+1214.1	+9116.3	-12.1	+10318.3
Other	+170.0	+178.0	-	+348.0
Support	-21.8	-122.3	-	-144.1
Subtotal	+1497.9	-1620.6	-16.8	+3101.7
Current Changes:				
Economic	-5.6	-212.5	-1.0	-219.1
Quantity	-	-	-	-
Schedule	-	+23.5	-	+23.5
Engineering	+94.1	-	-	+94.1
Estimating	-10.0	+108.6	+6.5	+105.1
Other	-	-	-	-
Support	-	-57.1	-	-57.1
Subtotal	+78.5	-137.5	+5.5	-53.5
Total Changes	+1576.4	+1483.1	-11.3	+3048.2
Current Estimate	6917.3	37576.0	366.8	44860.1

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

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	6463.2	34419.2	368.5	41250.9
Previous Changes:				
Quantity	-	-7360.2	-	-7360.2
Schedule	-	+724.5	-	+724.5
Engineering	+71.3	+91.9	-	+163.2
Estimating	+1085.4	+8429.8	-10.6	+9504.6
Other	+171.6	+170.7	-	+342.3
Support	-28.1	-483.2	-	-511.3
Subtotal	+1300.2	+1573.5	-10.6	+2863.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+86.7	-	-	+86.7
Estimating	-9.5	+103.3	+6.2	+100.0
Other	-	-	-	-
Support	-	-40.8	-	-40.8
Subtotal	+77.2	+62.5	+6.2	+145.9
Total Changes	+1377.4	+1636.0	-4.4	+3009.0
Current Estimate	7840.6	36055.2	364.1	44259.9

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-5.6
Increase for Large Aircraft Infrared Countermeasures (LAIRCM) (Engineering)	+86.7	+94.1
Adjustment for Current and Prior Inflation. (Estimating)	+0.5	+0.8
Congressional Add: Safety Modification (Estimating)	+9.1	+9.5
Congressional and General Reductions (Estimating)	-15.8	-16.6
Transfers to other programs (Estimating)	-3.3	-3.7
RDT&E Subtotal	+77.2	+78.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-220.9
Economic adjustment for negative program change. (Economic)	N/A	+8.4
Stretchout of annual procurement buy profile. (Schedule)	0.0	+23.5
Additional Schedule Variance. (Estimating)	+20.0	+16.4
Adjustment for Current and Prior Inflation. (Estimating)	+52.9	+56.1

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

b. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
Correction of misallocation of funds. (Estimating)	+34.0	+40.0	
Congressional Reduction of Non-Recurring Flyaway. (FY00) (Estimating)	-2.3	-2.5	
Transfers to other programs (Estimating)	-1.3	-1.4	
Adjustment for Current and Prior Inflation. (Support)	+8.2	+10.1	
Change in Initial Spares revised estimate. (Support)	-84.0	-105.6	
Change in Peculiar Support (Support)	+14.4	+15.8	
Congressional plus-up for Maintenance Trainer for Air National Guard. (FY00) (Support)	+3.2	+3.5	
Reallocation from initial spares to peculiar support. (Support)	+17.4	+19.1	
Procurement Subtotal	+62.5	-137.5	
(3) <b>MILCON</b>			
Revised escalation indices. (Economic)	N/A	-1.0	
Adjustment for Current and Prior Inflation. (Estimating)	+0.7	+0.7	
Revised estimate of FY01 construction contract costs. (Estimating)	+5.5	+5.8	
MILCON Subtotal	+6.2	+5.5	

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
189.30	-16.62	--	+5.04	+1.82	+13.76	--	+5.80	+9.80	199.10

14a. Unit Cost and Other History (Cont'd):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
199.10	-11.55	+41.76	+24.61	+1.97	+77.79	+2.60	-1.50	+135.68	334.78

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
170.16	-15.97	--	+3.45	+1.33	+7.71	--	+5.21	+1.72	171.87

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
171.87	-11.85	+26.32	+24.53	+0.72	+68.84	+1.33	-1.34	+108.55	280.42

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	NOV 1987	N/A	FEB 1985	FEB 1985
Milestone III	NOV 1987	N/A	JAN 1989	JAN 1989
FUE/IOC	JAN 1992	N/A	JUN 1993	JAN 1995
Total Cost	39753.8	N/A	41811.9	44861.1
Total Quantity	210	N/A	210	134
Prog Acq Unit Cost	189.3	N/A	199.1	334.78

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

a. RDT&E --  
Performance Improvement:  
 Boeing Airlift & Tankers, Long Beach, CA  
 F33657-95-D-2026, CPAF  
 Award: July 9, 1995  
 Definitized: July 9, 1995

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$71.3	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$395.5	N/A	0	\$389.5	\$389.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.2	\$-4.5
Cumulative Variances To Date (11/26/99)	<u>\$-3.2</u>	<u>\$-4.7</u>
Net Change	\$-3.4	\$-0.2

Explanation of Change:

The net unfavorable cost variance was primarily due to delays and replanning for the Software Block Upgrade project. The net schedule variance is insignificant.

The primary driver for the increase to the cumulative unfavorable schedule variance is a realignment of Terrain Awareness Warning System (TAWS) with other related FY01 (Block 13) projects.

Contract Comments:

Current Contract Price changed from the previous SAR with additional funding for the following Performance Improvement projects: Global Air Traffic Management (GATM); Terrain Awareness Warning System (TAWS); Block Software Upgrades; Landing Gear Durability Testing; Station Keeping Equipment (SKE); and Follow-On Flight Test.

b. Procurement --  
Producibility Enhancement:  
 Boeing Airlift & Tankers, Long Beach, CA  
 F33657-95-D-2026, CPAF  
 Award: July 9, 1995  
 Definitized: July 9, 1995

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$123.4	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$396.0	N/A	0	\$394.1	\$400.3

15b. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-7.5	\$-8.5
Cumulative Variances To Date (11/26/99)	<u>\$-14.8</u>	<u>\$-3.5</u>
Net Change	\$-7.3	\$5.0

Explanation of Change:

The primary driver of the increased net unfavorable cost variance was the cost overrun associated with the performance and testing of the Nacelle/Engine Affordability Team (N/EAT) project.

The primary driver for the reduction of the cumulative unfavorable schedule variance was the improved performance for the Multifunction Display Redesign (MFD) project.

Contract Comments:

Current Contract Price changed from the previous SAR due to the additional funding required for the Multifunction Display Redesign (MFD), Electronic Engine Control (EEC), and Pollution Prevention projects.

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>Aircraft MYP (FY97-03):</u> Boeing Airlift & Tankers, Long Beach, CA F33657-96-C-2059, FFP Award: May 31, 1996 Definitized: May 31, 1996	\$14209.4	N/A	80

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$14302.3	N/A	80	\$14302.3	\$14302.3

Explanation of Change:

On May 31, 1996, a 7-year multiyear procurement contract for 80 aircraft (P-41 through P-120) was signed.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

Increase in contract price due to Engineering Change Proposals.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY81-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
RDT&E	6093.5	159.0	176.4	488.4	6917.3
Procurement	21949.7	3354.9	2890.6	9380.8	37576.0
MILCON	327.9	26.1	12.8	-	366.8
O&M	-	-	-	-	-
Total	28371.1	3540.0	3079.8	9869.2	44860.1

b. Annual Summary -- C-17

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1996 Dollars Nonrec</u>	<u>Flyaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1981				54.1	33.4
1982					
1983				86.3	59.6
1984				37.4	26.8
1985				163.2	121.0
1986				461.4	350.4
1987				787.8	625.5
1988				1351.1	1101.4
1989				1098.1	938.3
1990				1026.2	903.9
1991				818.8	748.3
1992				268.9	252.9
1993				171.1	164.3
1994				228.8	223.5
1995				185.1	184.2
1996				71.1	72.0
1997				64.6	66.3
1998				98.1	101.3
1999				115.5	120.4
2000				150.7	159.0
2001				164.7	176.4
2002				128.2	139.4
2003				107.7	119.2
2004				104.3	117.7
2005				97.4	112.1
Subtotal				7840.6	6917.3

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987		32.2		74.3	61.2
1988	2	90.9	695.5	848.6	733.4
1989	4	17.2	1038.0	1329.3	1186.3
1990	4	77.2	1249.1	1642.0	1511.7
1991		80.3		244.7	233.7
1992	4	43.3	1391.6	1855.7	1804.5
1993	6	19.5	1934.2	1986.7	1959.4
1994	6	155.7	1834.5	2202.1	2206.5
1995	6	381.0	1706.5	2334.1	2373.6
1996	8	7.6	2014.0	2492.0	2565.6
1997	8	6.0	1756.7	1994.7	2073.1
1998	9		1907.7	2159.9	2257.8
1999	13		2485.0	2826.1	2982.9
2000	15		2746.7	3133.1	3354.9
2001	12		2272.0	2657.8	2890.6
2002	15		2655.9	2941.3	3253.5
2003	9		1707.8	2135.3	2407.0
2004	5		887.3	1292.3	1485.9
2005	8	129.2	1643.3	1905.2	2234.4
2006					
2007					
Subtotal	134	1040.1	29925.8	36055.2	37576.0

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				6.6	5.7
1990				5.4	5.0
1991				31.2	29.5
1992				79.2	76.1
1993				31.7	31.1
1994				15.2	15.2
1995					
1996				6.7	6.9
1997				78.3	80.9
1998				6.2	6.5
1999				67.4	71.0
2000				24.4	26.1
2001				11.8	12.8
Subtotal				364.1	366.8



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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	134	1040.1	29925.8	44259.9	44860.1

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	1	1
Procurement	57	57

Percent Total Program Quantities Delivered: 43.3%

b. Total Expenditures To Date (In Millions of Dollars): \$ 24511.8

Percent Total Program Expended: 54.6%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The average annual cost per C-17 squadron was derived from the most current Air Force Service Cost Position (dated September 13, 1995, revised on February 22, 1999), adjusted to include impacts from the Flexible Sustainment maintenance concept. The total Operating and Support (O&S) cost was divided by the nine operational squadrons and further divided by the number of years covered by the estimate (36 years, from FY96 through FY31). This estimate was developed in FY96 BY dollars.

The O&S costs were based on a total of 120 aircraft, 96 were operated under the Active/Associate Reserve concept, six under the Air Reserve Component Unit Equipped, eight training aircraft, and ten in backup aircraft inventory. The estimate includes direct and indirect costs, as described below:

(1) Direct costs include: mission personnel, unit-level consumables, depot maintenance, interim contractor support (ICS), contractor logistics support (CLS), and sustaining support costs. Mission personnel consist of aircrew, base maintenance, wing/squadron overhead, and weapon system security personnel requirements. Unit-level consumables include: fuel, base maintenance supplies, and depot-level reparable. Depot maintenance costs consist primarily of government furnished equipment software maintenance. Other costs previously included under depot maintenance are now captured under ICS/CLS. Sustaining support includes; replacement support equipment, sustaining engineering, and sustaining software support.

(2) Indirect costs include personnel support and installation support activities. Personnel support covers medical personnel and supplies, training (aircrew training system contracted support, maintenance trainer contract

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

support, initial C-17 flying training, and initial specialty training), and permanent change of station costs. Installation support covers base operating and real property maintenance personnel and miscellaneous operating expenses.

b. There is no antecedent system for the C-17 aircraft. The C-17 has a much wider range of capabilities than exists in the other current airlift aircraft. It can carry outsize cargo similar to the C-5, airdrop similar to the C-141, and operate in small austere environments similar to the C-130.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per C-17 Squadron	Avg Annual Cost for Antecedent System
Mission Pay & Allowances	26.3	0.0
Unit Level Consumption	34.7	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.2	0.0
Contractor Support	56.7	0.0
Sustaining Support	2.4	0.0
Indirect Costs	23.5	0.0
Total	143.8	0.0

AF-20 SBIRS

\*\*\* ~~SECRET~~ \*\*\*

SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: SBIRS

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Space Based Infrared System (SBIRS) Program
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:  
 SMC/MT Col Daniel L. Burkett II  
 185 Discoverer Blvd. Assigned: July 3, 1997  
 Suite 2512 DSN 833-1807; COMM (310) 363-1807  
 Los Angeles, CA 90245-4695 daniel.burkett@losangeles.af.mil
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
 (U) PE 0630441  
 (U) PE 0640441  
 (U) PE 0640442  
 PROCUREMENT:  
 (U) APPN 3020 ICN MSSBIR (Air Force)  
 MILCON:  
 (U) PE 0640441  
 O&M:  
 (U) PE 0350915

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FOR OPEN PUBLICATION

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

~~Classified by DoDD 3500.2, October 1, 1997  
Downgrade instructions to automatic downgrade  
Declassify on October 1, 2007~~

(THIS PAGE IS UNCLASSIFIED)

- 1 -

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00-0277  
CONGRESSIONAL  
00-C-0712

5. (U) References:

SBIRS (High)

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Baseline (APB) dated March 19, 1998.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated August 13, 1999.

SBIRS (Low)

SAR Baseline (Planning Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated August 13, 1999.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated August 13, 1999.

6. (U) Mission and Description:

(U) The Space Based Infrared System (SBIRS) program is intended to satisfy key requirements delineated in the SBIRS Operational Requirements Document dated August 15, 1996, with Annex 1 dated July 17, 1998, within the available budget and schedule. SBIRS is an integrated "system of systems", consisting of multiple space and ground elements, with incremental deployment phasing, simultaneously satisfying requirements in the following mission areas: Missile Warning, Missile Defense, Technical Intelligence, and Battlespace Characterization. The baseline architecture for SBIRS includes space elements in Highly Elliptical Orbits (HEO), Geosynchronous Earth Orbits (GEO), and Low Earth Orbits (LEO), in addition to the following ground elements: a CONUS-based Mission Control Station (MCS) and backup (MCSB), overseas Remote Ground Stations (RGSs), Multi-Mission Mobile Processor (M3P), and associated communication links. The High Component consists of four satellites in GEO, two hosted sensors in HEO (platforms provided by another organization), and associated ground elements. The Low Component will consist of TBD satellites and will be integrated with the High Component through the SBIRS ground segment.

7. (U) Executive Summary:

(U) SBIRS HIGH

(U) SBIRS HIGH ENGINEERING AND MANUFACTURING DEVELOPMENT (EMD): The SBIRS High EMD contract was awarded on November 8, 1996. Development and design contract work has progressed in accordance with the Integrated Master Plan.

SBIRS HIGH FUNDING: On December 17, 1999, the SBIRS System Program Office (SPO) issued a modification that reflected the contract restructure for

SBIRS, December 31, 1999

7. (U) Executive Summary (Cont'd):

delaying the first Geosynchronous Earth Orbit (GEO) satellite launch to FY04. At the same time, an Undefined Contract Action (UCA) option was issued for the block production buy for GEO satellites 3-5 in accordance with the guidance from the Under Secretary of Defense for Acquisition, Technology and Logistics (USD (AT&L)). Advanced Procurement for GEO 3-5 production units will be in FY02, with full funding for those three satellites in FY03. Accordingly, the current estimate columns for both cost and schedule now reflect the program manager's best estimate based on the December 17, 1999, contract modification and GEO 3-5 UCA.

The FY00 Appropriations Conference language limited obligations to no more than \$100M until the Secretary of Defense certified that the production program complied with all the DoD full funding policies, and that the program concurrency risk was reduced relative to the acquisition strategy proposed by the Joint Estimate Team. The Conferees further directed that, concurrent with the Secretary of Defense certification above, the Director of Operational Test and Evaluation (DOT&E) submit an assessment of whether the SBIRS High acquisition strategy allows for adequate testing to support a production decision. The DOT&E letter was submitted to Congress on December 6, 1999. With the Secretary of Defense sending the program certification letter to Congress on January 18, 2000, the Appropriations Conference requirements were met. As a result, additional funds over the \$100M limit have been released and obligated against SBIRS High efforts.

**SBIRS HIGH SCHEDULE:** The program will not meet the Increment 1 Integrated Tactical Warning/Attack Assessment (ITW/AA) certification by the February 2000 Acquisition Program Baseline (APB) threshold date. In accordance with DoD acquisition policy, the program office submitted the required Program Deviation Report through coordination to USD (AT&L). On December 17, 1999, the contractor proposed an Increment 1 program schedule that reflected a new ITW/AA Certification date in February 2001. Program office confidence in the contractor's schedule is pending demonstration of system stability anticipated in March 2000. The program office will not have sufficient data to assess corrective actions and schedule confidence until then.

**INTERIM MISSION CONTROL STATION BACKUP (IMCS-B):** The IMCS-B schedule is delayed by 14 months. Facility construction was essentially complete, with equipping continuing beyond the Joint Occupancy of the building on November 12, 1999. There are no APB schedule milestones associated with IMCS-B activation.

**HEO PAYLOAD DEVELOPMENT STATUS:** Several payload design changes caused by Interface Control Document (ICD) requirement changes will require additional weight and power allocations. The host has sufficient power margin; however, the weight increases are being held as a lien until the host succeeds in baselining a heavier launch vehicle. Both programs are proceeding at risk awaiting a formal launch vehicle decision.

**HEO PAYLOAD SCHEDULE:** The HEO qualification and first flight unit delivery schedules are at high risk. Under the program restructure, the HEO payload schedule margin was eliminated to meet FY99 and FY00 funding targets. The

SBIRS, December 31, 1999

7. (U) Executive Summary (Cont'd):

deferral of the GEO payload development reassigned the risks to the HEO payload development. Lockheed Martin Missiles and Space (LMMS) has implemented approved options to buy back schedule margin in FY00/FY01 with earlier procurement of flight components and additional integration and test shifts. The cost of the earlier procurement and additional shifts is about \$4M.

SPACECRAFT DEVELOPMENT STATUS: Action items from subsystem Critical Design Reviews are being worked. Reusable Flight Software (RFSW), being developed in Independent Research & Development, continues in support of HEO Payload software development. All RFSW and documentation were delivered to the HEO Line of Sight computer team at the end of December 1999, in time for initial software integration efforts. GEO spacecraft electronic cards are being assembled for qualification unit testing.

FOCAL PLANE DEVELOPMENT STATUS: Readout Integrated Circuit (ROIC) problems were discovered during qualification testing of the scanner Sensor Chip Assemblies (SCA). A tiger team developed redesigns to address problems discovered. The designs were finalized December 15, 1999, and the new design started fabrication in January 2000. New ROICs will be available in time to support integrated HEO payload qualification testing.

GEO PAYLOAD DEVELOPMENT STATUS: The GEO payload development effort has been deferred, due to the two-year program restructure. The development efforts for the components common to the GEO and HEO payloads are continuing under the HEO payload development effort.

SBIRS KEY PERFORMANCE PARAMETERS (KPP): The following KPPs fall short of the design margin needed: Missile Warning-North America (MW/NA) Probability of Warning (Pw); MW/NA Initial Report Time (IRT); Theater Pw; Theater IRT. By relaxing the HEO scanner revisit time we solve the MW-NA IRT KPP with negligible effects on Technical Intelligence (TI) performance. Actions aimed at restoring design margins have been identified and will be pursued when GEO payload design activities pick up.

TECHNICAL INTELLIGENCE (TI) REAL TIME OPERATION: This capability is being put on contract as part of the program restructure modifications. It will primarily support TI mission areas to detect and acquire targets beyond the Operational Requirements Document thresholds.

SBIRS INCREMENT 3 SYSTEM OF SYSTEMS (SoS): LMMS was placed on contract to conduct SoS tasks in support of SBIRS Increment 3, and has been directed to conduct requirements analysis leading to requirements allocation between SBIRS High and Low components, develop the High component Increment 3 ground segment to a System Design Review level, and define SBIRS High/Low interfaces to a Preliminary Design level. LMMS also has been working closely with SBIRS Low contractors to develop SBIRS Increment 3 architectures in support of Increment 3 requirements closure process.

SBIRS LOW

7. (U) Executive Summary (Cont'd):

SBIRS LOW CONTRACT AWARDS: Two competitive \$275M Program Definition/Risk Reduction (PDRR) contracts were awarded on August 16, 1999, to TRW, Redondo Beach, California, and Spectrum Astro, Gilbert, Arizona. All PDRR activities are on schedule to support a SBIRS Low Milestone II Defense Acquisition Board in Third Quarter FY02 and an EMD contract award in First Quarter FY03.

SBIRS LOW PDRR: Significant progress was made on requirements clarification since the September 30, 1999, SAR. User representatives and the System Program Office (SPO) reviewed answers and closure plans for all of the issues/requests from the PDRR contractors and the System of Systems (SoS) contractor. Closure plans were implemented to obtain clarifications from National Missile Defense (NMD) and Theater Missile Defense (TMD) users, and the SPO, in conjunction with the users and the PDRR contractors, developed a set of assumptions to be used in the absence of official user clarifications. A Requirements Clarification Document (RCD) was created to capture these answers and assumptions. The SPO is using this document to provide interim guidance to the PDRR and SoS contractors until a new Operational Requirements Document is approved in the August 2000 time frame. A formal release of the RCD was sent to the users and contractors on November 24, 1999, and subsequently updated.

REQUIREMENTS REVIEW 1 (RRI): Substantial work was done in preparation for RRI. An interim review at TRW, and a series of technical interchange meetings held by the Spectrum Astro team, served to prepare both contractors for RRI. Air Force Space Command (AFSPC) conducted an initial Requirements Review Group (RRG) on December 14, 1999, with all the mission areas represented: NMD, TMD, Battlespace Characterization, Technical Intelligence, and Integrated Tactical Warning/Attack Assessment. The User representatives and the SPO discussed RRI content, potential issues, and closure plans.

SBIRS Low Flight Demonstration System (FDS) and Low Altitude Demonstration System (LADS): The SPO continues to support the two Termination Contracting Officers (TCOs) on technical issues and property disposition associated with the February 5, 1999, termination of FDS and LADS. The FDS pathfinder and launch services issues will be addressed in the termination settlement proposals from TRW, which is expected not later than May 2000.

8. (U) Threshold Breaches:

SBIRS (High)

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	Yes
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Schedule and Cost breached due to Air Force two year delay to SBIRS High and were previously reported in both the December 31, 1998, and the September 30, 1999, SARs.

On December 17, 1999, The SBIRS Program Office issued a modification that reflected the contract restructure. At the same time, an Undefined Contract Action option was issued for the advanced production buy for GEO 3-5 beginning in FY02. The SBIRS High data now incorporates both of these actions. As a result, the SBIRS High Acquisition Program Baseline is being updated to reflect these events.



8c. (U) Threshold Breaches (Cont'd):

SBIRS (Low)

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

SBIRS (High)

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate	
High Component Milestone II	OCT 1996	OCT 1996	OCT 1996	
High Component PDR (Space and Ground Increment 2)	DEC 1997	DEC 1997	DEC 1997	
Ground Segment Increment 1 Certification	AUG 1999	AUG 1999	TBD	(Ch-1)
High Component CDR (Space and Ground Increment 2)	SEP 1999	SEP 1999	JUN 2001	
HEO Sensor 1 Delivery	SEP 2001	SEP 2001	FEB 2002	
Ground Segment Increment 2 Certification	JAN 2002	JAN 2002	JUL 2005	
GEO Satellite 1 Launch	N/A	JUN 2002	SEP 2004	
GEO Satellite 2 Launch	JUN 2003	JUN 2003	SEP 2005	
HEO Sensor 2 Delivery	SEP 2003	SEP 2003	NOV 2002	
SBIRS IOC	DEC 2003	DEC 2003	TBD	
GEO Satellite 3 Launch	JUN 2004	JUN 2004	SEP 2006	
GEO Satellite 4 Launch	JUN 2005	JUN 2005	SEP 2007	

(U) ACRONYMS:

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

- CDR - Critical Design Review
- GEO - Geosynchronous Earth Orbit
- HEO - Highly Elliptical Orbit
- IOC - Initial Operational Capability
- PDR - Preliminary Design Review

b. Current Change Explanations --

(U) (Ch-1) The program will not meet the Increment 1 Integrated Tactical Warning/Attack Assessment (ITW/AA) certification by the February 2000 Acquisition Program Baseline (APB) threshold date. On December 17, 1999, the contractor proposed an Increment 1 program schedule that reflected a new ITW/AA Certification date in February 2001. Program office confidence in the contractor's schedule is pending demonstration of system stability anticipated in March 2000. The program office will not have sufficient data to assess the corrective actions and schedule confidence until then. Therefore, the Ground Segment Increment 1 Certification date will remain TBD until the program office has assessed the effectiveness of the contractor's corrective actions.

SBIRS (Low)

a. Milestones --

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Low Component FDS CDR (Complete)	DEC 1996	DEC 1996	DEC 1996
Low Component PDRR Start	JUN 1999	JUN 1999	AUG 1999
Low Component EMD PDR	JAN 2002	JAN 2002	FEB 2002
Low Component Milestone II EMD ATP	APR 2002	APR 2002	JUN 2002
Low Component EMD CDR	MAR 2003	MAR 2003	APR 2003
LEO Satellite 1 Launch	APR 2006	APR 2006	SEP 2006
SBIRS Low Component IOC (NMD C2)	TBD	TBD	TBD

(U) ACRONYMS:

- ATP - Authority to Proceed
- CDR - Critical Design Review
- EMD - Engineering and Manufacturing Development
- FDS - Flight Demonstration System
- IOC - Initial Operational Capability
- LEO - Low Earth Orbits
- NMD C2 - National Missile Defense Capability<sup>2</sup>
- PDR - Preliminary Design Review
- PDRR - Program Definition/Risk Reduction

Note: The June 2002 date for the Low Component Milestone II EMD ATP reflects the projected successful completion of a SBIRS Low Milestone II Defense Acquisition Board. The EMD contract will not start until the PDRR

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

contracts are complete. As a result, the EMD contract is projected to begin in October 2002.

Note: It is intended that "SBIRS Low Component IOC" will be changed in the next revision of the APB to "SBIRS Increment 3 IOC."

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

SBIRS (High)

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
<del>1</del> Coverage North America Missile Warning	(b)(1)	(b)(1)	(b)(1)	(b)(1)
<del>1</del> Theater Msl Warning (Focused Areas)	(b)(1)	(b)(1)	(b)(1)	(b)(1)
<del>1</del> Theater Msl Defense (Focused Areas)	Thresh- hold + 10 FAS (each 925x925 km); FAS either inside	Thresh- hold + 10 FAS (each 925x925 km); FAS either inside	/ 2 MRCs / on or / between / 65S up / to & in- / cluding / 70N Lat / (each	TBD cluding 70 N Lat (each 2000 x 3500 km or equi- valent area) plus 3 FAs 2 MRCs on or between 65 S Lat up to & includ- ing 70 N Lat

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

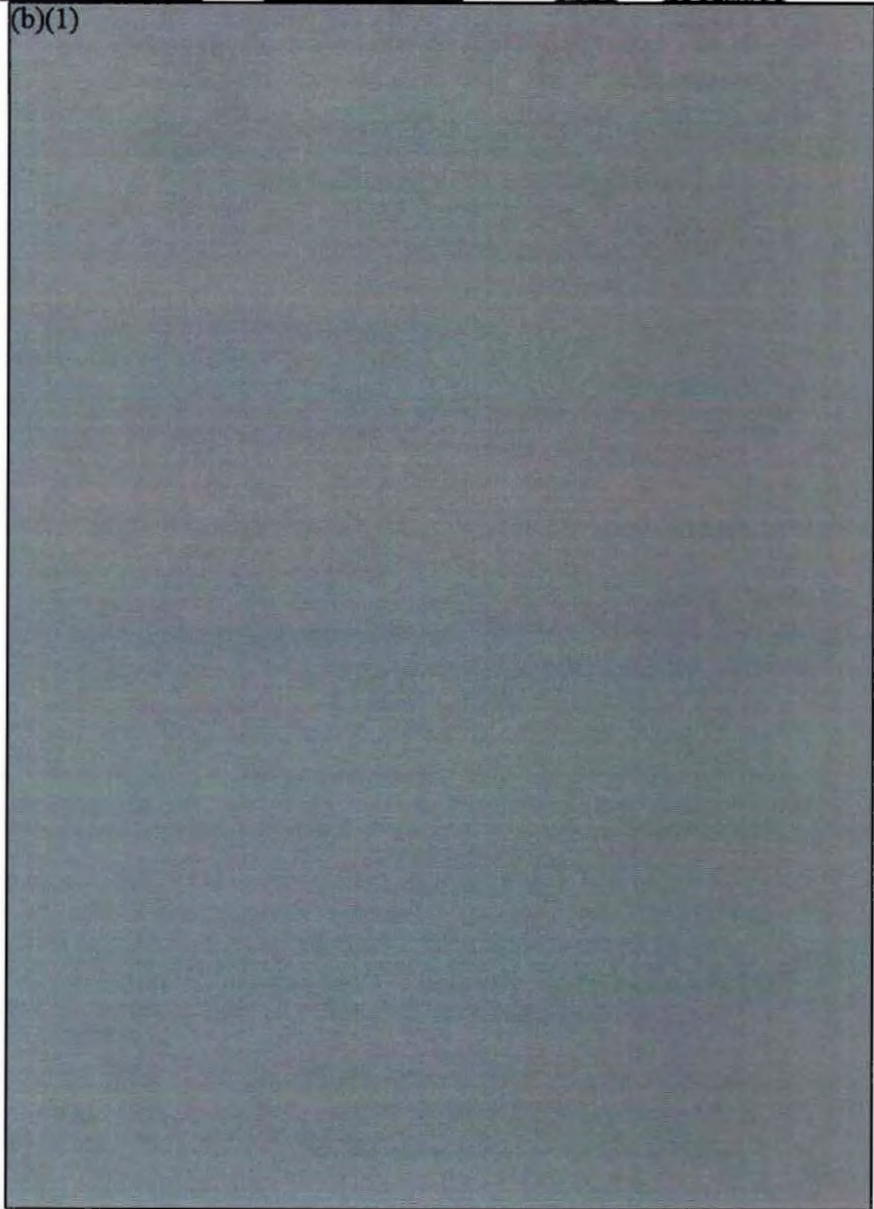
Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
-------------------------------	--------------------------------------------	---------------------------	---------------------

(b)(1)

~~(S)~~ Technical Intell-  
igence (Focused  
Areas)

~~(S)~~ Minimum Threat  
North America  
Missile Warning  
(km)

~~(S)~~ Theater Msl Warning  
(km)



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

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
(S) Theater Msl Defense (km)	(b)(1)			
(U) Technical Intell- igence				
(U) Report Time North America Missile Warning (seconds)				

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


	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
<del>1</del> Theater Msl Warning (seconds)	(b)(1)			
<del>1</del> Theater Msl Defense (seconds)	(b)(1)			
<del>1</del> Probability Warning North America Missile Warning	(b)(1)			
<del>1</del> Theater Msl Warning	(b)(1)			
<del>1</del> Theater Msl Defense	(b)(1)			
<del>1</del> Technical Intell- igence	(b)(1)			
<del>1</del> Data Availability Battlespace Characterization	(b)(1)			
<del>1</del> Theater Msl Defense	(b)(1)			

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

Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
-------------------------------	--------------------------------------------	---------------------------	---------------------

(b)(1)



 Technical Intell-  
igence

(U) ACRONYMS:

CFLOS - Cloud-free Line of Sight  
FA - Focused Area  
MRC - Major Regional Conflict  
MSLs - Missiles  
MTR - Major Threat Region  
NLT - Not Later Than  
Pc - Probability of Collection  
Pw - Probability of Warning  
RV - Re-entry Vehicle

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

TBD - To Be Determined

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

SBIRS (Low)

a. Performance --

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Coverage				
1) National Msl Defense (Inc 3)(This parameter to be met by combo of High and Low)	(b)(1)			
2) Minimum Threat Theater Msl Warning (MRCs, Focused Areas) (This parameter to be met by combo of High and Low)				
3) Technical Intelligence (Focused Areas) (Inc 2) (Inc 3)(This parameter to be met by combo of High and Low)				



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

<u>Planning</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
------------------------------------------	-----------------------------------------------------------------	------------------------------------------------	-----------------------------------

(b)(1)

~~1~~ National Msl Defense  
(Inc 3) (This  
parameter to be met  
by combo of High  
and Low)

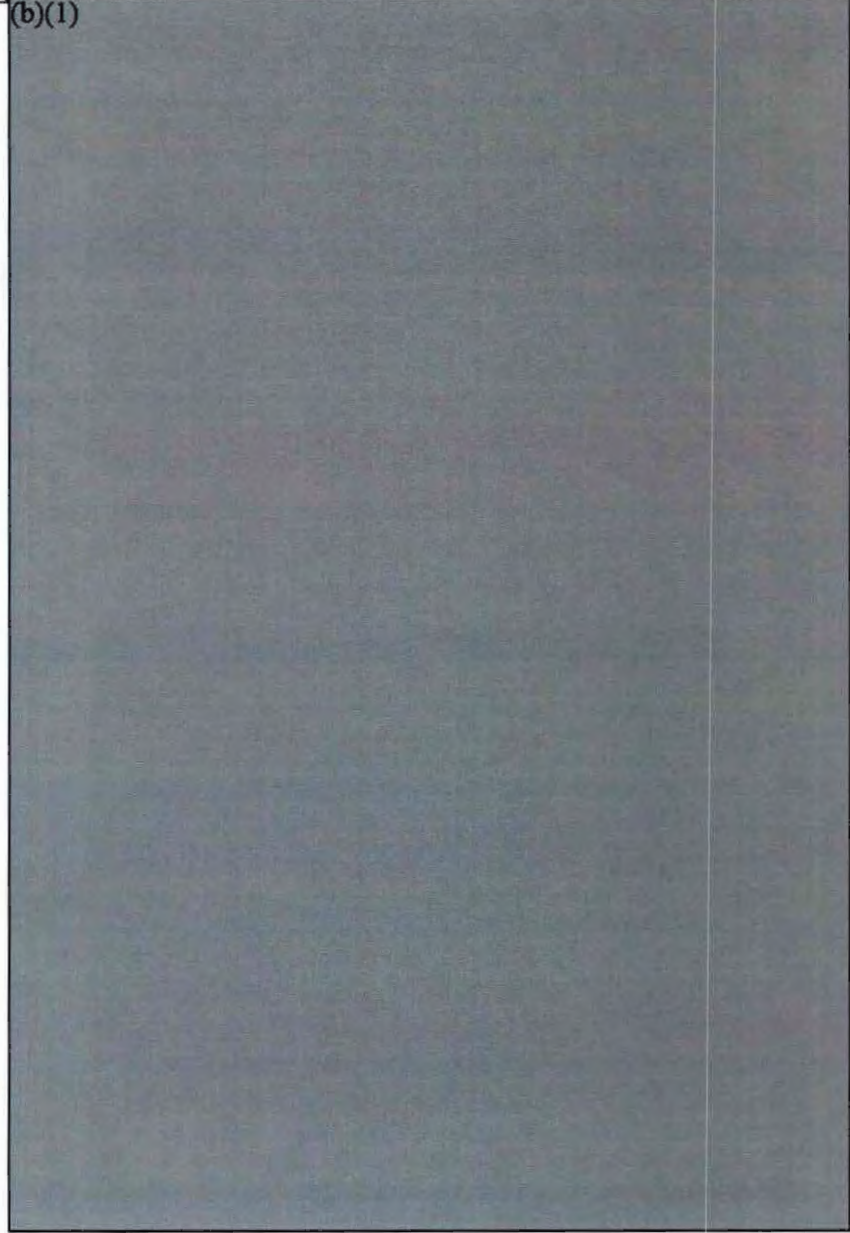
~~2~~ Theater Msl Defense  
(MRCs, Focused  
Areas) (Inc 2)  
(Inc 3)

~~1~~ Initial Boost Phase  
Report Time  
National Msl  
Defense (Inc 3)  
(This parameter to  
be met by a combo  
of High and Low)

~~1~~ Initial Post-Boost  
Phase Midcourse  
Report Time  
Missile Defense  
National (Inc 3)

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

Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
----------------------------	--------------------------------------------	---------------------------	---------------------



Update Post-Boost/  
Midcourse State  
Vector- for Deployed  
Objects (Inc 3)

~~(S)~~ Data Availability  
Theater Msl Defense  
(MRCs, Focused  
Areas) (Inc 2)  
(Inc 3) (This  
parameter to be  
met by combo of  
High and Low)

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

Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
----------------------------	--------------------------------------------	---------------------------	---------------------

(b)(1)



(U) Note: The following are referenced in the SBIRS Low ORD Annex dated July 15, 1998:

- \*2 - Targets as identified in Table 2-1 (as changed).
- \*3 - Targets as identified in Tables 2-2 and 2-4 (as changed).
- \*4 - Includes future dimshort burn missiles.
- \*5 - Targets as identified in Table 2-4 (as changed)
- \*6 - Targets as identified in Table 2-3
- \*7 - Includes future missiles incorporating enhanced RV penetration aids and signature reduction.

ACRONYMS:

CFLOS - Cloud-Free Line of Sight  
FA - Focused Area  
MRC - Major Regional Conflict  
MSLs - Missiles  
MTR - Major Threat Region  
NLT - Not Later Than  
PC - Probability of Collection  
Pw - Probability of Warning  
RV - Re-entry Vehicle

10b. (U) Performance Characteristics (Cont'd):  
SBIRS (Low)

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):  
SBIRS (High)

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	3016.6	3016.6	3074.9
Procurement	496.7	496.7	469.2
Flyaway	(496.7)		(421.5)
Other Weapon Systems			(47.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	26.0	26.0	42.0
Acquisition O&M	<u>140.2</u>	<u>140.2</u>	<u>101.7</u>
Total FY 1995 Base-Year \$	3679.5	3679.5	3687.8
Escalation	467.8	467.8	360.1
Development (RDT&E)	(369.9)	(369.9)	(275.5)
Procurement	(87.8)	(87.8)	(69.5)
Construction (MILCON)	(2.5)	(2.5)	(3.4)
Acquisition O&M	<u>(7.6)</u>	<u>(7.6)</u>	<u>(11.7)</u>
Total Then Year \$	4147.3	4147.3	4047.9

(U) The Current Estimate totals include Pre-EMD and EMD costs for SBIRS High through FY08. It also includes Missile Procurement funds for Geosynchronous Satellites GEO 3 thru GEO 5.

b. (U) Quantity --

Development (RDT&E)	3	3	2
Procurement	<u>2</u>	<u>2</u>	<u>3</u>
Total	5	5	5

(U) The SBIRS Single Acquisition Management Plan dated August 26, 1996, identifies no Low Rate Initial Production.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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

SBIRS (Low)

a. (U) Cost --	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	3745.9	3851.5	3733.7
Procurement	0.0	N/A	0.0
Total Flyaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	<u>0.0</u>	<u>N/A</u>	<u>0.0</u>
Total FY 1995 Base-Year \$	3745.9	3851.5	3733.7
 Escalation	 477.3	 371.7	 447.0
Development (RDT&E)	(477.3)	(371.7)	(447.0)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(N/A)</u>	<u>(0.0)</u>
Total Then Year \$	4223.2	4223.2	4180.7

(U) Note: The current APB is overstated in base year dollars due to an error in the calculation of the FY95 base year estimate. The SPO will provide the correct estimate as part of the SBIRS High APB approval process. The then year dollars are correct.

b. (U) Quantity --

Development (RDT&E)	3	3	3
Procurement	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Total	3	3	3

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

SBIRS (High)

	UCR Baseline (MAR 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	3679.5	3687.8	
(2) Quantity	5	5	
(3) Unit Cost	735.900	737.560	+0.23
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	496.7	469.2	
(2) Quantity	2	3	
(3) Unit Cost	248.350	156.400	-37.02

SBIRS (Low)

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

SBIRS (High)

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	3386.5	584.5	28.5	147.8	4147.3
Previous Changes:					
Economic	-95.3	-28.0	-0.7	-2.8	-126.8
Quantity	-152.7	+180.1	-	-	+27.4
Schedule	+485.1	+9.1	-	-	+494.2
Engineering	-	-	-	-	-
Estimating	-449.4	-108.9	+18.8	-59.6	-599.1
Other	-	-	-	-	-
Support	-	+31.2	-	-	+31.2
Subtotal	-212.3	+83.5	+18.1	-62.4	-173.1
Current Changes:					
Economic	-15.7	+3.0	-0.5	-0.5	-13.7
Quantity	-	-	-	-	-
Schedule	-	-155.1	-	-	-155.1
Engineering	+82.1	-	-	-	+82.1
Estimating	+109.8	-0.5	-0.7	+28.5	+137.1
Other	-	-	-	-	-
Support	-	+23.3	-	-	+23.3
Subtotal	+176.2	-129.3	-1.2	+28.0	+73.7
Total Changes	-36.1	-45.8	+16.9	-34.4	-99.4
Current Estimate	3350.4	538.7	45.4	113.4	4047.9

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SBIRS, December 31, 1999

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	3016.6	496.7	26.0	140.2	3679.5
Previous Changes:					
Quantity	-128.4	+155.6	-	-	+27.2
Schedule	+416.6	-	-	-	+416.6
Engineering	-	-	-	-	-
Estimating	-404.3	-115.2	+16.7	-63.8	-566.6
Other	-	-	-	-	-
Support	-	+27.2	-	-	+27.2
Subtotal	-116.1	+67.6	+16.7	-63.8	-95.6
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-115.1	-	-	-115.1
Engineering	+73.0	-	-	-	+73.0
Estimating	+101.4	-0.5	-0.7	+25.3	+125.5
Other	-	-	-	-	-
Support	-	+20.5	-	-	+20.5
Subtotal	+174.4	-95.1	-0.7	+25.3	+103.9
Total Changes	+58.3	-27.5	+16.0	-38.5	+8.3
Current Estimate	3074.9	469.2	42.0	101.7	3687.8

(U) ACRONYMS:

EELV - Evolved Expendable Launch Vehicle  
M3P - Multi-Mission Mobile Processor  
MCSB - Mission Control Station Backup

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-15.7
Increase in scope as result of the program restructure. Items include, but are not limited to, addition of MCSB, Dual EELV capability and S-Band kits for M3P. (Engineering)	+73.0	+82.1
Adjustment for Current and Prior Inflation. (Estimating)	+2.7	+2.9
FY00 Congressional addition to accommodate program restructure. (Estimating)	+85.5	+92.0
Adjustment of program management cost estimate. (Estimating)	+13.2	+14.9
<b>RDT&amp;E Subtotal</b>	<b>+174.4</b>	<b>+176.2</b>

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-7.3
	Economic adjustment for negative program change. (Economic)	N/A	+10.3
	Accelerated buy from 1 in FY03, 1 in FY04 and 1 in FY05, to 3 in FY05 (Long Lead in FY02). (Schedule)	0.0	-15.4
	Reduction associated with block buy of GEO 3-5, vice purchasing each satellite individually. (Schedule)	-115.1	-139.7
	Minor adjustment to Program Cost Estimate. (Estimating)	-0.5	-0.5
	Increase to cost of Mission Control Station Backup as a result of bottom up review. (Support)	+20.5	+23.3
	Procurement Subtotal	-95.1	-129.3
(3)	<u>MILCON</u>		
	Revised escalation indices. (Economic)	N/A	-0.5
	Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
	Reduced funding based on revised estimate. (Estimating)	-1.0	-1.0
	MILCON Subtotal	-0.7	-1.2
(4)	<u>O&amp;M</u>		
	Revised escalation indices. (Economic)	N/A	-0.5
	Increase in contract support (System Engineering and Technical Assistance) for site activation. (Estimating)	+25.3	+28.5
	O&M Subtotal	+25.3	+28.0



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

SBIRS (Low)

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	4223.2	-	-	4223.2
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-29.9	-	-	-29.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-12.6	-	-	-12.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-42.5	-	-	-42.5
Total Changes	-42.5	-	-	-42.5
Current Estimate	4180.7	-	-	4180.7

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	3745.9	-	-	3745.9
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-12.2	-	-	-12.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-12.2	-	-	-12.2
Total Changes	-12.2	-	-	-12.2
Current Estimate	3733.7	-	-	3733.7

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-29.9
Adjustment for Current and Prior Inflation. (Estimating)	+1.7	+1.8
FY98 return of unused funds and FY99 Congressional and Air Force reductions. (Estimating)	-13.9	-14.4
RDT&E Subtotal	-12.2	-42.5

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):  
SBIRS (High)

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
829.46	-28.10	+5.48	+67.82	+16.42	-92.40	--	+10.90	-19.88	809.58

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
292.25	-8.33	-37.38	-48.67	--	-36.47	--	+18.17	-112.68	179.57

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	OCT 1996	N/A	OCT 1996
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	DEC 2003	N/A	JUN 2006
Total Cost	2670.3	4147.3	N/A	4047.9
Total Quantity	N/A	5	N/A	5
Prog Acq Unit Cost	N/A	829.46	N/A	809.58

SBIRS (Low)

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

14c. (U) Unit Cost and Other History (Cont'd):  
SBIRS (Low)

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	JUN 1999	N/A	N/A	AUG 1999
Milestone II	APR 2002	N/A	N/A	JUN 2002
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	TBD	N/A	N/A	TBD
Total Cost	N/A	N/A	N/A	N/A
Total Quantity	N/A	N/A	N/A	N/A
Prog Acq Unit Cost	N/A	N/A	N/A	N/A

(U) Note: Program acquisition unit cost is not reported for SBIRS Low, since it is a pre-Milestone II program which reports only development costs in accordance with Section 2433, Title 10, USC.

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

a. RDT&E --	Initial Contract Price		
(U) <u>SBIRS High EMD Mod:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Lockheed-Martin Msl Sys, Sunnyvale CA			
F04701-95-C-0017, CPAF	\$80.0	\$80.0	0
Award: October 31, 1995			
Definitized: October 31, 1995			
Current Contract Price		Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>
\$2335.2	N/A	\$2361.7	\$2425.2
		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		\$-20.3	\$-8.0
Cumulative Variances To Date (12/31/99)		\$-32.0	\$-14.1
Net Change		\$-11.7	\$-6.1

Explanation of Change:

(U) Cost Variance

Major contributors to the unfavorable cost variance were the GEO Payload and the Integrated Master Plan (IMP) A. The GEO Payload experienced additional costs associated with Payload Control Assembly (PCA) Critical Design Review preparation, as well as Litton Common Gyro Reference Assembly (CGRA) life testing failure issues and Litton rate increases. The IMP A variance is due to Systems Engineering Integrated Test unanticipated requirements, analysis and integration tasks. Additional contributors to the unfavorable cost variance were continuing payload Readout Integrated

15. (U) Contract Information (Cont'd):

Circuit (ROIC) design problems and Optical Telescope Assembly test problems. In the Ground, variance is due to increased specialty engineering costs, Increment 2 increased non-Silicon Graphics, Inc., equipment costs, and increased cost due to continuing Increment 1 Deficiency Report resolution.

Schedule Variance

Major contributors to the unfavorable schedule variance were GEO Payload and Ground problems. The PCA in the GEO Payload is behind, due to payload ROIC design problems, Detector Array yield problems, and requirement changes to the CGRA. Additionally, the Focal Plane Array is behind due to the continued delay of the Sensor Chip Assembly. In the Ground, the Mission Control Station continues to experience delays due to focus on Increment 1. The variance is also due to increased specialty engineering costs and Increment 2 increased non-Silicon Graphics, Inc. equipment costs.

(U) Contract Comments:

On December 17, 1999, The SBIRS Program Office issued a modification that reflected the contract restructure for the Joint Estimate Team. At the same time, an Undefined Contract Action was issued that implemented the advanced production buy for GEO 3-5 beginning in FY02. The SBIRS High contract now incorporates both of these actions.

The SPO Estimate at Completion (EAC) was calculated using the Earned Value Management System formula Budget at Completion/Cost Performance Index.

The Estimate Price at Completion is based on the most likely estimate of cost at completion for all authorized contract work and the appropriate profit/fee, incentives and cost sharing.

	Initial Contract Price		
	Target	Ceiling	Qty
(U) <u>SBIRS Low PDRR:</u> Spectrum Astro, Gilbert, AZ F04701-99-C-0048, FFP Award: August 16, 1999 Definitized: August 16, 1999	\$275.0	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$275.0	N/A	0	\$275.0	\$275.0

Explanation of Change:

None.

15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>SBIRS Low PDRR:</u> TRW, Inc., Redondo Beach, CA F04701-99-C-0047, FFP Award: August 16, 1999 Definitized: August 16, 1999	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$275.0	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$275.0	N/A	0	\$275.0	\$275.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-11)</u>	<u>Total</u>
RDT&E	2342.5	646.1	810.2	3732.3	7531.1
Procurement	-	-	-	538.7	538.7
MILCON	28.5	-	2.8	14.1	45.4
O&M	27.4	5.9	14.4	65.7	113.4
<b>Total</b>	<b>2398.4</b>	<b>652.0</b>	<b>827.4</b>	<b>4350.8</b>	<b>8228.6</b>

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

SBIRS (High)

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-08)</u>	<u>Total</u>
RDT&E	1316.4	420.5	569.2	1044.3	3350.4
Procurement	-	-	-	538.7	538.7
MILCON	28.5	-	2.8	14.1	45.4
O&M	27.4	5.9	14.4	65.7	113.4
<b>Total</b>	<b>1372.3</b>	<b>426.4</b>	<b>586.4</b>	<b>1662.8</b>	<b>4047.9</b>

SBIRS (Low)

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-11)</u>	<u>Total</u>
RDT&E	1026.1	225.6	241.0	2688.0	4180.7
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>1026.1</b>	<b>225.6</b>	<b>241.0</b>	<b>2688.0</b>	<b>4180.7</b>

b. Annual Summary -- SBIRS (High)

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1995 Dollars Nonrcc</u>	<u>Flyaway FY 1995 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				111.3	113.0
1996				158.7	164.0
1997				184.3	193.0
1998				320.7	337.9
1999				478.1	508.5
2000				390.7	420.5
2001				520.9	569.2
2002				351.4	389.9
2003				174.4	196.8
2004				112.0	128.9
2005				85.9	100.9
2006				64.2	76.9
2007				61.2	74.8
2008				61.1	76.1
<b>Subtotal</b>	<b>2</b>			<b>3074.9</b>	<b>3350.4</b>

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001					
2002				83.2	94.0
2003	3		421.5	322.8	371.6
2004					
2005				6.0	7.2
2006				5.4	6.6
2007				4.1	5.1
2008					
Subtotal	3		421.5	421.5	484.5

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002				47.7	54.2
Subtotal				47.7	54.2

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				13.8	14.5
1998				13.2	14.0
2001				2.5	2.8
2002				12.5	14.1
Subtotal				42.0	45.4

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				9.9	10.4
1999				16.0	17.0
2000				5.5	5.9
2001				13.2	14.4
2002				13.3	14.7
2003				13.9	15.7

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

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2004				10.0	11.5
2005				8.6	10.1
2006				3.8	4.5
2007				3.8	4.6
2008				3.7	4.6
Subtotal				101.7	113.4

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	5		421.5	3687.8	4047.9

b. Annual Summary -- SBIRS (Low)

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				109.5	111.1
1996				238.7	246.6
1997				264.6	277.0
1998				199.2	210.0
1999				170.6	181.4
2000				209.7	225.6
2001				220.5	241.0
2002				276.4	306.5
2003				547.6	617.7
2004				663.2	763.4
2005				414.7	486.8
2006				161.6	193.6
2007				135.1	164.9
2008				67.5	84.1
2009				18.5	23.5
2010				18.3	23.7
2011				18.0	23.8
Subtotal	3			3733.7	4180.7

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	3			3733.7	4180.7

17. (U) Delivery/Expenditure Information:

SBIRS (High)

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1306.5

(U) Percent Total Program Expended: 32.3%

SBIRS (Low)

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 984.9

(U) Percent Total Program Expended: 23.6%

18. (U) Operating and Support Costs:

SBIRS (High)

a. (U) Assumptions and Ground Rules --

These Operations and Maintenance funds support the activation of new SBIRS High Component ground operating and training facilities at four sites worldwide. SBIRS High Component Increment 1 consolidates operations from three Defense Support Program sites into one CONUS-based site. These funds support the procurement of temporary facilities, minor construction, office equipment, furniture, travel, supplies, and communication links necessary for the activation of the SBIRS Mission Control Station, two OCONUS Remote Ground Stations, and Initial Qualification Training facility in FY99. Also supported with these funds are the repair and transportation of Government Furnished Equipment and TDY for training of the initial cadre of operators.

Annual cost is based upon Program Office Estimate dated November 1, 1999, and updated to support the FY01 President's Budget.

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

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SBIR (High) system	Avg Annual Cost Per DSP System
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	9.2	12.3
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	9.2	12.3

SBIRS (Low)

Not applicable for Pre-Milestone II programs.

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A) 6299)

PROGRAM: Army TACMS/APAM

AS OF DATE: December 31, 1997

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW DEPARTMENT OF DEFENSE

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ATACMS-APAM

1. (U) Designation and Nomenclature (Popular Name): Army Tactical Missile System (TACMS)/APAM
2. (U) DoD Component: Army
3. (U) Responsible Office and Telephone Number:  

Project Manager,	COL R. Kelley Griswold
Army TACMS-BAT Project Office	Assigned: September 2, 1998
ATTN: SFAE-MSL-AB	DSN 746-1141; COMM 256-876-1141
Redstone Arsenal, AL 35898-5650	Kelley.Griswold@msl.redstone.army.mil
4. (U) Program Elements/Procurement Line Items:  
RDT&E:  
(U) PE 064324A Project D302  
(U) PE 23802A Project D2MT, D304  
PROCUREMENT:  
(U) APPN 2032 ICN C98500 (Army)  
(U) APPN 2032 ICN C98501 (Army)  
(U) APPN 2032 ICN C98502 (Army)  
(U) APPN 2032 ICN C98510 (Army)  
(U) APPN 2032 ICN CA0261 (Army)  
MILCON:  
(U) PE 024030

~~Classified by Army TACMS BIKI/IA SCG dtd 28 Aug 1997, Army TACMS-BAT PO,  
PEO Tac Ms)  
Downgrade instructions:  
Declassify on: X3~~

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5. (U) References:

SAR Baseline (Production Estimate):

(U) Decision Change Paper (DCP), dated 15 Sep 90, subject: "Army Tactical Missile System Block I," based on Milestone III (DAB) decision.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated July 1, 1998.

6. (U) Mission and Description:

(U) The Army TACMS Block I is a ground-launched missile system consisting of a surface-to-surface guided missile with an anti-personnel/anti-materiel (APAM) warhead. The Improved Army TACMS (Block IA) integrates global positioning system (GPS) components and increases range of the Block I missile. The inherent GPS accuracies will be achievable independent of range. Army TACMS missiles are fired from the Multiple Launch Rocket System (MLRS) M270 family of launchers and are being deployed within the ammunition loads of corps MLRS battalions and/or division artillery MLRS batteries. Army TACMS includes: Guided Missile and Launching Assembly; Test Set, Guided Missile System; Training Set, Guided Missile System; M165; Trainer, Test Device, Guided Missile; M70; M270 family of launchers; and the Army TACMS Missile Facilities. The Army TACMS provides a deep fires missile system that operates in near all-weather conditions, day or night. It is used to attack tactical surface-to-surface missile sites, air defense missile sites, logistics elements and command/control/communication complexes. The Block IA missile will destroy high value targets at ranges approximately twice that of the current Block I missile. The Block IA missile is especially suited for destroying enemy surface-to-surface missile system launchers.

Army TACMS Block I replaces the conventional Lance system and the Army TACMS Block IA does not replace another defense system.

7. (U) Executive Summary:

(U) The Army TACMS Block I resulted from a requirement to engage high priority targets at ranges beyond those of existing weapons. The Required Operational Capability (ROC) was approved in May 1985. The Army TACMS Block I entered Full-Scale Development (FSD) in March 1986 and proceeded to Full-Rate Production (FRP) in 1991. The Army TACMS Block IA Program was approved for Engineering and Manufacturing Development in February 1994. Army TACMS Block IA entered Low-Rate Initial Production in 1996 and proceeded to FRP in 1998.

The Army TACMS-BAT and MLRS Project Offices launched an Army TACMS Block I Stockpile Reliability Program (SRP) missile on May 3, 1999, and a Block IA missile on May 5, 1999, from WSMR, as part of the Operational Flight Test phase of an Extended System Integration Test (ESIT) for the M270A1 launcher. Both tests successfully demonstrated missile system integration with the improved launcher system. An additional test was successfully flown on June 26, 1999 for the Block I SRP series.

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7. (U) Executive Summary (Cont'd):

As directed by the Office of the Deputy Chief of Staff for Operations (DCSOPS), a total of 298 (258 Block I and 40 Block IA) Army TACMS missiles were shipped to Albania in support of Operation Allied Force. DCSOPS directed acceleration of Block IA production to satisfy this requirement. An Emergency Conditional Materiel Release for Block IA missiles to U.S. Army Europe (USAREUR) was approved by the U.S. Army Aviation and Missile Command on April 27, 1999. No Army TACMS mission was executed. Retrograde of these missiles to USAREUR was completed in July 1999.

Delivery of 111 Army TACMS Block I variant missiles for Korea is continuing and will be completed in February 2000.

The Army TACMS Block IA FRP III contract for 110 missiles was awarded to Lockheed Martin Missiles and Fire Control - Dallas, December 10, 1999. This is the final Block IA missile buy. The FY 01 Block IA procurement buy (100 missiles) was deleted in the FY 01 President's Budget, February 07, 2000, for higher priority requirements. While the Authorized Acquisition Objective for Block IA remains at 652, the user accepts the risk associated with this reduction of 100 missiles.

Production is progressing satisfactorily and missile deliveries have remained 3 ahead of schedule for more than 100 consecutive months.

It is anticipated that this will be the final SAR for the ATACMS/APAM program based on the completion of 90 percent of missile deliveries and program expenditures.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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9. (U) Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
BLOCK I			
Assault Breaker Tech			
Demonstration			
Start	APR 1978	APR 1978	APR 1978
Complete	DEC 1982	DEC 1982	DEC 1982
Special Task Force Initiated	MAR 1981	N/A	MAR 1981
Mission Element Need	APR 1981	N/A	APR 1981
Statement Approval			
Joint (Army/AF) Program	JUN 1982	JUN 1982	JUN 1982
Directed			
ROC Approved	MAY 1985	MAY 1985	MAY 1985
Request For Proposal (RFP)	JUN 1985	N/A	JUN 1985
Released			
Milestone II (ASARC)	DEC 1985	N/A	DEC 1985
Milestone II (DSARC)	FEB 1986	FEB 1986	FEB 1986
FSD Contract Award	MAR 1986	MAR 1986	MAR 1986
EDT-C			
Start	MAR 1986	MAR 1986	MAR 1986
Complete	FEB 1989	FEB 1989	FEB 1989
Depot Service Support	N/A	JUN 1987	JUN 1987
Long Lead Time Items Contract	MAY 1988	MAY 1988	MAY 1988
Option Award			
DA Program Review (ASARC IIIA)	FEB 1989	JAN 1989	JAN 1989
LRIP Contract Option Award	FEB 1989	FEB 1989	FEB 1989
DT II Flight Test			
Start	MAR 1989	MAR 1989	MAR 1989
Complete	DEC 1989	DEC 1989	DEC 1989
OT Readiness Review	MAR 1990	MAR 1990	MAR 1990
First LRIP Delivery	MAR 1990	MAR 1990	MAR 1990
IOTE Flight/Ground Test			
Start	MAR 1990	MAR 1990	MAR 1990
Complete	JUN 1990	JUN 1990	JUN 1990
Confirmatory Test Complete	JUL 1990	JUN 1990	JUN 1990
(if required)			
First Unit Equipped	AUG 1990	AUG 1990	AUG 1990
Initial Operational	OCT 1990	AUG 1990	AUG 1990
Capability (IOC)			
Milestone III (DAB)	OCT 1990	NOV 1990	NOV 1990
Organic Support Capability	N/A	NOV 1990	NOV 1990
Full-Rate Production Contract	NOV 1990	NOV 1990	NOV 1990
Award			
Prod Verification Test			
(if required)			
Start	NOV 1990	NOV 1990	NOV 1990
Complete	MAY 1991	JAN 1991	JAN 1991
First Full Rate Production	OCT 1991	MAY 1991	MAY 1991
Delivery			

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Full-Rate Production-II Contract Award	N/A	DEC 1991	DEC 1991
First Full-Rate Production-II Delivery	N/A	SEP 1992	SEP 1992
BLOCK IA			
Milestone IV-Preplanned Product Improvement (P3I) Anti-Personnel/Anti-Materiel (APAM)	N/A	FEB 1994	FEB 1994
P3I APAM Engineering and Manufacturing Development (EMD) Contract Award	N/A	FEB 1994	MAR 1994
Critical Design Review	N/A	JUN 1995	JUN 1995
Production Prove-Out Test (PPT)			
Start	N/A	JUN 1995	JUL 1995
Complete	N/A	JAN 1996	MAR 1996
Pre-Production Qualification Tests (PPQT)			
Start	N/A	JAN 1996	MAY 1996
Complete	N/A	JUN 1996	OCT 1996
LRIP Decision	N/A	MAR 1996	MAY 1996
Operational Test & Evaluation			
Start	N/A	MAR 1996	AUG 1996
Complete	N/A	JUN 1996	SEP 1996
LRIP II Contract Award	N/A	APR 1997	APR 1997
Production Decision	N/A	MAR 1998	MAR 1998
Full-Rate Production (FRP) Contract Award	N/A	MAR 1998	MAY 1998
LRIP Delivery	N/A	AUG 1997	JUL 1997
Organic Support Capability	N/A	SEP 1997	SEP 1997
Depot Service Support	N/A	SEP 1997	SEP 1997
Initial Operational Capability (IOC)	N/A	FEB 1998	FEB 1998
LRIP II Delivery	N/A	JUN 1998	MAY 1998
First FRP Delivery	N/A	MAY 1999	APR 1999 (Ch-1)

b. Current Change Explanations --

(U) (CH-1) First FRP delivery date changed from May 1999 to April 1999 to reflect the actual date.

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10. (U) Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>					
<b>BLOCK I</b>										
Range (km)	130	130	/ 130	172@WSMR	165@Sea Level					
Payload (kg)	454	454	/ 454	567	567					
Accuracy	(b)(1)									
Min range to 107km (m)										
MILS at ranges greater than 107 km										
M/LPA Weight (NTE kg)										
Off-Axis Launch (+/- deg)	(b)(1)									
Reliability										
Launcher MTBOMF (hr)						54	54	/ 54	58.8	58.8
Missile PVT/FUE						.85	.85	/ .82	.935	.935
System Availability (As)	.75	.75	/ .75	.75	.75					
<b>BLOCK IA</b>										
Range (km)-Maximum	N/A	330	/ 300	316@WSMR	300@Sea Level					
Range (km)-Minimum	N/A	50-70	/ <130	93.4	70.0					
Payload (kg)	N/A	158	/ 158	173	173					
Accuracy	(b)(1)									
Min range to 107 km but w/o GPS aiding (m)										
Mils at ranges beyond 107 km but w/o GPS aiding										
Meters w/GPS but w/o countermeasures										
Meters w/GPS but w/countermeasures	N/A	(b)(1)								
M/LPA (NTE kg)	N/A									
Off-Axis Launch (+/- deg)	N/A									
Reliability Guided Missile and Launching Assembly: M39 (GMLA) End PPQT	N/A					.85	/ .82	.846	.846 (Ch-2)	

AS AMENDMENT

AS AMENDMENT

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

b. Current Change Explanations --

(U) (Ch-1) Block IA Accuracy (Meters w/GPS but w/o countermeasures) was changed from (b)(1) to reflect the actual demonstrated value obtained from additional flight tests.

(U) (Ch-2) Block IA Reliability was changed from .875 to .846 to reflect actual demonstrated value based on 13 test flights. The previous value was based on eight test flights. The reliability is still well within the threshold.

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	650.6	735.6	732.7
Procurement	846.4	1500.5	1424.4
Flyaway	(821.2)		(1396.4)
Nonrecurring			(7.7)
Total Flyaway	(821.2)		(1404.1)
Other Weapon Systems	(22.9)		(10.9)
Peculiar Support	(0.0)		(5.5)
Initial Spares	(2.3)		(3.9)
Construction (MILCON)	9.6	9.9	9.9
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1991 Base-Year \$	1506.6	2246.0	2167.0
 Escalation	1.6	95.9	67.5
Development (RDT&E)	(-89.3)	(-78.1)	(-78.7)
Procurement	(90.0)	(173.4)	(145.6)
Construction (MILCON)	(0.9)	(0.6)	(0.6)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	1508.2	2341.9	2234.5
 b. (U) Quantity --			
Development (RDT&E)	15	18	18
Procurement	<u>1542</u>	<u>2299</u>	<u>2199</u>
Total	1557	2317	2217

Note: Excludes 35 RDT&E prototypes from the SAR Baseline and 42 from the Current Estimate that are not considered fully configured.

(U) The current estimate for the Development quantity includes 15 Block I and 3 Block IA missiles. The current estimate for the Procurement quantity includes 1647 Block I and 552 Block IA missiles.

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

The ATACMS/APAM ADM, March 4, 1994, approved the Block IA Low Rate Initial Production (LRIP) quantity of 100 missiles (which exceeded 10 percent). As a result of funding reductions in FY 96, the Block IA LRIP quantity was reduced to 70 missiles which was below 10 percent. The current Block IA LRIP quantity of 167 missiles exceeds 10 percent of the total planned buy because a second LRIP buy of 97 missiles was approved in order to allow the Army time to respond to the effectiveness and reliability issues raised by the Operational Test Community during pre-ASARC reviews.

c. (U) Foreign Military Sales --  
Commitments to date for Army TACMS missiles are 72 for the government of Turkey for a total of \$61.4M; 111 for the government of Korea for a total of \$94.2M; and 71 for the government of Greece for a total of \$65.2M.

d. (U) Nuclear Costs --  
None.

12. (U) Unit Cost Summary:

	UCR Baseline (JUL 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1991 BY\$)	2246.0	2167.0	
(2) Quantity	2317	2217	
(3) Unit Cost	0.969	0.977	+0.83
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1991 BY\$)	1500.5	1424.4	
(2) Quantity	2299	2199	
(3) Unit Cost	0.653	0.648	-0.77

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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	-1.7	-89.7	-0.3	-91.7
Quantity	-	+394.5	-	+394.5
Schedule	-	+56.1	-	+56.1
Engineering	+96.7	-88.0	-	+8.7
Estimating	-2.3	+472.6	+0.3	+470.6
Other	-	-	-	-
Support	-	-18.1	-	-18.1
Subtotal	+92.7	+727.4	0.0	+820.1
Current Changes:				
Economic	-	+6.7	-	+6.7
Quantity	-	-55.0	-	-55.0
Schedule	-	-3.5	-	-3.5
Engineering	-	-	-	-
Estimating	-	-41.8	-	-41.8
Other	-	-	-	-
Support	-	-0.2	-	-0.2
Subtotal	-	-93.8	-	-93.8
Total Changes	+92.7	+633.6	0.0	+726.3
Current Estimate	654.0	1570.0	10.5	2234.5

(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	-	+307.7	-	+307.7
Schedule	-	+42.9	-	+42.9
Engineering	+83.4	-67.3	-	+16.1
Estimating	-1.3	+374.3	+0.3	+373.3
Other	-	-	-	-
Support	-	-4.7	-	-4.7
Subtotal	+82.1	+652.9	+0.3	+735.3
Current Changes:				
Quantity	-	-38.5	-	-38.5
Schedule	-	-2.9	-	-2.9
Engineering	-	-	-	-
Estimating	-	-33.3	-	-33.3
Other	-	-	-	-
Support	-	-0.2	-	-0.2
Subtotal	-	-74.9	-	-74.9
Total Changes	+82.1	+578.0	+0.3	+660.4
Current Estimate	732.7	1424.4	9.9	2167.0

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

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) Procurement

Revised escalation indices. (Economic)	N/A	-2.6
Economic adjustment for negative program change. (Economic)	N/A	+9.3
Total Quantity Variance associated with decrease of 100 units from 2299 to 2199.	-66.7	-89.3
Quantity decrease of -100 units. (Quantity)	-38.5	-55.0
Allocation to Schedule variance resulting from Quantity Change. (QR)(Schedule)	-2.9	-3.5
Allocation to Estimating variance resulting from Quantity Change. (QR)(Estimating)	-25.3	-30.8
Adjustment for Current and Prior Inflation. (Estimating)	+1.5	+1.9
Refinement of estimate to reflect curtailment of last production buy and budget reduction. (QR)(Estimating)	-9.5	-12.9
Refinement of estimate for data and training. (QR)(Support)	-0.2	-0.2
Procurement Subtotal	<u>-74.9</u>	<u>-93.8</u>

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.16	-0.05	-0.10	+0.03	+0.14	-1.23	--	+0.02	-1.19	0.97

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.97	-0.04	-0.12	+0.02	--	+0.19	--	-0.01	+0.04	1.01

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14b. (U) Unit Cost and Other History (Cont'd):

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.55	--	--	--	--	-0.01	--	--	-0.01	0.54

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.61	-0.04	-0.03	+0.02	-0.04	+0.20	--	-0.01	+0.10	0.71

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	FEB 1986	FEB 1986	FEB 1986	FEB 1986
Milestone III	N/A	SEP 1989	OCT 1990	NOV 1990
FUE/IOC	JUN 1990	JUN 1990	AUG 1990	AUG 1990
Total Cost	3585.8	1222.3	1508.2	2234.5
Total Quantity	N/A	1050	1557	2217
Prog Acq Unit Cost	N/A	1.16	0.97	1.01

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

a. Procurement -- Initial Contract Price  
 (U) LRIP II (Block IA): Target Ceiling Qty  
 Vought Systems, Dallas, TX  
 DAAH01-92-C-0038, FFP \$62.9 N/A 97  
 Award: April 23, 1997  
 Definitized: N/A

Current Contract Price Estimated Price At Completion  
 Target Ceiling Qty Contractor Program Manager  
 \$62.9 N/A 97 \$62.9 \$62.9

Explanation of Change:

None.

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15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

This contract has been completed and will no longer be reported.

(U) <u>FRP I (Block IA):</u> Vought Systems, Dallas, TX DAAH01-98-C-0093, FFP Award: May 15, 1998 Definitized: N/A	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$104.2	N/A	179

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$104.2	N/A	179	\$104.2	\$104.2

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

This contract has been completed and will no longer be reported.

(U) <u>FRP II (Block IA):</u> Vought Systems, Dallas, TX DAAH01-98-C-0093, FFP Award: December 15, 1998 Definitized: June 30, 1999	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$65.0	N/A	96

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$65.0	N/A	96	\$65.0	\$65.0

Explanation of Change:

(U) None.

Cost and Schedule variance reporting is not required on this FFP contract.

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15. (U) Contract Information (Cont'd):

(U) <u>FRP III (Block IA):</u> Vought Systems, Dallas, TX DAAH01-98-C-0093, FFP Award: December 10, 1999 Definitized: N/A	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$69.8	N/A	110

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$69.8	N/A	110	\$69.8	\$69.8

Explanation of Change:

(U) None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY80-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02)	<u>Total</u>
RDT&E	654.0	-	-	-	654.0
Procurement	1455.1	90.8	15.1	9.0	1570.0
MILCON	10.5	-	-	-	10.5
O&M	-	-	-	-	-
<b>Total</b>	<b>2119.6</b>	<b>90.8</b>	<b>15.1</b>	<b>9.0</b>	<b>2234.5</b>

b. Annual Summary -- ATACMS

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1991 Dollars Nonrec	Flyaway FY 1991 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1980				14.6	9.4
1981				19.9	14.0
1982				15.8	11.8
1983				7.7	6.0
1984				62.6	50.2
1985				92.3	76.4
1986				125.2	106.6

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Army TACMS/APAM, December 31, 1999

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

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1991 Dollars Nonrec	Flyaway FY 1991 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				87.1	76.5
1988				109.6	100.1
1989				77.7	73.8
1990				36.9	36.4
1991					
1992					
1993					
1994				23.3	25.4
1995				32.6	36.3
1996				22.4	25.4
1997				5.0	5.7
Subtotal	18			732.7	654.0

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY 1991 Dollars Nonrec	Flyaway FY 1991 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				3.7	3.5
1989	66	0.3	60.5	72.9	72.4
1990	104	3.2	94.8	100.6	103.0
1991	373		211.3	219.0	229.7
1992	300		153.6	160.7	172.3
1993	351		174.1	174.3	190.5
1994	255		147.4	128.3	142.8
1995	148		96.9	97.9	110.8
1996	120	4.2	99.5	105.7	120.6
1997	167		110.1	111.1	128.1
1998	109		76.5	77.9	90.8
1999	96		76.5	76.7	90.6
2000	110		95.2	75.9	90.8
2001				12.4	15.1
2002				7.3	9.0
Subtotal	2199	7.7	1396.4	1424.4	1570.0

Appropriation: 2050 - Military Construction, Army

Fiscal Year	Qty	Flyaway FY 1991 Dollars Nonrec	Flyaway FY 1991 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				4.8	5.0
1992				5.1	5.5

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

Appropriation: 2050 - Military Construction, Army

Fiscal Year	Qty	Flyaway FY 1991 Dollars Nonrec	Flyaway FY 1991 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal				9.9	10.5

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	2217	7.7	1396.4	2167.0	2234.5

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	18	18
Procurement	1990	1993

(U) Percent Total Program Quantities Delivered: 90.7%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 2012

(U) Percent Total Program Expended: 90.0%

(U) The fully configured end items for RDT&E are 15 Block I and 3 Block IA RDT&E units. The remaining RDT&E units will be used for testing as non-fully configured items.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
Army TACMS is fired from the MLRS M270 family of launchers within the MLRS organizational units. Army TACMS Operating and Support (O&S) general support costs, including manning and crew support, are included in the O&S section of the MLRS SAR. Army TACMS is a certified round. Maintenance support is determined on the basis of periodic surveillance tests.

The average annual cost reflects average annual cost for total Army TACMS Block I and Block IA missiles (2199).

There was no antecedent system for the Army TACMS/APAM. The date of the O&S cost estimate is February 7, 2000.

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

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

Cost Element	Avg Annual Cost For Total Block I/IA Qty	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	2.9	N/A
Unit Level Consumption	0.6	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	3.0	N/A
Contractor Support	0.0	N/A
Sustaining Support	3.5	N/A
Indirect Costs	0.0	N/A
Total	10.0	0.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: V-22 (OSPREY)

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): V-22 JOINT SERVICES ADVANCED VERTICAL LIFT AIRCRAFT (OSPREY)

2. DoD Component: Navy

Joint Participants:  
USMC, USN, USSOCOM, USAF

3. Responsible Office and Telephone Number:

PROGRAM EXECUTIVE OFFICE (PMA-275) COL NOLAN SCHMIDT  
AIR ASW ASSAULT AND SPECIAL MISSION Assigned: June 4, 1997  
47123 BUSE ROAD UNIT IPT SUITE 151 DSN 757-5161; COMM (301) 757-5161  
PATUXENT RIVER, MD 20670-1547 SCHMIDTND@NAVAIR.NAVY.MIL

4. Program Elements/Procurement Line Items:

RDT&E:

- PE 0603203N Project (SUNK)
- PE 0603256N (Shared) Navy Proj. W1557SUNK Project 642973
- PE 0604222A Project (SUNK)
- PE 0604262N (Shared) Navy MLR Proj. W2088 Project H1425
- PE 1110011F (Shared) Proj. 643752 (SUNK)
- PE 1160404BB (Shared) Proj. 643752

PROCUREMENT:

- APPN 1506 ICN 016300 (Navy)
- APPN 1506 ICN 016400 (Navy)
- APPN 0300 ICN 1160404BB (DCA/DNA)
- APPN 3010 ICN 41318F (Air Force)

MILCON:

- PE 1120493BB
- PE 1120547BB
- PE M62470

No Security Objection  
to Open Publication  
(AS AMENDED)

00-C-0126  
MAR 27 2000  
*Mark Newell*  
Office of the Chief of  
Naval Operations  
Dept. of the Navy

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MAR 28 2000 8

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

00-C-0829

5. References:

SAR Baseline (Development Estimate):  
FY 1988/89 President's Budget.

Approved Program:

NAE Approved Acquisition Program Baseline (APB) dated July 16, 1998.

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 and USSOCOM. The V-22 will replace the CH-46E and CH53A/D in the Marine Corps (MV-22), supplement the H-60 in the Navy (HV-22), and will supplement H-53, H-60, and C-130 in the Air Force and United States Special Operations Command (USSOCOM) (CV-22). The V-22 will be capable of flying over 2100 nautical miles with a single refueling, giving the services the advantage of a Vertical/Short Take-off, and Landing (VSTOL) aircraft that can rapidly self-deploy to any location in the world.

7. Executive Summary:

An Acquisition Decision Memorandum (ADM) was signed on February 10, 1995 authorizing an integrated MV-22/CV-22 program with the Navy as the lead service. ASN(RDA) ADM of March 29, 1999 approved full funding of LRIP lot 3 (FY99) and advanced procurement for lot 4 (FY00) contingent upon successful flight test of Automatic Flight Control (AFCS) software to enhance AFCS lateral stability. Successful flight test was accomplished in August 1999.

During very successful Sea Trials (Jan/Feb 1999) the MV-22 completed over 350 landings and tests to determine its suitability for operations aboard large deck amphibious ships, as well as all of its required maintenance and non-flying tests. EMD testing through December 1999 has consisted of a total of 723 flights and 1488 flight hours. The aircraft is currently meeting or exceeding all Key Performance Parameters.

During 1999, the V-22 began the transition from Development to Production with the delivery of the first low rate initial production (LRIP) aircraft (aircraft #11) to the Marine Corps. As of January 2000, 4 LRIP aircraft have been delivered and are participating in OPEVAL (Nov 99 - May 00).

As a result of MV-22 Lot 4 (FY00) airframe contract negotiations, and assessment of that impact on future estimates, the cost model which supports the budget has been revised to reflect higher estimates due to: Bell Helicopter rates; Bell-Boeing negotiated purchased equipment from vendors; and, Bell-Boeing Forward Pricing Rate Agreements (FPRA) related to labor costs. This change in the cost model results in a \$2,305.5M cost increase for the

7. Executive Summary (Cont'd):

MV-22 and HV-22. Full impact of this change has not yet been reflected in CV-22 procurement costs and will be addressed during POM02/Budget02 preparation. The V-22 average procurement unit cost (APUC) increased from \$39.506M to \$42.198M (6.8%) since the December 1998 SAR (in FY1986 Base Year dollars). The cumulative increase in APUC is 2.93% against the APB baseline.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Milestone 0 (DEPSECDEF MEMO)	DEC 1981	DEC 1981	DEC 1981
Milestone I (DSARC I)	DEC 1982	DEC 1982	DEC 1982
Preliminary Design Contract Award	APR 1983	APR 1983	APR 1983
Milestone II (DSARC II)	APR 1986	APR 1986	APR 1986
FSD Contract Award	MAY 1986	MAY 1986	MAY 1986
Production Contract Award (Long Lead AAC)	JAN 1989	JAN 1989	MAR 1989
Operational Testing IIA	AUG 1989	N/A	N/A
Milestone IIIA (USMC Pil Prod)	DEC 1989	N/A	N/A
Operational Testing IIB	AUG 1990	N/A	N/A
Milestone IIIB (All Serv Ltd Prod)	DEC 1990	N/A	N/A
Operational Testing IIIC (OPEVAL)	AUG 1991	N/A	N/A
Operational Testing IID (AF OPEVAL)	AUG 1991	N/A	N/A
First Fleet Deliveries	DEC 1991	N/A	N/A

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9a. Schedule (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
Milestone IIIC (USN/MC/A Full Production)	DEC 1991	N/A	N/A
USMC IOC (5 Acft Trng Det)	SEP 1992	N/A	N/A
USAF IOC (6 Acft Mission Capable)	SEP 1994	N/A	N/A
USA IOC (First Operational Company Equipped)	SEP 1995	N/A	N/A
EMD Airframe Contract Award	N/A	OCT 1992	OCT 1992
EMD Engine Contract Award	N/A	DEC 1992	DEC 1992
SRR Complete	N/A	AUG 1993	AUG 1993
EMD Trade Studies Complete	N/A	N/A	JAN 1994
PDR Complete	N/A	APR 1994	APR 1994
MS II Plus Program Review	N/A	SEP 1994	SEP 1994
CDR Complete	N/A	DEC 1994	DEC 1994
DAB LRIP REVIEW	N/A	FEB 1997	APR 1997
MV-22 TECHEVAL			
Start	N/A	FEB 1999	JUL 1999
Complete	N/A	APR 1999	SEP 1999
MV-22 OPEVAL			
Start	N/A	MAY 1999	NOV 1999 (Ch-1)
Complete	N/A	DEC 1999	MAY 2000
LRIP 1 Contract Award (Long lead \$)	N/A	FEB 1996	JUN 1996
LRIP 1 First Delivery	N/A	APR 1999	MAY 1999
LRIP 2 Contract Award (Long lead \$)	N/A	FEB 1997	APR 1997
LRIP 2 First Delivery	N/A	FEB 2000	APR 2000
LRIP 3 Contract Award (Long Lead \$)	N/A	FEB 1998	MAR 1998
LRIP 3 First Delivery	N/A	NOV 2000	MAR 2001
LRIP 4 Contract Award (Long Lead \$)	N/A	FEB 1999	MAR 1999
LRIP 4 First Delivery	N/A	OCT 2001	NOV 2001
Full Rate Production Contract Award (Long lead \$)	N/A	FEB 2000	FEB 2000
Physical Configuration Audit (PCA)	N/A	DEC 1999	DEC 1999
MS III	N/A	DEC 2000	OCT 2000 (Ch-2)
MV-22 IOC	N/A	APR 2001	JAN 2001
GSD	N/A	MAR 2007	MAR 2007
Modification to EMD Contract to Include CV-22 Efforts	N/A	JUN 1995	AUG 1995
CV-22 SRR	N/A	AUG 1996	AUG 1996
CV-22 PDR	N/A	FEB 1998	DEC 1997
CV-22 CDR	N/A	DEC 1998	DEC 1998
CV-22 Production Contract Award (Long lead \$)	N/A	FEB 2000	MAR 2000 (Ch-3)
CV-22 Flight Test			
Start	N/A	OCT 1999	MAR 2000 (Ch-3)
Complete	N/A	FEB 2002	FEB 2002
CV-22 IOT&E			
Start	N/A	MAR 2002	MAR 2002
Complete	N/A	SEP 2002	SEP 2002
CV-22 First Production Delivery	N/A	MAR 2003	MAR 2003

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9a. Schedule (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
IOC-CV	N/A	OCT 2005	OCT 2005

Milestone 0 through USA IOC (First Operational Company Equipped) reflects the FSD program which was terminated in April 1989.

b. Current Change Explanations --

(Ch-1) OPEVAL start slipped from Oct 99 to Nov 99 due to later than anticipated delivery of aircraft #12. (Delivery occurred 1 Nov 99)

(Ch-2) Despite the delay in OPEVAL start, MS III current estimate has been accelerated from Dec 00 to Oct 00 due to anticipated early completion of all MS III documentation.

(Ch-3) CV-22 Flight Test start has slipped from Dec 99 to Mar 00 due to extension of MV-22 EMD flight schedule. CV-22 Production Contract Award is contingent upon start of CV-22 flight test and has consequently slipped from Feb 00 to Mar 00.

10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Folded				
Length (ft)	62.24	N/A / N/A	N/A	N/A
Width (ft)	18.42	N/A / N/A	N/A	N/A
Height (ft)	17.98	N/A / N/A	N/A	N/A
Unfolded				
Length (ft)	57.33	N/A / N/A	N/A	N/A
Width (ft)	83.83	N/A / N/A	N/A	N/A
Height (ft)	21.73	N/A / N/A	N/A	N/A
Empty Weight (lbs)	31786	N/A / N/A	N/A	N/A
Readiness, Msn	70	N/A / N/A	N/A	N/A
Capability Rate (% MC)				
Mission Complete Probability, Rate (MFHBMA Design Controllable) (%)	98	N/A / N/A	N/A	N/A
Direct Maintenance Manhours per Flight Hour, Design Controllable:	N/A	N/A / N/A	TBD	
Org Level, Unscheduled (corrective)	7.0	N/A / N/A	N/A	N/A



10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold		Demon- strated Perf	Current Estimate	
Org Level, Scheduled (preventive)	2.5	N/A	/ N/A	N/A	N/A	
World-wide Self-Deployment (nm) (minimum distance)	2100	N/A	/ N/A	N/A	N/A	
Continuous Cruise Speed (kts)	250	N/A	/ N/A	N/A	N/A	
Dash Speed (kts) Instantaneous	275	N/A	/ N/A	N/A	N/A	
G-Loading						
Plus	4.0	N/A	/ N/A	N/A	N/A	
Minus	-1.0	N/A	/ N/A	N/A	N/A	
Troop Capacity	24	N/A	/ N/A	N/A	N/A	
External Cargo (lbs)	10000	N/A	/ N/A	N/A	N/A	
MV-22	-					
Cruise Speed (kts)	N/A	270	/ 240	265	265	(Ch-1)
			/			
Mission Radius (NM)						
Land Trooplift	N/A	200X1	/ 200X1	236	236X1	(Ch-1)
Land External	N/A	110X1	/ 50X1	55X1	55X1	(Ch-1)
Sea Trooplift	N/A	110X2	/ 50X2	93X2	93X2	(Ch-1)
Sea External	N/A	110X1	/ 50X1	117X1	117X1	(Ch-1)
Payload						
Troops	N/A	24	/ 24	TBD	24	
External Lift (lbs)	N/A	15,000	/ 10,000	10,000	10,000	(Ch-1)
Aerial Refuel Capable	N/A	yes	/ yes	TBD	yes	
Self-Deployment (nm)	N/A	2100 w/ no refuel	/ 2100 w/1 aerial refuel	TBD	2261 w/1 aerial refuel	(Ch-1)
Shipboard Compatible	N/A	yes	/ yes	yes	yes	(Ch-1)
V/STOL Capable	N/A	yes	/ yes	yes	yes	(Ch-1)
Survivability (mm API @90%vel)	N/A	14.5	/ 12.7	TBD	12.7	
Reliability						
MTBF	N/A	>=2.0	/ >=1.4	.78	1.4*	(Ch-1)
Mission (%)	N/A	>=85	/ >=85	85	85	(Ch-1)
CV-22						
Cruise Speed (kts)	N/A	250	/ 230	TBD	246	(Ch-2)
Mission Radius (nm)	N/A	750	/ 500	TBD	503	(Ch-2)
Payload - Troops	N/A	24	/ 18	TBD	18	
Aerial Refuel Capable	N/A	yes	/ yes	TBD	yes	

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10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Self-Deployment (nm)	N/A	2100 w/o/ aerial refuel	2100 w/1 aerial refuel	TBD	2313w/1 (Ch-2) aerial refuel
Shipboard Compatible	N/A	yes	/ yes	TBD	yes
Operational Environment	N/A	100' TF/TA, Day/Night, VMC/IMC	/ 300' TF/TA, Day/Night, VMC/IMC	TBD	300' TF/TA, Day/Night, VMC/IMC
Precision Navigation (diameter @ MAX Combat Radius)	N/A	Locate LZ W/IN 1 Rotor	/ Locate LZ W/IN 2X Rotor	TBD	Locate LZ W/IN 2X Rotor
Reliability <sup>-</sup>					
MTBF	N/A	>=2.0	/ >=1.4	TBD	1.4
Weapon System (%)	N/A	>=84	/ >=77	TBD	77

\* to be met in CY01.

NOTE #1: Performance characteristics "Folded through External Cargo" with the Current Estimate as N/A were for the FSD program cancelled in 1989 and will be deleted at Milestone III.

NOTE #2: Impact of production program termination. "Not applicables" reflect the termination of production.

b. Current Change Explanations --

(Ch-1) MV-22 Cruise Speed, mission radii, and self-deployment entries have been made in the demonstrated column and PM's estimates have been updated based on analysis of May 99 Performance Demo flight test data. Summary of changes are as follows:

MV-22	Demonstrated	Current Estimate
Cruise Speed (kts)	from TBD to 265	from 267 to 265
Mission Radius (NM)		
Land Trooplift	from TBD to 236	No Change
Land External	from TBD to 55x1	No Change
Sea Trooplift	from TBD to 93x2	No Change
Sea External	from TBD to 117x1	No Change
Payload		
External Lift	from TBD to 10,000	No Change
Self-Deployment (nm)	TBD (No Change)	from 2273w/1 to 2261w/1
Shipboard Compatible	from TBD to yes	No Change
V/STOL Capable	from TBD to yes	No Change
Reliability		
MTBF	from TBD to .78	1.4* (to be met in CY01)
Mission	from TBD to 85	No Change

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10b. Performance Characteristics (Cont'd):

(CH-2) CV-22 Cruise Speed, mission radius, and self-deployment PM estimates have been updated based on analysis of May 99 Performance Demo flight test data. Summary of changes are as follows:

CV-22	Current Estimate
Cruise Speed	from 252 to 246
CV-22 Mission Radius (nm)	from 509 to 503
Self-Deployment (nm)	from 2414 to 2313

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

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	2443.7	5562.5	5817.2
Procurement	20493.1	21441.7	19326.5
Flyaway	(15517.1)		(0.0)
Recurring Flyaway			(15676.3)
Nonrecurring Flyaway			(540.8)
Total Flyaway	(15517.1)		(16217.1)
Other Weapon Systems Cost	(3299.6)		(2179.9)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(1676.4)		(929.5)
Construction (MILCON)	136.2	34.5	35.2
Acquisition O&M	0.0	0.0	0.0
Total FY 1986 Base-Year \$	23073.0	27038.7	25178.9
Escalation	6589.3	25923.2	12933.3
Development (RDT&E)	(181.5)	(1388.5)	(1379.8)
Procurement	(6371.1)	(24515.2)	(11534.8)
Construction (MILCON)	(36.7)	(19.5)	(18.7)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	29662.3	52961.9	38112.2
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	913	523	458
Total	913	523	458

Note: Excludes 6 RDT&E prototypes from the SAR Baseline and 10 from the Current Estimate that are not considered fully configured.

An approved APB revision deleted the eleven (11) development aircraft from the baseline because they are not fully configured. The MV-22 LRIP quantities are as follows: 5 (FY97), 7 (FY98), 7 (FY99), and 11 (FY00). This does not represent more than 10% of the planned program buy.

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

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (JUL 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1986 BY\$)	27038.7	25178.9	
(2) Quantity	523	458	
(3) Unit Cost	51.699	54.976	+6.34
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1986 BY\$)	21441.7	19326.5	
(2) Quantity	523	458	
(3) Unit Cost	40.998	42.198	+2.93

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	-157.7	-5637.9	-12.3	-5807.9
Quantity	-77.0	+12024.2	-	+11947.2
Schedule	+28.2	-3595.9	+7.8	-3559.9
Engineering	+66.8	+374.3	-	+441.1
Estimating	+4663.8	-587.9	-119.2	+3956.7
Other	-	-	-	-
Support	-	-419.2	-	-419.2
Subtotal	+4524.1	+2157.6	-123.7	+6558.0
Current Changes:				
Economic	-4.3	-243.7	+4.2	-243.8
Quantity	-	-	-	-
Schedule	-	+42.2	-	+42.2
Engineering	-	-	-	-
Estimating	+52.0	+2329.1	+0.5	+2381.6
Other	-	-	-	-
Support	-	-288.1	-	-288.1
Subtotal	+47.7	+1839.5	+4.7	+1891.9
Total Changes	+4571.8	+3997.1	-119.0	+8449.9
Current Estimate	7197.0	30861.3	53.9	38112.2

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

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	-149.3	-	-222.2
Schedule	+16.9	-322.8	-	-305.9
Engineering	+46.6	+220.1	-	+266.7
Estimating	+3349.2	-437.2	-104.4	+2807.6
Other	-	-	-	-
Support	-	-1710.3	-	-1710.3
Subtotal	+3339.8	-2399.5	-104.4	+835.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+33.7	+1388.5	+3.4	+1425.6
Other	-	-	-	-
Support	-	-155.6	-	-155.6
Subtotal	+33.7	+1232.9	+3.4	+1270.0
Total Changes	+3373.5	-1166.6	-101.0	+2105.9
Current Estimate	5817.2	19326.5	35.2	25178.9

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (NAVY/USSOCOM) (Economic)	N/A	-5.1
Economic adjustment for negative program change. (NAVY) (Economic)	N/A	+0.8
Update to reflect actual program value. (NAVY) (Estimating)	-9.8	-13.7
Across the Board Reduction Congressional Recission. (NAVY) (Estimating)	-0.7	-1.0
Miscellaneous Rate Adjustments. (NAVY) (Estimating)	-6.0	-9.6
Adjustment for Current and Prior Inflation. (NAVY) (Estimating)	+1.3	+1.9
Addition results from refinement of costs for the Pre-Planned Product Improvement (P3I) upgrade development. (USSOCOM) (Estimating)	+44.8	+68.4

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

b. Current Change Explanations --		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
	Increase to fund CV-22 Initial Operational Testing and Evaluation. (Air Force) (Estimating)	+4.1	+6.0
	RDT&E Subtotal	+33.7	+47.7
(2)	<u>Procurement</u>		
	Revised escalation indices. (NAVY/AIRFORCE/USSOCOM) (Economic)	N/A	-302.0
	Economic adjustment for negative program change. (NAVY/AIRFORCE/USSOCOM) (Economic)	N/A	+58.3
	Stretchout of annual procurement buy profile. (NAVY) (Schedule)	0.0	+42.2
	Change in Initial Spares. (NAVY) (Support)	-126.5	-232.6
	Adjustment for Current and Prior Inflation. (NAVY) (Support)	+1.3	+2.2
	Increase to reflect revised labor rates, material costs, and misc. (NAVY) (Estimating)	+1365.6	+2305.5
	Adjustment for Current and Prior Inflation. (NAVY) (Estimating)	+5.0	+7.1
	Change in Initial Spares. (AIRFORCE) (Support)	-51.8	-91.3
	Adjustment for Current and Prior Inflation. (AIRFORCE) (Estimating)	+0.1	+0.2
	Increase to reflect revised labor rates, material costs, and misc. (AIRFORCE) (Estimating)	+32.6	+47.7
	Impact of stretchout of Navy procurement profile on Air Force. (AIRFORCE) (Estimating)	+6.4	+9.8
	Adjustment for Current and Prior Inflation. (AIRFORCE) (Support)	+0.2	+0.2
	Change in Initial Spares. (USSOCOM) (Support)	+21.1	+33.3

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment for Current and Prior Inflation. (USSOCOM) (Support)	+0.1	+0.1
Reduction due to program decrement beyond FYDP (FY06 & FY07). (USSOCOM) (Estimating)	-21.2	-41.2
Procurement Subtotal	<u>+1232.9</u>	<u>+1839.5</u>
(3) <u>MILCON</u>		
Revised escalation indices. (NAVY/USSOCOM) (Economic)	N/A	-0.5
Economic adjustment for negative program change. (NAVY) (Economic)	N/A	+4.7
Reduction due to revised estimate. (NAVY) (Estimating)	-6.8	-15.6
Increase due to refinement of estimate. (USSOCOM) (Estimating)	+10.2	+16.1
MILCON Subtotal	<u>+3.4</u>	<u>+4.7</u>

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
40.18	-4.97	-6.48	+0.83	--	+0.03	--	+2.90	-7.69	32.49

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
32.49	-13.21	+58.35	-7.68	+0.96	+13.84	--	-1.54	+50.72	83.21

14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
36.64	-4.86	-5.58	+0.65	--	-0.33	--	+2.90	-7.22	29.42

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
29.42	-12.84	+55.48	-7.76	+0.82	+3.80	--	-1.54	+37.96	67.38

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	DEC 1982	DEC 1982	N/A	DEC 1982
Milestone II	MAY 1985	APR 1986	N/A	APR 1986
Milestone III	JUL 1989	DEC 2000	N/A	OCT 2000
FUE/IOC	DEC 1991	APR 2001	N/A	JAN 2001
Total Cost	24467	46599.7	N/A	38112.2
Total Quantity	609	523	N/A	458
Prog Acq Unit Cost	40.18	89.1	N/A	83.21

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

a. RDT&E --

EMD (Airframe):  
 Bell-Boeing JPO, Patuxent River MD  
 N00019-93-C-0006, CPAF  
 Award: October 22, 1992  
 Definitized: May 3, 1994

Initial Contract Price		
Target	Ceiling	Qty
\$2650.0	N/A	4

Current Contract Price		
Target	Ceiling	Qty
\$3377.8	N/A	4

Estimated Price At Completion	
Contractor	Program Manager
\$3526.8	\$3507.8



15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-10.8	\$-12.1
Cumulative Variances To Date (11/30/99)	<u>\$-21.4</u>	<u>\$-18.2</u>
Net Change	\$-10.6	\$-6.1

Explanation of Change:

Target Price increased \$10.1M, from \$3,367.7M to \$3,377.8M (since the last SAR), due to addition of contract modifications to include Contractor and Engineering Technical Services (CETS) to support OPEVAL. Previous changes included the addition of new scope for efforts such as: fatigue test article; CV-22 development; logistics; icing, and affordability studies.

Contractor Estimated Price at Completion reflects an overrun of \$149M. The primary reasons for the increase (from the last SAR) are increased vendor costs and revised labor rates.

Program Manager Estimated Price at Completion reflects an overrun of \$130M (unchanged since the last SAR). The overrun is attributable to increased effort expended to achieve first flight and ferry flight of aircraft 7-10 to Patuxent River; subcontractor cost growth; and slower start in performing flight test activities than anticipated. An MV-22 Over Target Baseline (OTB) of \$130M was authorized in February 1998 and fully implemented in the April 1998 Cost Performance Report.

There is currently a \$19M difference between Contractor's Estimate and Program Manager's estimate. Existing Management Reserve, when combined with continuing favorable cost performance on the CV-22 portion of the program is considered sufficient to cover risks at this time. A comprehensive review of remaining efforts is in progress.

	Initial Contract Price				
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
<u>NAMTS:</u>					
Bell Boeing JPO, Patuxent River MD					
N0001993C0006/1, CPIF	\$41.1	N/A	1		
Award: March 17, 1997					
Definitized: March 17, 1997					
	Current Contract Price			Estimated Price At Completion	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
	\$41.1	N/A	1	\$41.1	\$41.1

15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.2	\$0.3
Cumulative Variances To Date (11/30/99)	<u>\$0.3</u>	<u>\$-5.3</u>
Net Change	\$0.1	\$-5.6

Explanation of Change:

An FPI subcontract between Reflectone and Bell-Boeing is experiencing/projecting a cost overrun. The Government share of the overrun is limited due to ceiling; however, schedule risk is a continuing concern and prime (Boeing) costs are CPIF.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
b. Procurement -- <u>FY-97 LRIP 1 (AIRFRAME):</u> Bell-Boeing JPO, Patuxent River MD N0001996C0054/1,- CPIF Award: May 30, 1996 Definitized: May 30, 1996	\$419.5	N/A	4

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$532.5	N/A	5	\$516.2	\$532.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$10.0	\$-2.0
Cumulative Variances To Date (11/30/99)	<u>\$20.0</u>	<u>\$-3.7</u>
Net Change	\$10.0	\$-1.7

Explanation of Change:

Target Price increase of \$19.1M from \$513.4M to \$532.5M (since the last SAR), is due to addition of contract modifications. Major changes include the addition of a Display System Upgrade and miscellaneous configuration changes. Previous changes include the addition of one aircraft, the Pitot Static Probe, fiber placement, Supplier Outreach Program, and miscellaneous configuration changes.

Cumulative favorable cost variance continued to increase due to lower actual rates in overhead and G&A than expected.

15. Contract Information (Cont'd):

<p><u>V-22 Engine:</u> Allison Engine Co., Indianapolis IN N00019-95-C-0209, FFP Award: N/A Definitized: May 8, 1998</p>	<table border="0"> <tr> <th colspan="3">Initial Contract Price</th> </tr> <tr> <th><u>Target</u></th> <th><u>Ceiling</u></th> <th><u>Qty</u></th> </tr> <tr> <td>\$19.5</td> <td>N/A</td> <td>10</td> </tr> </table>	Initial Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$19.5	N/A	10
Initial Contract Price										
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>								
\$19.5	N/A	10								

<table border="0"> <tr> <th colspan="3">Current Contract Price</th> </tr> <tr> <th><u>Target</u></th> <th><u>Ceiling</u></th> <th><u>Qty</u></th> </tr> <tr> <td>\$101.8</td> <td>N/A</td> <td>38</td> </tr> </table>	Current Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$101.8	N/A	38	<table border="0"> <tr> <th colspan="2">Estimated Price At Completion</th> </tr> <tr> <th><u>Contractor</u></th> <th><u>Program Manager</u></th> </tr> <tr> <td>\$101.8</td> <td>\$101.8</td> </tr> </table>	Estimated Price At Completion		<u>Contractor</u>	<u>Program Manager</u>	\$101.8	\$101.8
Current Contract Price																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
\$101.8	N/A	38														
Estimated Price At Completion																
<u>Contractor</u>	<u>Program Manager</u>															
\$101.8	\$101.8															

Explanation of Change:

Change from the Initial to Current Target Price reflect the procurement of more engines.

Cost and Schedule variance reporting is not required on this FFP contract.

<p><u>FY98 LRIP 2 (AIRFRAME):</u> Bell-Boeing JPO, Patuxent River MD N0001996C0054/2, CPIF Award: April 28, 1997 Definitized: April 28, 1997</p>	<table border="0"> <tr> <th colspan="3">Initial Contract Price</th> </tr> <tr> <th><u>Target</u></th> <th><u>Ceiling</u></th> <th><u>Qty</u></th> </tr> <tr> <td>\$418.9</td> <td>N/A</td> <td>5</td> </tr> </table>	Initial Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$418.9	N/A	5
Initial Contract Price										
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>								
\$418.9	N/A	5								

<table border="0"> <tr> <th colspan="3">Current Contract Price</th> </tr> <tr> <th><u>Target</u></th> <th><u>Ceiling</u></th> <th><u>Qty</u></th> </tr> <tr> <td>\$593.7</td> <td>N/A</td> <td>7</td> </tr> </table>	Current Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$593.7	N/A	7	<table border="0"> <tr> <th colspan="2">Estimated Price At Completion</th> </tr> <tr> <th><u>Contractor</u></th> <th><u>Program Manager</u></th> </tr> <tr> <td>\$593.7</td> <td>\$593.7</td> </tr> </table>	Estimated Price At Completion		<u>Contractor</u>	<u>Program Manager</u>	\$593.7	\$593.7
Current Contract Price																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
\$593.7	N/A	7														
Estimated Price At Completion																
<u>Contractor</u>	<u>Program Manager</u>															
\$593.7	\$593.7															

<p>Previous Cumulative Variances</p> <p>Cumulative Variances To Date (11/30/99)</p> <p>Net Change</p>	<table border="0"> <tr> <th><u>Cost Variance</u></th> <th><u>Schedule Variance</u></th> </tr> <tr> <td>\$1.3</td> <td>\$3.1</td> </tr> <tr> <td><u>\$0.0</u></td> <td><u>\$-1.6</u></td> </tr> <tr> <td>\$-1.3</td> <td>\$-4.7</td> </tr> </table>	<u>Cost Variance</u>	<u>Schedule Variance</u>	\$1.3	\$3.1	<u>\$0.0</u>	<u>\$-1.6</u>	\$-1.3	\$-4.7
<u>Cost Variance</u>	<u>Schedule Variance</u>								
\$1.3	\$3.1								
<u>\$0.0</u>	<u>\$-1.6</u>								
\$-1.3	\$-4.7								

Explanation of Change:

Target Price decrease of \$8.0M from \$601.7M to \$593.7M (since last SAR) primarily due to definitization of Internal Cargo Handling Effort.

Previous changes included an increase of \$182.8M due to 2 aircraft plus up, addition of Internal Cargo Handling System, and miscellaneous configuration changes.

15. Contract Information (Cont'd):

<u>MV-22 LRIP SIM.FFS/FTD:</u>			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
Bell-Boeing JPO, Patuxent River MD	\$34.2	N/A	2		
N0001996C0054/0, CPIF					
Award: November 25, 1997					
Definitized: November 25, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$47.3	N/A	2	\$47.3	\$47.3	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (11/30/99)			\$1.2	\$0.0	
Net Change			\$2.3	\$-0.5	
			\$1.1	\$-0.5	

Explanation of Change:

Previous changes included increase of \$13.1M from initial contract price due to the addition of Flight Training Device, and configuration changes.

<u>FY99 LRIP 3 (AIRFRAME):</u>			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
Bell Boeing JPO, Patuxent River MD	\$528.5	N/A	7		
N0001996C0054/3, CPIF					
Award: March 27, 1998					
Definitized: March 27, 1998					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$547.4	N/A	7	\$547.4	\$547.4	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (11/30/99)			\$0.0	\$0.0	
Net Change			\$0.0	\$0.0	

Explanation of Change:

Target Price increased \$12.0M due to miscellaneous configuration changes.

No cost/schedule performance measurement reported to date (Actual to date of \$53.7M).

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V-22 (OSPREY), December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY82-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-15)	<u>Total</u>
RDT&E	6480.7	214.1	188.7	313.5	7197.0
Procurement	2402.9	1029.0	1703.3	25726.1	30861.3
MILCON	4.8	0.7	1.1	47.3	53.9
O&M	-	-	-	-	-
Total	8888.4	1243.8	1893.1	26086.9	38112.2

b. Annual Summary -- V-22 OSPREY

Appropriation: 0400 - RDT&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1986 Dollars Nonrec</u>	<u>Flyaway FY 1986 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1991				6.3	7.7
1992				11.3	14.1
1993					
1994				11.3	14.7
1995					
1996					
1997					
1998					
1999					
2000				22.8	32.2
2001				28.3	40.5
2002				27.1	39.3
2003				23.2	34.3
2004				6.8	10.3
2005				12.7	19.6
2006				12.8	20.0
2007				12.8	20.4
Subtotal				175.4	253.1

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1986 Dollars Nonrec</u>	<u>Flyaway FY 1986 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1982				1.5	1.3
1983				37.2	34.4
1984				88.7	85.0
1985				174.4	172.4

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V-22 (OSPREY), December 31, 1999

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1986 Dollars Nonrec	Flyaway FY 1986 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986				516.4	525.1
1987				402.8	421.7
1988				375.0	405.8
1989				239.4	269.9
1990				174.0	204.2
1991				174.5	212.2
1992				605.5	757.6
1993				556.8	712.7
1994				7.0	9.1
1995				340.6	452.7
1996				530.0	716.4
1997				442.6	605.5
1998				353.6	487.6
1999				241.5	336.1
2000				129.1	181.9
2001				103.6	148.2
2002				65.9	95.7
2003				28.1	41.5
2004				11.9	17.9
2005				5.5	8.5
Subtotal				5605.6	6903.4

NOTE: FY 1983 \$'s reflect \$29.9M of Army funds (PE 0604222A).

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1986 Dollars Nonrec	Flyaway FY 1986 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985				0.6	0.6
1986				2.2	2.2
1987				2.8	2.9
1988				23.1	25.0
1989				3.4	3.8
2002				4.1	6.0
Subtotal				36.2	40.5

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V-22 (OSPREY), December 31, 1999

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

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1986 Dollars Nonrec	Flyaway FY 1986 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				2.8	4.0
2000				2.5	3.6
2001		2.2		5.8	8.5
2002		7.1	22.3	70.2	103.8
2003		21.9	27.6	84.2	127.0
2004		26.0	26.0	94.7	145.6
2005		36.9	24.6	102.6	160.9
2006		35.9	23.7	94.3	150.8
2007			11.0	29.9	48.8
Subtotal		130.0	135.2	487.0	753.0

Quantities for the CV-22 are shown under appropriation 3010. In accordance with the approved program plan, the Air Force is funding the majority of the procurement cost for the CV-22. USSOCOM is funding delta costs above the baseline (MV-22) aircraft for SOF unique equipment.

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1986 Dollars Nonrec	Flyaway FY 1986 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989		196.7		196.7	231.4
1990					
1991					
1992					
1993					
1994					
1995					
1996				33.9	46.4
1997	5	48.7	378.5	514.7	709.9
1998	7	4.1	436.7	504.1	702.6
1999	7	12.7	405.4	486.7	686.6
2000	11	22.9	523.9	687.3	983.7
2001	16	33.4	687.1	904.3	1314.9
2002	19	15.5	715.4	1050.7	1554.2
2003	28	15.9	943.1	1184.8	1786.2
2004	28	1.2	921.6	1136.5	1747.7
2005	28	1.2	892.4	1070.1	1678.5
2006	30	1.1	936.2	1065.1	1704.0
2007	30	1.1	921.4	1027.9	1677.4
2008	30	1.1	957.0	1061.3	1766.7
2009	30	1.1	945.6	1043.2	1771.2
2010	32	1.6	996.8	1161.2	2010.9

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V-22 (OSPREY), December 31, 1999

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1986 Dollars Nonrec	Flyaway FY 1986 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2011	32	1.6	986.4	1092.3	1929.5
2012	36	1.2	1095.9	1219.6	2197.4
2013	30	7.4	933.2	961.7	1767.5
2014	9	2.4	294.9	322.2	604.0
Subtotal	408	370.9	13971.5	16724.3	26870.7

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1986 Dollars Nonrec	Flyaway FY 1986 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				15.6	22.0
2000				29.1	41.7
2001	4	11.7	201.3	261.3	379.9
2002	6	18.1	213.3	329.8	487.8
2003	9	9.3	277.8	357.3	538.6
2004	9	0.4	267.6	344.6	529.9
2005	9	0.4	255.5	338.1	530.3
2006	9		246.6	301.9	483.0
2007	4		107.5	137.5	224.4
Subtotal	50	39.9	1569.6	2115.2	3237.6

Appropriation: 0500 - Military Construction, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1986 Dollars Nonrec	Flyaway FY 1986 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000				0.1	0.2
2001				0.2	0.3
2002				7.0	10.4
2003				0.4	0.6
2004				4.3	6.6
2005				4.0	6.3
2006				3.0	4.8
2007				2.8	4.5
Subtotal				21.8	33.7

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V-22 (OSPREY), December 31, 1999

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

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY 1986 Dollars Nonrec	Flyaway FY 1986 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990				4.0	4.8
1991					
1992					
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000				0.3	0.5
2001				0.6	0.8
2002					
2003				0.7	1.0
2004				1.5	2.3
2005				1.1	1.7
2006					
2007				0.4	0.7
2008				0.8	1.3
2009					
2010				2.4	4.1
2011					
2012					
2013					
2014					
2015				1.6	3.0
Subtotal				13.4	20.2

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD		130.0	135.2	684.2	1039.8
Navy	408	370.9	13971.5	22343.3	33794.3
USAF	50	39.9	1569.6	2151.4	3278.1
Grand Total	458	540.8	15676.3	25178.9	38112.2

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17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E		
Procurement		4

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 7265

Percent Total Program Expended: 19.1%

Deliveries reflect Navy MV-22 aircraft.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

(U) The following are the Assumptions and Ground Rules:

	MV-22	HV-22	CV-22
Aircraft Service Life	10,000 hrs	10,000 hrs	10,000 hrs
Aircraft Attrition Rate	1%	1%	0.6%
Aircraft Pipeline Rate	0	10%	13%
Total Aircraft in the Inventory	360	48	50
Total Operational Aircraft	322	32	43
Aircraft per Operating Squadron	12(18squad)	16(2squad)	0
Aircraft per Operating Squadron	CONUS		6(1squad)
Aircraft per Operating Squadron	CONUS		7(1squad)
Aircraft per Operating Squadron	OVERSEAS		7(4squad)
A/C per Training Squadron(FRS)	35	0	0
A/C per Training Squadron (AETC)	0	0	6
Aircraft per Special Squadron	23	0	0
Aircraft per Reserve Squadron	12(4squad)	0	0
Flight Hours per Month	35	35	36
Flight Hours per Year	420	420	432
JP-5 Cost per Gallon (FY99)	\$0.93	\$0.93	\$0.93
JP-5 Cost per Barrel (42 gal)	\$39.06	\$39.06	\$39.06
Consumption Rate	402 gal/hr	402 gal/hr	402 gal/hr
Lubricating Oil Cost per Gallon	\$2.19	\$2.19	\$2.19
Lube Oil Consumption Rate	0.16 gal/hr	0.16 gal/hr	0.16 gal/hr
Flyaway cost (FY94\$)	\$39.2M	\$34.0M	\$42.2M
Airframe Unit Weight (AUW) lbs	29433 lbs	29433	29433
Weight Empty lbs.	33140 lbs	33601	34062
Average Operating Years	39(FY99-FY37)	51(FY12-FY62)	30(FY03-FY32)
Complexity Factor	1.5	1.3	1.8

The average annual operating and support cost is per aircraft.

Date of estimate: December 1999.

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V-22 (OSPREY), December 31, 1999

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

b. Costs -- (FY 1986 Constant (Base-Year) Dollars in Thousands)

Cost Element	V-22	
Mission Pay & Allowances	797.2	N/A
Unit Level Consumption	941.9	N/A
Intermediate Maintenance	103.0	N/A
Depot Maintenance	112.2	N/A
Contractor Support	131.9	N/A
Sustaining Support	130.8	N/A
Indirect Costs	0.0	N/A
acts	N/A	N/A
Total	2217.0	N/A

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N-12 LHD 1

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: LHD - 1

AS OF DATE: December 31, 1999

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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 PROGRAM OFFICE      CAPT. T.H. GORSKI  
 PROGRAM EXECUTIVE OFFICE,                      Assigned: June 21, 1996  
 EXPEDITIONARY WARFARE                      DSN 332-8511; COMM (703) 602-8511  
 ARLINGTON, VA 22242-5171                      GORSKITH@NAVSEA.NAVY.MIL
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
   (U) PE 0603564N (Shared) (SUNK) Project 0408  
   (U) PE 0604567N (Shared) (SUNK) Project 01803, S0857  
 PROCUREMENT:  
   (U) APPN 1611 ICN 3035 (Navy)

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 DIRECTORATE FOR FREEDOM OF INFORMATION  
 AND SECURITY REVIEW  
 DEPARTMENT OF DEFENSE

No Security Objection  
 to Open Publication  
 (AS AMENDED)  
 MAR 23 2000  
 Office of the Secretary of the Navy  
 Dept. of the Navy

Derived from:  
 Downgrade instruction OPNAVINS 35513.3B - 101  
 Declassify on: X3

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LHD - 1, December 31, 1999

5. (U) References:

SAR Baseline (Development Estimate):

(U) SECNAV Memo dated 2 December 1982, subject "LHD 1 Class Amphibious Assault Ship SAIP"; LHD 1 Class NDCP dated August 15, 1985.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated February 11, 1994.

6. (U) Mission and Description:

(U) The ship's 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.

7. (U) Executive Summary:

(U) 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. The ship was delivered in May 1989. A competitive contract for LHD 2, with options for LHD 3 and 4 was awarded to ISI in September 1986. The options for LHD 3 and 4 were exercised November 1987 and October 1988, respectively. LHD 2, 3 and 4 were delivered to the Navy July 1992, August 1993 and November 1994, respectively. A competitive contract for the LHD 5, with unevaluated and undefinitized options for LHD 6 and 7, was awarded to ISI in December 1991. LHD 5 was delivered to the Navy in June 1997. The options for LHD 6 and 7 were exercised on a sole source basis on December, 1992 and December, 1995; respectively. LHD 6 was delivered to the Navy in May 1998.

LHD 6 Final Contract Trials were completed on January 26, 1999 and Post Shakedown Availability (PSA) completed July 30, 1999.

Funds were appropriated in FY99 and FY00 for advance procurement and advance construction of components for LHD 8. FY00 Appropriations Act approved incremental funding. The Navy has requested a release of funds; however, funds still remain on deferral at OSD. Balance of funding will be addressed as a POM02 issue.

The FY01 President's Budget includes procurement funds for a FY05 Ship. An Analysis of Alternatives (AoA) is planned for FY01 and FY02 to define the detail requirements.

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7. (U) Executive Summary (Cont'd):

Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The LHD 1 Program has deviated from the revised approved Acquisition Program Baseline (APB) dated February 11, 1994. A procurement cost breach occurred as a result of an additional ship in FY05 in the FY01 President's Budget. An analysis of alternatives is planned for FY01 and 02 to define the detail requirements. An APB and a Program Deviation Report (PDR) revising the baseline are being prepared and will be submitted.

9. (U) Schedule:

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I	OCT 1981	OCT 1981	OCT 1981
Milestone II SAIP	JUL 1982	JUL 1982	JUL 1982
Start Contract Design	AUG 1982	AUG 1982	AUG 1982
Milestone IIIA Production-Decision	JUN 1983	JUN 1983	JUN 1983
Award Lead Ship Contract	DEC 1983	FEB 1984	FEB 1984
Milestone IIIB Production-Decision	JUL 1985	AUG 1985	AUG 1985
Approve Full-Production (AFP)	AUG 1985	AUG 1985	AUG 1985
Launch First Ship	AUG 1987	AUG 1987	AUG 1987
Acceptance Trials (Lead Ship)	FEB 1989	FEB 1989	MAR 1989
Lead Ship Delivery	MAR 1989	MAR 1989	MAY 1989
Material Support Date	MAR 1989	MAR 1989	JUL 1989
Naval Support Date	MAY 1990	MAR 1993	MAR 1993
IOC	MAY 1990	MAY 1990	NOV 1990

(U) IOC - Reflects date the lead ship was ready for operational deployment.

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
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/inches)	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
(a) Endurance at 22 knots (NM)	(b)(1)			
Armament:				
Close in Weapon System	3	3 / 3	3	3

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

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Self Defense Missile System	2	2 / 2	2	2

b. Current Change Explanations -- None

(U) 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.

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development <u>Estimate (SAR)</u>	Approved Program (APB)	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	39.9	48.9	42.3
Procurement	2891.9	6432.1	7463.7
Sailaway	(2872.5)		(7441.5)
Total Other Wpn Sys			(0.0)
Peculiar Support	(10.1)		(11.5)
Initial Spares	(9.3)		(10.7)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1982 Base-Year \$	2931.8	6481.0	7506.0
Escalation	1519.2	1943.2	2746.6
Development (RDT&E)	(3.7)	(6.0)	(5.4)
Procurement	(1515.5)	(1937.2)	(2741.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	4451.0	8424.2	10252.6

(U) Current estimate total program cost includes FY99 and FY00 advance procurement then year dollars (\$44.2M and \$356.2M, respectively) for LHD 8. FY00 Appropriations Act approved incremental funding. The Navy has requested a release of funds; however, funds still remain on deferral at OSD.

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>3</u>	<u>7</u>	<u>8</u>
Total	3	7	8

c. Foreign Military Sales -- None.



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

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (FEB 1994 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1982 BY\$)	6481.0	7506.0	
(2) Quantity	7	8	
(3) Unit Cost	925.857	938.250	+1.34
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1982 BY\$)	6432.1	7463.7	
(2) Quantity	7	8	
(3) Unit Cost	918.871	932.962	+1.53

(U) The Dec 99 current estimate includes FY99 and FY00 advance procurement then year dollars (\$44.2M and \$356.2M, respectively) for LHD 8.

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	-	4451.0
Previous Changes:				
Economic	-0.4	-1355.6	-	-1356.0
Quantity	-	+5552.1	-	+5552.1
Schedule	+4.5	-332.7	-	-328.2
Engineering	-	+36.1	-	+36.1
Estimating	-	-528.7	-	-528.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+4.1	+3371.2	-	+3375.3
Current Changes:				
Economic	-	-20.7	-	-20.7
Quantity	-	+1400.8	-	+1400.8
Schedule	-	-40.2	-	-40.2
Engineering	-	+4.4	-	+4.4
Estimating	-	+1082.0	-	+1082.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+2426.3	-	+2426.3
Total Changes	+4.1	+5797.5	-	+5801.6
Current Estimate	47.7	10204.9	-	10252.6

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

(U) Summary (FY 1982 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	39.9	2891.9	-	2931.8
Previous Changes:				
Quantity	-	+3395.2	-	+3395.2
Schedule	+3.4	+80.7	-	+84.1
Engineering	-	+23.8	-	+23.8
Estimating	-1.0	-394.5	-	-395.5
Other	-	-	-	-
Support	-	+2.8	-	+2.8
Subtotal	+2.4	+3108.0	-	+3110.4
Current Changes:				
Quantity	-	+830.4	-	+830.4
Schedule	-	+16.4	-	+16.4
Engineering	-	+4.9	-	+4.9
Estimating	-	+612.1	-	+612.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+1463.8	-	+1463.8
Total Changes	+2.4	+4571.8	-	+4574.2
Current Estimate	42.3	7463.7	-	7506.0

(U) Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-20.7
Total Quantity Variance associated with increase of 1 units.	+771.3	+1301.1
Quantity increase of 1 units. (Quantity)	+830.4	+1400.8
Allocation to Schedule variance resulting from Quantity Change. (QR)(Schedule)	+16.4	-40.2
Allocation to Engineering variance resulting from Quantity Change. (QR)(Engineering)	+4.9	+4.4
Allocation to Estimating variance resulting from Quantity Change. (QR)(Estimating)	-80.4	-63.9

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment for Current and Prior Inflation. (Estimating)	+14.1	+20.3
Transfer of funds from LHD 3-7 to DDG 51, LPD 17 and CVN Refueling SCN programs (Estimating)	-24.3	-33.6
Actual cost on completed portion of program (Estimating)	-3.2	-4.2
Advance Procurement/Construction for LHD 8 (QR) (Estimating)	+261.7	+400.4
Revised Outfitting and Post Delivery cost estimates for FY02 and prior (Estimating)	-0.2	-0.4
Revised estimate resulting from increased cost associated with additional ship in FY05 (QR) (Estimating)	+131.2	+221.6
Cost to complete, outfitting and post Delivery funds associated with FY05 ship (QR) (Estimating)	+313.2	+541.8
Procurement Subtotal	+1463.8	+2426.3

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1483.67	-172.09	-58.17	-46.05	+5.06	+69.16	--	--	-202.09	1281.58

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1469.13	-172.04	-49.09	-46.61	+5.06	+69.16	--	--	-193.52	1275.61

14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	OCT 1981	N/A	OCT 1981
Milestone II	N/A	JUL 1982	N/A	JUL 1982
Milestone III	N/A	AUG 1985	N/A	AUG 1985
FUE/IOC	N/A	MAY 1990	N/A	NOV 1990
Total Cost	N/A	4451	N/A	10252.6
Total Quantity	N/A	3	N/A	8
Prog Acq Unit Cost	N/A	1483.67	N/A	1281.58

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

a. Procurement --  
 (U) LHD 7 CONSTRUCTION:  
 INGALLS SHIPBUILDING, INC, PASCAGOULA, MS  
 N00024-92-C-2204, FPI  
 Award: December 28, 1995  
 Definitized: December 28, 1995

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$833.9	\$855.0	1	\$841.8	\$843.0
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>
Cumulative Variances To Date (12/31/99)			\$-9.4	\$-45.9
Net Change			\$-10.6	\$-35.2
			\$-1.2	\$10.7

Explanation of Change:

(U) Cost Variance: The majority of unfavorable change variance reported by the contractor is primarily identified with inefficiencies achieved in vessel labor.

Schedule Variance: The majority of favorable change variance reported by the contractor is attributed to receipt of delinquent material.

The PM's Estimated Price at Completion takes these variances into consideration.

(U) Contract Comments:

The Program Manager's Estimated Price at Completion is based on the Government's share of a projected total overrun of \$18.3M which would result in a net contractor profit of \$119.4M.

The current changes from the initial contract price are primarily

15. (U) Contract Information (Cont'd):

attributed to: Fuel Oil Compensating Mod to improve stability, Advance Combat Direction System (Block 1), Monorail Train Transfer from Government Furnished Equipment to Contractor Furnished Equipment and other miscellaneous change orders.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY81-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-11)	<u>Total</u>
RDT&E	47.7	-	-	-	47.7
Procurement	7750.5	371.1	19.1	2064.2	10204.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	7798.2	371.1	19.1	2064.2	10252.6

b. Annual Summary -- LHD

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Sailaway FY 1982 Dollars Nonrec</u>	<u>Sailaway FY 1982 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1981				0.9	0.9
1982				11.0	11.3
1983				17.9	19.2
1984				0.8	0.9
1985				1.8	2.1
1986				0.3	0.4
1987				0.5	0.6
1988				0.7	0.9
1989				2.8	3.7
1990				4.9	6.7
1991				0.7	1.0
Subtotal				42.3	47.7

Appropriation: 1611 - Shipbuilding and Conversion, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Sailaway FY 1982 Dollars Nonrec</u>	<u>Sailaway FY 1982 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1982				41.3	45.0
1983				48.4	53.7
1984	1	150.0	1110.5	1159.2	1310.1

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1982 Dollars Nonrec	Sailaway FY 1982 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985				34.0	39.2
1986	1		765.2	705.9	832.8
1987				29.8	35.9
1988	1		629.2	608.3	755.4
1989	1		602.5	578.7	740.5
1990				35.2	46.4
1991	1		907.9	872.0	1180.0
1992				20.5	28.4
1993				240.7	337.5
1994	1		843.0	645.1	924.1
1995				44.1	63.8
1996	1		955.8	871.0	1268.4
1997				7.6	11.2
1998				9.3	13.8
1999			29.3	42.6	64.3
2000			232.4	242.1	371.1
2001				12.2	19.1
2002					
2003					
2004					
2005	1		1215.7	902.5	1522.4
2006				285.5	491.2
2007					
2008				4.0	7.2
2009				21.4	39.0
2010				0.8	1.5
2011				1.5	2.9
Subtotal	8	150.0	7291.5	7463.7	10204.9

(U) The FY01 President's Budget includes procurement funds for a FY05 ship. An Analysis of Alternatives is planned for FY01 and FY02 to define the detail requirement.

The sailaway costs in FY99 and FY00 reflect the advance procurement and advance construction cost for the LHD 8. FY 00 Appropriations Act approved incremental funding. Release of funds have been requested, however, funds remain on deferral at OSD. Balance of funding will be addressed as a POM02 issue.

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

	Qty	Sailaway Dollars Nonrec	Sailaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	8	150.0	7291.5	7506.0	10252.6

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	6	6

(U) Percent Total Program Quantities Delivered: 75.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 7129.8

(U) Percent Total Program Expended: 69.5%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
 O&S costs for LHD 1 Class Ships were developed from historical (VAMOSOC) cost data for LHD 1 Class Ships (1990-1997). Permanent Change of Station (PCS) rate and retirement costs are included as part of mission pay and allowances.

Assumed service life is stated as 40 years for ships of the LHD 1 Class. All costs are in FY82 constant dollars - year of the first construction contract for an LHD 1 Class ships. (Cost estimate dated December 1999.)

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 (Antecedent)
Mission Pay & Allowances	26.7	23.3
Unit Level Consumption	6.6	7.3
Intermediate Maintenance	0.3	0.3
Depot Maintenance	9.9	14.4
Contractor Support	0.0	0.0
Sustaining Support	4.6	6.7
Indirect Costs	1.4	1.2
Total	49.5	53.2

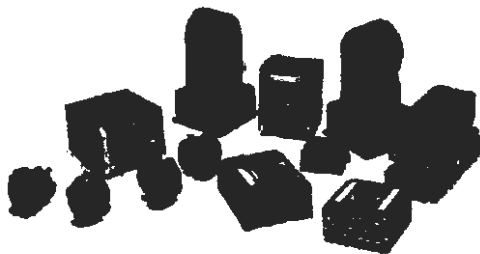
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: ATIRCM/CMWS

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Advanced Threat Infrared Countermeasure/Common Missile Warning System

2. (U) DoD Component: Army

Joint Participants:

U.S. Navy/U.S. Marine Corps, U.S. Air Force

3. (U) Responsible Office and Telephone Number:

PM ATIRCM/CMWS  
ATTN: SFAE-AV-IR  
Redstone Arsenal, Bldg 5683  
Huntsville, AL 35898-5000

Dr. Steven L. Messervy  
Assigned: September 2, 1997  
DSN 897-4650; COMM 256-313-4650  
MesservyS@PeoAvn.Redstone.Army.Mil

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

RDT&E:

- (U) PE 64270A (Shared) Project 2VT, D665 (Shared), DL20
- (U) PE 64270F
- (U) PE 64270N

PROCUREMENT:

- (U) APPN 1506 ICN 1506 (Navy)
- (U) APPN 3010 ICN 3010 (Air Force)
- (U) APPN 2031 ICN AA0722 (Army)
- (U) APPN 2031 ICN AA0980 (Army)
- (U) APPN 2031 ICN AZ3507 (Army)

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

~~Classified by: 500 for ATIRCM/CMWS dated 27 Jun 98  
Downgrade instructions:  
Declassify on: X-3~~

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\* As Amended

00-C-0818



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5. (U) References:

SAR Baseline (Development Estimate):

(U) Approved Acquisition Program Baseline dated March 29, 1996.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated June 12, 1997.

6. (U) Mission and Description:

(U) The ATIRCM/CMWS is a U.S. Army program to develop, test, and integrate defensive infrared (IR) countermeasures capabilities into existing, current generation host platforms for more effective protection against a greater number of IR guided missile threats than afforded by currently fielded IR countermeasures. The CMWS component system is a joint U.S. Army, U.S. Navy, U.S. Marine Corps, and U.S. Air Force program to develop, test, and integrate common missile warning system on tactical aircraft and rotorcraft for protection against IR guided missile threat (warning). The ATIRCM/CMWS is the core system of the U.S. Army's modular Suite of Integrated Infrared Countermeasures (SIIRCM).

For the Army, the current Infrared Countermeasure (IRCM) configuration for the fleet helicopter consists of the AN/ALQ-144A for the AH-64 and the UH/MH-60 and the AN/ALQ-156 missile detector and M-130 flare/chaff dispenser for the CH/MH-47 and the AN/ALQ-144A, AN/ALQ-156 and M-130 on the EH-60. The ATIRCM/CMWS will selectively replace the AN/ALO-144A, AN/ALO-156 or AN/AAR-47, and the M-130. For the Navy and the Air Force, no existing equivalent systems exist.

7. (U) Executive Summary:

(U) In January 1995, the Undersecretary of Defense for Acquisition and Technology (USD(A&T)), approved: (1) the recommendation from the Service Acquisition Executives to jointly develop a CMWS as a component system of the U.S. Army ATIRCM program, and (2) the proposed streamlined joint program acquisition strategy. The USD(A&T) designated the U.S. Army as the lead Service, and designated the U.S. Army Acquisition Executive as the Milestone Decision Authority, in consultation with the other Service Executives.

The Milestone II decision review occurred on June 23, 1995. The Operational Requirements Document (ORD) was approved in September 1995, and the Test and Evaluation Master Plan (TEMP) was Integrated Product Team (IPT) coordinated in December 1995. The Milestone II Engineering, Manufacturing and Development (EMD) contract was awarded to Sanders, a Lockheed-Martin company on September 27, 1995. The Critical Design Review (CDR) was completed February 1997. The most recent program milestone, First Prototype Delivery, was April 1998.

The ATIRCM/CMWS program is well into Contractor Qualification Testing. The system has been integrated on the Army's EH-60 aircraft and limited performance

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7. (U) Executive Summary (Cont'd):

evaluation flights are scheduled to begin March 2000. The CMWS has conducted Baseline System Performance Testing (SPT) to predict Probability of Detection (Pd) and False Alarm Rate (FAR). An early assessment indicates that CMWS should easily meet the required specification value for Pd. The analysis of FAR shows a slight increase in the specified requirement. Software updates are currently being addressed to improve on FAR, and regression testing is scheduled to be completed in June 2000 for the start of Contractor Flight Testing. ATIRCM SPT testing is also underway and scheduled to be completed by June 2000.

On August 19, 1999 Sanders formally agreed to a Not-to-Exceed (NTE) contract restructure position as a result of the alpha contracting negotiations. The ATIRCM/CMWS contract restructure activity was completed September 1999. A NTE contract modification was signed changing the basic contract type from Cost Plus Award Fee (CPAF) to a cost share contract. The alpha contracting position is \$53.8M, which includes work from February 1999 through completion of the contract. Additional agreements are as follows: 1) A 40/60 (Government/Contractor) shared savings below the \$53.8M Target Cost (\$7,669,750 being the maximum amount of shared contractor savings (or fee) available.) 2) A shared overrun of 80/20 (Government/Contractor) from \$58.3M to \$62.5M. 3) A shared overrun of 50/50 for cost in excess of \$62.5M. If the successful completion of the final Contractor Qualification Testing (CQT) event occurs after June 30, 2001, the contractor shall forfeit to the Government all data rights of the final system configuration, unless the Government causes the delay. This \$53.8M NTE completion cost results in a total contract cost of \$171.8M. A contract modification which definitized the effort was awarded October 29, 1999.

The USAF position is that the overall program slip has substantially impacted their ability to integrate the CMWS on the F-16/40T6 OFP upgrade and it would not be cost effective to integrate at the next window of opportunity (FY05/06) based on current F-16 tactics and PGM capability. The USAF currently plans to continue with A-10 as the only platform, eliminating F-16. This reduces the USAF quantity by 491 leaving A-10 with 362.

At the same time the Navy has reduced F/A-18 quantities by 284 and delayed production from FY02 to FY05. Also, the Navy's FY01 President's Budget deletes all 117 AV-8B quantities and funding. This is a total quantity reduction to the total program of 892 platforms. As a result of the CMWS program schedule slip, the F/A-18 E/F and the AV-8B correspondingly shifted their CMWS efforts. The impact of the delay so far has caused the F/A-18 E/F to miss the window of opportunity to install CMWS forward fit on 140 aircraft. Furthermore, production is now anticipated to begin in FY05.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	Yes
Average Procurement Unit Cost	Yes

c. (U) Explanation of Breach:

Poor contractor performance, which led to a complete restructure of the EMD program, and non availability of the F-16 as the lead test platform added one year to the schedule. These factors, which increase development costs as well as delay Milestone III, caused an APB breach.

The PAUC increased due to the RDT&E increase as well as elimination of the Air Force's F-16 and Navy's AV-8B CMWS production quantities. The total CMWS quantities have been reduced by 50%, therefore increasing the APUC as well. A new revised APB reflecting the production quantity and cost changes will be submitted. Costs are under review with USA CEAC for approval to APB changes at this time. Results are expected, allowing new APB changes to be approved by April 2000.

9. (U) Schedule:

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
DEMVAL Contract Award	SEP 1991	SEP 1991	SEP 1991
Technical Test			
Start	JUL 1994	JUL 1994	JAN 1994
Complete	DEC 1995	DEC 1995	JUN 1994
Milestone I/II	JUN 1995	JUN 1995	JUN 1995
EMD Contract Award	SEP 1995	SEP 1995	SEP 1995
Preliminary Design Review Complete	JUN 1996	JUN 1996	JUN 1996
Critical Design Review Complete	SEP 1996	SEP 1996	FEB 1997
First Prototype Delivery	JUL 1997	JUN 1998	APR 1998
Developmental Testing			
Start	MAY 1998	SEP 1998	NOV 2000 (Ch-1)
Complete	FEB 1999	JUN 1999	JAN 2002
Operational Testing			
Start	JAN 1999	AUG 1999	OCT 2001
Complete	JAN 2000	DEC 2000	MAY 2004 (Ch-1)
Milestone III	FEB 2000	MAR 2001	JUL 2003 (Ch-1)
Production Contract Award	APR 2000	MAY 2001	AUG 2003 (Ch-1)
First Production Delivery	APR 2001	MAY 2002	AUG 2004 (Ch-1)
First Unit Equipped without Obstacle Avoidance System	NOV 2001	DEC 2002	OCT 2003 (Ch-1)
Initial Operational Capability	(b)(1)	(b)(1)	(b)(1)
Organic Support Available	FEB 2005	MAR 2006	MAR 2006
Depot Level Maintenance Support Established	FEB 2005	MAR 2006	MAR 2006

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b. Current Change Explanations --

(U) Schedule milestones listed below, have changed due to the following:  
 (Ch-1) The Air Force has terminated all remaining CMWS platform integration development. The deletion of the Air Force's F-16 platform from the test program causes the Army to now rely solely upon the QF-4 drone target for fixed wing development testing. This slip in the test schedule will result in a delay in the critical Milestone III date.

<u>Milestone:</u>	<u>FROM:</u>	<u>TO:</u>
Developmental Testing		
Start	Aug 00	Nov 00
Operational Testing		
Complete	Nov 02	May 04
Milestone III	Mar 03	Jul 03
Production Contract Award	Jan 03	Aug 03
First Production Delivery	Dec 03	Aug 04
First Unit Equipped without Obstacle Avoidance System	Apr 04	Oct 03

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Minimum probability (in the aggregate for each type aircraft) of the host aircraft successfully countering the tier one missiles (Mistral desired) as listed in the CMWS attachment to the SIIRCM ORD (percent)	(b)(1)			
ATIRCM/CMWS False Alarm Rate (per flight hour)				
ATIRCM/CMWS Jamming Capability System Weight (lb)	125	125 / 125	TBD	125
CMWS Missile Warning Sensor Weight (lbs)	3.5	3.5 / 3.75	TBD	3.5
CMWS Processor Weight (lbs)	22	22 / 22	TBD	22
CMWS Missile Warning Sensor Size (Length and diameter) (in)	4.25/ 4.75	4.25/ 4.75 / 4.25/ 4.75	TBD	4.25/ 4.75
CMWS Processor Size (in)	11x9.8x 5.5	11x9.8x / 11x9.8x 5.5 / 5.5	TBD	11x9.8x 5.5
CMWS False Alarm Rate (per flight hour)	(b)(1)			
CMWS Number of Simultaneous Missiles Declared and Number in Same Quadrant	(b)(1)			
CMWS Percent Declaration of Aggregate Valid Tier One Missiles within 3 seconds or 1/2 Time of Flight Time to Intercept	(b)(1)			
CMWS Mission Reliability	99.0	99.0 / 97.5	TBD	99.0

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

b. Current Change Explanations -- None

(U) None - Initial SAR

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	516.4	516.4	604.0
Procurement	2112.0	2112.0	1651.1
Recurring Flyaway	(1772.2)		(1346.5)
Nonrecurring Flyaway	(142.6)		(89.3)
Total Flyaway	(1914.8)		(1435.8)
Other Wpn System Costs	(131.0)		(70.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(66.2)		(145.3)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1996 Base-Year \$	2628.4	2628.4	2255.1
 Escalation	 733.2	 733.2	 410.6
Development (RDT&E)	(43.4)	(43.4)	(30.0)
Procurement	(689.8)	(689.8)	(380.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	3361.6	3361.6	2665.7
 b. (U) Quantity --			
Development (RDT&E)	25	25	25
Procurement	<u>3069</u>	<u>3069</u>	<u>1673</u>
Total	3094	3094	1698

Note: Excludes 15 RDT&E prototypes from the SAR Baseline and 15 from the Current Estimate that are not considered fully configured.

(U) The unit of measure reflects the number of platforms upon which the ATIRCM/CMWS units that will be installed.

There are no LRIP quantities approved for this program.

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

d. (U) Nuclear Costs --  
None.

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12. (U) Unit Cost Summary:

	UCR Baseline (JUN 1997 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	2628.4	2255.1	
(2) Quantity	3094	1698	
(3) Unit Cost	0.850	1.328	+56.24
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	2112.0	1651.1	
(2) Quantity	3069	1673	
(3) Unit Cost	0.688	0.987	+43.46
	UCR Baseline (JUN 1997 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
c. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (TY\$)	3361.6	2665.7	
(2) Unit Cost	1.086	1.570	+44.57
d. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (TY\$)	2801.8	2031.7	
(2) Unit Cost	0.913	1.214	+32.97
e. (U) Changes from Previous SAR (Dec 1998)	Dollars/Qty	Percent	
(1) PAUC (BY\$)	0.361	+37.33	
(2) APUC (BY\$)	0.257	+35.21	
(3) PAUC Quantity	-892	-34.44	
(4) PAUC (TY\$)	0.424	+37.00	
(5) APUC (TY\$)	0.320	+35.78	
f. (U) Initial SAR Information			
Initial SAR Date (Dec 1995):			
(1) Program Acquisition Cost (BY\$)	2638.8		
(2) Program Acquisition Cost (TY\$)	3378.2		
g. (U) Unit Cost PAUC Changes --			
The PAUC increase is due to the following: A RDT&E increase resulting from EMD program restructure and overall schedule slip. The elimination of the Air Force's F-16 and the Navy's AV-8B from production.			
(U) Unit Cost APUC Changes --			
The total CMWS quantities are reduced by 59%, from 1518 to 626. (See previous paragraph).			
h. Impact of Perf or Sched Changes --	None.		
i. Program Management & Control --	None.		
j. Cost Control Actions --	None.		

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12k. (U) Unit Cost Summary (Cont'd):

k. (U) Contract Information (In Millions of Then-Year Dollars) --

- (U) (1) Contractor(s): Lockheed Sanders Inc
- (2) Contract Title: ATIRCM/CMWS Black Boxes
- (3) Contract Number: DAAB07-95-C-D606
- (4) Actual Cost of Work Performed (ACWP) to date: 138.5
- (5) Percent contract completed (BCWP/target cost): 0.81
- (6) Variances:

	Cost Variance		Schedule Variance	
	(\$/%)		(\$/%)	
Baseline Report	\$0.1/	0.00	\$-0.7/	0.00
Previous SAR	\$-11.7/	+0.11	\$-6.0/	+0.06
Current Values	\$0.3/	0.00	\$-0.4/	0.00
Change from the Baseline Report	\$0.2/	0.00	\$0.3/	0.00
Change from the Previous SAR	\$12.0/	-0.11	\$5.6/	-0.06

(U) Explanation of Variances --

The cumulative variances through July 1999 for SPI and CPI were set to 1.000 with the new baseline. The net new cumulative variances are CPI of 1.002 and SPI of .997. The favorable cumulative \$0.313M cost variance is the result of better than expected performance on CMWS hardware and in manufacturing touch labor. In addition, the Test Instrument Package (TIP) hardware and software required less rework than anticipated. The unfavorable cumulative \$0.412M schedule variance is primarily drive by delays in CMWS support, TIP documentation Safety of Flight testing and the delayed shipment of trackers by a supplier. Causes for each of the delays have been researched and corrective actions are underway.

Impact of Variances on Contract -- None.

Impact of Variances on Unit Costs -- None.

l. (U) Contracts exceeding Contract Cost Baseline Thresholds -- None.

m. General Comments -- None.



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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	559.8	2801.8	-	3361.6
Previous Changes:				
Economic	-13.9	-173.9	-	-187.8
Quantity	-	-414.5	-	-414.5
Schedule	-	-303.9	-	-303.9
Engineering	-	-	-	-
Estimating	+126.4	+321.5	-	+447.9
Other	-	-	-	-
Support	-	+63.0	-	+63.0
Subtotal	+112.5	-507.8	-	-395.3
Current Changes:				
Economic	+8.4	+11.9	-	+20.3
Quantity	-	-676.4	-	-676.4
Schedule	-	+38.3	-	+38.3
Engineering	+113.0	-	-	+113.0
Estimating	-159.7	+384.7	-	+225.0
Other	-	-	-	-
Support	-	-20.8	-	-20.8
Subtotal	-38.3	-262.3	-	-300.6
Total Changes	+74.2	-770.1	-	-695.9
Current Estimate	634.0	2031.7	-	2665.7

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	516.4	2112.0	-	2628.4
Previous Changes:				
Quantity	-	-266.1	-	-266.1
Schedule	-	-245.3	-	-245.3
Engineering	-	-	-	-
Estimating	+115.1	+232.5	-	+347.6
Other	-	-	-	-
Support	-	+38.6	-	+38.6
Subtotal	+115.1	-240.3	-	-125.2
Current Changes:				
Quantity	-	-509.0	-	-509.0
Schedule	-	-	-	-
Engineering	+109.2	-	-	+109.2
Estimating	-136.7	+308.9	-	+172.2
Other	-	-	-	-
Support	-	-20.5	-	-20.5
Subtotal	-27.5	-220.6	-	-248.1
Total Changes	+87.6	-460.9	-	-373.3
Current Estimate	604.0	1651.1	-	2255.1

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

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
b. (U) Current Change Explanations --			
(1)	<u>RDT&amp;E</u>		
	Correction to Dec 98 SAR due to Air Force P3I effort.	0.0	0.0
	Adjustment to Engineering. (Estimating)	-20.3	-23.4
	Adjustment to Estimating. (Engineering)	+20.3	+23.4
	Correction to Dec 98 SAR reallocation of Army P3I efforts.	0.0	0.0
	Adjustment to Engineering. (Estimating)	-103.5	-114.9
	Adjustment to Estimating. (Engineering)	+103.5	+114.9
	Revised escalation indices. (Economic)	N/A	-3.1
	Economic adjustment for negative program change. (Economic)	N/A	+11.5
	Adjustment for Current and Prior Inflation. (Estimating)	+0.9	+1.1
	Reduction in Army planned P3I program. (Engineering)	-14.6	-25.3
	Reduction in Navy participation on EMD contract. (Estimating)	-12.1	-19.8
	Reduction to Air Force FY99-01 funds. (Estimating)	-1.7	-2.7
	RDT&E Subtotal	<u>-27.5</u>	<u>-38.3</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-21.8
	Economic adjustment for negative program change. (Economic)	N/A	+33.7
	Air Force Quantity decrease of -491 units, from 853 to 362. (Quantity)	-269.9	-352.0
	Navy Quantity decrease of -401 units, from 665 to 264. (Quantity)	-239.1	-324.4
	Navy Stretchout of annual procurement buy profile. (QR) (Schedule)	0.0	+20.3
	Army initial production slips one year, with a slower ramp up for the initial lots. (QR) (Schedule)	0.0	+1.6
	Air Force Stretchout of annual procurement buy profile. (QR) (Schedule)	0.0	+16.4
	Navy increased cost due to significant rate reduction in CMWS quantities. (QR) (Estimating)	+135.0	+162.2
	Army increased costs due to severe reduction in Navy and Air Force platforms quantities and loss of learning curve. (QR) (Estimating)	+189.3	+241.6

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Reduction in Navy funding for remaining A-10 production support. (QR) (Estimating)	-15.4	-19.1
Navy Change in Initial Spares Requirements. (Support)	+0.4	+2.6
Navy Change in Other Wpn System Costs. (QR) (Support)	-8.4	-10.0
Increased Army spares unit costs due to reduction in Air Force/Navy platform quantities and Army schedule slip. (QR) (Support)	+4.8	+7.1
Increased other weapons system support cost due to Army revised production schedule. (QR) (Support)	+0.1	+0.3
Decrease in Air Force funds for initial spares in FY06. (QR) (Support)	-10.0	-11.9
Air Force Change in Other Wpn System Costs (QR) (Support)	-7.4	-8.9
Procurement Subtotal	-220.6	-262.3

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.09	-0.10	+0.25	-0.16	+0.07	+0.40	--	+0.02	+0.48	1.57

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.91	-0.10	+0.11	-0.16	--	+0.42	--	+0.03	+0.30	1.21

14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	JUN 1995	N/A	JUN 1995
Milestone II	N/A	JUN 1995	N/A	JUN 1995
Milestone III	N/A	FEB 2000	N/A	JUL 2003
FWE/TOC	N/A	(b)(1)		
Total Cost	0	3361.6	0	2665.7
Total Quantity	0	3094	0	1698
Prog Acq Unit Cost	0	1.09	0	1.57

**AS AGENCY**

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

a. RDT&E --  
 (U) ATIRCM/CMWS Black Boxes:  
 Lockheed Sanders Inc, Nashua, NH  
 DAAB07-95-C-D606, CPAF  
 Award: September 27, 1995  
 Definitized: September 27, 1995

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$165.9	N/A	57	\$171.8	\$171.8

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-11.7	\$-6.0
Cumulative Variances To Date (12/24/99)	\$313.0	\$-412.0
Net Change	\$324.7	\$-406.0

Explanation of Change:

(U) Net change explanation:

The favorable cumulative cost variance is the result of better than expected performance on CMWS hardware and in manufacturing touch labor. The TIP hardware and software required less rework than anticipated. The unfavorable cumulative schedule variance is primarily driven by delays in CMWS support, TIP documentation Safety of Flight testing and the delayed shipment of trackers by a supplier.

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ATIRCM/CMWS, December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY90-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-14)	<u>Total</u>
RDT&E	334.4	97.9	61.3	140.4	634.0
Procurement	16.4	-	-	2015.3	2031.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	350.8	97.9	61.3	2155.7	2665.7

b. Annual Summary -- ATIRCM/CMWS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1996 Dollars Nonrec</u>	<u>Flyaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				8.8	8.9
1997				16.0	16.4
1998				11.5	12.0
1999				1.5	1.6
2000				0.3	0.3
2001				0.1	0.1
2002				1.1	1.3
Subtotal	9			39.3	40.6

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1996 Dollars Nonrec</u>	<u>Flyaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				0.7	0.6
1991				3.1	2.8
1992				15.6	14.6
1993				8.3	8.0
1994				7.7	7.5
1995				7.7	7.7
1996				15.6	15.8
1997				20.2	20.7
1998				31.6	32.6
1999				37.4	39.0
2000				46.4	49.0
2001				38.5	41.3
2002				29.4	32.0
2003				14.8	16.4

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ATIRCM/CMWS, December 31, 1999

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

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2004				8.9	10.1
2005				8.7	10.0
2006				8.7	10.2
2007				8.8	10.5
Subtotal	7			312.1	328.8

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				21.5	21.4
1996				35.7	36.2
1997				33.9	34.8
1998				22.7	23.4
1999				29.2	30.4
2000				46.1	48.6
2001				18.6	19.9
2002				14.1	15.3
2003				10.2	11.3
2004				10.2	11.5
2005				10.3	11.8
Subtotal	9			252.5	264.6

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2005	48		14.7	14.9	18.1
2006	48		14.1	23.1	28.7
2007	48		13.8	23.0	29.1
2008	48		13.8	22.4	29.0
2009	48		13.8	22.4	29.6
2010	24		7.3	13.2	17.8
2011				0.4	0.5
Subtotal	264		77.5	119.4	152.8

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ATIRCM/CMWS, December 31, 1999

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

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997		8.8		8.8	9.1
1998		7.0		7.0	7.3
1999					
2000					
2001					
2002	12	10.4	22.7	35.0	38.4
2003	28	11.4	53.6	74.2	82.8
2004	68	12.2	92.6	120.0	136.7
2005	89	4.0	106.1	123.9	143.9
2006	99	0.4	104.9	121.4	143.8
2007	105		110.1	123.5	149.3
2008	107		121.3	135.2	166.7
2009	107	0.5	118.6	132.6	166.7
2010	108	4.7	116.9	135.0	173.1
2011	108	2.5	114.3	130.6	170.9
2012	108		107.2	118.0	157.4
2013	108		90.2	89.3	121.6
2014				12.5	17.4
Subtotal	1047	61.9	1158.5	1367.0	1685.1

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	70	4.0	26.2	36.2	40.0
2003	70	7.5	20.0	32.2	41.0
2004	70	6.2	21.0	32.3	37.1
2005	70	9.7	20.3	34.9	40.9
2006	82		23.0	28.2	33.7
2007				0.1	0.1
2008				0.1	0.1
2009				0.1	0.1
2010				0.6	0.8
Subtotal	362	27.4	110.5	164.7	193.8

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	273		77.5	158.7	193.4
Army	1054	61.9	1158.5	1679.1	2013.9
USAF	371	27.4	110.5	417.2	458.4

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

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1698	89.3	1346.5	2255.0	2665.7

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 308.6

(U) Percent Total Program Expended: 11.6%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
 Average of twenty year operational life of 3069 baseline quantity. Baseline quantity assumes system composite configuration for the sum of the airframes. Includes all O&M funded human resource requirements not identified in development or procurement. Based on a total ATIRCM system Mean Time Between Failure (MTBF) of 1000 hours. No airframe (group-A) operations and support costs are associated with the system (group-B).

Source of estimate is the methodology approved by the Army Cost Review Board, June 1995.

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Aircraft Composite System	
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	5.9	0.0
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	5.9	0.0



AF-7 C-130J

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: C-130J Hercules

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): C-130J Hercules

2. DoD Component: USAF

3. Responsible Office and Telephone Number:

WR-ALC/LB

Robins AFB, GA 31098-1647

Col Gerald J. Butler

Assigned: June 1, 1998

DSN 468-2322; COMM 912-926-2322

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0603852F

PROCUREMENT:

APPN 3010 ICN C-130J (Air Force)

5. References:

SAR Baseline (Production Estimate):

AFAE Approved Acquisition Program Baseline dated October 25, 1996.

Approved Program:

AFAE Approved Acquisition Program Baseline (APB) dated February 8, 1999.

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C-130J Hercules, December 31, 1999

#### 6. Mission and Description:

The C-130 Hercules is a medium-range, tactical airlift aircraft designed primarily for transport of cargo and personnel within a theater of operations. Variants of the C-130 perform other missions, including close-air support, rescue and recovery, special operations, and weather reconnaissance. Since 1954, over 1,000 C-130s have been delivered to the US Air Force, making it the "workhorse of the Air Force".

The C-130 can carry more than 40,000 pounds of cargo (up to six pallets or a varied number of wheeled vehicles). The cargo area can be quickly adapted to accommodate any combination of passenger, cargo, or aeromedical airlift mission.

The C-130 can deliver personnel, equipment, or supplies either by landing or by various aerial delivery modes. The two primary methods of aerial delivery used for equipment delivery are parachutes pulling the load from the aircraft, and the Container Delivery system which uses the force of gravity to pull the supplies from the aircraft.

Each of the four turboprop engines on the C-130J drives a six-blade, constant-speed, reversible-pitch propeller with feathering capability. The Hercules can operate on as little as 3,000 feet of dirt runway.

#### 7. Executive Summary:

In 1992, Lockheed Martin began a C-130J development program funded by the Company and its supplier team. The C-130J design resulted from applying the latest technology and focusing on the wealth of experience in operating an already successful aircraft. The objective of the C-130J program is to provide a cargo transport superior to earlier C-130s with substantial reduction of life cycle costs. Its upgrades include a modern flight station with modern displays and digital avionics, computerized management of aircraft functions, three-person flight crews (a two person reduction from the previous five-person crew), and improved cargo handling and delivery system. The C-130J will provide performance improvements and improved operations efficiencies.

Many of these improved characteristics were demonstrated during the past year. The C-130J performed well during humanitarian relief and world tour flights. Also, the C-130J set or broke 50 international records in the Class C-1 Turboprop, Group II, Heavy airplanes and STOL divisions.

The C-130H was used extensively during Desert Shield/Storm and Bosnia because of its ability to operate on a short austere airfield; the C-130J is expected to continue this role.

The C-130J program provides a one-for-one replacement of C-130Es and C-130Hs. Qualification Operational Test and Evaluation (QOT&E), starting Nov 99, is being accomplished by Air Force Operational Test and Evaluation Center (AFOTEC). The using commands will accomplish Follow-on Test and Evaluation (FOT&E).

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C-130J Hercules, December 31, 1999

**7. Executive Summary (Cont'd):**

Congress has added aircraft to the Air Force program through the appropriation process. Of the 35 aircraft on contract through FY99, 32 were congressionally added: 3 EC-130Js (ANG) and 9 WC-130Js (AFRC) which were funded with Air Force funds, and 13 ANG and 7 USMC C-130J aircraft which were funded with their appropriations. Air Force designated the one aircraft in FY97 Air Force line to be a WC-130J, thereby making a total of 10 WC-130Js.

Air Force has accepted 14 C-130J and derivative aircraft through December 31, 1999.

Since the December 1998 SAR, OSD, Air Force, and the program office have made significant adjustments to the C-130J program. The following highlights these changes:

QUANTITY	FY99/ PRIOR	FY00	FY01	FY02	FY03	FY04	FY05	TOTAL
Dec 98 SAR	15	0	0	2	2	8	10	37
Dec 99 SAR	15	1	2	2	2	4	6	32
		NET CHANGE						-5

FUNDING (TY\$\$-\$0.0M)	FY99/ PRIOR	FY00	FY01	FY02	FY03	FY04	FY05	TOTAL
Dec 98 SAR	1023.9	32.4	32.1	173.4	182.9	608.8	796.9	2850.4
Dec 99 SAR	1021.0	135.2	208.1	206.3	225.3	308.9	519.2	2624.0
		NET CHANGE						-226.4

The explanations of these changes are discussed in Section 13b of this SAR.

**8. Threshold Breaches:**

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

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8. Threshold Breaches (Cont'd):

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Program Initiation	JUN 1996	JUN 1996	JUN 1996
FY96 Basic Aircraft Contract	NOV 1996	NOV 1996	NOV 1996
First Delivery	OCT 1997	MAR 1999	MAR 1999

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Cockpit Crew (All Missions)	2	2 / 2	TBD	2
Maximum Payload (lbs)	39311	39311 / 38910	TBD	38910
Normal Maximum Take-off Gross Weight (lbs)	155000	155000 / 155000	155000	155000
Design Landing Gross Weight (lbs)	130000	130000 / 130000	130000	130000
Take-off Distance at Max Take-off Weight over 50 ft Obstacle (ft)	4530	4530 / 5142	4660	5142
Landing Distance at Design Landing Weight Over 50 ft Obstacle (ft)	2500	2500 / 2550	2483	2550
Shortfield Capability Assault Take-off Distance (Take- off Ground Roll) (ft)	2700	2700 / 2700	TBD	2700
Assault Landing Distance (Ground Roll) (ft)	1800	1800 / 1800	1295	1800

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C-130J Hercules, December 31, 1999

10a. Performance Characteristics (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
IMC Airdrop	158	158 / 158	TBD	158
Accuracy - Total System Error (ft)				
Cruising Speed at 100,000 lbs @25,000 ft (KTAS)	342	342 / 315	361	315
Max Range with 42,764 lbs fuel & 29,722 lbs Payload (NM)	3070	3070 / 2350	3139	2350
Environmental Factors - Operational Ambient Temperature (deg F)	-40 - +120	-40 - +120 / +120	TBD	-40/+120
Sortie Reliability (SR) (%)	95.4	95.4 / 94.2	TBD	94.2
Mission Capable Rate (MC) (%)	84.0	84.0 / 81.0	TBD	81.0
Mean Repair Time (hrs)	6.3	6.3 / 7.4	TBD	7.4
Mean Time Between Repair (MTBR) (hrs)	4.6	4.6 / 3.8	TBD	3.8
Mean-Time Between Maintenance Corrective Actions (MTBMC) (hrs)	1.2	1.2 / 1.0	TBD	1.0

Notes:

1. IMC is Instrument Meteorological Conditions.
2. Demonstrated performances are based on the Performance Compliance Report (LG98ER0362 Rev 1, May 99).

b. Current Change Explanations -- None

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C-130J Hercules, December 31, 1999

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

a. Cost --	Production <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	8.9	9.1	9.4
Procurement	721.8	2544.6	2394.8
Airframe	(540.1)		(1663.3)
OTHER COSTS	(122.2)		(640.8)
Peculiar Support	(9.4)		(22.8)
Initial Spares	(50.1)		(67.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1996 Base-Year \$	730.7	2553.7	2404.2
Escalation	109.0	305.9	229.0
Development (RDT&E)	(0.3)	(0.1)	(-0.2)
Procurement	(108.7)	(305.8)	(229.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	839.7	2859.6	2633.2
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>11</u>	<u>37</u>	<u>32</u>
Total	11	37	32

There was no low rate initial production for the C-130J.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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C-130J Hercules, December 31, 1999

12. Unit Cost Summary:

	UCR Baseline (FEB 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	2553.7	2404.2	
(2) Quantity	37	32	
(3) Unit Cost	69.019	75.131	+8.86
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	2544.6	2394.8	
(2) Quantity	37	32	
(3) Unit Cost	68.773	74.838	+8.82

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	9.2	830.5	-	839.7
Previous Changes:				
Economic	-0.5	-53.0	-	-53.5
Quantity	-	+1565.8	-	+1565.8
Schedule	-	-221.6	-	-221.6
Engineering	+0.4	-	-	+0.4
Estimating	+0.1	+256.3	-	+256.4
Other	-	-	-	-
Support	-	+472.4	-	+472.4
Subtotal	0.0	+2019.9	-	+2019.9
Current Changes:				
Economic	-	+50.3	-	+50.3
Quantity	-	-318.3	-	-318.3
Schedule	-	-71.3	-	-71.3
Engineering	-	-	-	-
Estimating	-	-20.4	-	-20.4
Other	-	-	-	-
Support	-	+133.3	-	+133.3
Subtotal	-	-226.4	-	-226.4
Total Changes	0.0	+1793.5	-	+1793.5
Current Estimate	9.2	2624.0	-	2633.2

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

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	8.9	721.8	-	730.7
Previous Changes:				
Quantity	-	+1387.2	-	+1387.2
Schedule	-	-187.6	-	-187.6
Engineering	+0.4	-	-	+0.4
Estimating	+0.1	+267.0	-	+267.1
Other	-	-	-	-
Support	-	+427.0	-	+427.0
Subtotal	+0.5	+1893.6	-	+1894.1
Current Changes:				
Quantity	-	-270.8	-	-270.8
Schedule	-	-52.1	-	-52.1
Engineering	-	-	-	-
Estimating	-	-20.5	-	-20.5
Other	-	-	-	-
Support	-	+122.8	-	+122.8
Subtotal	-	-220.6	-	-220.6
Total Changes	+0.5	+1673.0	-	+1673.5
Current Estimate	9.4	2394.8	-	2404.2

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	+49.5
Economic adjustment for negative program change. (Economic)	N/A	+0.8
Quantity decrease of -5 C-130J aircraft from 37 to 32. (Quantity)	-270.8	-318.3
Allocation to Schedule variance resulting from Quantity Change. (QR)(Schedule)	-52.1	-61.3
Allocation to Estimating variance resulting from Quantity Change. (QR)(Estimating)	+17.2	+20.3
Acceleration of annual procurement buy profile. (Schedule)	0.0	-10.0
Adjustment for Current and Prior Inflation. (Estimating)	-16.3	-17.0
Decreased estimate for previously unfunded requirements (Estimating)	-21.4	-23.7
Adjustment for Current and Prior Inflation. (Support)	-7.2	-7.6
Change in OTHER COSTS (Support)	+130.0	+140.9
Procurement Subtotal	-220.6	-226.4

QR = Quantity related changes.

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C-130J Hercules, December 31, 1999

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

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
76.34	-0.10	-11.12	-9.15	+0.01	+7.38	--	+18.93	+5.95	82.29

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
75.50	-0.08	-10.57	-9.15	--	+7.37	--	+18.93	+6.50	82.00

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	JUN 1996
FUE/IOC	N/A	N/A	N/A	N/A
Total Cost	N/A	N/A	839.7	2633.2
Total Quantity	N/A	N/A	11	32
Prog Acq Unit Cost	N/A	N/A	76.34	82.29

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

a. RDT&E --  
Test Option:  
 Lockheed Martin, Marietta, GA  
 F33657-90-C-0071, FFP  
 Award: May 15, 1997  
 Definitized: May 15, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$0.3	N/A	0

Current Contract Price			Estimated Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager	
\$0.7	N/A	0	\$0.7	\$0.7	

Explanation of Change:

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C-130J Hercules, December 31, 1999

15. Contract Information (Cont'd):

None.

Cost and Schedule variance reporting is not required on this FFP contract.

<u>C-130J - Production:</u> Lockheed Martin, Marietta, GA F33657-95-C-2055, FFP Award: November 6, 1996 Definitized: November 6, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$115.0	N/A	2

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1846.4	N/A	33	\$1846.4	\$1846.4

Explanation of Change:

Current contract price and Program Manager's estimated price increased by \$478.5M from \$1367.9M to \$1846.4M:

- Procured 7 aircraft (\$360.3M)
- Procured ICS spares (\$59.2M)
- Modified 4 C-130J aircraft into weather recon configuration (\$11.8M)
- Procured WC-130J SATCOM ground stations (\$3.5M)
- Exercised option for KC-130J Avionics Maintenance Trainer (\$10.4M)
- Procured spares for KC-130J aircraft (\$12.7M)
- Procured logistics support requirement for the KC-130J program (\$5.6M)
- Procured logistics support requirements for the C-130J program (\$15.0M)

Cost and Schedule variance reporting is not required on this FFP contract.

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C-130J Hercules, December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	9.2	-	-	-	9.2
Procurement	1021.0	135.2	208.1	1259.7	2624.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1030.2	135.2	208.1	1259.7	2633.2

b. Annual Summary -- C-130J

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1996 Dollars Nonrec</u>	<u>Flyaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				5.3	5.1
1996				0.4	0.4
1997					
1998				3.7	3.7
Subtotal				9.4	9.2

Appropriation: 3010 - Aircraft Procurement, Air Force

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1996 Dollars Nonrec</u>	<u>Flyaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996	5		214.6	229.2	236.1
1997	5		231.7	286.9	298.1
1998	3		138.9	228.4	238.7
1999	2		101.3	235.2	248.1
2000	1		53.4	126.2	135.2
2001	2		109.9	191.3	208.1
2002	2		111.4	186.5	206.3
2003	2		117.6	199.9	225.3
2004	4		233.5	268.6	308.9
2005	6		351.0	442.6	519.2
Subtotal	32		1663.3	2394.8	2624.0

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C-130J Hercules, December 31, 1999

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	32		1663.3	2404.2	2633.2

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	12	12

Percent Total Program Quantities Delivered: 37.5%

b. Total Expenditures To Date (In Millions of Dollars): \$ 1202.3

Percent Total Program Expended: 45.7%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The information for Operating and Support (O&S) costs is based on the June 1996 program office developed estimates for the C-130J life cycle costs which formed the basis for the Air Force Cost Analysis Improvement Group report:

- Estimates are based on commercial buy prices, as applicable.
- O&S costs are based on sustainment of 135 C-130J aircraft through FY 2043.
- Two-level maintenance is planned.
- Interim Contractor Support (ICS) will be required for the first ten years after contract award.
- The depot will be fully activated by the end of the ICS period.

b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	C-130J Hercules O&S Cost/Squadron per Year	C-130E, C-130H
Mission Pay & Allowances	18.3	N/A
Unit Level Consumption	12.2	N/A
Intermediate Maintenance	0.0	N/A
Depot Maintenance	1.8	N/A
Contractor Support	0.0	N/A
Sustaining Support	6.0	N/A
Indirect Costs	8.9	N/A
Total	47.2	N/A

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AF-1 ABL

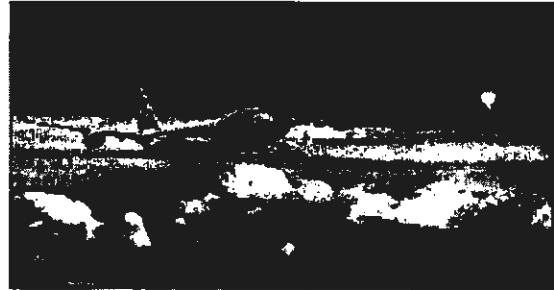
\*\*\* ~~SECRET~~ \*\*\*

SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: Airborne Laser

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): YAL-1A Attack Laser Aircraft (Airborne Laser)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:  

SMC/TM	Col Michael Booen
3300 Target Rd Bldg 760	Assigned: December 31, 1996
Kirtland AFB	DSN 246-2102; COMM 505-846-2102
Albuquerque, NM 87117-6612	booenm@plk.af.mil
4. (U) Program Elements/Procurement Line Items:  
RDT&E:  
(U) PE 0603319F  
(U) PE 0604350F

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AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

00-0278  
CONGRESSIONAL

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Downgrade instructions:  
Declassify on: A3, X4~~

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- 1 -

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Airborne Laser, December 31, 1999

5. (U) References:

SAR Baseline (Planning Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated January 29, 1997.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated May 4, 1999.

6. (U) Mission and Description:

(U) The Airborne Laser (ABL) is an ACAT ID program which will provide a rapidly deployable airborne platform equipped with a long range laser weapon, capable of autonomously detecting, acquiring, tracking, and negating both liquid and solid-fueled Theater Ballistic Missiles (TBMs) during the boost phase of flight. The system will have a multi-megawatt Chemical Oxygen Iodine Laser (COIL) integrated into a Boeing 747 aircraft to kill TBMs at ranges in excess of several hundred kilometers. It will have an autonomous, 360 degree threat detection capability with on-board infrared sensors and a wide laser field of regard. The system will also have a salvo engagement capability and carry enough chemical fuel to destroy approximately 20 enemy missiles before refueling. The ABL does not replace any other defense system.

7. (U) Executive Summary:

(U) This is the fourth SAR for the ABL program; an RDT&E only SAR in accordance with Title 10, United States Code, Section 2432. This SAR is submitted with preliminary cost estimates which represent the Program Manager's best judgment of the current program status. As a result of the FY 01 President's Budget (PB), the PDRR program will require a restructure. This will result in at least a two year delay to the lethality demonstration and several more years for the remaining major schedule milestones shown above. All schedule milestones and costs are TBD, pending the program restructure and a new APB being approved.

The ABL program leverages over 25 years of science, technology, and engineering experience in both the DoD and Department of Energy. Since 1992, a focused technology program has verified that all required technologies needed for Program Definition and Risk Reduction (PDRR) and Engineering and Manufacturing Development (EMD) exist; ABL has proceeded into PDRR. The PDRR phase will integrate and test all key technologies, allowing the Air Force to advance to EMD. Operational Test and Evaluation is planned during EMD.

The PDRR program began with contract award November 12, 1996 to the team of Boeing, TRW, and Lockheed-Martin, and will culminate with lethality demonstrations against boosting TBM representative targets. A contract restructure of the ABL PDRR contract during FY 99 was the result of Congressional action that mandated a \$25M cut to the FY 99 ABL budget. The restructure contract modification was awarded on April 29, 1999, and a new Acquisition Program Baseline was approved on May 6, 1999. This restructure resulted in a 12-month extension of the original PDRR program. The FY 01 PB

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Airborne Laser, December 31, 1999

7. (U) Executive Summary (Cont'd):

will require the PDRR contract to be restructured again and delay the lethality demonstration by at least two years.

The successful delivery of the ABL prototype aircraft began with the August 10, 1999 kick-off for the major assembly of the first ABL aircraft. Congressional language in the FY 00 Authorization Bill, Section 235 states, "No modification of the PDRR aircraft may commence until the Secretary of the Air Force certifies to Congress that the commencement of such modification is justified on the basis of existing test data and analyses involving the following activities: (1) The North Oscura Peak test program; (2) Scintillometry data collection and analysis; (3) The lethality/vulnerability program; (4) The countermeasures test and analysis effort; (5) Reduction and analysis of atmospheric data for fiscal years 1997 and 1998." The Secretary of the Air Force certified that the Airborne Laser program is on track and ready to start extensive modifications to the PDRR aircraft on December 6, 1999.

The North Oscura Peak (NOP) test program conducted peak-to-peak characterization tests and aircraft tracking tests the summer of 1999, resulting in huge risk buy-downs for the PDRR effort. Future plans for non-cooperative tests are on track for Spring of 2000. The successes of the 1999 NOP tests and the tests in 2000 will complete the ABL NOP testing program.

Ten successful CONUS flights over the White Sands Missile Range in June 1999 began a series of scintillometer missions, data collection and analysis for FY 99. The Fall 1999 OCONUS Star Scintillometer campaign was completed on November 19, 1999 when the ARGUS aircraft returned to Kirtland AFB after meeting 100% of its objectives. The Fall campaign was conducted in Korea and Qatar. Data reduction from this mission is ongoing. The Winter campaign to the Middle East is planned for the end of January 2000.

The Directed Energy Countermeasures Assessment Team (DECAT) was chartered by SAF/AQ in August 1998 to analyze and test the potential and effectiveness of many theoretical countermeasures. A kick-off meeting was held January 1999. As of November 1999, DECAT initially identified approximately 135 countermeasures and continues to evaluate "technical countermeasures". To date, no "showstoppers" have been identified.

A reduction and analysis of atmospheric data collected in FY 97 and FY 98 was conducted during 1999. This data includes 199 balloon missions, over 200 hours of aircraft missions, over five years of radar data, and four star scintillometer missions. The conclusions from this reduction and analysis is that the Air Force knows where it will be best to fly on any given day, and closer to being able to predict qualitatively ABL performance relative to turbulence. The ultimate goal is to quantitatively predict performance.

The Air Force completed the third in a series of laser risk reduction tests, the Flight-Weighted Laser Module (FLM-3) in August, 1999. These tests have produced actual ABL flight hardware that has yielded over 100% of the required power and exceeded beam quality requirements during nearly 500 seconds of operation. All of these results were achieved a full six months prior to the

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7. (U) Executive Summary (Cont'd):

ABL program's system Critical Design Review planned for April 2000.

The integration of the Infrared Search and Track (IRST) with the Virtual ABL Facility (VAF) was completed on July 21, 1999, 12 days prior to the scheduled event date of August 2, 1999. This marked the first demonstration of integrated hardware and software in the VAF. This demonstration marked the completion of Software Build 1a for BMC4I--the first of six software builds for the ABL PDRR system. This software build included the basic software architecture (and operating system) upon which all the remaining software will be based.

The Electron Bombarded Charge Coupled Device (EBCCD) camera system was delivered on September 20, 1999. The units in this system will be used for testing critical interfaces between the ABL Tracker/Ranger sensors and the Beam Control/Fire Control processor. It took an international team of nine companies just 18 months to complete this on-cost, on-schedule state-of-the-art camera system.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The Schedule and Cost breaches of the Airborne Laser (ABL) program are a result of the FY 01 President's Budget (PB), which took \$647M of RDT&E funds out of the FYDP (FY01-FY05). This action extends the RDT&E program well over three years resulting in a net RDT&E program increase of over \$875M. This preliminary cost estimate represents the Program Manager's best judgment of the current program impact to include the FY 01 funding profile and government estimates of the extended program. The program funding profile has not been coordinated with the ABL contractor team, therefore any actual cost and schedule impact are TBD



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Airborne Laser, December 31, 1999

8c. (U) Threshold Breaches (Cont'd):

pending the program restructure and a new APB being approved.

9. (U) Schedule:

a. Milestones --

	Planning	Approved	Current
	<u>Estimate (SAR)</u>	<u>Program (APB)</u>	<u>Estimate</u>
Milestone I	NOV 1996	NOV 1996	NOV 1996
PDRR Contract Award	NOV 1996	NOV 1996	NOV 1996
Authority To Proceed	SEP 1998	SEP 1998	JUN 1998
(ATP)-1			
Authority To Proceed	SEP 2001	SEP 2002	AUG 2004 (Ch-1)
(ATP)-2			
Lethal TBM Intercept	SEP 2002	SEP 2003	SEP 2005 (Ch-1)
Demonstration			
Milestone II	MAR 2003	MAR 2004	TBD (Ch-1)
Milestone III	MAR 2005	MAR 2006	TBD (Ch-1)
IOC	SEP 2006	SEP 2007	TBD (Ch-1)
FOC	SEP 2008	SEP 2009	TBD (Ch-1)

(U) The schedule change for Milestone II, Milestone III, IOC, and FOC are TBD pending the restructure of the ABL program and within the guidance and language of the FY 01 President's Budget.

b. Current Change Explanations --

(U) (CH-1) The PDRR program has been directed to restructure by the FY 01 PB. This will result in at least a two year delay to the lethality demonstration and several more years for the remaining major schedule milestones shown above. ATP-2 has moved from Aug 02 to Aug 04. The Lethal TBM Intercept Demonstrations have moved from Sep 03 to Sep 05. All other Schedule Milestones are TBD, pending the program restructure and a new APB being approved.

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10. (U) Performance Characteristics:  
 a. Performance --

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate	
(b)(1)			TBD	(b)(1)	(Ch-1)
			TBD		(Ch-1)
			TBD		(Ch-1)
			TBD		(Ch-1)
			TBD		
			TBD		
Range (km)					
Interoperability	JTIDS/ LINK-16	JTIDS/ LINK-16 / JTIDS/ LINK-16	TBD	JTIDS/ LINK-16 4/	
On-Station Availability	90% of a 24hr CAP	90% of a / 85% of a 24hr CAP / 24hr CAP	TBD	87% of a 24hr CAP	
MTBCF (hrs)	100	100 / 60	TBD	5/ 78	
Lethality (J/cm2)	(b)(1)	(b)(1)		5/ N/A	(Ch-2)
Magazine Size (sec)				6/ 100	
Weapon Field of Regard					
Azimuth (deg)				+/-120	
Elevation (deg)				-30 to	
Salvo Engagements	N/A	3 TBM / 3 TBM Salvo / Salvo	TBD	TBD	(Ch-3)

(b)(1)

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10a. ~~(S)~~ Performance Characteristics (Cont'd):

(b)(1)



b. Current Change Explanations -- None

~~(S)~~ Ch-1 Range estimates are based upon current ABL model predictions.

~~(S)~~ Ch-2 It was recommended that this Performance Characteristic be deleted as stated in the APB dated 4 May 1999

~~(S)~~ Ch-3 Per the current APB, this is an OUSD(A&T) directed technical parameter and is not in the current ORD. Objective salvo values and conditions under which they are to be assessed are defined in paragraphs 4.2.1 and 4.2.1.1 of the ABL Technical Requirements Document (TRD), Rev 3, dated 23 Mar 98. Threshold values are as specified in the TRD with the following exception: (b)(1). These objective and threshold values are tentative until Air Combat Command updates the ABL ORD to include a salvo requirement at which time the APB will be changed to reflect the ABL ORD requirement. ACC will finalize an ORD salvo requirement, per the normal requirements process, not later than 31 Jul 00. Currently, a salvo requirement was incorporated into the ORD dated 22 Dec 99 and approved by the AFROC. That requirement is defined in para 4.3.5.

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Airborne Laser, December 31, 1999

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	2210.9	2499.2	3165.2
Procurement	0.0	N/A	0.0
Total Flyaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	<u>0.0</u>	<u>N/A</u>	<u>0.0</u>
Total FY 1997 Base-Year \$	2210.9	2499.2	3165.2
Escalation	288.3	214.7	380.3
Development (RDT&E)	(288.3)	(214.7)	(380.3)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(N/A)</u>	<u>(0.0)</u>
Total Then Year \$	2499.2	2713.9	3545.5
b. (U) Quantity --			
Development (RDT&E)	2	2	2
Procurement	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Total	2	2	2

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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Airborne Laser, December 31, 1999

12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2499.2	-	-	2499.2
Previous Changes:				
Economic	-123.9	-	-	-123.9
Quantity	-	-	-	-
Schedule	+364.7	-	-	+364.7
Engineering	-	-	-	-
Estimating	-26.1	-	-	-26.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+214.7	-	-	+214.7
Current Changes:				
Economic	-18.9	-	-	-18.9
Quantity	-	-	-	-
Schedule	+875.2	-	-	+875.2
Engineering	-	-	-	-
Estimating	-24.7	-	-	-24.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+831.6	-	-	+831.6
Total Changes	+1046.3	-	-	+1046.3
Current Estimate	3545.5	-	-	3545.5

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

(U) Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2210.9	-	-	2210.9
Previous Changes:				
Quantity	-	-	-	-
Schedule	+313.6	-	-	+313.6
Engineering	-	-	-	-
Estimating	-25.1	-	-	-25.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+288.5	-	-	+288.5
Current Changes:				
Quantity	-	-	-	-
Schedule	+688.6	-	-	+688.6
Engineering	-	-	-	-
Estimating	-22.8	-	-	-22.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+665.8	-	-	+665.8
Total Changes	+954.3	-	-	+954.3
Current Estimate	3165.2	-	-	3165.2

(U) The FY 01 PB took \$647M of RDT&E funds out of the FYDP (FY01-FY05). This action extends the RDT&E program well over three years resulting in a net RDT&E program increase of over \$875M. This preliminary cost estimate represents the Program Manager's best judgment of the current program impact to include the FY 01 funding profile and government estimates of the extended program. The program funding profile has not been coordinated with the ABL contractor team, therefore any actual cost and schedule impact are TBD pending the program restructure and a new APB being approved.

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-19.7
Economic adjustment for negative program change. (Economic)	N/A	+0.8
RDT&E Restructure per FY 01 PB;	+688.6	+875.2
Lethality demo from FY03 to FY05; EMD		
Aircraft purchase delayed until EMD start. (Schedule)		
Adjustment for Current and Prior Inflation. (Estimating)	+2.1	+2.3

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Execution and Congressional Adjustments based on SBIRS; Defense-wide recision; and several small PBD adjustments. (Estimating)	-24.9	-27.0
RDT&E Subtotal	<u>+665.8</u>	<u>+831.6</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	NOV 1996	N/A	N/A	NOV 1996
Milestone II	MAR 2003	N/A	N/A	TBD
Milestone III	MAR 2005	N/A	N/A	TBD
FUE/IOC	SEP 2006	N/A	N/A	TBD
Total Cost	2499.2	N/A	N/A	3545.5
Total Quantity	2	N/A	N/A	2
Prog Acq Unit Cost	1249.6	N/A	N/A	1772.75

(U) Total Cost, Total Quantity, and Program Acquisition Unit Cost are not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

Funding reductions taken in the FY 01 PB will require the PDRR program to restructure. This will result in at least a two year delay to the lethality demonstration and several more years for the remaining major schedule milestones shown above. ATP-2 has moved from Aug 02 to Aug 04. The Lethal TBM Intercept Demonstrations have moved from Sep 03 to Sep 05. All other schedule milestones and cost impacts are TBD, pending the program restructure and a new APB being approved.

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

	Initial Contract Price			Estimated Price At Completion	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
a. RDT&E -- (U) <u>ABL PDRR Contract:</u> Boeing Space & Comm. Grp., Seattle WA F29601-97-C-0001, CPAF Award: November 12, 1996 Definitized: November 12, 1996	\$1118.0	N/A	1	\$0.0	\$0.0
	<u>Current Contract Price</u>				
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$1310.5	N/A	1		
				<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances				\$-0.7	\$-0.6
Cumulative Variances To Date (12/31/99)				\$-3.3	\$-2.5
Net Change				\$-2.6	\$-1.9

Explanation of Change:

(U) The Current (PDRR) Contract price, based on the FY 99 Congressional restructure modification of the ABL program, has a contract value of \$1310.5M. The \$1310.5M represents an increase from the initial contract price of \$1118.0M. This increase is primarily attributed to several items: 1) an additional year of effort as a result of the congressionally-directed FY 99 restructure, 2) added risk reduction to address congressional concerns, and addition of two efforts identified as risk items during the source selection period, Software Lines of Code, and Advanced Adaptive Optics, 3) final price adjustment of the PDRR Aircraft and 4) additional material compatibility for testing. The Projected Contract Price is TBD pending restructure of the ABL PDRR contract per the FY 01 PB.

Cost impacts have not been coordinated with the ABL contractor team. The FY 01 PB took \$647M of RDT&E funds out of the FYDP (FY01-FY05). This action extends the RDT&E program well over three years resulting in a net RDT&E program increase of over \$875M. This preliminary cost estimate represents the Program Manager's best judgment of the current program impact to include the FY 01 funding profile and government estimates of the extended program. Until the new funding profile has been addressed with the contractor, a restructure of the program completed and an APB approved, any Contractor or PM Estimate at Completion (EAC) is TBD. Note: Because of the CARS software TBD cannot be sustained in the appropriate field, therefore \$0 is shown in both the Contractor and PM EAC area.

The cumulative cost variance to date is -\$3.3M. This is a net change of -\$2.6M. This variance is a result of Aircraft overruns for the detail design of the aft lower skin structural modifications, overruns in the Beam Transfer Assembly and Turret Assembly, and overruns in FLM3 performance testing.

The cumulative schedule variance to date is -\$2.5M. This is a net change of -\$1.9. This variance is a result of delays in the Aircraft aft lower

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Airborne Laser, December 31, 1999

15. (U) Contract Information (Cont'd):

skin mods, the Beam Turret Assembly and subsystems, and completion of the Laser FSS and illuminator laser designs.

(U) Contract Comments:

The PDRR contract is a Cost Plus Award Fee (CPAF) contract with two fixed priced (subject to escalation) Contract Line Items (CLINS) for the acquisition of the commercial aircraft.

Of the \$1310.5M shown as the target price, \$300.1M represents the fixed price amount for the acquisition of the commercial aircraft, \$940.2M represents the contract budget baseline, and the remaining \$70.1M makes up the award fee pool, and the fixed fee portion of the PDRR contract. There is no ceiling price for a CPAF or fixed price contract; therefore, we have annotated ceiling price N/A.

The Target price of the contract provides for Advanced Technology Studies, initial payments for the EMD Aircraft, and pre-EMD design activity. Since funding for the EMD Aircraft and associated EMD activities has been cut, the ABL program must restructure, any disposition of associated funding for the EMD aircraft and pre-EMD studies is TBD until that restructure is completed.

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

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

<u>Appropriation</u>	<u>Prior Years (FY94-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-09)</u>	<u>Total</u>
RDT&E	507.5	304.2	148.6	2585.2	3545.5
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	507.5	304.2	148.6	2585.2	3545.5

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Airborne Laser, December 31, 1999

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

b. Annual Summary -- Airborne Laser

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994		1.9		1.9	1.8
1995		21.8		21.8	21.3
1996		20.6		20.6	20.4
1997		55.7		55.7	56.0
1998		151.7		151.7	153.5
1999		259.7		249.2	254.5
2000		297.0		294.3	304.2
2001		228.3		141.7	148.6
2002		200.1		132.0	140.7
2003		161.3		103.2	111.8
2004		370.8		98.6	108.9
2005		368.7		263.2	296.8
2006		361.8		521.8	600.0
2007				376.8	442.0
2008				372.0	445.0
2009				360.6	440.0
Subtotal	2	2499.4		3165.1	3545.5

(U) The FY 01 PB took \$647M of RDT&E funds out of the FYDP (FY01-05) and directed the restructure of the ABL program. This action extends the RDT&E program well over three years resulting in a net RDT&E program increase of over \$875M. This preliminary cost estimate represents the Program Manager's best judgment of the current program impact to include the FY 01 funding profile and government estimates of the extended program. The program funding profile has not been coordinated with the ABL contractor team, therefore any actual cost and schedule impacts are TBD pending the program restructure and a new APB being approved.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	2	2499.4		3165.1	3545.5

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Airborne Laser, December 31, 1999

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	2	0
Procurement		

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 679.5

(U) Percent Total Program Expended: 19.2%

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A) 823)  
PROGRAM: SINCGARS

AS OF DATE: December 31, 1999

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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:

Acting Project Manager, Tactical Radio Communication Systems	Mr. L. Scott Sharp
ATTN: SFAE-C3S-TRC	Assigned: November 7, 1999
Fort Monmouth, NJ 07703-5505	DSN 987-3063; COMM (908) 427-3063
	ssharp@c3smail.monmouth.army.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 63746 (Shared) Project D555 (Shared)  
PE 64805 Project D098, D282

PROCUREMENT:

APPN 1109 ICN 043638 (Navy)  
APPN 1810 ICN 068342 (Navy)  
APPN 1810 ICN 068892 (Navy)  
APPN 0350 ICN 101025 (NGRE)  
APPN 0350 ICN 104000 (NGRE)  
APPN 0350 ICN 104025 (NGRE)  
APPN 0350 ICN 107000 (NGRE)  
APPN 0350 ICN 222000 (NGRE) (Shared)  
APPN 0350 ICN 230000 (NGRE)  
APPN 1810 ICN 24163N (Navy)  
APPN 3080 ICN 27423F (Air Force)  
APPN 2031 ICN AA0974 (Army) (Shared)  
APPN 2031 ICN A23500 (Army)  
APPN 2035 ICN B00500 (Army)  
APPN 2035 ICN B00508 (Army)

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4a. Program Elements/Procurement Line Items (Cont'd):

APPN 2035 ICN B45500 (Army) (Shared)  
APPN 2035 ICN BA9102 (Army) (Shared)  
APPN 2035 ICN BA9520 (Army) (Shared)  
APPN 2035 ICN BA9722 (Army)  
APPN 2035 ICN BS9722 (Army)  
APPN 2035 ICN BW0006 (Army)  
APPN 2035 ICN J30500 (Army)  
APPN 2035 ICN MA9722 (Army)  
APPN 2035 ICN T99500 (Army) (Shared)  
APPN 2035 ICN Z16800 (Army)

5. References:

SAR Baseline (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 (APB) dated August 18, 1993.

6. Mission and Description:

SINGGARS is a family of VHF-FM combat net radios which provides the primary means of command and control for Infantry, Armor and Artillery Units. The SINGGARS 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 SINGGARS 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 operates on any of the 2320 channels between 30-88 Megahertz and is designed to survive in a nuclear environment. The SINGGARS system is operable in a hostile environment through use of electronic counter-counter measures (ECCM). Communication Security (COMSEC) for the basic (non-ICOM) radio is provided by use of the VINSON device. An Integrated COMSEC (ICOM) version of the SINGGARS was introduced in FY85. The System Improvement Program (SIP) models were introduced in FY95, incorporating upgrades to enhance operational capability in the Tactical Internet (TI). The Advanced System Improvement Program (ASIP) models currently being produced was introduced in FY97 and are of a reduced size and weight and provide further enhancements to operational capability. SINGGARS is replacing the standard manpack and vehicular radios, the AN/PRC-77 and the AN/VRC-12 family, respectively. An airborne version of the SINGGARS radio is replacing the standard aircraft radios, the AN/ARC-114 and AN/ARC-131.

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**7. Executive Summary:**

The Department of the Army approved the Single Channel Ground and Airborne Radio System (SINCGARS) Required Operation Capability (ROC) in Dec 1974. The SINCGARS ground radio production hardware was type classified standard at ASARC III in Sep 1983 and has been in production since Dec 1983. The airborne version of the radio commenced production in May 1985 with the acquisition objective being completed in FY97.

Dual-sourced production of the ground version of the SINCGARS radio commenced in FY88 as directed by Secretary of Defense Decision Memorandum (SDDM) to independently select and manage a second source which would be a form, fit, and function equivalent to the ITT A/CD Integrated COMSEC (ICOM) SINCGARS at the Line Replaceable Unit (LRU) level. On October 9, 1996, the Army Acquisition Executive (AAE) approved revision of the ground radio acquisition strategy from dual to single source commencing with the FY97 acquisition and continuing through completion of the program for the balance of the ground radio major components. The FY97 head-to-head competition between ITT and GD resulted in the down selection to a single source with ITT being the winner. ITT was awarded a new contract for a Basic production year (FY97) and two Option years (FY98-FY99).

The Army increased the Ground radio Acquisition Objective (AAO) by 11,351 radios in April 1998. The AAO for Airborne radios was increased by 626 radios in June 1999. Congressional program plus ups in FY99 and FY00 permits procurement of approximately 65 percent of the delta between the revised AAO and the Army Procurement Objective (APO) for the Ground radio. The budget contains funding in FY01 and FY02 to procure the additional Airborne radios.

Evolutionary enhancements of the SINCGARS ASIP radio and Internet Controller (INC) are envisioned to continue over the next several years, if funded.

This may be the final SAR submission since the SINCGARS program has met the criteria of being greater than 90% expended. There is, however, the possibility that the program may be extended by one to two years to procure additional equipment.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone 0 (ROC Approval)	DEC 1974	N/A	DEC 1974
ASARC I	OCT 1975	N/A	OCT 1975
Milestone I (DSARC I)	FEB 1976	N/A	FEB 1976
Award AD Contracts	APR 1978	N/A	APR 1978
Milestone IIIA	SEP 1983	SEP 1983	SEP 1983
Complete DT/OT -- I/II	DEC 1983	N/A	DEC 1983
Complete Limited DT/OT	DEC 1982	N/A	DEC 1982
Complete Maturity DT/OT	DEC 1983	N/A	DEC 1983
Initial Ground (ITT) Production Contract Award	DEC 1983	DEC 1983	DEC 1983
Initial Airborne Production Contract Award	N/A	MAY 1985	MAY 1985
JRMB - Level Program Review	N/A	DEC 1986	DEC 1986
Ground (ITT) FAT Complete	JUN 1985	JAN 1988	JAN 1988
Ground (ITT) Production Delivery Begins	AUG 1985	JAN 1988	JAN 1988
Airborne Option I Award	N/A	APR 1988	APR 1988
Ground (ITT) Option I Delivery Begins	N/A	MAY 1988	MAY 1988
Initial Ground (GD) Award	N/A	JUL 1988	JUL 1988
Airborne FAT Complete	N/A	SEP 1988	SEP 1988
Airborne Production Delivery Begins	N/A	NOV 1988	NOV 1988
ICOM EUT&E	N/A	NOV 1988	NOV 1988
Milestone IIIB -- ITT Full Rate Production (Non-ICOM)	N/A	MAR 1989	MAR 1989

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9a. Schedule (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Airborne Option 2 Award	N/A	APR 1989	APR 1989
Ground (ITT) Option 3 Award	N/A	JUN 1989	JUN 1989
Ground (ITT) Option 2 Delivery Begins	N/A	JUN 1989	JUN 1989
Airborne Option 1 Delivery Begins	N/A	AUG 1989	AUG 1989
Airborne Option 2 Delivery Begins	N/A	APR 1990	APR 1990
ICOM IOT&E (ITT)	N/A	JUN 1990	JUN 1990
Ground (ITT) Option 3 Delivery Begins	N/A	JUL 1990	JUL 1990
Milestone IIIB -- ITT Full Rate (ICOM) and GD Low Rate Option I	N/A	DEC 1990	DEC 1990
Ground (ITT) Option 4 Award	N/A	DEC 1990	DEC 1990
IOC (1st Div Equipped)	OCT 1987	DEC 1990	DEC 1990
Airborne Option 3 Award	N/A	DEC 1990	JAN 1991
Ground (GD) Option 1 Award	N/A	DEC 1990	MAR 1991
Ground (GD) FAT Complete	N/A	DEC 1991	JUN 1992
Airborne Option 3 Delivery Begins	N/A	JAN 1992	JAN 1992
Ground (ITT) Option 4 Delivery Begins	N/A	JAN 1992	JAN 1992
Ground (GD) Production Delivery Begins	N/A	FEB 1992	JUL 1992
Ground (GD) Option 2 Award	N/A	JUN 1992	NOV 1992
Ground (GD) Option 1 Delivery Begins	N/A	DEC 1992	DEC 1992
ICOM FOT&E (GD)	N/A	FEB 1993	FEB 1993
ITT Sole-Source (Basic) Award	N/A	MAR 1992	MAR 1992
ITT Sole-Source (Basic) Delivery Begins	N/A	JUN 1993	JUN 1993
Second Source (GD) Full Rate Production Program Review	N/A	JUN 1993	AUG 1993
Organic Support Capability (ITT ICOM)	N/A	FEB 1992	FEB 1992
Depot Support Capability ITT	N/A	N/A	FEB 1992
GD	N/A	MAR 1994	MAR 1994
ITT Sole-Source (Option) Award	N/A	MAR 1993	MAR 1993
Ground (GD) Option 3 Award	N/A	JUN 1993	AUG 1993
Organic Support Capability (GD ICOM)	N/A	JUL 1993	JUL 1993
Ground (GD) Option 2 Delivery Begins	N/A	NOV 1993	NOV 1993
ITT Competitive (Basic) Award	N/A	MAR 1994	APR 1994
GD Competitive (Basic) Award	N/A	MAR 1994	APR 1994
ITT Sole-Source (Option) Delivery Begins	N/A	JUN 1994	JUN 1994
Ground (GD) Option 3 Delivery Begins	N/A	OCT 1994	OCT 1994
ITT Competitive (Basic) Delivery Begins	N/A	JUN 1995	JUN 1995
GD Competitive (Basic) Delivery Begins	N/A	NOV 1995	NOV 1995

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9b. Schedule (Cont'd):

b. Current Change Explanations --  
None

10. Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Frequency Band (MHz)	30 -	30 - / 30 -	30 -	30 -
		87.975 / 87.975	87.975	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	18.8	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)	N/A	35 / 35	60	35
(Data @ 16 kbps @ 10 <sup>-3</sup> 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	8382	1250
Airborne	750	750 / 750	7345	750
ECCM (Hrs)	3500	N/A / N/A	8382	3500
Mean Time To Repair (MTTR) (Min)				
Organizational Level Direct Support (DS)	15	15 / 15	2.9	15
Non-ICOM	N/A	60 / 60	52.2	45/60
ICOM	N/A	45 / 45	16	45
General Support (GS) (Hrs)	2	N/A / N/A	1.78	2

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10a. Performance Characteristics (Cont'd):

PERFORMANCE CHARACTERISTICS AS DISPLAYED ARE SUBJECT TO THE FOLLOWING CONDITIONS:

- a. Data for specified performance characteristics demonstrated performance on production models is available from First Article Test and Follow-on Evaluations including operational testing.
- b. Performance characteristic parameters are point values not ranges.
- c. Measurement conditions for Communications Range: rolling plains, antenna not buried in foliage, average soil conditions, 10% bit error rate (ber).
- d. Since Manpack and Vehicular have the same value for MTBF, they have been combined and designated as Ground.
- e. The SINGGARS 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.

b. Current Change Explanations --  
None.

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

a. Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	154.4	220.2	209.2
Procurement	4013.3	3089.8	2691.8
Major System Equipment	(3151.8)		(2400.1)
Ancillary Equipment	(431.8)		(123.0)
Total Flyaway	(3583.6)		(2523.1)
Total Other Weapon Syst	(25.9)		(144.8)
Airborne Retrofit Kits			(6.0)
Total Other Wpn Sys	(25.9)		(150.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(403.8)		(17.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1984 Base-Year \$	<u>4167.7</u>	<u>3310.0</u>	<u>2901.0</u>
 Escalation	 1444.0	 1312.6	 984.0
Development (RDT&E)	(-19.0)	(4.5)	(2.5)
Procurement	(1463.0)	(1308.1)	(981.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	<u>5611.7</u>	<u>4622.6</u>	<u>3885.0</u>
 b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>292853</u>	<u>246845</u>	<u>273530</u>
Total	292853	246845	273530

Note: Excludes 123 RDT&E prototypes from the SAR Baseline and 123 from the Current Estimate that are not considered fully configured.

The unit of measure is the Receiver-Transmitter, the major component contained in the ground and airborne radio.

There was no Low Rate Initial Production (LRIP) on the SINGGARS program.

c. Foreign Military Sales --			
Recipient Country	Case ID	Quantity	*Estimated Cost
Bahrain	BA-B-JAT/JAH	73	1.2
Bahrain	BA-B-JBO	6	.1
Bahrain	BA-B-JBT	34	.4
Bahrain	BA-B-UGY	301	4.3
Estonia	EN-B-JAD	101	1.0
Finland	FI-B-YBG	6	.1
Georgia	GG-B-UAA	63	.8
Hellenic Republic	GR-B-JAX	131	1.6
Hellenic Republic	GR-B-XIG	362	10.4

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

Hungary	HU-B-UAC	13	.4
Kuwait (AF)	KU-B-UGO	61	1.0
Kuwait (Army)	KU-B-JAT	575	10.3
SANG	SI-B-JBP	3,370	88.0
SANG	SI-B-WFW	2,122	33.6
SDAF	N/A	318	6.7
Shape Tech Center	A2-B-UBB	3	.3
Spain	SP-N-LDE	4	.1
Taiwan	TW-B-JAX	57	2.0
Taiwan MADS Avenger	N/A	126	5.9
Ukraine	UP-B-UAE	13	.2
Uzbekistan	U2-B-UAA	12	.3

\* Estimated cost includes Total Package Fielding services/supplies.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (AUG 1993 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1984 BY\$)	3310.0	2901.0	
(2) Quantity	246845	273530	
(3) Unit Cost	0.013	0.011	-15.38
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1984 BY\$)	3089.8	2691.8	
(2) Quantity	246845	273530	
(3) Unit Cost	0.013	0.010	-23.08

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	135.4	5476.3	-	5611.7
Previous Changes:				
Economic	+0.5	-75.6	-	-75.1
Quantity	+11.6	-744.9	-	-733.3
Schedule	+2.2	+780.0	-	+782.2
Engineering	+46.4	+47.7	-	+94.1
Estimating	+15.6	-1506.6	-	-1491.0
Other	-	-	-	-
Support	-	-345.3	-	-345.3
Subtotal	+76.3	-1844.7	-	-1768.4
Current Changes:				
Economic	-	-1.7	-	-1.7
Quantity	-	+87.5	-	+87.5
Schedule	-	+28.3	-	+28.3
Engineering	-	+1.4	-	+1.4
Estimating	-	-100.1	-	-100.1
Other	-	-	-	-
Support	-	+26.3	-	+26.3
Subtotal	-	+41.7	-	+41.7
Total Changes	+76.3	-1803.0	-	-1726.7
Current Estimate	211.7	3673.3	-	3885.0

Summary (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	154.4	4013.3	-	4167.7
Previous Changes:				
Quantity	+9.7	-311.7	-	-302.0
Schedule	-	+50.9	-	+50.9
Engineering	+35.0	+31.4	-	+66.4
Estimating	+10.0	-842.2	-	-832.2
Other	-	-	-	-
Support	-	-278.5	-	-278.5
Subtotal	+54.7	-1350.1	-	-1295.4
Current Changes:				
Quantity	-	+58.3	-	+58.3
Schedule	-	+4.7	-	+4.7
Engineering	-	+2.6	-	+2.6
Estimating	+0.1	-54.5	-	-54.4
Other	-	-	-	-
Support	-	+17.5	-	+17.5
Subtotal	+0.1	+28.6	-	+28.7
Total Changes	+54.8	-1321.5	-	-1266.7
Current Estimate	209.2	2691.8	-	2901.0

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

b. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Adjustment to actuals. (Estimating)	+0.1	0.0
	RDT&E Subtotal	<u>+0.1</u>	<u>0.0</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-1.8
	Economic adjustment for negative program change. (Economic)	N/A	+0.1
	Total Quantity Variance associated with increase of 3146 units, from 270384 to 273530.	+24.1	+36.5
	Quantity increase of 264 units for National Guard & Reserves, from 11977 to 12241. (Quantity)	+4.9	+7.3
	Quantity decrease of -88 units for Navy, from 4148 to 4060. (Quantity)	-2.0	-3.0
	Quantity increase of 2970 units for Active Army, from 220492 to 223462. (Quantity)	+55.4	+83.2
	Allocation to Schedule variance resulting from Quantity Change. (QR) (Schedule)	+4.7	+28.3
	Allocation to Engineering variance resulting from Quantity Change. (QR) (Engineering)	+2.6	+1.4
	Allocation to Estimating variance resulting from Quantity Change. (QR) (Estimating)	-41.5	-80.7
	Adjustment for Current and Prior Inflation. (Estimating)	+1.2	+1.6
	Revised unit cost based on contract award. (Estimating)	-33.8	-51.2
	Revised unit cost estimate for additional quantities based on sole source award for Army buy out. (Estimating)	+19.6	+30.2
	Adjustment for Current and Prior Inflation. (Support)	+0.2	+0.2
	Revised estimate for Initial Spares based on actuals. (Support)	-0.5	-0.7
	Additional requirement for New Equipment Training (NET) and Total Package Fielding (TPF) to support additional quantities. (QR) (Support)	+17.8	+26.8
	Procurement Subtotal	<u>+28.6</u>	<u>+41.7</u>

QR = Quantity related changes.

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

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.02	--	--	--	--	-0.01	--	--	-0.01	0.01

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.02	--	--	--	--	-0.01	--	--	-0.01	0.01

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	FEB 1976	FEB 1976
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	SEP 1983	SEP 1983
FUE/IOC	N/A	N/A	OCT 1987	DEC 1990
Total Cost	0	0	5611.7	3885
Total Quantity	0	0	292853	273530
Prog Acq Unit Cost	0	0	0.02	0.01

Additional Milestone III information:

Milestone IIIB Non-ICOM Mar 89; Milestone IIIB ICOM Dec 90; and Milestone IIIB Second Source Aug 93.

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

a. Procurement --

<p><u>SINGGARS Ground PY10:</u>                  ITT CORPORATION, Port Wayne, IN                  DAAB07-96-C-C501, FPAF                  Award: April 19, 1996                  Definitized: April 19, 1996</p>	<table border="0"> <tr> <th colspan="3" style="text-align: center;">Initial Contract Price</th> </tr> <tr> <th style="text-align: left;"><u>Target</u></th> <th style="text-align: left;"><u>Ceiling</u></th> <th style="text-align: left;"><u>Qty</u></th> </tr> <tr> <td>\$153.8</td> <td>N/A</td> <td>16501</td> </tr> </table>	Initial Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$153.8	N/A	16501
Initial Contract Price										
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>								
\$153.8	N/A	16501								

<table border="0"> <tr> <th colspan="3" style="text-align: center;">Current Contract Price</th> </tr> <tr> <th style="text-align: left;"><u>Target</u></th> <th style="text-align: left;"><u>Ceiling</u></th> <th style="text-align: left;"><u>Qty</u></th> </tr> <tr> <td>\$168.2</td> <td>N/A</td> <td>16501</td> </tr> </table>	Current Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$168.2	N/A	16501	<table border="0"> <tr> <th colspan="2" style="text-align: center;">Estimated Price At Completion</th> </tr> <tr> <th style="text-align: left;"><u>Contractor</u></th> <th style="text-align: left;"><u>Program Manager</u></th> </tr> <tr> <td>\$168.2</td> <td>\$168.2</td> </tr> </table>	Estimated Price At Completion		<u>Contractor</u>	<u>Program Manager</u>	\$168.2	\$168.2
Current Contract Price																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
\$168.2	N/A	16501														
Estimated Price At Completion																
<u>Contractor</u>	<u>Program Manager</u>															
\$168.2	\$168.2															

Explanation of Change:

The target price increase of \$1.1M from the Dec 1998 SAR is due to award of earned reliability award fees.

This is the last time this contract will appear in the SAR because deliveries are complete.

Cost and Schedule variance reporting is not required on this FPAF contract.

<p><u>SINGGARS Ground PY7:</u>                  GENERAL DYNAMICS, Tallahassee, FL                  DAAB07-96-C-C502, FPAF                  Award: April 19, 1996                  Definitized: April 19, 1996</p>	<table border="0"> <tr> <th colspan="3" style="text-align: center;">Initial Contract Price</th> </tr> <tr> <th style="text-align: left;"><u>Target</u></th> <th style="text-align: left;"><u>Ceiling</u></th> <th style="text-align: left;"><u>Qty</u></th> </tr> <tr> <td>\$107.0</td> <td>N/A</td> <td>11001</td> </tr> </table>	Initial Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$107.0	N/A	11001
Initial Contract Price										
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>								
\$107.0	N/A	11001								

<table border="0"> <tr> <th colspan="3" style="text-align: center;">Current Contract Price</th> </tr> <tr> <th style="text-align: left;"><u>Target</u></th> <th style="text-align: left;"><u>Ceiling</u></th> <th style="text-align: left;"><u>Qty</u></th> </tr> <tr> <td>\$112.1</td> <td>N/A</td> <td>11001</td> </tr> </table>	Current Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$112.1	N/A	11001	<table border="0"> <tr> <th colspan="2" style="text-align: center;">Estimated Price At Completion</th> </tr> <tr> <th style="text-align: left;"><u>Contractor</u></th> <th style="text-align: left;"><u>Program Manager</u></th> </tr> <tr> <td>\$112.1</td> <td>\$112.1</td> </tr> </table>	Estimated Price At Completion		<u>Contractor</u>	<u>Program Manager</u>	\$112.1	\$112.1
Current Contract Price																
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>														
\$112.1	N/A	11001														
Estimated Price At Completion																
<u>Contractor</u>	<u>Program Manager</u>															
\$112.1	\$112.1															

Explanation of Change:

The target price increase of \$1.3M from the Dec 1998 SAR is due to award of earned reliability award fees.

This is the last time this contract will appear in the SAR because deliveries are complete.



15. Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FPAF contract.

<u>SINGGARS Ground PY11:</u> ITT Corporation, Fort Wayne, IN DAAB07-97-C-C600, FFP Award: April 25, 1997 Definitized: August 13, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$190.0	N/A	35000

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$390.5	N/A	76520	\$390.5	\$390.5

Explanation of Change:

The target price increase of \$29.3M since the Dec 1998 SAR is due to award of production Option year 2 and incorporation of an Engineering Change Proposal (ECP) for the Hub Battery insert.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years (FY76-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02)</u>	<u>Total</u>
RDT&E	211.7	-	-	-	211.7
Procurement	3615.6	32.7	18.3	6.7	3673.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3827.3	32.7	18.3	6.7	3885.0

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

b. Annual Summary -- SINCGARS

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1976				0.7	0.4
1977				0.4	0.2
1977				3.2	2.0
1978				9.2	6.2
1979				16.6	12.4
1980				24.4	20.0
1981				27.3	24.4
1982				13.9	13.2
1983				12.0	11.8
1984				10.1	10.3
1985				9.9	10.4
1986				11.1	12.0
1987				13.2	14.8
1988				14.2	16.5
1989				7.6	9.2
1990				10.2	12.8
1991				2.1	2.7
1992				1.3	1.7
1993				5.3	7.2
1994				3.9	5.4
1995				3.0	4.2
1996				5.0	7.2
1997				4.6	6.7
Subtotal				209.2	211.7

Appropriation: 0350 - National Guard & Reserve Equipm, Defense

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	1511		10.7	10.7	14.3
1992	2394		17.1	17.1	23.3
1993	4522		30.4	30.4	42.4
1994	3150		24.8	24.8	35.1
1995					
1996	400		3.0	2.9	4.2
1997				0.1	0.2
1998					
1999	264		0.5	0.5	0.7
Subtotal	12241		86.5	86.5	120.2

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SINCGARS, December 31, 1999

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

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989	2300		21.8	21.8	27.4
1990					
1991					
1992	4100		38.4	38.4	52.4
1993	5450		37.7	37.7	52.5
1994	4539		32.6	32.6	46.1
1995	7100		36.5	36.5	52.6
1996	3606		30.5	30.5	44.3
1997	4218		21.2	21.2	31.1
1998	155		1.5	1.5	2.2
Subtotal	31468		220.2	220.2	308.6

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985	332		1.8	1.8	2.0
1986					
1987					
1988					
1989	100		0.6	0.6	0.8
1990					
1991	586		4.3	4.3	5.7
1992	378		2.9	2.9	4.0
1993	948		8.3	8.3	11.6
1994	405		3.8	3.8	5.3
1995	221		1.5	1.5	2.2
1996	128		1.0	1.0	1.4
1997	128		0.7	0.7	1.1
1998	47		0.1	0.1	0.2
1999	787		2.3	2.3	3.4
Subtotal	4060		27.3	27.3	37.7

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985	150	4.3	10.6	17.5	19.0
Subtotal	150	4.3	10.6	17.5	19.0

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

OPA inflation indices were used since the Airborne radios are Communications-Electronics equipment. All requirements for the Airborne radio are funded in the OPA appropriation beginning in FY88.

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983	175	1.2	17.3	19.8	20.3
1984	1325	3.1	56.7	63.4	66.9
1985	10268	0.1	131.5	133.7	145.5
1986	400	0.4	76.8	76.8	85.6
1987				11.2	13.0
1988	720		29.1	26.7	32.2
1989	13599	3.1	155.4	179.2	225.6
1990	2925	5.4	64.7	62.2	80.8
1991	15328	1.0	200.2	201.3	269.1
1992	16580	5.5	179.1	200.2	273.4
1993	18157	0.6	135.1	148.9	207.4
1994	24219	0.1	229.8	243.6	344.1
1995	23850	0.1	223.5	240.7	346.6
1996	23797	0.1	221.1	245.3	356.4
1997	31302	0.1	178.4	213.2	313.2
1998	32847	0.1	194.2	184.2	273.1
1999	6092		26.0	37.9	56.8
2000	1350		9.5	21.6	32.7
2001	304		6.1	11.9	18.3
2002	224		4.3	4.3	6.7
Subtotal	223462	20.9	2138.8	2325.8	3167.7

Excluded from the FY98 program value is \$6.0M that applies specifically to the Frequency Hopping Multiplexer (FHMUX) program. FY00 program includes a plus up to procure additional radios; however, quantities were not identified in the database. Quantities shown reflect anticipated buy.

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	375		2.1	2.1	2.8
1992	974		5.6	5.6	7.7
1993	137		1.1	1.1	1.5
1994	485		4.1	4.1	5.8

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

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	178		1.6	1.3	1.9
1996					
1997					
1998				0.3	0.4
Subtotal	2149		14.5	14.5	20.1

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Army	223612	25.2	2149.4	2552.5	3398.4
OSD	12241		86.5	86.5	120.2
Navy	35528		247.5	247.5	346.3
USAF	2149		14.5	14.5	20.1
Grand Total	273530	25.2	2497.9	2901.0	3885.0

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	231460	231460

Percent Total Program Quantities Delivered: 84.6%

b. Total Expenditures To Date (In Millions of Dollars): \$ 3615.9

Percent Total Program Expended: 93.1%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

SINGGARS is the VHF-FM radio communication system which provides the primary means of command and control for infantry, artillery and armor units. Since SINGGARS 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. Ninety-eight per cent of the total buy will be fielded; costs shown are based on fielded divisions. SINGGARS 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

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

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 SINGGARS is 20 years. No operating and support cost data are currently available for the antecedent system, AN/PRC-77 and AN/VRC-12 family of radios.

SINGGARS Program Life Cycle Cost Estimate validated April 5, 1993.

Total Operation and Sustainment cost for the life cycle of the program is \$2977.1M in Base Year FY84 Dollars, \$5714.5M in Then Year Dollars.

b. Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Division (4500 RTs)	Avg Annual Cost Per (Antecedent)
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	2.6	0.0
Intermediate Maintenance	0.1	0.0
Depot Maintenance	0.1	0.0
Contractor Support	0.9	0.0
Sustaining Support	0.1	0.0
Indirect Costs	N/A	N/A
Total	3.8	0.0

N-19 STD MSL 2

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: STANDARD MISSILE-2

AS OF DATE: December 31, 1999

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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:

PMS422	CAPT C.M. BOURNE
PEO THEATER SURFACE COMBATANTS	Assigned: December 23, 1998
2531 JEFFERSON DAVIS HIGHWAY	DSN 332-0662; COMM (703)602-0662
ARLINGTON, VA 22242-5170	BOURNECM@NAVSEA.NAVY.MIL

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

RDT&E:

- (U) PE 0603318N Project U01632
- (U) PE 0604366N Project K00439

PROCUREMENT:

- (U) APPN 1507 ICN 2234 (Navy)

MILCON:

- (U) PE 0702096N

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00-C-0850

5. (U) References:

SM-2 BLK I\II\III\A\B

SAR Baseline (Production Estimate):

(U) SM-2 Block II Milestone III E Navy Program Decision Meeting of December 17, 1986. Block III Milestone III B NAVY Acquisition Review Board of May 12, 1988.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated July 10, 1996.

SM-2 BLK IV

SAR Baseline (Development Estimate):

(U) NAE Approved Acquisition Program Baseline (APB) dated November 20, 1990.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated August 4, 1999.

6. (U) Mission and Description:

The STANDARD Missile Medium Range (SM-2 MR) and Extended Range (SM-2 ER) are solid propellant, tail controlled surface-to-air missiles with mid-course guidance, semi-active homing guidance and home-on jam capability. The SM-2 Block I ER missile was produced in FY 76 thru FY 83. The SM-2 Block I MR missile was produced in FY 80 thru FY 83. Both missiles incorporated command guidance, inertial reference system and monopulse receiver to improve range, accuracy and electronic countermeasure (ECM) resistance over the SM-1 missile.

(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 (ASMs). 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 ER was deployed on all TERRIER Guided Missile Cruisers and Destroyers prior to their decommissioning. The SM-2 Block II MR is deployed on AEGIS CG-47/51 Cruisers and AEGIS DDG-51 Destroyers.

(U) The STANDARD Missile-2 Block III, IIIA and IIIB provide improved low altitude and guidance performance over SM-2 Block II. The SM-2 Block III incorporates (b)(1)

(b)(1)

SM-2 Block IIIA is essentially a Block III Missile with (b)(1) (b)(1) coupled with (b)(1) to provide improved lethality throughout the envelope. A moving target indicator (MTI) is also incorporated in the fuze design to permit engagement of (b)(1) cruise missiles. The SM-2 Block IIIB Missile Homing Improvement Program (MHIP) encompasses improvements to the Block IIIA for continued evolution in SM guidance capability with incorporation of a dual mode Infrared/RF guidance system.



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STANDARD MISSILE-2, December 31, 1999

u  
6. ~~u~~ Mission and Description (Cont'd):

These versions of STANDARD Missile will be employed on ships capable of firing SM-2 Block III. The SM-2 Block III missile achieved IOC in August, 1990. The SM-2 Block IIIA Missile achieved IOC in January, 1994. The SM-2 Block IIIB Missile achieved IOC in October 1997.

u  
~~u~~ STANDARD Missile-2 Block IV will provide dramatic increases in performance for AEGIS/VLS ships. Block IV incorporates a new separable booster with thrust vector control, a new guidance section, all digital autopilot, and the ordnance section and dual thrust rocket motor of Block IIIA. The Block IV missile will be capable of supporting the entire SPY 1B/D envelope and will have improved capability at very high altitudes and at large crossranges. Block IV will also retain the low altitude performance of Block III/IIIA. SM-2 Block IV achieved IOC August 30, 1999 in USS O'KANE (DDG-77). After five years of production it is anticipated that the Block IV will evolve into the Block IVA variant in FY 00.

7. (U) Executive Summary:

(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.

(U) 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. The SM-2 BLK II MR and ER variants are no longer in production.

(U) Approval for production of the Block III, which includes a guidance section upgrade to increase capability against low altitude targets, was received May 12, 1988 by the Navy Acquisition Review Board. The Block III achieved IOC in August 1990. The Block IIIA which includes an upgraded ordnance section, completed OPEVAL in August 1991 with eleven out of twelve successful firings and achieved IOC in January, 1994 with the missile loadout of USS Vicksburg (CG 69).

(U) The new SM-2 Block IIIB TEMP was approved by OUSD(A&T) on April 26, 1994. A new APB for the SM-2 Block I/II/III/A/B was approved on June 28, 1994. On October 21, 1994, the first fully successful test flight of the SM-2 Block IIIB occurred. In July, 1994 the first at-sea firings of SM-2 Block IV were conducted, with 4 of the 5 flights successful. The unsuccessful mission was repeated on October 5, 1994 and was a success. The new TEMP for the SM-2 Block IV was approved by OUSD(A&T) on August 2, 1994. The SM-2 Block IV GTV series was completed in November, 1994 with 7 of 8 flights successful. On October 6, 1994, DT/IOT&E was completed for SM-2 Block IV onboard USS Lake Erie (CG 70) with 4 of 6 flights successful. The SM-2 Block IV ARB was held on January 9, 1995 and the program was certified to proceed to the NPDM.

(U) On June 15, 1995, the SM-2 Block IIIB completed its initial phase of flight testing at WSMR, with the successful intercept of a Vandal target simulating

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STANDARD MISSILE-2, December 31, 1999

7. (U) Executive Summary (Cont'd):

the prime threat. On May 1, 1995 the SM-2 Block IV received DAB approval for LRIP. A new APB for the SM-2 Block IV was approved on May 4, 1995.

(U) On October 16, 1995, the SM-2 Block IIIB received approval to proceed to LRIP. A new APB for the SM-2 Block I/II/III/A/B was approved on October 31, 1995. On November 20, 1995 the ADM was signed. The at-sea DT for the SM-2 Block IIIB was successfully completed on December 8, 1995.

(U) The SM-2 Block IIIB at-sea OPEVAL was successfully completed on April 15, 1996, and full rate production was approved at a MSIII NPDM on July 15, 1996. The SM-2 Block IIIB ADM was signed September 19, 1996. SM-2 Block IIIB IOC was achieved on October 21, 1997. A new APB for the SM-2 Block Block I/II/III/A/B was approved on July 10, 1996. A new APB for the SM-2 Block IV was approved on August 4, 1999 revising the schedule for IOC.

(U) On January 16, 1997, Raytheon entered into definitive agreements with Hughes Electronics Corporation (parent of Hughes Missile Systems Company) to bring about the merger of the Hughes Electronics defense operation and Raytheon. On December 17, 1997 Raytheon completed its merger with Hughes to create Raytheon Systems Company (RSC).

(U) SM-2 Block IV achieved First Production Delivery in November 1998. IOC was achieved August 30, 1999 in USS O'KANE (DDG-77). Two successful engineering tests were held December 14 and 16, 1999 at the Pacific Missile Range Facility, Barking Sands, Hawaii. The SM-2 Block IV performed flawlessly in all phases against stringent maneuvering targets.

8. (U) Threshold Breaches:

SM-2 BLK I\II\III\A\B

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

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8. (U) Threshold Breaches (Cont'd):

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

SM-2 BLK IV

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

SM-2 BLK I\II\III\A\B

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
BLOCK II MR			
First Flt Test (development test)	FEB 1983	FEB 1983	FEB 1983
Pilot Production Approved	JUN 1983	JUN 1983	JUN 1983
Lot 1 Approval for Limited Prod	FEB 1984	FEB 1984	FEB 1984
DT/OT and OPEVAL	SEP 1984	SEP 1984	SEP 1984
Lot 2 Approval for Limited Prod	JUN 1985	JUN 1985	JUN 1985
FOT&E USS VINCENNES CG-49	NOV 1985	NOV 1985	NOV 1985
Lot 3 ALP	APR 1986	APR 1986	APR 1986
Milestone IIIIE (AFP)	DEC 1984	DEC 1986	DEC 1986
BLOCK II ER			
FOT&E Vertical Launch Cruiser CG 54	DEC 1986	N/A	APR 1988
USS Antietam (Blk II MR)			
OPEVAL Complete	MAR 1983	MAR 1983	MAR 1983

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9a. (U) Schedule (Cont'd):  
SM-2 BLK I\II\III\A\B

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
Pilot Production Approved	APR 1982	APR 1982	APR 1982
Lot 1 Approval for Limited Production	JUN 1983	JUN 1983	JUN 1983
Lot 2 Approval for Limited Production	FEB 1984	FEB 1984	FEB 1984
Lot 3 Approval for Limited Production	MAR 1985	MAR 1985	MAR 1985
FOT&E USS MAHAN DDG 42	MAR 1985	MAR 1985	MAR 1985
Lot 4 Approval for Limited Production	APR 1986	APR 1986	MAY 1986
Milestone III E (AFP)	DEC 1984	DEC 1984	DEC 1986
FOT&E USS Scott DDG 995 (Blk II ER)	DEC 1986	N/A	DEC 1989
BLOCK III			
Milestone II	JUN 1985	JUN 1985	JUN 1985
Prelim Design Review	JUN 1985	JUN 1985	JUN 1985
Critical Design Review	JUN 1986	JUN 1986	JUN 1986
Developmental Test			
Start	SEP 1987	SEP 1987	SEP 1987
Complete	JUN 1988	JUN 1988	JUN 1988
Release to Production	JUN 1988	JUN 1988	JUN 1988
IOC	SEP 1990	SEP 1990	AUG 1990
BLOCK IIIA			
Milestone II	JUN 1985	JUN 1985	JUN 1985
Prelim Design Review	DEC 1987	DEC 1987	DEC 1987
Critical Design Review	MAR 1990	MAR 1990	MAR 1990
Developmental Test	JUN 1991	JUN 1991	JUL 1991
Operational Test	JUN 1991	JUN 1991	AUG 1991
Milestone III	SEP 1991	SEP 1991	FEB 1992
IOC	SEP 1993	SEP 1993	JAN 1994
BLOCK IIIB			
Milestone II	JUN 1989	JUN 1989	JUN 1989
Prelim Design Review	SEP 1989	SEP 1989	SEP 1989
Critical Design Review	JUN 1991	FEB 1992	APR 1992
Milestone IIIA	SEP 1991	N/A	OCT 1995
LRIP Program Decision	N/A	OCT 1995	OCT 1995
Developmental Test (WSMR)	DEC 1991	DEC 1993	JUN 1994
ARB (Kit Release)	SEP 1992	N/A	N/A
Developmental Test (at Sea)	MAR 1993	DEC 1995	DEC 1995
Operational Test	JUN 1993	FEB 1996	APR 1996
IOC	JUN 1993	APR 1997	OCT 1997
Milestone IIIB	SEP 1993	N/A	N/A
Milestone III (Full Rate Production)	N/A	JUN 1996	JUL 1996

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

SM-2 BLK I\II\III\A\B

b. Current Change Explanations -- None

SM-2 BLK IV

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone II	AUG 1986	AUG 1986	AUG 1986
FSED Contract	JUL 1987	JUL 1987	JUL 1987
Preliminary Design Review	DEC 1988	DEC 1988	DEC 1988
Critical Design Review	JUL 1989	AUG 1989	AUG 1989
Development Test	NOV 1990	MAY 1994	JUL 1994
Milestone IIIA (NPDM) Pilot Production	DEC 1990	N/A	N/A
Operational Test	SEP 1991	JUL 1994	OCT 1994
Milestone IIIB (Full Production)	DEC 1991	N/A	N/A
LRIP Program Decision	N/A	JAN 1995	MAY 1995
First Production Delivery	FEB 1993	OCT 1998	NOV 1998
Milestone III (Full Rate Production)	N/A	TBD	TBD
IOC	MAR 1993	SEP 1999	AUG 1999 (Ch-1)

b. Current Change Explanations --

(U) (Ch-1) - The change in IOC from Jul 99 to Aug 99 reflects the actual IOC achieved on August 30, 1999 in USS O'KANE (DDG-77).

10. (U) Performance Characteristics:

SM-2 BLK I\II\III\A\B

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obi/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
BLOCK II MR	<div style="background-color: gray; width: 100%; height: 100%; display: flex; align-items: center; justify-content: center;"> <span>(b)(1)</span> </div>			
Max Range (nm)				
Min Range (nm)				
Max Alt (k ft)				
Miss Distance (ft)				
Prob of Successful Engagement (%)				
Flight Reliability				
Launch Reliability				
BLOCK II ER				
Max Range (nm)				
Min Range (nm)				
Max Alt (k ft)				
Miss Distance (ft)				
Prob of Successful Engagement (%)				

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

SM-2 BLK I\II\III\A\B

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Flight Reliability	(b)(1)			
Launch Reliability	(b)(1)			
BLOCK III				
Intercept Altitude (ft)	(b)(1)			
Prob of Air Target Kill (%)	(b)(1)			
Technical Reliability	(b)(1)			
Flight Reliability	(b)(1)			
Launch Availability (8 mon storage)	(b)(1)			
Compatability	(b)(1)			
BLOCK IIIA				
Intercept Altitude (ft)	(b)(1)			
Warhead Fragment Velocity (ft per sec)	(b)(1)			
Prob of Air Target Kill (%)	(b)(1)			
Technical Reliability	(b)(1)			
Flight Reliability	(b)(1)			
Launch Availability (8 mon storage)	(b)(1)			
Compatability	(b)(1)			
BLOCK IIIB				
Unintegrated IR Seeker Sensitivity (pw/cm^2)	(b)(1)			
Integrated IR Seeker Sensitivity (pw/cm^2)	(b)(1)			
Pointing Accuracy (deg)	(b)(1)			
Track Rate (deg per sec)	(b)(1)			
Prob of Air Target Kill (%)	(b)(1)			

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

SM-2 BLK I\II\III\A\B

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
1 Technical Reliability	(b)(1)		TBD	(b)(1)
1 1 1 Flight Reliability	(b)(1)		TBD	(b)(1)
1 1 1 Launch Availability (8 mon storage)			TBD	
1 1 1 Compatibility			TBD	

b. Current Change Explanations -- None

SM-2 BLK IV

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
1 Intercept Altitude (K ft)	(b)(1)			
1 1 1 Probability of Air Target Kill (%)	(b)(1)			
1 1 1 Technical Reliability				
1 1 1 Flight Reliability				
1 1 1 Launch Availability (8 month storage) (Objective not tested until FOT&E)				
1 1 1 Compatibility				

(U) Note: Changes in demonstrated performance figures reflect latest reliability analyses.

b. Current Change Explanations -- None

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

SM-2 BLK I\II\III\A\B

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	648.4	770.6	781.7
Procurement	5923.2	6432.1	6502.1
AUR Hardware	(4510.5)		(4498.8)
Other Flyaway	(500.0)		(949.8)
Total Flyaway	(5010.5)		(5448.6)
Non-recurring Support	(388.9)		(502.6)
Fleet Support	(330.9)		(361.4)
Total Other Wpn Sys	(719.8)		(864.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(192.9)		(189.5)
Construction (MILCON)	0.0	34.0	34.2
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1984 Base-Year \$	6571.6	7236.7	7318.0
Escalation	1481.2	1536.0	1439.1
Development (RDT&E)	(53.2)	(86.6)	(80.2)
Procurement	(1428.0)	(1440.6)	(1350.3)
Construction (MILCON)	(0.0)	(8.8)	(8.6)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	8052.8	8772.7	8757.1
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>10778</u>	<u>11504</u>	<u>11505</u>
Total	10778	11504	11505

(U) Excludes 88 RDT&E units that are not considered fully configured.

(U) There were no Block II/III/A/B LRIP All Up Round quantities procured.

c. (U) Foreign Military Sales --

Commitments to date are: In FY88, Canada procured 22 SM-2 Block II missiles for \$8.5M. In FY89, Canada procured 74 SM-2 Block IIs for \$34.3M, and Japan 41 SM-2 Block IIs for \$15.8M. In FY92, Canada procured 10 SM-2 Block IIIs for \$5.6M, and Japan 85 SM-2 Block II and 19 Block III missiles for \$67.8M. In FY94, Japan purchased 22 SM-2 Block II and 65 Block III missiles for \$58.8M. In FY96, Canada ordered 21 SM-2 Block III missiles for \$11.9M, and Japan 87 Block III missiles for \$58.4M. In FY97, Canada ordered 12 SM-2 Block IIIA missiles and Japan ordered 26 SM-2 Block III missiles. In FY98 Canada ordered 10 SM-2 Block IIIA and Japan ordered 5 SM-2 Block III missiles. In FY99, Japan procured 16 SM-2 Block III missiles. In FY00, Japan will be procuring 16 SM-2 Block III missiles, The Netherlands will be procuring 24 SM-2 Block IIIA missiles, Spain anticipates procuring 35 SM-2 Block IIIA missiles and Germany anticipates procuring 14 SM-2 Block IIIA missiles.

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11d. (U) Total Program Cost and Quantity (Cont'd):  
SM-2 BLK I\II\III\A\B

d. Nuclear Costs -- None.

SM-2 BLK IV

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	283.9	319.8	320.0
Procurement	1914.6	338.1	319.1
AUR Hardware	(1551.7)		(205.4)
Other Flyaway	(207.0)		(56.4)
Total Flyaway	(1758.7)		(261.8)
Fleet Support	(60.1)		(19.8)
Non-Recurring Support	(66.8)		(28.2)
Total Other Wpn Sys	(126.9)		(48.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(29.0)		(9.3)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1984 Base-Year \$	2198.5	657.9	639.1
Escalation	815.9	231.1	220.7
Development (RDT&E)	(56.2)	(72.1)	(71.9)
Procurement	(759.7)	(159.0)	(148.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	3014.4	889.0	859.8
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>3000</u>	<u>162</u>	<u>160</u>
Total	3000	162	160

(U) Note: At the LRIP Program Decision (4 May 95), a quantity of 106 was approved with a provision for additional quantities should the program not transition to the SM-2 Block IVA as planned. ASN (RD&A) Memo dtd 17 Oct 97 authorizes procurement of additional SM-2 Block IV LRIP Missiles to a maximum quantity of 180.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. (U) Unit Cost Summary:

SM-2 BLK I\II\III\A\B

	UCR Baseline (JUL 1996 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1984 BY\$)	7236.7	7318.0	
(2) Quantity	11504	11505	
(3) Unit Cost	0.629	0.636	+1.11
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1984 BY\$)	6432.1	6502.1	
(2) Quantity	11504	11505	
(3) Unit Cost	0.559	0.565	+1.07

SM-2 BLK IV

	UCR Baseline (AUG 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1984 BY\$)	657.9	639.1	
(2) Quantity	162	160	
(3) Unit Cost	4.061	3.994	-1.65
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1984 BY\$)	338.1	319.1	
(2) Quantity	162	160	
(3) Unit Cost	2.087	1.994	-4.46

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13. (U) Cost Variance Analysis:

SM-2 BLK I\II\III\A\B

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	701.6	7351.2	-	8052.8
Previous Changes:				
Economic	-34.0	-908.2	+1.6	-940.6
Quantity	-	+271.6	-	+271.6
Schedule	-	+593.2	-	+593.2
Engineering	+5.1	+202.1	-	+207.2
Estimating	+189.5	+248.3	+41.2	+479.0
Other	-	-	-	-
Support	-	+77.0	-	+77.0
Subtotal	+160.6	+484.0	+42.8	+687.4
Current Changes:				
Economic	-0.2	-14.5	-	-14.7
Quantity	-	-	-	-
Schedule	-	-2.2	-	-2.2
Engineering	-	-	-	-
Estimating	-0.1	+16.4	-	+16.3
Other	-	-	-	-
Support	-	+17.5	-	+17.5
Subtotal	-0.3	+17.2	-	+16.9
Total Changes	+160.3	+501.2	+42.8	+704.3
Current Estimate	861.9	7852.4	42.8	8757.1

(U) Summary (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	648.4	5923.2	-	6571.6
Previous Changes:				
Quantity	-	+289.6	-	+289.6
Schedule	-	+108.7	-	+108.7
Engineering	+16.1	+161.7	-	+177.8
Estimating	+117.3	-132.4	+34.2	+19.1
Other	-	-	-	-
Support	-	+126.8	-	+126.8
Subtotal	+133.4	+554.4	+34.2	+722.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.1	+10.5	-	+10.4
Other	-	-	-	-
Support	-	+14.0	-	+14.0
Subtotal	-0.1	+24.5	-	+24.4
Total Changes	+133.3	+578.9	+34.2	+746.4
Current Estimate	781.7	6502.1	34.2	7318.0

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

SM-2 BLK I\II\III\A\B

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.2
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
Miscellaneous program cost changes (Estimating)	-0.2	-0.2
RDT&E Subtotal	<u>-0.1</u>	<u>-0.3</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-15.4
Economic adjustment for negative program change. (Economic)	N/A	+0.9
Acceleration of annual procurement buy profile. (Schedule)	0.0	-2.2
Adjustment for Current and Prior Inflation. (Estimating)	+0.8	+1.2
Decrease in procurement support due to Block IIIB support reallocation to other SM variants in production. (Estimating)	-26.0	-44.1
Increase in All Up Round unit price due to revised procurement profile/adjusted hardware unit prices. (Estimating)	+35.7	+59.3
Adjustment for Current and Prior Inflation. (Support)	+0.3	+0.3
Change in Initial Spares (Support)	-0.2	-1.4
Change in Non-recurring Support (Support)	+9.1	+12.9
Change in Fleet Support (Support)	+4.8	+5.7
Procurement Subtotal	<u>+24.5</u>	<u>+17.2</u>

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

SM-2 BLK IV

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	340.1	2674.3	-	3014.4
Previous Changes:				
Economic	+1.1	-12.3	-	-11.2
Quantity	-	-3036.8	-	-3036.8
Schedule	-	+1030.1	-	+1030.1
Engineering	-	+127.5	-	+127.5
Estimating	+50.7	-198.3	-	-147.6
Other	-	-	-	-
Support	-	-87.4	-	-87.4
Subtotal	+51.8	-2177.2	-	-2125.4
Current Changes:				
Economic	-	+1.1	-	+1.1
Quantity	-	-2.1	-	-2.1
Schedule	-	-3.6	-	-3.6
Engineering	-	+0.2	-	+0.2
Estimating	-	+28.1	-	+28.1
Other	-	-	-	-
Support	-	-52.9	-	-52.9
Subtotal	-	-29.2	-	-29.2
Total Changes	+51.8	-2206.4	-	-2154.6
Current Estimate	391.9	467.9	-	859.8

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13a. (U) Cost Variance Analysis (Cont'd):  
SM-2 BLK IV

(U) Summary (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	283.9	1914.6	-	2198.5
Previous Changes:				
Quantity	-	-1743.9	-	-1743.9
Schedule	-	+249.5	-	+249.5
Engineering	+41.2	-	-	+41.2
Estimating	-5.1	-19.6	-	-24.7
Other	-	-	-	-
Support	-	-62.5	-	-62.5
Subtotal	+36.1	-1576.5	-	-1540.4
Current Changes:				
Quantity	-	-1.3	-	-1.3
Schedule	-	-2.3	-	-2.3
Engineering	-	-	-	-
Estimating	-	+20.7	-	+20.7
Other	-	-	-	-
Support	-	-36.1	-	-36.1
Subtotal	-	-19.0	-	-19.0
Total Changes	+36.1	-1595.5	-	-1559.4
Current Estimate	320.0	319.1	-	639.1

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-0.9
Economic adjustment for negative program change. (Economic)	N/A	+2.0
Total Quantity Variance associated with decrease of 2 units.	-3.4	-5.2
Quantity decrease from 162 to 160 units. (Quantity)	-1.3	-2.1
Allocation to Schedule variance resulting from Quantity Change. (QR)(Schedule)	-2.3	-3.6
Allocation to Engineering variance resulting from Quantity Change. (QR)(Engineering)	0.0	+0.2
Allocation to Estimating variance resulting from Quantity Change. (QR)(Estimating)	+0.2	+0.3
Adjustment for Current and Prior Inflation. (Estimating)	+0.6	+0.9
Reduction in procurement support due to Block IV support reallocation to other SM variants in production. (Estimating)	-6.8	-10.5
Decrease in All Up Round cost due to GC&A cost reduction in final buy year. (Estimating)	-15.0	-22.7
Change in Initial Spares. (QR)(Support)	-0.1	-0.2

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13b. (U) Cost Variance Analysis (Cont'd):  
SM-2 BLK IV

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Change in Fleet Support. (Support)	+2.6	+3.9
Change in Non-Recurring Support. (Support)	+3.1	+3.5
Correction to recategorize non-recurring flyaway to non-recurring support. (Estimating)	-25.1	-37.8
(Support)	+25.1	+37.8
Correction to realign flyaway and support costs. (Estimating)	+66.8	+97.9
(Support)	-66.8	-97.9
Procurement Subtotal	<u>-19.0</u>	<u>-29.2</u>

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):  
SM-2 BLK I\II\III\A\B

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.75	-0.08	-0.03	+0.05	+0.02	+0.04	--	+0.01	+0.01	0.76

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.68	-0.08	-0.02	+0.05	+0.02	+0.02	--	+0.01	--	0.68

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STANDARD MISSILE-2, December 31, 1999

14c. (U) Unit Cost and Other History (Cont'd):

SM-2 BLK I\II\III\A\B

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	JUN 1989	JUN 1989
Milestone III	N/A	N/A	N/S	JUL 1996
FUE/IOC	N/A	N/A	JUN 1993	OCT 1997
Total Cost	N/A	N/A	8052.8	8757.1
Total Quantity	N/A	N/A	10778	11505
Prog Acq Unit Cost	N/A	N/A	0.75	0.76

(U) Milestone events and IOC Current Estimate dates reflect SM-2 Block IIIB. Cost and quantity figures reflect SM-2 Block I/II/III/A/B combined.

SM-2 BLK IV

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.00	-0.06	-1.16	+6.42	+0.80	-0.75	--	-0.88	+4.37	5.37

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.89	-0.07	-3.18	+6.42	+0.80	-1.06	--	-0.88	+2.03	2.92

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STANDARD MISSILE-2, December 31, 1999

14c. (U) Unit Cost and Other History (Cont'd):  
SM-2 BLK IV

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	AUG 1986	N/A	AUG 1986
Milestone III	N/A	N/A	N/A	TBD
FUE/IOC	N/A	MAR 1993	N/A	AUG 1999
Total Cost	N/A	3014.4	N/A	859.8
Total Quantity	N/A	3000	N/A	160
Prog Acq Unit Cost	N/A	1	N/A	5.37

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

a. Procurement --

(U) SM-2 BLK IV FY95-98 LRIP: Standard Missile Company, Mclean VA N00024-96-C-5337, CPAF/FPIF Award: March 3, 1996 Definitized: April 11, 1997	Initial Contract Price		
	Target	Ceiling	Qty
	\$126.7	N/A	45

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$276.4	N/A	117	\$282.2	\$282.2

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-12.2	\$-12.1
Cumulative Variances To Date	\$-1.0	\$-1.3
Net Change	\$11.2	\$10.8

Explanation of Change:

(U) Total quantity includes FY95/96/97/98 procurements.

(U) Changes in cost and schedule variances are due to rebaselining of contract.

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15. (U) Contract Information (Cont'd):

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>SM2 BLK IIIB AUR:</u> Standard Missile Company, McLean VA N00024-97-C-5353, FPAF Award: April 4, 1997 Definitized: N/A	\$85.9	N/A	80

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$105.7	\$105.7	148	\$105.7	\$105.7

Explanation of Change:

(U) Change in contract type from FPIF to FPAF made to correct clerical error.

Cost and Schedule variance reporting is not required on this FPAF contract.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>SM-2 BLK IV AUR:</u> RAYTHEON (RSC), TUCSON, AZ N00024-99-C-5373, FPAF Award: N/A Definitized: January 28, 2000	\$43.4	\$43.4	43

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$43.4	\$43.4	43	\$43.4	\$43.4

Explanation of Change:

(U) This is a new SM-2 Block IV production contract. Contract price includes only USN All Up Rounds.

Cost and Schedule variance reporting is not required on this FPAF contract.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>SM-2 BLK IIIB AUR:</u> RAYTHEON (RSC), TUCSON, AZ N00024-99-C-5373, FPAF Award: N/A Definitized: January 28, 2000	\$45.8	\$45.8	71

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$45.8	\$45.8	71	\$45.8	\$45.8

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STANDARD MISSILE-2, December 31, 1999

15. (U) Contract Information (Cont'd):

Explanation of Change:

(U) This is a new SM-2 Block IIIB production contract. Contract price includes only USN All Up Rounds.

Cost and Schedule variance reporting is not required on this FPAF contract.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY76-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	1238.3	1.1	1.2	13.2	1253.8
Procurement	6953.1	119.0	117.5	1130.7	8320.3
MILCON	42.8	-	-	-	42.8
O&M	-	-	-	-	-
Total	8234.2	120.1	118.7	1143.9	9616.9

SM-2 BLK I\II\III\A\B

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

<u>Appropriation</u>	<u>Prior Years (FY76-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	846.4	1.1	1.2	13.2	861.9
Procurement	6485.2	119.0	117.5	1130.7	7852.4
MILCON	42.8	-	-	-	42.8
O&M	-	-	-	-	-
Total	7374.4	120.1	118.7	1143.9	8757.1

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STANDARD MISSILE-2, December 31, 1999

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

SM-2 BLK IV

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

<u>Appropriation</u>	<u>Prior Years</u> (FY87-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	391.9	-	-	-	391.9
Procurement	467.9	-	-	-	467.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	859.8	-	-	-	859.8

b. Annual Summary -- SM-2 BLK I\II\III\A\B

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1984 Dollars Nonrec</u>	<u>Flyaway FY 1984 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1982				324.1	305.0
1983				23.6	23.2
1984				17.0	17.3
1985				27.8	29.2
1986				56.8	61.4
1987				40.2	44.7
1988				27.3	31.4
1989				49.6	59.5
1990				47.3	59.0
1991				37.1	48.0
1992				27.6	36.7
1993				24.3	33.0
1994				38.5	53.3
1995				9.3	13.2
1996				14.3	20.6
1997				6.3	9.2
1998				0.3	0.5
1999				0.8	1.2
2000				0.7	1.1
2001				0.8	1.2
2002				0.8	1.3
2003				0.9	1.4
2004				0.9	1.4
2005				0.9	1.4
2006				0.9	1.5
2007				0.9	1.5
2008				0.9	1.5
2009				0.9	1.6
2010				0.9	1.6

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STANDARD MISSILE-2, December 31, 1999

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

SM-2 BLK I\II\III\A\B

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal				781.7	861.9

(U) Total Then Year (TY\$) Program amount for FY99 does not include congressional plus-up for the Advanced Surface to Air Missile (ADSAM) Demo and Optical Correlator.

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1976	22		88.0	92.4	48.4
1977					
1977	36		62.2	73.9	42.9
1978	40		66.5	74.2	48.2
1979	40		57.1	66.1	47.3
1980	85		67.7	82.1	64.7
1981	345		156.2	198.2	174.3
1982	495		230.3	287.2	274.3
1983	500		294.1	399.5	403.5
1984	490		311.9	385.5	405.1
1985	730		394.4	443.5	479.7
1986	1271		589.2	659.9	738.4
1987	1194		471.2	583.2	676.2
1988	1310		414.2	472.7	569.6
1989	1310		435.7	474.7	594.4
1990	710		264.5	304.5	394.5
1991	405		185.8	228.4	303.4
1992	330		151.7	194.4	264.8
1993	330		162.7	180.3	250.1
1994	202		125.0	157.5	222.7
1995	160		92.3	113.9	163.6
1996					
1997	80		54.5	70.0	102.8
1998	68		64.4	76.3	113.1
1999	71		45.2	68.7	103.2
2000	75		43.5	78.1	119.0
2001	75		55.6	75.9	117.5
2002	80		57.0	76.7	120.8
2003	88		56.3	71.1	114.2
2004	90		51.4	62.8	102.8
2005	90		48.4	57.8	96.5

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

SM-2 BLK I\II\III\A\B

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2006	120		58.8	67.7	115.3
2007	150		69.4	78.5	136.4
2008	175		77.8	87.2	154.5
2009	190		81.5	90.7	163.9
2010	148		64.1	68.5	126.3
Subtotal	11505		5448.6	6502.1	7852.4

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				23.6	29.3
1990				10.6	13.5
Subtotal				34.2	42.8

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	11505		5448.6	7318.0	8757.1

b. Annual Summary -- SM-2 BLK IV

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				25.2	28.0
1988				57.7	66.4
1989				85.9	102.9
1990				72.7	90.7
1991				33.2	42.9
1992				25.6	34.1
1993				12.6	17.1
1994				6.5	9.0
1995				0.6	0.8
Subtotal				320.0	391.9

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STANDARD MISSILE-2, December 31, 1999

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

SM-2 BLK IV

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1984 Dollars Nonrec	Flyaway FY 1984 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	28		49.9	53.7	77.1
1996	22		65.0	91.6	133.2
1997	47		67.2	76.4	112.1
1998	20		39.7	43.2	64.1
1999	43		40.0	54.2	81.4
Subtotal	160		261.8	319.1	467.9

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	160		261.8	639.1	859.8

17. (U) Delivery/Expenditure Information:

SM-2 BLK I\II\III\A\B

a. (U) Deliveries To Date

	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	10077	10049

(U) Percent Total Program Quantities Delivered: 87.3%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 6983.3

(U) Percent Total Program Expended: 79.7%

SM-2 BLK IV

a. (U) Deliveries To Date

	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	22	16

(U) Percent Total Program Quantities Delivered: 10.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 767.2

(U) Percent Total Program Expended: 89.2%

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18. (U) Operating and Support Costs:

SM-2 BLK I\II\III\A\B

a. ~~(S)~~ Assumptions and Ground Rules --

Since the SM-2 is a wooden round, Personnel Costs 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.

~~(S)~~ Computation is based on an inventory objective of (b)(1) SM-2 BLK I/II/III/A/B missiles at the end of the FY 2005 funded delivery period. Operations & support cost estimate as of Feb 2000.\*

NOTE: Other (2.7) = Other Direct Support (2.2) = Disposal (@ 24 years)

b. ~~(S)~~ Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	SM-2 BLK I/II/III Avg Annual Cost Per	Avg Annual Cost Per N/A
Mission Pay & Allowances	(b)(1)	0.0
Unit Level Consumption	5.9	0.0
Intermediate Maintenance	4.9	0.0
Depot Maintenance	5.8	0.0
Contractor Support	0.0	0.0
Sustaining Support	1.4	N/A
Indirect Costs	0.0	N/A
Other	2.7	N/A
Other	2.2	N/A
Overhaul/Rework	8.1	N/A
Total	(b)(1)	(b)(1)

SM-2 BLK IV

a. (U) Assumptions and Ground Rules --

Since the SM-2 is a wooden round, Personnel Costs 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.

~~(S)~~ Computation is based on an inventory objective of (b)(1) SM-2 BLK IV missiles at the end of the FY 2005 funded delivery period. Operations and support cost estimate as of Feb 2000.\*

Note: Other (.02) = Other direct support; Other (.02) = Disposal (@ 24 years)



18b. (U) Operating and Support Costs (Cont'd):  
SM-2 BLK IV

b. ~~Costs~~ Costs -- (FY 1984 Constant (Base-Year) Dollars in Millions)

Cost Element	SM-2 Block IV	Avg Annual Cost Per	Avg Annual Cost Per
	(b)(1)	(b)(1)	N/A
Mission Pay & Allowances	(b)(1)	(b)(1)	(b)(1)
Unit Level Consumption	(b)(1)	(b)(1)	(b)(1)
Intermediate Maintenance	(b)(1)	(b)(1)	(b)(1)
Depot Maintenance	(b)(1)	(b)(1)	(b)(1)
Contractor Support	(b)(1)	(b)(1)	(b)(1)
Sustaining Support	(b)(1)	(b)(1)	(b)(1)
Indirect Costs	(b)(1)	(b)(1)	(b)(1)
Overhaul/Rework	(b)(1)	(b)(1)	(b)(1)
Other	(b)(1)	(b)(1)	(b)(1)
Total	(b)(1)	(b)(1)	(b)(1)

AF-10 GBS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: GBS

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Global Broadcast Service (GBS)

2. DoD Component: OSD

Joint Participants:  
Army, Air Force, Navy

3. Responsible Office and Telephone Number:

SMC/MCB	Col(S) Alphonzo Moseley (Acting)
2420 Vela Way	Assigned: December 2, 1999
Suite 1467-A8	DSN 833-4850; COMM (310) 336-4850
El Segundo, CA 90245-	alphronzo.moseley@losangeles.af.mil

4. Program Elements/Procurement Line Items:

RDT&E:  
PE 0603854F (Shared) Project 2679

PROCUREMENT:  
APPN 1810 ICN 33109N (Navy) (Shared)  
APPN 3080 ICN 33601F (Air Force)  
APPN 1109 ICN 463300 (Navy)  
APPN 2035 ICN BC4120 (Army)

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

SAF/PAS

00--0294

CONGRESSIONAL

00-C-0739

GBS, December 31, 1999

**5. References:**

**SAR Baseline (Development Estimate):**

DAE Approved Acquisition Program Baseline (APB) dated November 14, 1997.

**Approved Program:**

DAE Approved Acquisition Program Baseline (APB) dated November 14, 1997.

**6. Mission and Description:**

GBS will augment other communications systems and provide a continuous high-speed, one-way information flow to deployed, mobile or garrisoned forces. GBS will support routine operations, training and military exercises, special activities, crisis, situational awareness, weapons targeting, reconnaissance, and the transition to and conduct of opposed operations short of nuclear war. Access will be near worldwide (65 degrees north latitude to 65 degrees south latitude), with constellation orbit positions selected to minimize requirements for overseas fixed broadcast injection sites.

The Joint Program Office (JPO) will procure, via a single contract, development of the transmit and receive suites, development of the transportable injection points, and performance of end-to-end system integration. The Navy has procured the space segment Ultra-High Frequency(UHF) Follow-On (UFO) satellite tertiary payloads, and will acquire the Navy-unique shipboard receive terminals (SRTs) which will be integrated with shipboard receive broadcast managers to form shipboard receive suites.

The GBS is a worldwide, high-throughput broadcast (one way) information transmission system that extends the Defense Information Infrastructure (DII). It is intended to consistently provide the warfighter with information that allows action inside the decision cycle-time of the adversaries. The full Joint Operational Requirements Document (Joint ORD) threshold performance requirements will be met with the fielding of the ground capabilities in support of UFO 10.

**7. Executive Summary:**

Since the last Selected Acquisition Report (SAR), the GBS JPO completed the acquisition and installation of the Norfolk Satellite Broadcast Management(SBM) facilities, the second of three fixed uplink sites. The Norfolk site became available for operational and exercise support in early 1999. That SBM provided support to the USS MOUNT WHITNEY during their Mediterranean deployment. The first SBM at Wahiawa, Hawaii provided data and video support to Pacific Command (PACOM) exercises, including Foal Eagle and Ulchi Focus Lens in Korea. After-action reports from those exercises highlighted the broad availability and speed of delivery of both video and data products. In addition, the Hawaiian SBM provided broadcast support to the shipboard receive suite (SRS) installed aboard the USS CORONADO. The third SBM, located at Sigonella, Sicily, received Host Nation Approval for installation in early 1999, but Italian government approval delays prevented ground breaking until October 22, 1999. The SBM equipment was kept in storage until December 1999 when it was

GBS, December 31, 1999

7. Executive Summary (Cont'd):

prepared for shipment to Italy. This third site will initially be available for operations June 2000. The program also achieved an objective goal of successfully transmitting to a prototype airborne receive suite aboard a modified C-135.

As a result of the Cost As an Independent Variable (CAIV) restructure mentioned in the previous SAR, the Government acquisition of development receive suites changed from 150 to a total of 96. The contractor's workforce was also reduced, which extended the schedule by six months, delaying the Multi-Service Operational Test and Evaluation (MOT&E) from mid-1999 into FY2000.

Raytheon Systems of Reston, Virginia, the prime contractor, experienced development problems in addition to the antenna reliability addressed in the previous SAR. Raytheon addressed the receive terminal reliability inadequacies by first providing additional on-site technical support in Korea, as well as substituting a different, proven antenna (the Navy Television-Direct to Sailor) for four of the sites in Korea. As the long-range solution, Raytheon has contracted with a different vendor for the threshold antennas.

These delays were the basis of an Overarching Integrated Product Team (OIPT) meeting March 22, 1999 that resulted in a Program Deviation Report (PDR) submitted in April 1999. The JPO and the contractor took steps to revise the program acquisition schedule, which culminated in a series of Engineering Change Proposals (ECPs) developed from April to September 1999. Before the CAIV-based contract ECPs could be definitized, Raytheon encountered additional software development and integration challenges. The original approach to portions of the SBM's software proved to be inadequate, so Raytheon was forced to spend additional resources analyzing and addressing the issue. While the solution path is understood by the contractor and the Government, it created a delay in the testing phase of the program of eight months. The cumulative effect is a twenty-three month delay to the program's acquisition schedule, and the resultant schedule breach.

The GBS Continental U.S. (CONUS) Testbed, including the satellite uplink, continued to support exercises and service-developed Concepts of Operation for the GBS system.

The UHF-10 satellite was successfully launched on November 22, 1999. It was turned over for operations in mid-February 2000.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

SCHEDULE BREACH EXPLANATION: The GBS acquisition experienced delays associated with the construction at Sigonella on the third Primary Injection Point (PIP) as well as software and hardware integration delays experienced by the prime contractor. The original Program Manager anticipated a nine-month slip in March 1999; that estimate was revised to twenty-three months by the current Program Manager. The Program Manager is preparing a new Acquisition Program Baseline (APB) which reflects this revised schedule. Final approval for the current plan is expected in March/April 2000 following an Overarching Integrated Product Team meeting.

PROCUREMENT COST BREACH EXPLANATION: Due to the delay described above, Low-Rate Initial Production (LRIP) quantities were extended beyond FY1999. The increase in procurement cost is due to inclusion of the LRIP procurement receive suites and the associated funding for FY2001 and FY2002. A revised APB will address these additional years of LRIP.

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9. Schedule:

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Milestone II (DAE)	DEC 1997	DEC 1997	NOV 1997
System Available for Operational Use	JUN 1999	JUN 1999	MAY 2001(Ch-1)
Initial Operational Capability (IOC)	DEC 1999	DEC 1999	NOV 2001(Ch-1)
Milestone III	DEC 1999	DEC 1999	NOV 2001(Ch-1)

Initial Operational Capability (IOC) is defined in the Joint Operational Requirements Document (JORD) dated April 30, 1997, using specific performance and operational support criteria.

b. Current Change Explanations --

(Ch-1): The original Joint Program Office Program Manager briefed a program delay to the Overarching Integrated Product Team (OIPT) in March 1999. At that meeting, the Program Manager reviewed the framework for a revised Acquisition Program Baseline (APB) which would accommodate a nine-month delay to the program due to slips in the construction at Sigonella as well as software and hardware integration delays experienced by the prime contractor. That revised APB plan was based on the Sigonella ground site beginning in late 1998; an event that did not take place until late October 1999, bringing the total delay for Sigonella to 14 months. Before the new Program Manager could complete the contract negotiations for that delay, the program development experienced another technical delay. In November 1999 it was discovered that previously delivered software for the Satellite Broadcast Manager (SBM) proved inadequate at the system level, and needed to be redesigned, developed and tested. This has imposed an additional eight month delay to the program's schedule. The new Program Manager briefed three Integrating Integrated Product Team (IIPTs) in January/February 2000 on his plan to gain approval of a revised APB reflecting a total delay of 23 months.

A summary of the Current Estimate changes from the December 1998 Selected Acquisition Report to this report (explained above) are:

	FROM:	TO:
System Available for Operational Use	DEC 1999	MAY 2001
Initial Operational Capability (IOC)	JUN 2000	NOV 2001
Milestone III	JUN 2000	NOV 2001

Following discussions with the warfighting CINCs and Joint Staff in late March 2000, the above milestone dates will be adjusted to accommodate an incremental Block IOC approach.

10. Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
System Coverage	65 deg South to 65 deg North	65 deg / 65 deg South to / 65 deg North / North	65 deg South to 65 deg North (UFO-8 and UFO-9)	65 deg South to 65 deg North
Spot Beams	Two 500nm steerable, one 2000 nm steerable	Two / Two 500nm / 500nm steerable, / One 2000 nm / 2000 nm steerable / able	Two 500nm steerable, One 2000 nm steerable	Two 500nm steerable, One 2000 nm steerable
Simultaneous Uplinks	One PIP and up to 3 TIPS simultaneously	One PIP / One PIP and up to 3 TIPS / simultaneously /	TBD (Awaiting TIP in Spring 2000)	One PIP and one TIP
Security	Pass unclassified to <del>TOP SECRET</del> traffic	Pass / unclassified to / <del>TOP SECRET</del> / traffic /	Pass unclassified to <del>TOP SECRET</del> traffic	Pass unclassified to <del>TOP SECRET</del> traffic
Receive Frequency Band	20.2-21.2 GHz UFO GBS	20.2-21.2 GHz / UFO GBS, / one or / more / commercial / satellite / frequency bands /	20.2-21.2 GHz UFO GBS and 11.7 to 12.2 GHz Commercial (Orion and	20.2-21.2 GHz UFO GBS
Support operations with multiple satellite beams and terminal types (i.e., Receive Variable Data Rates)	2000nm: add SSRT and ART 500nm: Add ART	2000nm: / add SSRT / and ART / 500nm: / Add ART /	Video and data over 2000nm and 500nm beams to SRT	2000nm: FGRT, TGRT and SRT 500nm: FGRT, TGRT and SSRT

10a. Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Pointing of Steerable Spot Beam Antenna	Frequent	Frequent/ Frequent	Frequent pointing to support ship movements in PACOM/ACM/EUCOM	Frequent
Steerable Antenna Tasking	SBM Primary means	SBM / SBM Primary / Primary Means / Means	SBM Primary Means through coordination with NCTAMS EHF terminal operator	SBM Primary Means

ACRONYMS:

- ART -Airborne Receive Suite Terminal
- FGRT -Fixed Ground Receive Suite Terminal
- GBS -Global Broadcast Service
- PIP -Primary Injection Point
- SBM -Satellite Broadcast Manager
- SRT -Shipboard Receive Suite Terminal
- SSRT -Sub-surface (submarine) Receive Suite Terminal
- TGRT -Transportable Ground Receive Suite Terminal
- TIP -Theater Injection Point
- UFO -UHF Follow-on Satellite

The following Demonstrated Performance parameters were changed since the last SAR:

System Coverage: Changed to include performance experienced with UFO-9.  
Receive Frequency Band: Additional information provided for commercial satellite experience.

Pointing of Steerable Spot Beam Antenna: Changed to reflect test and exercise support experience.

Steerable Antenna Tasking: Changed to better reflect the intent of the original Operational Requirements Document (ORD) requirement.



10b. Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

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

a. Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	397.5	397.5	403.3
Procurement	53.9	53.9	91.0
Flyaway	(48.5)		(85.2)
Other Wpn System Costs	(4.3)		(5.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(1.1)		(0.5)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1997 Base-Year \$	451.4	451.4	494.3
 Escalation	 45.7	 45.7	 30.8
Development (RDT&E)	(41.7)	(41.7)	(24.7)
Procurement	(4.0)	(4.0)	(6.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	497.1	497.1	525.1
 b. Quantity --			
Development (RDT&E)	221	221	136
Procurement	<u>125</u>	<u>125</u>	<u>304</u>
Total	346	346	440

Note: Excludes 0 RDT&E prototypes from the SAR Baseline and 10 from the Current Estimate that are not considered fully configured.

For the current estimate, the Development Quantity includes 133 Fixed and Transportable Ground Receive Suites, Shipboard Receive Suites and 3 Primary Injection Points; the Procurement Quantity includes 299 Fixed and Transportable Ground Receive Suites, Shipboard Receive Suites and 5 Theater Injection Points.

NOTE: A Low Rate Initial Production (LRIP) quantity of up to 500 receive suites and 140 shipboard antennas was approved at MSII by the DAE. The LRIP quantity exceeds 10% of the total program quantities to provide production representative articles for operational test and evaluation. This quantity will also permit an orderly increase in the fielding (production) rate sufficient to lead to a full-rate fielding (production) of the receive suite hardware.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (NOV 1997 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1997 BY\$)	451.4	494.3	
(2) Quantity	346	440	
(3) Unit Cost	1.305	1.123	-13.95
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1997 BY\$)	53.9	91.0	
(2) Quantity	125	304	
(3) Unit Cost	0.431	0.299	-30.63

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	439.2	57.9	-	497.1
Previous Changes:				
Economic	-18.4	-0.8	-	-19.2
Quantity	-2.7	+17.9	-	+15.2
Schedule	-	+0.2	-	+0.2
Engineering	-	-	-	-
Estimating	-13.3	-22.4	-	-35.7
Other	-	-	-	-
Support	-	+0.1	-	+0.1
Subtotal	-34.4	-5.0	-	-39.4
Current Changes:				
Economic	-1.7	0.0	-	-1.7
Quantity	-	+30.6	-	+30.6
Schedule	-	+27.7	-	+27.7
Engineering	+4.6	-	-	+4.6
Estimating	+20.3	-14.8	-	+5.5
Other	-	-	-	-
Support	-	+0.7	-	+0.7
Subtotal	+23.2	+44.2	-	+67.4
Total Changes	-11.2	+39.2	-	+28.0
Current Estimate	428.0	97.1	-	525.1

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

Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	397.5	53.9	-	451.4
Previous Changes:				
Quantity	-2.6	+16.9	-	+14.3
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-11.3	-20.4	-	-31.7
Other	-	-	-	-
Support	-	+0.1	-	+0.1
Subtotal	-13.9	-3.4	-	-17.3
Current Changes:				
Quantity	-	+29.1	-	+29.1
Schedule	-	+24.5	-	+24.5
Engineering	+4.3	-	-	+4.3
Estimating	+15.4	-13.7	-	+1.7
Other	-	-	-	-
Support	-	+0.6	-	+0.6
Subtotal	+19.7	+40.5	-	+60.2
Total Changes	+5.8	+37.1	-	+42.9
Current Estimate	403.3	91.0	-	494.3

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year    Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-1.7
Adjustment for Current and Prior Inflation. (Estimating)	+0.4	+0.4
Increased estimate for enhancements and upgrades, such as multiplexer, planning and scheduling database upgrades; human-machine interface enhancements; and conditional access/remote disable functionality. (Engineering)	+4.3	+4.6
Refinement of estimate for transponder lease and support activities (Estimating)	+18.0	+23.0
Congressional Reduction in FY00 required reduction of technical support (Estimating)	-3.0	-3.1
RDT&E Subtotal	+19.7	+23.2
(2) <u>Procurement</u>		
Revised escalation indices (Economic)	N/A	-0.2
Economic adjustment for negative program change. (Economic)	N/A	+0.2
Adjustment for current and prior inflation. (Estimating)	+0.2	+0.2

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Total Quantity Variance associated with increase of 31 receive suites and TIPS from 272 to 304.	+15.8	+16.7
Quantity decrease of eight Air Force receive suites and TIPS from 49 to 41. (Quantity)	-3.6	-4.0
Quantity increase of Army receive suites from 48 to 170. (Quantity)	+40.5	+42.7
Quantity decrease for Marine Corps receive suites from 105 to zero. (Quantity)	-12.0	-12.8
Quantity increase for Navy receive suites from 70 to 93. (Quantity)	+4.2	+4.7
Allocation to schedule variance resulting from Quantity Change. (QR)(Schedule)	0.0	+0.4
Allocation to Estimating Variance resulting from Quantity Change. (QR)(Estimating)	-13.9	-15.0
Rephase of Army procurement receive suites. (Schedule)	+24.5	+27.3
Addition of Other Weapons System Cost for Marine Corps estimate. (Support)	+0.6	+0.7
Procurement Subtotal	+40.5	+44.2

QR = Quantity related changes.

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.44	-0.05	-0.20	+0.06	+0.01	-0.07	--	--	-0.25	1.19

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.46	--	-0.11	+0.09	--	-0.12	--	--	-0.14	0.32

14c. Unit Cost and Other History (Cont'd):

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	DEC 1997	N/A	NOV 1997
Milestone III	N/A	DEC 1999	N/A	NOV 2001
FUE/IOC	N/A	DEC 1999	N/A	NOV 2001
Total Cost	N/A	497.1	N/A	525.1
Total Quantity	N/A	346	N/A	440
Prog Acq Unit Cost	N/A	1.44	N/A	1.19

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

a. RDT&E --

Terminals:

Raytheon Systems, Reston, VA

F04701-97-C-0044, CPAF

Award: November 17, 1997

Definitized: November 17, 1997

Initial Contract Price  
Target      Ceiling      Qty

\$84.8                      N/A                      221

Current Contract Price  
Target      Ceiling      Qty

\$103.7                      N/A                      160

Estimated Price At Completion  
Contractor      Program Manager

\$163.1                      \$169.4

Cost Variance      Schedule Variance

Previous Cumulative Variances  
Cumulative Variances To Date (12/31/99)  
Net Change

\$-13.8                      \$-0.4  
\$-1.8                      \$-4.4  
\$12.0                      \$-4.0

Explanation of Change:

During this reporting period, the contractor and the Government agreed to segregate the cumulative cost variance for work performed through September 1999 from the work remaining to be accomplished. The contractor was allowed to reset the cost variance (an unfavorable \$13.8M at the time) to zero, and begin reporting performance only against the remaining work. The lower unfavorable cumulative cost variance is the result of that decision. The contractor was also directed to take steps in future Cost Performance Reports (CPRs) to ensure the Government retains the necessary cost and schedule visibility. The current cumulative variance represents performance against the contract since December 1998. The cumulative unfavorable cost and schedule variances are the result of delays experienced completing the third uplink site, as well as software and hardware integration issues.

The initial contract quantity was changed in this report from 344 to 221: the 344 was reported in error. The initial contract quantity of 221 was

15. Contract Information (Cont'd):

comprised of RDT&E funding for 218 Receive Suites (RSs) and 3 Primary Injection Points (PIPs). Since contract award, the number of RSs on contract decreased to 156, the number of PIPs remained at three, and a Theater Injection Point (TIP) was added to the contract, resulting in a total of 160. The increase in target cost resulted from the addition of the TIP, delays experienced in development of the third PIP site in Sigonella, and hardware redesign and software integration delays experienced by the prime contractor.

Contract Comments:

This contract will be funded with RDT&E, Procurement and Operations and Support funds by the Air Force, Army and Navy.

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

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-13)</u>	<u>Total</u>
RDT&E	186.7	45.4	34.2	161.7	428.0
Procurement	17.3	15.9	27.2	36.7	97.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	204.0	61.3	61.4	198.4	525.1

b. Annual Summary -- Global Broadcast Service

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1997 Dollars Nonrec</u>	<u>Flyaway FY 1997 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				14.1	14.0
1997				37.7	37.9
1998				69.4	70.2
1999				63.3	64.6
2000				43.9	45.4
2001				32.6	34.2
2002				38.1	40.6
2003				23.5	25.5
2004				15.4	17.0
2005				13.8	15.6
2006				11.8	13.6

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2007				5.6	6.6
2008				5.8	6.9
2009				5.8	7.1
2010				5.8	7.2
2011				5.5	7.0
2012				5.6	7.2
2013				5.6	7.4
Subtotal	136			403.3	428.0

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000					
2001				0.7	0.7
2002					
Subtotal				0.7	0.7

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997	12		1.6	1.6	1.6
1998					
1999	20		2.5	2.5	2.6
2000	14		2.1	2.1	2.2
2001					
2002	47		6.7	6.7	7.3
Subtotal	93		12.9	12.9	13.7

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	1	2.1	2.9	7.1	7.3
1999	8		4.0	5.6	5.8
2000	32		8.9	10.3	10.9
2001	10		8.7	8.7	9.3

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

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	119		19.9	19.9	21.7
Subtotal	170	2.1	44.4	51.6	55.0

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	3		2.7	2.7	2.8
2001	21		16.0	16.0	17.2
2002	17		7.1	7.1	7.7
Subtotal	41		25.8	25.8	27.7

In the original Acquisition Program Baseline (APB), the Procurement funding was limited to that required to achieve Milestone III rather than that required for the total program. This report reflects this limited Procurement funding.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
USAF	177		25.8	429.1	455.7
Navy	93		12.9	13.6	14.4
Army	170	2.1	44.4	51.6	55.0
Grand Total	440	2.1	83.1	494.3	525.1

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 173.8

Percent Total Program Expended: 33.1%



18. Operating and Support Costs:

a. Assumptions and Ground Rules --  
There is no antecedent system.

Operations and support costs include all costs of operating, maintaining and supporting the GBS assets for an assumed life of ten years (from Full Operational Capability (FOC) in 2004 to 2013). Costs also include the costs for contractor support for sustaining engineering, logistics support and the operations personnel at each of the Primary Injection Sites.

The O&S cost estimate was revised in September 1998.

b. Costs -- (FY 1997 Constant (Base-Year) Dollars in Thousands)

Cost Element	GBS Average Annual/Unit	Antecedent N/A
Mission Pay & Allowances	238.3	N/A
Unit Level Consumption	6.4	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	37.9	N/A
Sustaining Support	15.4	N/A
Indirect Costs	43.5	N/A
	N/A	N/A
Total	341.5	N/A



**5. References:**

SAR Baseline (Planning Estimate):

DAE Approved Acquisition Program Baseline (APB) dated April 19, 1999.

Approved Program:

Approved Acquisition Program Baseline (APB) dated April 19, 1999.

**6. Mission and Description:**

The National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Program is required to provide, for a period of at least 10 years, a remote sensing capability to acquire, receive at ground terminals, and disseminate to processing centers, global and regional environmental imagery and specialized meteorological, climatic, terrestrial, oceanographic, solar-geophysical and other data supporting Department of Commerce (DOC)/National Oceanic and Atmospheric Administration (NOAA) mission requirements, and Department of Defense (DoD) peacetime and wartime missions.

**7. Executive Summary:**

In April 1999, Mr. Robert S. Winokur retired as the National Oceanic and Atmospheric Administration (NOAA) Assistant Administrator for Satellite and Information Services and the Acting National Polar-orbiting Operational Environmental Satellite System (NPOESS) System Program Director (SPD). Mr. Gregory Withee, the current NOAA Assistant Administrator for Satellite and Information Services, became the Acting NPOESS SPD until 1 November 1999 when Mr. John Cunningham assumed the position of NPOESS SPD.

The Integrated Program Office (IPO) and the Air Force signed an Initial Implementation Agreement with NASA for the Phase I development of the NPOESS Preparatory Project (NPP), a joint IPO/NASA mission that is currently planned for launch in late 2005. An objective of this project is to provide the IPO with risk-reduction demonstration and validation for 3 of the 4 launch critical NPOESS instruments and algorithms. Another objective is the near-real time processing of their data at the Air Force Weather Agency (AFWA) to demonstrate the NPOESS data ingest processing and distribution segment. The third objective is to provide NASA with a bridge to continue measurements of global climate change parameters between the Earth Observing Satellites (EOS) Terra and EOS Aqua missions and the first operational NPOESS launch.

On 14 May 1999, the NPOESS IPO awarded the Ozone Mapping and Profiler Suite (OMPS) detail design and fabrication contract totaling approximately \$91 million (including options) to Ball Aerospace & Technologies Corporation, Boulder, Colorado. The contract will ultimately produce three OMPS units that will fly aboard NPOESS and will collect data to map vertical and horizontal distributions of ozone in the earth's atmosphere. An early flight opportunity for OMPS risk reduction is also being explored.

On 30 Aug 1999, the NPOESS IPO awarded the Cross-track Infrared Sounder (CrIS) detail design and fabrication contract totaling approximately \$98 million,

7. Executive Summary (Cont'd):

including options, to ITT Industries, ITT Aerospace/Communication Divisions, Ft. Wayne, Indiana. The contract will produce four CrIS units that will use advanced infrared sounding technologies at high spectral resolution to accurately measure vertical distributions of temperature, moisture, and pressure in the earth's atmosphere.

The Visible/Infrared Imager Radiometer Suite (VIIRS) contractors have completed the System Functional Reviews (SFRs). The VIIRS performance is being modified to accommodate the requirements of the joint NASA/IPO NPP. In addition, we have continued to conduct Technical Interchange Meetings (TIMs) to further refine the detailed design and development efforts for the Global Positioning System Occultation Sensor (GPSOS) and the Conical Microwave Imager/Sounder (CMIS).

On 10 Sep 99, the NPOESS Executive Committee (EXCOM) approved the modification to the acquisition strategy replacing the current architecture definition and the Pre-TSPR (Total System Performance Responsibility) phase with the System Program Definition and Risk Reduction (PDRR) phase, and moved the start date from Nov 00 to Dec 99. The EXCOM concurred in the need to immediately begin risk reduction for the ground segment Integrated Data Processing System (IDPS). The NPOESS IPO awarded two PDRR contracts on 13 Dec 99 of approximately \$21M each to Lockheed Martin Missiles and Space of Sunnyvale, Calif., and TRW Space and Electronics Group of Redondo Beach, Calif. During the PDRR phase, the contractors will complete system architecture trades, define the system requirements, and provide a preliminary design of the IDPS. The contractors will also conduct demonstrations of their ability to provide the data processing segment using the spiral development method. After successful completion of these efforts, the NPOESS IPO will conduct a source selection in 2002 to determine the prime contractor to build and deploy the total NPOESS program. Each contractor will also plan to support the NPP, while maximizing commonality for the future NPOESS operational system.

During the first quarter FY00, the Final FY00 Appropriation bills reduced the NPOESS budget by a total of \$40 million. Both the Department of Commerce (DOC) and the Department of Defense (DoD) NPOESS budgets were reduced by \$20 million each. These reductions resulted in a delay in the availability of the first NPOESS satellite until Sep 2008. In addition, the Conical Microwave Imager Sounder (CMIS), Space Environmental Sensor Suite (SESS), and Ozone Mapping and Profiler Suite (OMPS) sensors were delayed from 3 to 6 months. The Multispectral Operational Linescan System (MOLS), an upgrade for the Defense Meteorological Satellite Program (DMSP), was cancelled. Programmatic changes resulting from the FY00 cut led to an additional \$114.9 million reduction over fiscal years 2001 thru 2005. Both agencies reduced the NPOESS budget by \$57.45 million each. However, none of these actions will cause the program to breach the APB.

DMSP F-15, launched on 12 Dec 99, is the first DMSP satellite controlled by NOAA's Satellite Operations Control Center (SOCC) in Suitland, MD through its entire operational life, from launch through mission completion.

**7. Executive Summary (Cont'd):**

With the award of the OMPS, CrIS and PDRR contracts, and the progress on NPP, the NPOESS program is proceeding along the path to creating a high performance, integrated polar-orbiting satellite system that will cost less, be more responsive to user demands, and deliver more capability than those in use today.

This is a pre-Milestone II SAR which reflects development funds only.

**8. Threshold Breaches:**

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	NO
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

**9. Schedule:**

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	MAR 1997	MAR 1997	MAR 1997
Payload Contract Awards	JUL 1997	JUL 1997	JUL 1997
Pre-Total System Performance Responsibility (pre-TSPR) Contract Award	MAY 1999	NOV 2000	DEC 1999 (Ch-1)
Milestone II	SEP 2000	N/A	N/A (Ch-2)
Milestone II/III	N/A	FEB 2002	FEB 2002 (Ch-2)
Total System Responsibility (TSPR) Contract Award	OCT 2000	MAR 2002	MAR 2002
Initial Operational Capability (IOC)	DEC 2010	JUL 2011	JUL 2011
Milestone III	DEC 2011	DEC 2011	N/A (Ch-2)
Follow-on Decision	N/A	OCT 2013	OCT 2013

Schedule Milestone Footnotes

9a. Schedule (Cont'd):

As of December 1998, the EXCOM redesignated Milestone II as Milestone II/III.

IOC is met when the IOC criteria are satisfied per paragraph 8.1 of the IORD-1, dated March 28, 1996.

The pre-TSPR milestone was re-designated as PDRR on 10 September 1999 by the EXCOM. During the PDRR phase, the contractors will complete system architecture trades, define system requirements, and provide a preliminary design of the IDPS.

b. Current Change Explanations --

(Ch-1.) The pre-TSPR milestone was re-designated as PDRR on 10 September 1999 by the EXCOM. During the PDRR phase, the contractors will complete system architecture trades, define system requirements, and provide a preliminary design of the IDPS.

(Ch-2.) The NPOESS APB Memorandum was signed by the last of the three EXCOM members on 19 Apr 1999. This new APB redesignated Milestone II as Milestone II/III.

10. Performance Characteristics:

a. Performance --

Key EDR Parameters	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Atmospheric Vertical Moisture Profile				
Measurement Accuracy (Clear: Surface - 600mb)	+/- 10%	+/- 10% / +/- 20% DOC / DOC +/- 25% / +/- 25% DoD / DoD	TBD	+/- 20% DOC, +/-25% DoD
Measurement Accuracy (Cloudy: Surface - 600mb)	+/- 10%	+/- 10% / +/- 20% DOC / DOC +/- 10% / +/- 25% DoD / DoD	TBD	+/- 20% DOC, +/- 25% DoD
Atmospheric Vertical Temperature Profile				
Measurement Accuracy (Clear: Surface - 300mb)	+/- 0.5K	+/- 0.5K / +/- 1.6K / per 1 km / layer	TBD	+/- 1.0K per 1 km layer

10a. Performance Characteristics (Cont'd):

	Planning <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Measurement Accuracy (Cloudy: Surface 700mb)	+/- 0.5K	+/- 0.5K/ +/- 2.5K / per 1 km / layer	TBD	+/- 2.5K per 1 km layer
Imagery				
Horizontal Resolution				
Global at Nadir	.65 km	.65 km / 1.0 km	TBD	1.0 km (2)
Regional at Nadir	0.1 km	0.1 km / 0.4 km	TBD	0.4 km (3)
Refresh Visible and IR bands				
Average Revisit Time	1 hour	1 hour / 4 hours / or less	TBD	4 hours or less (4)
Maximum Revisit Time	1 hour	1 hour / 6 hours / or less	TBD	6 hours or less
Sea Surface Temperature				
Horizontal Resolution				
Regional at Nadir	0.25 km	0.25 km / 1.0 km	TBD	1.0 km (3)
Measurement Accuracy	+/-0.1 deg C	+/-0.1 / +/-0.5 deg C / deg C	TBD	+/- 0.5 °C
Sea Surface Winds (Speed)	greater of +/- 1 m/s or +/-10%	greater of +/- 1 m/s or +/-10% / greater of +/- 2 m/s or +/- 20%	TBD	greater of +/- 2 m/s or +/- 20%
Soil Moisture (Surface) Sensing Depth	Surface to -80cm	Surface / Surface (skin / layer: to -80cm/ (skin / layer:	TBD	Surface (skin layer: -0.1cm) (1)
Key System Parameters				
Data Access	Select. denial of all U.S. data (ARGOS and SARSAT ex- cepted)	Select. / Select denial / denial of all U.S. environ- mental / environ- mental data (ARGOS and SARSAT / SARSAT	TBD	Select. denial of all U.S. environ- mental data (ARGOS and SARSAT

10a. Performance Characteristics (Cont'd):

<u>Planning</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u> ex- / ex- cepted) / cepted)	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u> ex- cepted)
------------------------------------------	---------------------------------------------------------------------------------------------------	------------------------------------------------	-----------------------------------------------------

Performance Characteristics Footnotes:

1. Ref: NPOESS Integrated Operational Requirements Document (IORD) dated March 28, 1996.
2. Low resolution mode for real time transmission plus a full orbit of stored data.
3. High resolution mode for real time transmission plus 1/2 orbit of selected stored data.
4. At least 75% of revisit time will be 4 hours or less.

Acronyms:

C - Celsius  
 EDR - Environmental Data Record  
 K - Kelvin  
 km - kilometer  
 m/s - meters per second  
 mb - millibars

b. Current Change Explanations -- None



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

a. Cost --	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	4314.2	4182.3	4545.6
Procurement	0.0	N/A	0.0
Flyaway	(0.0)		(0.0)
Total Other Wpn sys			(0.0)
Total Flyaway	(0.0)		(0.0)
Other Wpn System Cost	(0.0)		(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	<u>0.0</u>	<u>N/A</u>	<u>0.0</u>
Total FY 1996 Base-Year \$	4314.2	4182.3	4545.6
 Escalation	 1014.8	 747.0	 800.0
Development (RDT&E)	(1014.8)	(747.0)	(800.0)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(N/A)</u>	<u>(0.0)</u>
Total Then Year \$	5329.0	4929.3	5345.6

Cost and Quantity Footnotes:

Approved Program APB is the objective. Current APB threshold is \$4,600.5M.

Per the Tri-Agency MOA, the Departments of Defense and Commerce jointly provide funding for NPOESS. The Planning Estimate (PE) reflects the total estimated program, excluding Operating and Support, presented at Milestone I in March 1997. The numbers listed above in the APB column reflect the December 18, 1998 EXCOM approved program. The Current Estimate column reflects the Integrated Program Office December 1999 Program baseline. These funds include the total DOD and DOC funds required to obtain the five NPOESS satellites and ground activities, NPOESS launch vehicles, NPOESS launch support, NPOESS Government Program Office Support, the IPO share of the NASA/IPO NPP, payload sets for two European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) Meteorological Operational (METOP) satellites, and installation of dual capable antennas at Fairbanks, Alaska. Development costs and quantities include amounts that will be shifted to Procurement prior to Milestone II/III.

b. Quantity --

Development (RDT&E)	5	5	5
Procurement	<u>0</u>	<u>N/A</u>	<u>0</u>
Total	5	5	5

Development quantities include amounts that will be shifted to Procurement prior to Milestone II/III. Satellites 3-5 will be funded with Procurement.

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

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	5329.0	-	-	5329.0
Previous Changes:				
Economic	-300.6	-	-	-300.6
Quantity	-	-	-	-
Schedule	+58.0	-	-	+58.0
Engineering	-69.2	-	-	-69.2
Estimating	-87.9	-	-	-87.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-399.7	-	-	-399.7
Current Changes:				
Economic	-53.6	-	-	-53.6
Quantity	-	-	-	-
Schedule	+95.5	-	-	+95.5
Engineering	+2.1	-	-	+2.1
Estimating	+372.3	-	-	+372.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+416.3	-	-	+416.3
Total Changes	+16.6	-	-	+16.6
Current Estimate	5345.6	-	-	5345.6

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

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	4314.2	-	-	4314.2
Previous Changes:				
Quantity	-	-	-	-
Schedule	+2.3	-	-	+2.3
Engineering	-58.2	-	-	-58.2
Estimating	-76.0	-	-	-76.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-131.9	-	-	-131.9
Current Changes:				
Quantity	-	-	-	-
Schedule	+49.4	-	-	+49.4
Engineering	-2.6	-	-	-2.6
Estimating	+316.5	-	-	+316.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+363.3	-	-	+363.3
Total Changes	+231.4	-	-	+231.4
Current Estimate	4545.6	-	-	4545.6

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-53.6
Revised Schedule. Changes due to FY00 reductions that delayed availability of the first NPOESS satellite until September 2008. Also, various sensors were delayed three to six months. (Schedule)	+49.4	+95.5
New Engineering Change. Changes due to addition of an eighth VIIRS sensor for NPP while discontinuing MOLs, an upgrade for DMSP. (Engineering)	-2.6	+2.1
Adjustment for Current and Prior Inflation. (Estimating)	+1.1	+1.1
New Estimating Change. Changes due to a new estimate received from launch vehicle System Program Office (SPO). There was also an increase in launch vehicle hardware costs moving from a Delta booster to an Evolved Expendable Launch Vehicle (EELV). (Estimating)	+315.4	+371.2
RDT&E Subtotal	+363.3	+416.3

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	MAR 1997	N/A	N/A	MAR 1997
Milestone II	SEP 2000	N/A	N/A	FEB 2002
Milestone III	DEC 2011	N/A	N/A	FEB 2002
FUE/IOC	DEC 2010	N/A	N/A	JUL 2011
Total Cost	5329	N/A	N/A	5345.6
Total Quantity	N/A	N/A	N/A	N/A
Prog Acq Unit Cost	N/A	N/A	N/A	N/A

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

a. RDT&E --  
NPOESS-OMPS:  
 Ball Aerospace & Tech, Boulder, CO  
 F04701-99-C-0044, CPAF  
 Award: May 14, 1999  
 Definitized: May 14, 1999

	Initial Contract Price	
	Target	Ceiling
	\$63.1	N/A
		Qty
		2

Current Contract Price	Estimated Price At Completion	
	Target	Ceiling
\$63.1	N/A	2
	Contractor	Program Manager
	\$63.1	\$63.1

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (02/06/00)	\$0.2	\$-0.3
Net Change	\$0.2	\$-0.3

Explanation of Change:

This is the first report on this contract in the SAR.

Positive cost variance is the result of subcontractor understaffing and taking credit for delivery of high dollar material items and subcontractor work before payment has been made. Cost variance will move closer to zero.

15. Contract Information (Cont'd):

<u>NPOESS-CrIS:</u>			<u>Initial Contract Price</u>		
ITT Industries, Ft. Wayne, IN	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
F04701-99-C-0061, CPAF	\$74.1	N/A	4		
Award: August 30, 1999					
Definitized: August 30, 1999					
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$74.1	N/A	4	\$74.1	\$74.1	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$0.0	\$0.0	
Cumulative Variances To Date (01/28/00)			\$0.0	\$-0.5	
Net Change			\$0.0	\$-0.5	

Explanation of Change:

This is the first report on this contract in the SAR.

Currently, some subcontracts are not definitized, thus showing unrealistic schedule variance since the efforts have changed due to specification and scope of work modifications. The date of the System/Subsystem Specification Review (S/SSR) was moved six weeks due to an agreed to instrument volume change. According to the contractor, Schedule Variance will be eliminated before DDR.

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

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

<u>Appropriation</u>	<u>Prior</u> <u>Years</u> (FY95-99)	<u>Budget</u> <u>Year</u> (FY00)	<u>Budget</u> <u>Year</u> (FY01)	<u>Balance To</u> <u>Complete</u> (FY02-18)	<u>Total</u>
RDT&E	287.4	120.1	153.2	4784.9	5345.6
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>287.4</b>	<b>120.1</b>	<b>153.2</b>	<b>4784.9</b>	<b>5345.6</b>

Program Funding Summary Footnotes:

The funding summary reflects the total program funding profile, excluding Operations and Support. The total dollars listed consists of funding provided jointly by DoD (50%) and DOC (50%). Air Force RDT&E and NOAA Procurement Acquisition and Construction (PAC) costs include amounts that

16. Program Funding Summary (Cont'd):  
Weather Satellite System

will be shifted to Procurement prior to Milestone II/III.

b. Annual Summary -- Weather Satellite System

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				23.5	23.4
1996				27.4	27.8
1997				55.0	56.4
1998				63.3	65.4
1999				109.7	114.4
2000				113.8	120.1
2001				143.0	153.2
2002				287.7	313.0
2003				427.7	473.0
2004				543.3	612.8
2005				565.6	651.0
2006				393.8	462.3
2007				485.9	582.1
2008				296.2	361.6
2009				227.8	283.9
2010				159.2	202.4
2011				234.6	304.0
2012				92.0	121.6
2013				26.3	35.5
2014				98.8	135.9
2015				26.3	36.9
2016				99.8	142.8
2017				27.2	39.7
2018				17.7	26.4
Subtotal	5			4545.6	5345.6

The total dollars listed consists of funding provided jointly by DoD (50%) and DOC (50%). Air Force RDT&E and NOAA Procurement Acquisition and Construction (PAC) costs include amounts that will be shifted to Procurement prior to Milestone II/III.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	5			4545.6	5345.6

\*\*\* UNCLASSIFIED \*\*\*

NPOESS, December 31, 1999

**17. Delivery/Expenditure Information:**

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 296.4

Percent Total Program Expended: 5.5%

Total expenditures includes \$166.5M of DOC obligations.

**18. Operating and Support Costs:**

Not applicable for Pre-Milestone II programs.

\*\*\* UNCLASSIFIED \*\*\*





**5. References:**

SAR Baseline (Production Estimate):

DAE Approved Acquisition Program Baseline dated January 19, 1995.

Approved Program:

NAE Approved Acquisition Program Baseline (APB) dated March 2, 1999.

**6. Mission and Description:**

The T45TS is the Navy's strike pilot training system designed to replace both the T-2C and TA-4J and to produce 306 Strike and 46 E2/C2 pilots each year through FY 2035 at two sites, NAS Kingsville and NAS Meridian. The system includes: 169 production aircraft (of two type/model/series: the T-45A, equipped with an analog cockpit; and T-45C, equipped with the "Cockpit-21" digital cockpit and avionics suite); 17 simulators; academic material, training aids, & equipment; a computer based Training Integration System (TIS) at both NAS Kingsville and NAS Meridian to achieve total system efficiencies; and contractor logistics support of all system elements.

(U) The T-45 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) and Operational Flight Trainers (OFT). Academics include textbook materials, classroom aids, and a computer-assisted instruction (CAI) system. The TIS utilizes existing hardware and software to provide scheduling and tracking of training events in order to achieve required training efficiency. Contractor Logistics Support (CLS) has been structured to provide for competition of maintenance support services to ensure that the system is supported in the most cost effective manner. The system is currently up and operating at both NAS Kingsville and NAS Meridian. NAS Kingsville continues to produce T-45A winged Naval Aviators; NAS Meridian began training students in the T-45C in July 1998, with the 1st T-45C student winging in April 1999.

**7. Executive Summary:**

Development of the T45TS was initiated in 1975 when the Navy perceived that both the T-2B/C and TA-4J aircraft should be replaced, beginning approximately in the mid 1980's, because of age and attrition. After extensive program strategy reviews the program was approved by SECNAV after a DNSARC on August 31, 1984. The subsequent DSARC review resulted in DOD approval on September 24, 1984.

The first production T-45A was delivered to Naval Air Station (NAS) Kingsville, Texas in December 1991. The first T-45TS trained aviators were winged on October 5, 1994. A total of 83 production T-45A aircraft were procured.

The first production T-45C successfully completed DT-IIIB testing on February 9, 1998 at Naval Air Warfare Center (Aircraft Division), NAS Patuxent River. This aircraft subsequently joined three additional T-45C production aircraft at NAS Meridian, MS where operational testing (OT-IIIB) commenced

T45TS, December 31, 1999

7. Executive Summary (Cont'd):

February 18, 1998. The T-45C aircraft, Training Integration System (TIS), and academics completed operational testing on June 5, 1998. The final component that was operationally tested was the Operational Flight Trainer (OFT) Simulator. The OFT (unit #7) was slowed by some software maturity issues, but corrections were made during the summer that allowed student simulator training to begin at NAS Meridian on August 24, 1998. The production baseline OFT (OFT#9) was installed at NAS Meridian in April 1999, with final Systems Operational Testing conducted in May 1999. The required reliability and maintainability (R&M) testing on (OFT #9) will be completed at NAS Meridian in April 2000. The software baseline was certified Y2K compliant, which brings all Ground Based Training System (GBTS) components into certified compliance.

During 1999 12 T-45 aircraft were manufactured and delivered to NAS Meridian. As of December 31, 1999 there are 74 T-45A aircraft at NAS Kingsville and 30 T-45C aircraft at NAS Meridian.

The program continues to aggressively monitor aircraft operational performance, as well as Boeing/Rolls Royce production performance. Program focus continues on correction of engine surge, ground directional control, and Boeing/Rolls Royce production quality issues.

The FY00 production contract was awarded to Boeing on September 8, 1999 and the contract was definitized on December 22, 1999.

The program successfully transitioned the T-45 Contractor Logistics Support (CLS) effort from a sole source to a competitive procured contract during the year. The contract was awarded in April 1999 and performance commenced on October 1, 1999.

A government/industry team is working to establish an achievable road map to ensure the T45TS will provide effective and efficient jet pilot training through 2035. The team is concentrating on keeping pace with the evolving Operational Advisory Group (OAG) requirements and capabilities of both the fleet replacement squadrons and primary flight trainer systems. Obsolescence avoidance, increasing airframe life, O&S cost reduction and avionics advances are considered top priorities.

During 1999 the program successfully completed 43,484 flight hours at NAS Kingsville and 14,263 flight hours at NAS Meridian. As of December 1999, the Training command had flown over 236,154 T-45A flight hours and 19,614 T-45C flight hours.

Upon completion of full fatigue testing and assessment of aircraft utilization rates, which indicate the T-45 aircraft could be operated until FY 2035 vice FY 2020, the CNO approved an Inventory Objective increase from 187 to 234 aircraft. However, due to CNO assessment of continued use of existing trainer aircraft, on-going analysis of T-45 attrition rates, and budgetary constraints, the FY01 President's Budget reflects a total of 169 aircraft.

The T45TS program was selected for Commercial Operations & Support Savings

7. Executive Summary (Cont'd):

Initiative (COSSI) funding for implementation of two Commercial Technology Insertion programs. The avionics IPT was awarded \$6.9 million to develop a Commercially based Mission Display Processor, expanded to incorporate future processing and memory requirements and avoid current parts obsolescence. This contract was awarded to Boeing in September 99. The Engine IPT was awarded \$1.3 million for life enhancement of the T45's F405 engine compressor drum. The engine COSSI program contract with Rolls Royce was signed on June 22, 1999.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Program Initiated	JUL 1975	JUL 1975	JUL 1975
Requirements Validation Study	MAR 1978	MAR 1978	MAR 1978
MENS Approved	JUN 1979	JUN 1979	JUN 1979
RFQ For Concept Definition	DEC 1979	DEC 1979	DEC 1979
Project Charter Approved	AUG 1980	AUG 1980	AUG 1980
ASE Studies Completed	MAR 1981	MAR 1981	MAR 1981
Sustain Engr Contract Award	NOV 1981	NOV 1981	NOV 1981
DEM/VAL Contract Award (Pre FSED)	SEP 1982	SEP 1982	SEP 1982
Program Redirect (All Carrier Qual)	NOV 1983	NOV 1983	NOV 1983
Advance Development Contract Award	JUL 1984	JUL 1984	JUL 1984
Milestone I/II (DSARC)	SEP 1984	SEP 1984	SEP 1984
FSED Letter Contract	SEP 1984	SEP 1984	SEP 1984

9a. Schedule (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone IIIA Approval Pilot Prod (APP)	SEP 1987	SEP 1987	SEP 1987
T45A First Flight	MAR 1988	MAR 1988	APR 1988
Pilot Lot II FY 89	DEC 1989	DEC 1989	DEC 1989
Milestone IIIA (ALRIP) FY92	NOV 1991	NOV 1991	APR 1992
Complete Navy Tech Eval (NTE)	AUG 1993	AUG 1993	NOV 1993
Complete OPEVAL	DEC 1993	DEC 1993	APR 1994
Initial Operational Capability	NOV 1992	NOV 1992	APR 1993
Milestone III Authorized Full Production	JAN 1995	JAN 1995	JAN 1995
Contractor Logistics Support (CLS) Competition	OCT 1997	OCT 1999	OCT 1999

b. Current Change Explanations --  
N/A

10. Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
<b>Aircraft</b>				
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)	13725	13725 / 14000	13868	13868
Specific Range @ 30,000 ft (takeoff less 40% useable fuel) (nm/lb)	.33	.33 / .32	.359	.359
Endurance @ 5000 ft (takeoff less 80% useable fuel) (lb/hr)	1130	1130 / 1160	940	940
Waveoff (altitude loss ft)	50	50 / 70	<70	<70
Bolter (ground roll distance ft @ 15 kts WOD)	325	325 / 425	310-375	310-375
Lateral Directional Stability (sideslip excursion approach configuration) (deg)	4	4 / 6	6	6
Roll Off at Stall (approach configuration) (deg)	<30	<30 / 30	15-20	15-20

10a. Performance Characteristics (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
"G" Excursion Speed	.25	.25 / .40	.35	.35
Brake Extension (Gs)				
Longitudinal Stability (stick free damping ratio 10,000 ft & .86 IMN)	.45	.45 / .25	.30	.30
Simulator				
Total Time Lag Error (ms)	124	124 / 155	155	155
Digital Computational System				
Main Memory with spare (MB)	4.0/2.75	4.0/2.75/ 4.0/2.0	4.0/2.0	4.0/2.0
Processing Capacity (ms)	16.05	16.05 / 16.67	<16.67	<16.67
Visual System Luminance (ft-1)	2.0	2.0 / 1.5	2.16	2.16
Academics				
Memory/Spare (K/MB)	640/80	640/80 / 640/40	640 / 80	640 / 80
Terminal Response Time (sec avg)	<3	<3 / 3	<3	<3
Training Integration System				
Memory (RAM) (MB)	256	256 / 192	192	192
I/Os per second	210	210 / 75	75	75
Terminal Response Time (sec avg)	<3	<3 / 3	<3	<3
Aircraft				
Speed				
Max Level Flt (Mach)	.84	.84 / .83	.845	.845
Approach (kts)	125	125 / 125	124.4	124.4
Sustain G's @ 15,000 ft	3.4	3.4 / 3.2	3.3	3.3
Mean Flight Hours Between Failure (MFHBF)	3.2	3.2 / 2.0	3.2	3.2
Direct Maintenance Man Hours/Flight Hour (DMMH/FH)	10	10 / 10	8.33	8.33
Availability (%)	85	85 / 75	76	76
Simulator				
Availability (%)				

10a. Performance Characteristics (Cont'd):

	<u>Production Estimate (SAR)</u>		<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Instrument Flight Trainer (IFT)	95	95	/ 80	90	90
Operational Flight Trainer (OFT)	95	95	/ 80	90	90
Academics					
Computer Aided Instruction (CAI) System Availability (% Sched)	95	95	/ 85	100	100
Training Integration System (TIS)					
Availability (% Sched)	95	95	/ 85	85	100
Pilot Training Rate	450	N/A	/ N/A	N/A	N/A

b. Current Change Explanations -- None

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

a. Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	898.9	1086.0	1054.6
Procurement	4595.2	5707.9	4334.7
Airframe/CFE	(2738.5)		(2734.0)
Engines	(184.3)		(190.9)
GFE	(137.8)		(102.2)
Change Allowance/ECO	(62.6)		(13.4)
Nonrecurring flyaway	(198.6)		(196.5)
Total Flyaway	(3321.8)		(3237.0)
Training Equipment	(337.1)		(227.1)
Other	(651.3)		(644.1)
Total Other Wpn Sys	(988.4)		(871.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(285.0)		(226.5)
Construction (MILCON)	34.0	34.0	33.9
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1995 Base-Year \$	5528.1	6827.9	5423.2
Escalation	71.4	62.1	-181.1
Development (RDT&E)	(-167.1)	(-186.8)	(-174.7)
Procurement	(241.4)	(251.8)	(-3.6)
Construction (MILCON)	(-2.9)	(-2.9)	(-2.8)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	5599.5	6890.0	5242.1

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

b. Quantity --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	2	2	2
Procurement	<u>174</u>	<u>234</u>	<u>169</u>
Total	176	236	171

The percentage of LRIP units has adjusted proportionately to the total quantity aircraft reduction (300 to 169). The original program planned 48 LRIP (FY89/90) units or 16% of 300 total. Due to delays in completing development, OSD directed procurement of 60 LRIP units (FY89 thru FY94). Subsequent adjustments have lead to the current 169 aircraft and the resulting present 36% ratio to the total (169).

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (MAR 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	6827.9	5423.2	
(2) Quantity	236	171	
(3) Unit Cost	28.932	31.715	+9.62
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	5707.9	4334.7	
(2) Quantity	234	169	
(3) Unit Cost	24.393	25.649	+5.15

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	731.8	4836.6	31.1	5599.5
Previous Changes:				
Economic	+5.5	-128.6	+0.1	-123.0
Quantity	-	+1196.5	-	+1196.5
Schedule	-	-225.8	-	-225.8
Engineering	-19.6	+45.1	-	+25.5
Estimating	+162.2	+77.3	-0.1	+239.4
Other	-	-	-	-
Support	-	+158.6	-	+158.6
Subtotal	+148.1	+1123.1	+0.0	+1271.2
Current Changes:				
Economic	-	+131.6	-	+131.6
Quantity	-	-1362.9	-	-1362.9
Schedule	-	+49.3	-	+49.3
Engineering	-	-5.9	-	-5.9
Estimating	-	-53.1	-	-53.1
Other	-	-	-	-
Support	-	-387.6	-	-387.6
Subtotal	-	-1628.6	-	-1628.6
Total Changes	+148.1	-505.5	+0.0	-357.4
Current Estimate	879.9	4331.1	31.1	5242.1

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	898.9	4595.2	34.0	5528.1
Previous Changes:				
Quantity	-	+988.4	-	+988.4
Schedule	-	-129.8	-	-129.8
Engineering	-20.3	+54.7	-	+34.4
Estimating	+176.0	+74.3	-0.1	+250.2
Other	-	-	-	-
Support	-	+125.1	-	+125.1
Subtotal	+155.7	+1112.7	-0.1	+1268.3
Current Changes:				
Quantity	-	-1071.8	-	-1071.8
Schedule	-	+41.4	-	+41.4
Engineering	-	-5.9	-	-5.9
Estimating	-	-36.1	-	-36.1
Other	-	-	-	-
Support	-	-300.8	-	-300.8
Subtotal	-	-1373.2	-	-1373.2
Total Changes	+155.7	-260.5	-0.1	-104.9
Current Estimate	1054.6	4334.7	33.9	5423.2



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

b. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-20.6
	Economic adjustment for negative program change. (Economic)	N/A	+152.2
	Total change associated with decrease of 65 T-45 aircraft.	-1044.2	-1330.7
	Quantity decrease of 65 (from 234 to 169 T-45 aircraft). (Quantity)	-1071.8	-1362.9
	Allocation to schedule resulting from quantity change. (QR)(Schedule)	+41.4	+48.3
	Allocation to engineering resulting from quantity change. (QR)(Engineering)	-5.9	-5.9
	Allocation to estimating resulting from quantity change. (QR)(Estimating)	-7.9	-10.2
	Stretchout of annual procurement buy profile (delayed 3 T-45 aircraft from FY01 to FY02.) (Schedule)	0.0	+1.0
	Adjustment for Current and Prior Inflation. (Estimating)	+2.8	+3.5
	Decrease due to deletion of production shut down costs. (Estimating)	-31.0	-46.4
	Adjustment for Current and Prior Inflation. (Support)	+0.9	+1.0
	Decrease in Initial Spares due to reduction of 65 T-45 aircraft. (Support)	-47.4	-58.3
	Refinement of estimate in Training Equipment. (Support)	-0.1	-0.1
	Decrease in Other Weapons Support due to reduction of 65 T-45 aircraft. (Support)	-254.2	-330.2
	Procurement Subtotal	<u>-1373.2</u>	<u>-1628.6</u>

QR = Quantity related changes.

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
17.97	-1.31	+4.06	+0.44	+4.34	+5.01	--	+1.31	+13.85	31.81

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
31.82	+0.05	-0.04	-1.03	+0.11	+1.09	--	-1.34	-1.16	30.66

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
13.73	-1.20	+0.97	+4.00	+3.70	+4.68	--	+1.92	+14.07	27.80

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
27.80	+0.02	-0.16	-1.04	+0.23	+0.14	--	-1.36	-2.17	25.63

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	JUL 1975	N/A	JUL 1975	JUL 1975
Milestone II	N/A	N/A	SEP 1984	SEP 1984
Milestone III	N/A	N/A	JAN 1995	JAN 1995
FUE/IOC	MAY 1991	N/A	NOV 1992	APR 1993
Total Cost	5462	N/A	5599.5	5242.1
Total Quantity	304	N/A	176	171
Prog Acq Unit Cost	17.97	N/A	31.82	30.66

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

a. Procurement --

<u>T-45 A/C GFE ENGINES:</u>	Initial Contract Price		
ROLLS ROYCE, plc, Bristol, England	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00019-93-C-0100, FFP	\$2.7	N/A	12
Award: November 30, 1993			
Definitized: March 23, 1995			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$166.5	N/A	93	\$197.9	\$197.9

Explanation of Change:

The Current Target Price increase (\$29.2M) from \$137.3M to \$166.5M reflects the award of the FY-00 GFE engine option.

Total funding and quantities reflect GFE engines for FY-94 thru FY-00 (options), plus the price of modules, and spare engines awarded to date.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

(U)The Program Managers Price at Completion reflects the total contract estimate for the GFE engines for the eight (8) option years.

(U)The Basic contract was awarded to Rolls Royce (Nov 93) and contains eight options, FY-94 through FY01.

(U)The Initial Target Price reflects the Termination Liability funding (initially) awarded on the Advanced Acquisition contract prior to definitization.

15. Contract Information (Cont'd):

<u>T45TS FY98 PROD:</u> McDonnell Douglas, ST. LOUIS, MO N00019-97-C-0059, FFP Award: September 15, 1997 Definitized: December 10, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$23.2	N/A	15

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$257.5	N/A	15	\$257.5	\$257.5

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

The Current Target Price increase of (\$13.1M) from \$249.8M to \$257.5M is due to award of T45TS support items including ILS efforts, Tech Data, Support Equipment Sustaining Engineering , GFE electronics APN-194, and Fuel Tank Stiffeners.

This SAR report is expected to be the last report for the production contract N00019-97-C-0059 (FY-98) since the contract is expected to be 90% completed by the Dec 00 SAR.

<u>T45TS FY99 PRODUCTION:</u> MCDONALD DOUGLAS CORP, ST. LOUIS MO N00019-98-C-0114, FFP Award: September 24, 1998 Definitized: February 16, 1999	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$3.1	N/A	15

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$490.2	N/A	30	\$490.2	\$490.2

Explanation of Change:

The increase in Current Target Price of (\$274.6M) from \$215.6M to \$490.2M is due to the award of the FY-00 option (\$245.9M) for 15 T-45 aircraft and technical efforts including ILS, LSA, spares, sustaining engineering for Support Equipment, Tech Data and Pubs, IFT and OFT systems, and academic support and additional items awarded for the FY-99 production (\$28.7M) which include ancillary equipment, simulator, CLS, academic support, ECPs, and spares.

T45TS, December 31, 1999

15. Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

The contract provides four (4) option years (FY-00 through FY-03 production). The FY-00 option quantity of 15 aircraft option was awarded in September 1999, and price was definitized in December 1999.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY80-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02)	<u>Total</u>
RDT&E	879.9	-	-	-	879.9
Procurement	3584.1	343.5	280.7	122.8	4331.1
MILCON	31.1	-	-	-	31.1
O&M	-	-	-	-	-
Total	4495.1	343.5	280.7	122.8	5242.1

b. Annual Summary -- T45TS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1995 Dollars Nonrec</u>	<u>Flyaway FY 1995 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1980			7.1	7.1	4.2
1981			2.5	2.5	1.6
1982			7.3	7.3	4.9
1983			11.1	11.1	7.8
1984			32.3	32.3	23.6
1985			89.6	89.6	67.5
1986			156.6	156.6	121.4
1987			178.6	178.6	142.5
1988			120.5	120.5	99.4
1989			106.0	106.0	91.1
1990			216.6	216.6	193.8
1991			15.6	15.6	14.5
1992			50.3	50.3	48.0
1993			30.4	30.4	29.7
1994			28.1	28.1	27.9
1995			0.6	0.6	0.6
1996			1.3	1.3	1.3
1997			0.1	0.1	0.1

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal	2		1054.6	1054.6	879.9

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				78.8	65.1
1988	12	55.9	274.4	481.3	414.9
1989	24	9.1	428.9	418.6	375.3
1990		17.8		137.1	127.2
1991		39.9		159.5	152.2
1992	12	25.9	220.3	367.3	358.3
1993	12	8.3	225.2	281.7	279.9
1994	12	8.2	247.6	316.2	320.1
1995	12	5.2	219.1	257.2	264.5
1996	12	2.3	206.8	306.8	319.8
1997	12	3.5	203.9	284.5	299.1
1998	15	5.4	237.3	278.5	295.8
1999	15	2.5	237.7	290.1	311.9
2000	15	2.7	245.6	314.9	343.5
2001	12	10.4	206.8	253.3	280.7
2002	4	1.8	84.5	108.9	122.8
Subtotal	169	198.9	3038.1	4334.7	4331.1

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				10.8	9.2
1989					
1990				12.9	11.8
1991					
1992					
1993				10.2	10.1
Subtotal				33.9	31.1

MILCON claimant is Chief of Naval Education and Training (CNET).

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	171	198.9	4092.7	5423.2	5242.1

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	2	2
Procurement	99	111

Percent Total Program Quantities Delivered: 66.1%

b. Total Expenditures To Date (In Millions of Dollars): \$ 4041

Percent Total Program Expended: 77.1%

T-45 deliveries accepted through the "As Of" date Dec 99 are through the 111th aircraft (A111).

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.

(U) The (234 quantity) March 2, 1999 Acquisition Program Baseline (APB) program was specifically scoped to a 361 pilot training rate (PTR) per year, spread over two sites (NAS Meridian MS, and NAS Kingsville, TX). With the program limited to a production quantity of 169 T-45 aircraft the pilot training rate (PTR) level is set at 324 per year for the two sites. The 324 per year PTR level assumes: 124 aircraft are required to fly approximately 719 flight hours each aircraft per year. The steady state quantity of flight hours is 89,462 per year.

(U) O&S cost elements include: Mission Personnel, Unit-Level Consumption, Contractor Logistics Support (CLS), Sustaining Support and Indirect Support. In section b costs, Mission Personnel costs include the costs for pay and allowances for enlisted personnel and officers. Contractor personnel involved in the maintenance of the T-45 are not included in Mission Personnel, but within the CLS portion of the O&S.

(U) Unit-Level Consumption costs include the cost for Petroleum, Oil & Lubricants (POL) required for peacetime operations, and Training Ordnance costs. The 18 equivalent (46 @ 37% of syllabus) PTR for E2/C2 aircraft have

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

no ordnance requirements, and therefore are not included in the estimate.

(U) CLS costs include the following elements: the costs for Aircraft Maintenance; Ground Training System (GTS Maintenance, Replenishment Spares, ROR, Simulator Maintenance, and Operations Costs); Training Support Center Maintenance; Program & Administrative Mgt; Off Site Repair (Engine Depot ROR, Aircraft ROR, SE ROR, and Airframe Rework); Detachment Support; Travel & Per Diem; and other Direct Charges. Sustaining Support Costs include the costs for modification kits needed to achieve acceptable levels of safety, overcome mission capability deficiencies, and reliability, and reduce maintenance costs. Support Equipment Replacement is performed by the contractor, and is included in CLS under ROR. Sustaining Engineering Support, Software Maintenance, and Simulator Operations costs are also included in the cost for CLS.

(U) Indirect costs include the following: 1) Pipeline training costs for all instructor pilots that are assigned to the T-45 during their first tour; and 2) Installation Support costs. Installation Support Costs include costs for personnel and infrastructure at the host installation where training is performed.

(U) Date of estimate: December 7, 1999.

(U) The T-45A/C was designed to replace the T-2C, and TA-4J aircraft. The Average Annual Cost Per Steady State reflects the current T-45A/C aircraft estimate. The cost of antecedent (T-2C, and TA-4J) systems were not available.

**b. Costs -- (FY 1995 Constant (Base-Year) Dollars in Thousands)**

Cost Element	Avg Annual Cost Per T-45/YEAR	Avg Annual Cost Per Steady State
Mission Pay & Allowances	198.3	161.1
Unit Level Consumption	230.6	187.3
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	1635.2	1332.9
Sustaining Support	112.9	91.8
Indirect Costs	369.1	301.7
Total	2546.1	2074.8



AF-17 MINUTEMAN III PRP.

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: Minuteman III PRP

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Minuteman III Propulsion Replacement Program (MM III PRP)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:  

OO-ALC/LMP	Maj Chris Terry
6031 Gum Lane	Assigned: July 17, 1998
Hill AFB, UT 84056-5826	DSN 775-5541; COMM (801)775-5541
	Christopher.Terry@hill.af.mil
4. (U) Program Elements/Procurement Line Items:  

RDT&E:	
(U) PE 0604851F	
PROCUREMENT:	
(U) APPN 3020 ICN LGM30G (Air Force)	

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Minuteman III PRP, December 31, 1999

5. (U) References:

SAR Baseline (Development Estimate):

(U) Acquisition Decision Memorandum dated June 30, 1994, Subject: Milestone II

Approved Program:

(U) AFAE Approved Acquisition Program Baseline (APB) dated December 23, 1996.

6. (U) Mission and Description:

(U) The Propulsion Replacement Program (PRP) extends the life, maintains the performance, and improves the reliability of the Minuteman (MM) III operational force by replacing the solid propellant propulsion subsystems prior to the onset of ageout. The solid propulsion systems now in the force are projected to begin aging out in 2002 and must be replaced in order to support current force planning. The PRP will be executed in two phases, Technology Insertion (TI) and Remanufacture. During the TI phase, new materials and manufacturing processes will be qualified to replace unavailable or environmentally prohibited materials. Additionally, known failure modes and design weaknesses will be corrected by incrementally inserting and qualifying current rocket motor technologies. The PRP will reuse existing components to the greatest extent possible. Another goal of TI is to maintain the industrial base so that rocket motor production capability is available when needed for motor remanufacture. During remanufacture, the solid rocket motors and interstage hardware and ordnance will be recycled from the force and remanufactured at a rate up to eight motors per month during the period FY 2000 through FY 2008.

Software changes must be incorporated because of material changes incorporated in stage manufacturing. Because both the stage 2 liquid injection thrust vector control injectant and stage 3 motor case must be replaced, the missile control dynamics, mass properties, and propulsion characterization programs must also be modified to ensure a controlled flight.

7. (U) Executive Summary:

(U) During the previous year, PRP has focused on nearing completion of the qualification phase of the program while simultaneously transitioning to production. As part of the qualification efforts, PRP successfully static fired three Stage 1 motors, four Stage 2 motors, and three Stage 3 motors during 1999. In addition, the program successfully launched its first Flight Test Missile (FTM-1) from Vandenberg AFB on November 13, 1999. The program will conduct dedicated IOT&E in January 2000, culminating in the second Flight Test scheduled for May 24, 2000 from Vandenberg AFB.

In support of the transition to production, the program completed comprehensive Manufacturing Process Reviews for each of the contractors and an organic Recycle Readiness Review at the depot. Successful completion of these reviews resulted in the exercise of the Low Rate Initial Production (LRIP) contract option in October 1999. In 2000, PRP objectives include completion of the motor qualification and flight test efforts, as well as preparing for Full Rate Production scheduled to start in FY01.

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7. (U) Executive Summary (Cont'd):

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II AFSARC	JUN 1994	JUN 1994	JUN 1994
DT&E Phase Start	APR 1995	APR 1995	APR 1995
PDR Close-out	FEB 1998	FEB 1998	JAN 1998
CDR Close-out	AUG 1998	AUG 1998	NOV 1998
LRIP Contract Award	OCT 1999	OCT 1999	OCT 1999
DT&E Phase Complete	JUN 1999	JUN 1999	JUN 1999
IOT&E Phase Start	JUL 1999	JUL 1999	JUL 1999
IOT&E Phase Complete	MAR 2000	MAR 2000	MAY 2000 (Ch-1)
PCA Close-out	SEP 2000	SEP 2000	SEP 2000
Milestone III Review	SEP 2000	SEP 2000	SEP 2000
LRIP Booster FAD	MAR 2001	MAR 2001	MAR 2001
IOC	JAN 2002	JAN 2002	JAN 2002

(U) ACRONYMS:

CDR- Critical Design Review  
 DT&E- Developmental Test and Evaluation  
 IOC- Initial Operational Capability  
 IOT&E- Initial Operational Test and Evaluation  
 LRIP- Low Rate Initial Production

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

PCA- Physical Configuration Audit  
 PDR- Preliminary Design Review

b. Current Change Explanations --  
 (U) Ch-1 IOT&E Phase Complete changed From "Mar 2000" to "May 2000" as a result of Flight 2 reschedule.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
(b)(1)	(b)(1)			
(b)(1) Countdown & Flight Reliability (CD&FR) (Boost Reliability)	(b)(1)			
(b)(1) Range (System) (NM)	(b)(1)			
Nuclear Hardness and Survivability (NH&S) (Each Stage)	MIII wpn sys spec hardness levels	Silo: / keeper In Flight: / SICBM / Hardness/ Levels / wpn sys / spec / hardness/ levels /	MIII / Wpn Sys / Spec / Hardness / Levels	TBD
(b)(1) Alert Readiness Rate (Stages 1,2,3)	(b)(1)			
Service Life (Each Stage) (yrs)	17	30 / 17	TBD	17
(b)(1) Mean Time Between Maintenance (MTBM) (Each Stage) (hrs)	(b)(1)			
(b)(1) Accuracy (System) (ft)	(b)(1)			
(b)(1) Guidance Update Program (GUP)	(b)(1)			
(b)(1) GUP plus FS	(b)(1)			

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Minuteman III PRP, December 31, 1999

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

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	340.0	336.8	309.5
Procurement	1911.4	1750.0	1512.8
Flyaway	(1864.7)		(1428.6)
Other Wpn System Costs	(46.7)		(84.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1994 Base-Year \$	2251.4	2086.8	1822.3
Escalation	567.9	514.0	320.1
Development (RDT&E)	(30.6)	(30.5)	(20.4)
Procurement	(537.3)	(483.5)	(299.7)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2819.3	2600.8	2142.4
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>607</u>	<u>607</u>	<u>607</u>
Total	607	607	607

(U) The planned LRIP quantities at Milestone III are 9 (FY2000/first year).

This does not represent more than 10% of the planned program buy.

The unit of measure is a reassembled fully integrated Minuteman III with remanufactured solid propellant stages.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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Minuteman III PRP, December 31, 1999

12. (U) Unit Cost Summary:

	UCR Baseline (DEC 1996 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1994 BY\$)	2086.8	1822.3	
(2) Quantity	607	607	
(3) Unit Cost	3.438	3.002	-12.68
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1994 BY\$)	1750.0	1512.8	
(2) Quantity	607	607	
(3) Unit Cost	2.883	2.492	-13.56

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	370.6	2448.7	-	2819.3
Previous Changes:				
Economic	-6.9	-107.8	-	-114.7
Quantity	-	-	-	-
Schedule	-	+13.0	-	+13.0
Engineering	-	-	-	-
Estimating	-32.0	-555.6	-	-587.6
Other	-	-	-	-
Support	-	+46.4	-	+46.4
Subtotal	-38.9	-604.0	-	-642.9
Current Changes:				
Economic	-0.3	-19.9	-	-20.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.5	-13.3	-	-14.8
Other	-	-	-	-
Support	-	+1.0	-	+1.0
Subtotal	-1.8	-32.2	-	-34.0
Total Changes	-40.7	-636.2	-	-676.9
Current Estimate	329.9	1812.5	-	2142.4

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Minuteman III PRP, December 31, 1999

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

(U) Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	340.0	1911.4	-	2251.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-29.0	-424.6	-	-453.6
Other	-	-	-	-
Support	-	+36.6	-	+36.6
Subtotal	-29.0	-388.0	-	-417.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.5	-11.5	-	-13.0
Other	-	-	-	-
Support	-	+0.9	-	+0.9
Subtotal	-1.5	-10.6	-	-12.1
Total Changes	-30.5	-398.6	-	-429.1
Current Estimate	309.5	1512.8	-	1822.3

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.3
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
Congressional/SAF Reductions (Estimating)	-1.8	-1.8
RDT&E Subtotal	-1.5	-1.8
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-20.4
Economic adjustment for negative program change. (Economic)	N/A	+0.5
Congressional/SAF Reductions (Estimating) (Support)	-12.0	-13.9
(Estimating)	+0.9	+1.0
Procurement Subtotal	+0.5	+0.6
Procurement Subtotal	-10.6	-32.2

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Minuteman III PRP, December 31, 1999

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
--	--	--	--	--	--	--	--	--	--

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.64	-0.22	--	+0.02	--	-0.99	--	+0.08	-1.11	3.53

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
--	--	--	--	--	--	--	--	--	--

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.03	-0.21	+0.01	+0.02	--	-0.94	--	+0.08	-1.04	2.99

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	JUN 1994	N/A	JUN 1994
Milestone III	N/A	SEP 2000	N/A	SEP 2000
FUE/IOC	N/A	JAN 2002	N/A	JAN 2002
Total Cost	N/A	2819.3	N/A	2176.4
Total Quantity	N/A	607	N/A	607
Prog Acq Unit Cost	N/A	4.64	N/A	3.59

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Minuteman III PRP, December 31, 1999

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

a. RDT&E --  
(U) MMIII PRP STAGE 3:  
TRW Space & Missile Div, Fairfax VA  
F42610-98-C-0001, CPAF  
Award: December 22, 1997  
Definitized: December 22, 1997

			Initial Contract Price		
	Target	Ceiling	Qty		
	\$100.4	N/A	0		
Current Contract Price			Estimated Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager	
\$103.2	N/A	0	\$103.2	\$103.2	
Previous Cumulative Variances			Cost Variance	Schedule Variance	
			\$1.8	\$-1.2	
Cumulative Variances To Date (11/30/99)			\$0.0	\$-1.1	
Net Change			\$-1.8	\$0.1	

Explanation of Change:

(U) The variance change results from completion of delayed Stage 3 motor disposal.

b. Procurement --  
(U) MMIII PRP LRIP:  
TRW Space & Missile Div, Fairfax VA  
F42600-98-C-0001, CPAF  
Award: December 22, 1997  
Definitized: December 22, 1997

			Initial Contract Price		
	Target	Ceiling	Qty		
	\$73.3	N/A	9		
Current Contract Price			Estimated Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager	
\$76.1	N/A	9	\$76.1	\$76.1	
Previous Cumulative Variances			Cost Variance	Schedule Variance	
			\$0.0	\$0.0	
Cumulative Variances To Date (11/30/99)			\$0.0	\$0.0	
Net Change			\$0.0	\$0.0	

Explanation of Change:

(U) Low Rate Initial Production (LRIP) is an option to the existing contract which was exercised on October 1, 1999. This is the first time this has been reported in the Selected Acquisition Report.

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Minuteman III PRP, December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-07)	<u>Total</u>
RDT&E	300.3	29.6	-	-	329.9
Procurement	-	90.1	138.2	1584.2	1812.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>300.3</b>	<b>119.7</b>	<b>138.2</b>	<b>1584.2</b>	<b>2142.4</b>

b. Annual Summary -- Minuteman III PRP

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1994 Dollars Nonrec</u>	<u>Flyaway FY 1994 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				14.7	14.9
1995				25.0	25.8
1996				61.9	65.2
1997				64.8	69.1
1998				60.2	64.7
1999				55.9	60.6
2000				27.0	29.6
<b>Subtotal</b>				<b>309.5</b>	<b>329.9</b>

Appropriation: 3020 - Missile Procurement, Air Force

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1994 Dollars Nonrec</u>	<u>Flyaway FY 1994 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
2000	9		78.7	80.9	90.1
2001	33		116.4	122.1	138.2
2002	86		205.9	216.9	249.7
2003	96		205.7	218.4	256.2
2004	96		205.6	219.3	262.3
2005	96		197.1	210.5	256.8
2006	96		210.4	223.3	278.0
2007	95		208.8	221.4	281.2
<b>Subtotal</b>	<b>607</b>		<b>1428.6</b>	<b>1512.8</b>	<b>1812.5</b>

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Minuteman III PRP, December 31, 1999

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	607		1428.6	1822.3	2142.4

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 181.2

(U) Percent Total Program Expended: 8.5%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The concept of operations is based on 500 deployed boosters. With the possible exception of changes resulting from the Technology Insertion (TI) portion of the program of PRP, Integrated Logistics Support areas/requirements mentioned herein will remain the same as those required for the existing MM III weapon system. Maintenance planning will involve two level maintenance; Organizational, and Depot. There will be no new support equipment, training, logistics/supply support, computer systems, and operational facilities resources necessary to support the new motors beyond those already in place. Existing technical data will govern all work to be performed unless a specific technical order, drawing, or work specification is revised to reflect a new process and/or material as a result of the TI effort. Since the PRP was designed to interface seamlessly with existing MM III support functions, there are no delta costs associated with implementing the PRP.

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

Cost Element		
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: Comanche (RAH-66)

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Comanche Program (RAH-66)

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:

Comanche Program Manager's Office	BG Joseph L. Bergantz
ATTN: SFAE-AV-RAH, Building 5681	Assigned: June 16, 1997
Redstone Arsenal	DSN 897-0846; COMM 205-313-0846
Huntsville, AL 35898-5000	bergantzj@comanche.redstone.army.mi
	1

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

RDT&E:

- (U) PE 63220 Project D325
- (U) PE 64216 Project DC72
- (U) PE 64223 Project D327, D397, DC72
- (U) PE 64810 Project D327, DC72

(U) NOTE: PE 64810 Project D327/DC72 (FY 88 Only)

**CLEARED AS AMENDED -**  
**FOR OPEN PUBLICATION**

MAR 31 2000 10

**DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE**

~~Classified by: [redacted] Security Classification [redacted], January 30, 2000  
Downgrade instructions: [redacted]  
Declassify on: X3~~

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Comanche (RAH-66), December 31, 1999

5. (U) References:

SAR Baseline (Planning Estimate):

(U) AMC Approved Acquisition Strategy (December 16, 1985).

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated May 27, 1999.

6. (U) Mission and Description:

(U) This program provides for the development of the RAH-66 Comanche. The Army requires an aviation system capable of performing aerial reconnaissance on the modern battlefield. Combat lessons learned and mission analysis have repeatedly supported a critical combat requirement for an aviation reconnaissance system capable of 24 hour combat operations, responsive to the battlefield commander in night and adverse weather conditions and able to survive on the 21st century battlefield. This air cavalry helicopter system will be self-deployable with highly improved sustainability and availability to support continuous combat operations in any world trouble spot. Comanche will be able to find the enemy with a low probability of self-detection and either engage or hand-off the target based on the battle commander's decision. The air cavalry system will be able to operate effectively in the close, deep or rear battles. Comanche incorporates emerging technologies to provide a leap-ahead air cavalry system, field a world-wide deployable, air cavalry reconnaissance helicopter; operate with minimal logistical burden, serve as the command and control node for the commander to win the knowledge war. This system will provide three dimensional battlefield situational awareness with greater depth and breadth than currently possible. This picture of the battlefield will be overlaid on digital maps that consolidate all real time data. The system will display friend or foe discrimination and will avoid detection and survive by reducing signature and incorporating low observable technology. The Comanche helicopter will replace the current light fleet of tactically obsolescent AH-1, OH-6 and OH-58A/C helicopters. The Comanche system will be integrated with the Army aviation force structure to complement the AH-64 Apache helicopter.

7. (U) Executive Summary:

(U) In March 1982, the Army Aviation Mission Area Analysis (AAMAA) was endorsed by senior Army leadership at the Army Aviation Systems Program Review. From that review, the Comanche emerged as the most viable concept to meet fleet needs. A Comanche Justification for Major Systems New Start (JMSNS) was submitted in June 1983. The Comanche was further developed and refined during FY 1984. In December 1985, a Defense Science Board (DSB) Task Force was established to review the Comanche program. The task force reported the Army had a need for a new light helicopter and that technology existed which could support the design of a weapon system of much greater performance than the existing fleet. As the result of the June 9, 1988, Comanche Milestone I Defense Acquisition Board (DAB) review, an Acquisition Decision Memorandum (ADM) dated June 17, 1988, approved the Comanche program to proceed with Demonstration/ Validation (Dem/Val). In 1988, the Light Helicopter Turbine Engine Company (LHTEC) was

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Comanche (RAH-66), December 31, 1999

7. (U) Executive Summary (Cont'd):

announced the winner of the competitive T800 engine program. The Comanche program was restructured in August 1990. The restructure deferred the Engineering and Manufacturing Development (EMD) and extended the Dem/Val phase by an additional two years. In 1991, the Boeing Sikorsky team was declared the winner of the competitive Comanche air vehicle program and was awarded a contract for the Dem/Val Prototype phase. The Comanche program was again restructured in January 1992, as a result of the Defense Acquisition Executive Guidance and the FY 1993 President's budget reductions. The restructured contract modifications were issued to Boeing Sikorsky and LHTEC in January 1993. In December 1994, the Comanche Program was restructured as a prototype industrial/ technology base program with two flyable prototypes. As a result of the Defense Acquisition Board review of the Comanche restructured program, an Acquisition Decision Memorandum was issued in March 1995, to continue the Demonstration/Validation phase with two flyable prototypes and add six aircraft within the FYDP for user evaluation. The Comanche successfully completed first flight on January 4, 1996. Boeing Sikorsky was awarded a contract modification in December 1996 for the completion of the Comanche Demonstration/Validation Program. A change to the Early Operational Capability (EOC) program plan was proposed in June 1998. The significant improvements were the acceleration of the Fire Control Radar (FCR) by 5 years so it would be available to support the initial fielding of the RAH-66 in December 2006 and the increased capability of the EOC test aircraft to the full production configuration. Eight aircraft will be delivered for Initial Operational Testing and Evaluation. Seven aircraft will remain in Developmental Testing. The Defense Acquisition Executive approved the initiation of the Pre-Production Prototype (PPP) Program on July 27, 1998. In July 19, 1999, the OSD Overarching Integrated Process Team recommended to the DAE, Comanche proceed to Milestone II in March 2000. All tests for exit criteria are nearing satisfactory completion. The Defense Acquisition Board Review is scheduled in April 2000. This is an RDT&E only SAR.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Nunn-McCurdy unit cost reporting is not required for this pre-milestone II program in accordance with Title 10, United States Code, Section 2433.

9. (U) Schedule:

a. Milestones --

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
T800 Engine FSD Contract Award	JUL 85	JUL 85	JUL 1985
Milestone I (ASARC)	FEB 87	MAY 88	MAY 1988
Milestone I (DAB)	MAR 87	JUN 88	JUN 1988
Award Air Vehicle Phase I Dem/Val	OCT 87	OCT 88	OCT 1988
Contracts			
T800 FSD Downselection	SEP 88	OCT 88	OCT 1988
USD(A) Program Review	N/A	JAN 91	JAN 1991
Award Dem/Val Prototype Phase Contract	N/A	APR 91	APR 1991
Critical Design Review	N/A	OCT 93	DEC 1993
Milestone II (ASARC)	FEB 87	N/A	N/A
Milestone II	MAR 87	MAR 00	APR 2000 (Ch-1)
Award EMD Contract	JUL 89	APR 00	APR 2000
First Flight	SEP 91	NOV 95	JAN 1996
T800 Engine Production Contract Award	JAN 93	N/A	N/A
LUT			
Start	N/A	JAN 05	MAR 2005 (Ch-1)
Complete	NOV 93	FEB 05	MAY 2005 (Ch-1)
LRIP Program Review (IPR)/Contract Award	N/A	FEB 05	JUN 2005 (Ch-1)
IOT&E			
Start	N/A	MAR 06	APR 2006 (Ch-1)
Complete	N/A	JUL 06	AUG 2006 (Ch-1)

Comanche (RAH-66), December 31, 1999

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

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
First Air Vehicle Production Delivery	JUL 95	N/A	N/A
First Unit Equipped	MAY 96	N/A	N/A
Production Contract	JAN 94	DEC 06	DEC 2006
Milestone III	JAN 94	DEC 06	DEC 2006
IOC	N/A	DEC 06	DEC 2006
Depot Support Date	N/A	DEC 06	DEC 2006
Organic Support Date	N/A	DEC 09	DEC 2009
Customer Test III (EOSS User Survey)			
Start	N/A	SEP 02	MAR 2003 (Ch-1)
Complete	N/A	OCT 02	APR 2003 (Ch-1)

b. Current Change Explanations --

(U) (Ch-1) The following dates have changed to reflect latest estimates for the Comanche Program.

	<u>FROM</u>	<u>TO</u>
Milestone II	Mar 00	Apr 00
LUT		
Start	Jan 05	Mar 05
Complete	Feb 05	May 05
LRIP Program Rev Contract Awd	Feb 05	Jun 05
IO&E		
Start	Mar 06	Apr 06
Complete	Jul 06	Aug 06
Customer Test III (EOSS User Survey)		
Start	Sep 02	Mar 03
Complete	Oct 02	Apr 03

10. (U) Performance Characteristics:

a. Performance --

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Flight Performance (Primary Mission):				
RAH				
Vertical Rate of Climb (VROC) (Feet per Minute (FPM), @4000 ft, 95 F & PMGW & 97.5% MRP)	500	750 / 500	510	510 (Ch-1)
Signature Levels:				
Radar Cross-Section (RCS) (dBsm)	N/A			
Infrared (IR) Engine Exhaust System (watts/steradian)	N/A			

(b)(1)

AS AMENDED  
AS AMENDED



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

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
(U) Night Hot Target Classification Range (km)	N/A	(b)(1)		
(S) Night Target Acquisition Range Identification (km)	N/A			
Digitally Exchange Battlefield Information to Joint & Combined Arms Forces	N/A	TBD	/ Link 16	TBD
Multifunctional Launch Stations ATGM, ATAM, Rockets (Internal)/ Turret Gun System	N/A	6/1	/ 6/1	TBD
Operational Availability (Ao) (percent):				
Wartime	N/A	78	/ 75	TBD
Reliability:				
Mean Time Between Essential Maintenance Actions (MTBEMA) (hrs)	4.5	4.5	/ 4.5	TBD
Maintainability:				
Mean Time To Repair (MTTR) (hrs)	1.0	0.86	/ 1.0	TBD
Mean Time Between Mission Affecting Failure (MTBMAF) (hrs)	8.4		/ N/A	TBD
Maintenance Manhours per flight hr (MMH/FH) @ User Level	2.8	2.6	/ 2.6	TBD
Self Deployable (NM) w/ 30 min. reserve	1260	N/A	/ N/A	TBD

AS AMENDED  
AS AMENDED

(U) The Vertical Rate of Climb has changed from TBD to 510 to reflect demonstrated performance.

(U) The Infrared (IR) Engine Exhaust System has changed from TBD to (b)(1) to reflect demonstrated performance.

AS AMENDED

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Comanche (RAH-66), December 31, 1999

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

b. Current Change Explanations --

(U) (Ch-1) Current estimate has been increased from TBD to 510 to reflect the Vertical Rate of Climb (VROC) performance demonstrated.

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Planning	Approved	Current
a. (U) Cost --	<u>Estimate (SAR)</u>	<u>Program (APB)</u>	<u>Estimate</u>
Development (RDT&E)	1756.2	5636.0	5684.4
Procurement	0.0	N/A	0.0
Total Flyaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	<u>0.0</u>	<u>N/A</u>	<u>0.0</u>
Total FY 1984 Base-Year \$	1756.2	5636.0	5684.4
Escalation	376.8	2542.1	2531.5
Development (RDT&E)	(376.8)	(2542.1)	(2531.5)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(N/A)</u>	<u>(0.0)</u>
Total Then Year \$	2133.0	8178.1	8215.9
b. (U) Quantity --			
Development (RDT&E)	0	8	8
Procurement	<u>0</u>	<u>N/A</u>	<u>0</u>
Total	0	8	8

Note: Excludes 2 RDT&E prototypes from the SAR Baseline and 7 from the Current Estimate that are not considered fully configured.

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

d. (U) Nuclear Costs --  
None.

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Comanche (RAH-66), December 31, 1999

12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2133.0	-	-	2133.0
Previous Changes:				
Economic	-299.0	-	-	-299.0
Quantity	+649.1	-	-	+649.1
Schedule	+203.2	-	-	+203.2
Engineering	+1154.8	-	-	+1154.8
Estimating	+4327.4	-	-	+4327.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+6035.5	-	-	+6035.5
Current Changes:				
Economic	-36.3	-	-	-36.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+73.1	-	-	+73.1
Estimating	+10.6	-	-	+10.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+47.4	-	-	+47.4
Total Changes	+6082.9	-	-	+6082.9
Current Estimate	8215.9	-	-	8215.9

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

(U) Summary (FY 1984 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	1756.2	-	-	1756.2
Previous Changes:				
Quantity	+397.6	-	-	+397.6
Schedule	+145.2	-	-	+145.2
Engineering	+685.6	-	-	+685.6
Estimating	+2644.8	-	-	+2644.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+3873.2	-	-	+3873.2
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+48.2	-	-	+48.2
Estimating	+6.8	-	-	+6.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+55.0	-	-	+55.0
Total Changes	+3928.2	-	-	+3928.2
Current Estimate	5684.4	-	-	5684.4

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year    Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-36.3
FY 00 and FY 01 Increase for Mission Equipment Package (Engineering)	+48.2	+73.1
Adjustment for Current and Prior Inflation. (Estimating)	+2.6	+3.9
The Net of Undistributed Reductions (SBIR) (Estimating)	-8.5	-12.6
Change to revision of program estimate (Estimating)	+2.5	+3.5
Revised estimate to reflect lower OSD approved inflation indices (Estimating)	+0.4	+0.8
FY 00 increase for Flight Testing (Estimating)	+9.8	+15.0
RDT&E Subtotal	+55.0	+47.4

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Comanche (RAH-66), December 31, 1999

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	MAR 1987	N/A	N/A	JUN 1988
Milestone II	MAR 1987	N/A	N/A	APR 2000
Milestone III	JAN 1994	N/A	N/A	DEC 2006
FUE/IOC	N/A	N/A	N/A	DEC 2006
Total Cost	2133	0	0	8215.9
Total Quantity	0	0	0	0
Prog Acq Unit Cost	0	0	0	0

(U) The Comanche Program is pre-Milestone II program and reports only RDT&E costs.

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

a. RDT&E --

(U) <u>Dem/Val Prototype:</u> Boeing Sikorsky JPO, Philadelphia PA DAAJ09-91-C-A004, CPIF/AF Award: April 12, 1991 Definitized: April 12, 1991	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1956.2	N/A	0

	Current Contract Price			Estimated Price At Completion	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
	\$3773.9	N/A	0	\$3773.9	\$3766.0
				<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances				\$1.2	\$-10.8
Cumulative Variances To Date (12/31/99)				\$7.3	\$-7.6
Net Change				\$6.1	\$3.2

Explanation of Change:

(U) No significant change in schedule and cost performance. The Program Manager's Estimated Price at Completion has been reduced due to accomplishment of work for less than anticipated cost.

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15. (U) Contract Information (Cont'd):

(U) <u>T800 Growth AVS:</u> LHTEC, Indianapolis, IN DAAJ09-92-C-0453, CPFF Award: April 13, 1992 Definitized: January 5, 1993			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$208.3	N/A	0		
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$305.1	N/A	0	\$310.8	\$312.0	
			<u>Cost Variance</u> <u>Schedule Variance</u>		
Previous Cumulative Variances			\$-7.8                      \$-10.8		
Cumulative Variances To Date (12/31/99)			<u>\$-24.8</u> <u>\$-5.1</u>		
Net Change			\$-17.0                      \$5.7		

Explanation of Change:

(U) Schedule performance has decreased due to hardware availability for System Test. Cost performance has increased due to higher than anticipated costs in System Test and the development of the T801 engine.

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

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

<u>Appropriation</u>	<u>Prior</u> <u>Years</u> (FY84-99)	<u>Budget</u> <u>Year</u> (FY00)	<u>Budget</u> <u>Year</u> (FY01)	<u>Balance To</u> <u>Complete</u> (FY02-06)	<u>Total</u>
RDT&E	4200.3	463.1	614.0	2938.5	8215.9
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	4200.3	463.1	614.0	2938.5	8215.9

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Comanche (RAH-66), December 31, 1999

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

b. Annual Summary -- LH RAH-66 COMANCHE

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984				1.0	1.0
1985				67.8	71.3
1986				98.8	107.0
1987				123.2	137.6
1988				109.4	127.1
1989				146.4	177.0
1990				215.3	270.2
1991				259.8	338.3
1992				382.2	509.3
1993				291.3	397.3
1994				262.9	365.2
1995				335.3	474.9
1996				197.1	284.1
1997				223.1	325.2
1998				178.7	262.6
1999				237.4	352.2
2000				308.3	463.1
2001				402.7	614.0
2002				493.7	764.6
2003				468.5	738.4
2004				474.4	762.7
2005				248.8	408.0
2006				158.3	264.8
Subtotal	8			5684.4	8215.9

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	8			5684.4	8215.9

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 4241.6

(U) Percent Total Program Expended: 51.6%

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Comanche (RAH-66), December 31, 1999

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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N-17 SSN 21 / AN/BSY-2

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: SSN 21 CLASS/BSY-2

AS OF DATE: December 31, 1999

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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	CAPT S. E. JOHNSON
NATIONAL CENTER 3, ROOM 7N24	Assigned: May 14, 1998
PMS350	DSN 332-7200; COMM 703-602-7200
ARLINGTON, VA 22242-5168	JohnsonSE@NAVSEA.NAVY.MIL

(U) AN/BSY-2 SCS PROGRAM MANAGER	CAPT T. J. O'CONNOR
National Center 3, Room 6E16	Assigned: September 4, 1998
PMS425	DSN 332-0021; COMM 703-602-7200
Arlington, VA 22242-5168	OConnorTJ@NAVSEA.NAVY.MIL

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

RDT&E:

(U)	PE 0603561N	
(U)	PE 0603562N	
(U)	PE 0603569N	
(U)	PE 0603570N	
(U)	PE 0604524N (Shared)	Project F1941, S1347
(U)	PE 0604561N	
(U)	PE 0604567N	

PROCUREMENT:

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00-25152  
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SSN 21 CLASS/BSY-2, December 31, 1999

4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) APPN 1611 ICN 0204281N (Navy)  
(U) APPN 1810 ICN 0204282N (Navy)  
(U) APPN 1810 ICN 0204283N (Navy) (Shared)  
(U) APPN 1810 ICN 0804731N (Navy) (Shared)  
MILCON:  
(U) PE 0204896N  
(U) PE 0804731N (Shared)

5. (U) References:

SAR Baseline (Production Estimate):

(U) Production Estimates: DCP, SEAWOLF (SSN21) Class Submarine dated May 11, 1988.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated July 27, 1999.

6. (U) Mission and Description:

(U) The SEAWOLF submarine is a multi-mission vessel that introduces unprecedented performance capabilities. It is the quietest, most heavily-armed attack submarine the Navy has ever built. The design of the SEAWOLF is based on an extensive research and development program and incorporates technological advancements to provide: order of magnitude improvement in ship quieting; improved acoustic sensors; more capable combat systems; greater weapon capacity and capability; quieter launch; weapon launch at high ship speed; advanced reactor; improved performance machinery program; an advanced propulsor; increased operating depth; improved ship control; and enhanced survivability.

The SEAWOLF has eight large-diameter torpedo tubes, and holds significantly more weapons than any other U.S. nuclear attack submarine. A stronger hull material enables deeper dives. In addition, the vessel is configured for operation in Arctic areas.

The AN/BSY-2 Submarine Combat System supports the SSN 21 mission to conduct prompt and sustained combat operations. The AN/BSY-2 Submarine Combat System improves upon existing combat systems to meet the expanded operational requirements of attack submarines in countering the future threat. The AN/BSY-2 Submarine Combat System provides combat control and acoustic functions to support the ship characteristics of the SSN-21. The warfare tasks supporting this mission are: Strike Warfare, Anti-Submarine Warfare (ASW), Surveillance/Indication and Warning, Anti-Surface Warfare, Mine Warfare, Special Warfare; Ocean Surveillance, Intelligence/Reconnaissance, Command, Control, and Communication (C3); Electronic Warfare, support of battle group operations, and Naval Special Warfare.

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7. (U) Executive Summary:

(U) The SEAWOLF Submarine Program has delivered and commissioned the first two ships under the Congressional Cost Cap. The third and final SEAWOLF class submarine, Pre-Commissioning Unit (PCU) JIMMY CARTER (SSN 23) is being modified with additional volume to accommodate advanced technology for naval special warfare, tactical surveillance, and mine warfare operations. An \$887M contract modification for design and construction changes was signed December 10, 1999. The delivery date has been adjusted to June 2004.

SSN 21 - Post Shakedown Availability (PSA) on USS SEAWOLF (SSN 21) completed November 1999. Testing continues to demonstrate this ship is the most technically advanced and most capable warfighting platform in the Navy. Post PSA Acoustic Trials, Target Strength Measurement Trials, and Hydrodynamic Performance Trials are complete demonstrating that the SEAWOLF class is the quietest, stealthiest and most powerful attack submarine in the Fleet. Excellent data sets were acquired that significantly advanced the technical understanding of SEAWOLF's Radiated Noise Signatures. The Hydrodynamic performance is also superb with the submarine responding in a well mannered fashion to extreme ship control maneuvers. Propulsor performance has been consistent with predictions. The ship has commenced a fifteen month Developmental Testing/Operational Testing (DT/OT) period. Two improvements are planned and budgeted for Operational Test and Evaluation (OT&E). A VIRGINIA Class Propulsor will be installed to further improve acoustic performance and a Commercial Off the Shelf (COTS) Based Upgrade to the AN/BSY-2 Combat System will improve search capability. Both improvements will be tested in FY 2004.

The DOT&E end of year report addresses historical findings that were discovered during planned testing and reported by the Navy to DOT&E as a matter of routine. As can be expected with an end of the year report, many items discussed have been corrected. The SEAWOLF has spent the last 33 months undergoing a rigorous series of shakedown operations and acceptance trials. The results of these trials demonstrated this ship to be superior to all other nuclear powered submarines in the world today. For example, in December 1999, following Post Shakedown Availability, USS SEAWOLF completed radiated noise, hydrodynamic and target strength testing. Although the results of the testing remain classified, the results were superb and clearly showed the SEAWOLF Class performance is a leap forward over previous designs.

One area that the report addressed was SEAWOLF Shock Testing. The Navy has carefully examined the advantages and disadvantages of conducting a shock test since 1988. The following technical points led to the Navy's decision that a Full Ship Shock Test was not warranted:

1. The SEAWOLF design is the first to have a full component shock qualification by analysis or test.
2. The lessons learned from the USS Jacksonville shock test have been incorporated into the SEAWOLF Design.
3. There were no major problems found in the USS Jacksonville test. The structure of the SEAWOLF is similar to the USS Jacksonville; therefore there is little knowledge to be gained by a full ship test.
4. Innovative testing procedures have made a full ship shock test much less

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SSN 21 CLASS/BSY-2, December 31, 1999

7. (U) Executive Summary (Cont'd):

important than in the past.

The safety of the crew and ship has not been compromised. No other class of warship has been designed or tested as carefully as the SEAWOLF Class. The Navy designed and constructed a dedicated testing facility, at Aberdeen, MD, in order to conduct detailed, intense, realistic testing of the SEAWOLF design. The facility was built to allow higher levels of testing with minimum environmental concerns at a reduced cost. This level of testing provided tremendous contributions to improving component and system design quality for the SEAWOLF Class of submarines. The facility design supports a wide range of testing and has subsequently been used for follow on ship and submarine designs including the VIRGINIA Class. The submarine force has tremendous confidence in this platform's shock performance based on the extensive and improved testing conducted at the Aberdeen facility and its supporting component testing efforts.

The shock performance information gained from the testing efforts previously described has already been used to upgrade all three SEAWOLF class ships. For instance, stronger fasteners have been installed as a result of this testing.

In summary, the exhaustive nature of the design and construction phase testing coupled with the outstanding results of all at-sea trials to date, completely support the safe operation of the ship in routine operations deployed operations and combat operations.

SSN 22 - The USS CONNECTICUT (SSN 22) Post Shakedown Availability (PSA) commenced on September 1999, which is scheduled to complete in September 2000.

SSN 23 - The contract for the Pre-Commissioning Unit (PCU) JIMMY CARTER (SSN 23) was awarded in June 1996. Most construction key events are being met on time or ahead of schedule. SSN 23 is being modified with additional volume to accommodate advanced technology for naval special warfare, tactical surveillance, and mine warfare operations. An \$887M contract modification for design and construction changes was signed December 10, 1999. As part of the contract modification, the base ship contract was converted to a Firm Fixed Price contract (SCN) with a revised ship delivery date of June 2004. The details of this modification and the advanced technologies, while classified, will support the Defense Science Board (DSB) recommendation for improved payload capabilities and flexible interface with the undersea environment. This will be accomplished without sacrificing current SEAWOLF Class multi-mission warfighting capability. The modification will make the submarine longer than the first two SEAWOLF Class submarines.

Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. See the Cost Variance Analysis section for further details.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The SEAWOLF program's revised estimate for OPEVAL (Dec 2001) exceeds the threshold established in the APB (Sep 2000).

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
SSN-21 Submarine			
Program Initiated	JUL 1982	N/A	JUL 1982
Milestone I (DSARC I)	DEC 1983	N/A	DEC 1983
Milestone II (DSARC II)	JUN 1985	N/A	JUN 1985
FSD Contract Award	JUL 1985	N/A	JUL 1985
Milestone IIB (JRMB)	OCT 1986	N/A	OCT 1986
Milestone IIIA	JUN 1988	JUN 1988	JUN 1988
First Production Contract Award	JAN 1989	JAN 1989	JAN 1989
DAB Review	MAR 1990	N/A	MAR 1990
Delivery (First Ship)	MAY 1995	MAY 1997	JUL 1997
Initial Operational Capability	MAY 1995	MAY 1997	JUL 1997
Complete OPEVAL (OT-III)	(b)(1)		
Intermediate Maintenance Activity (IMA) Ready for Operation	N/A	JUN 1997	JUN 1997
Depot Maintenance Activity Ready for Operation	N/A	DEC 1998	DEC 1998
Assign Homeport for 2 Ship Class	N/A	NOV 1995	NOV 1995
Assign Intermediate Activity (IMA)	N/A	NOV 1995	NOV 1995
Assign Depot Maintenance Activity	N/A	NOV 1995	NOV 1995
AN/BSY-2			

Ch-1)

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
System Design Definition Contract	N/A	N/A	
Award			
RCA Corporation	JAN 1986	N/A	JAN 1986
IBM Corporation	MAR 1986	N/A	MAR 1986
Milestone I (JRMB)	JUN 1986	N/A	JUN 1986
Milestone II	NOV 1987	FEB 1988	FEB 1988
FSD Contract Award	JAN 1988	N/A	MAR 1988
Authorization for Limited Production	DEC 1989	N/A	DEC 1989
(DAB)			
Authorization for Limited Production	DEC 1991	N/A	JAN 1991
(DAB)			
Material Support Date (AN/BQG-5)	NOV 1992	N/A	OCT 1993
TECHEVAL (AN/BQG-5)	AUG 1993	N/A	N/A
Material Support Date (AN/BSY-2)	NOV 1993	N/A	MAY 1995
Authorization for Limited Production	DEC 1993	N/A	N/A
(DAB)			
OPEVAL (AN/BQG-5)	MAR 1994	N/A	N/A
Initial Operational Capability (AN/BQG-5)	(b)(1)	N/A	N/A
AN/BSY-2 TECHEVAL (DT IIE)	DEC 1994	N/A	SEP 2000 (Ch-2)
Complete TECHEVAL (DT III)	DEC 1994	N/A	N/A
AN/BSY-2 OPEVAL (OT IIC)	JUN 1995	N/A	N/A
Complete OPEVAL (OT III)	JUN 1995	N/A	DEC 2001 (Ch-1)
Navy Support Date	JUL 1996	N/A	N/A
AN/BQG-5 Sys Design Certification	N/A	(b)(1)	
Test Complete			
1st System Delivered to Shipbuilder (Hardware & Thread 1-5 Software)	N/A	(b)(1)	
Final Software Delivery to Navy	N/A	(b)(1)	
Initial Operational Capability	(b)(1)	(b)(1)	
Complete OPEVAL (OT-II)	N/A		
Milestone III	(b)(1)	N/A	N/A
EMSP			
Start Alpha Sea Trial	N/A	(b)(1)	
SEM B First Tactical System Delivery	N/A	SEP 1991	SEP 1991
CCAPS			
PROPULSION SYSTEM	N/A	N/A	
Reactor Vessel in Yard	N/A	(b)(1)	
Land Reactor Vessel	N/A		
Load Primary Shield Tank Complex Module	N/A		
Start Pre Fill Testing	N/A		
Power Unit Landed	N/A		

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

b. Current Change Explanations --

(Ch-1): Complete OPEVAL (OT-III) - Note: Test and Evaluation Master Plan (TEMP) 1127, revision 4 changed this event to a consolidated AN/BSY-2 and SEAWOLF Operational Evaluation (OPEVAL) Test OT-IIF. An Acquisition Program Baseline (APB) Deviation Report and change request was submitted on March 12, 2000 to extend the OPEVAL window for SSN 21 and BSY-2 OT-IIF from (b)(1). The extension will allow sufficient preparation by ship's force for the test as well as allow the use of USS CONNECTICUT (SSN-22) in testing. This APB change will also: (1) reflect performing battle group operations and Arctic tests after the ship completed OPEVAL (OT-IIF) and returns from the first deployment, (2) add new schedule milestones for completion of Battle Group Operations Test (OT) and Arctic DT/OT. Dates are under review with the testing community and the Type Commander, (3) add new schedule milestone to install BSY-2 Commercial Off the Shelf (COTS) Insertion upgrade, and (4) add new schedule milestone to install VIRGINIA Class Propulsor on USS SEAWOLF (SSN 21) at the first Ship Refit Availability (SRA).

(Ch-2): AN/BSY-2 TECHEVAL (DT-IIE) - The current estimate was changed from (b)(1).

Additional PSA work was added to make necessary equipment changes identified during the shakedown period.

(Ch-3): AN/BSY-2 Complete OPEVAL (OT-II) - An APB Deviation Report and change request was submitted on March 12, 2000 to extend the OPEVAL window from (b)(1). This change allows for use of SSN 22 as the opposition platform as requested by Director of Operational Test and Evaluation (DOT&E) and as identified in the Test and Evaluation Master Plan (TEMP). (b)(1)

(b)(1)

10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Length (ft)	353	N/A / N/A	353	353
Beam Max (ft)	40	N/A / N/A	40	40
Draft Nav (ft)	34	N/A / N/A	34	34
Displacement (tons)	9150	N/A / N/A	9150	9150
Operational Depth (ft)	(b)(1)			
Speed (knots)	(b)(1)			
SSN-21 Submarine Endurance Fuel/Fuel Stores/Stores (days)	(b)(1)			
Propulsion Type	(b)(1)			

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

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
(b) Shaft Horsepower Silencing:	(b)(1)			
(b) Radiated Noise (including Propulsor)	(b)(1)			
(b) Radiated Noise (without Special Hull Treatment)	(b)(1)			
(b) Transients	(b)(1)			
Ship Control	(b)(1)			
(b) Bow Plane Extension and Operation (kts)	(b)(1)			
(b) Bow Plane Retraction	(b)(1)			
Arctic Operations:	(b)(1)			
(b) Ascent at zero speed (from 200 ft) (ft/min)	(b)(1)			
(b) Surface through ice:	(b)(1)			
(b) Routine (ft thick)	(b)(1)			
(b) Emergency (ft thick)	(b)(1)			
Armament	(b)(1)			
(b) Torpedo Tubes	(b)(1)			
(b) Reloads	(b)(1)			
Weapons Handling:	(b)(1)			
(b) Simultaneous Wire Guide (weapons: 2 port, 2 starboard)	(b)(1)			
(b) Minimum Launch Interval: (sec)	(b)(1)			
(b) Same Bank	(b)(1)			
(b) Alternate Bank	(b)(1)			
(b) Maximum Torpedo Launch Speed (kts)	(b)(1)			
(b) Reload Time (min)	(b)(1)			
(b) Load	(b)(1)			
(b) Any mix conventional diameter weapons	(b)(1)			



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

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Large Diameter Weapon	(b)(1)			
Mean Time Between Failure (MTBF) (hrs) Ship System	(b)(1)			
External Communications System	(b)(1)			
Electronic Warfare Support Measures	(b)(1)			
Mean Time to Repair (MTTR) (hrs) Ship System	(b)(1)			
External Communication System	(b)(1)			
Electronic Warfare Support Measures	(b)(1)			
Operational Availability (Ao) (%) Ship System	(b)(1)			
External Communication System	(b)(1)			
Electronic Warfare Support Measures	(b)(1)			
Officers Berths	(b)(1)			
Enlisted Berths	(b)(1)			
Crew	(b)(1)			
Total Billets Underway	(b)(1)			
Combat Systems	(b)(1)			
ESM	(b)(1)			
AN/BSY-2	(b)(1)			
PBB Detection FOM (Spherical Array) (db)	(b)(1)			
PNB Detection FOM (TB-12X) (db)	(b)(1)			
Wide Aperture Array Acquisition FOM (Submarine) (db)	(b)(1)			
Average Solution Time for Torpedo Attack (>20 Kyd) (mins)	(b)(1)			
Time to Snapshot MK 48 ADCAP (sec)	(b)(1)			

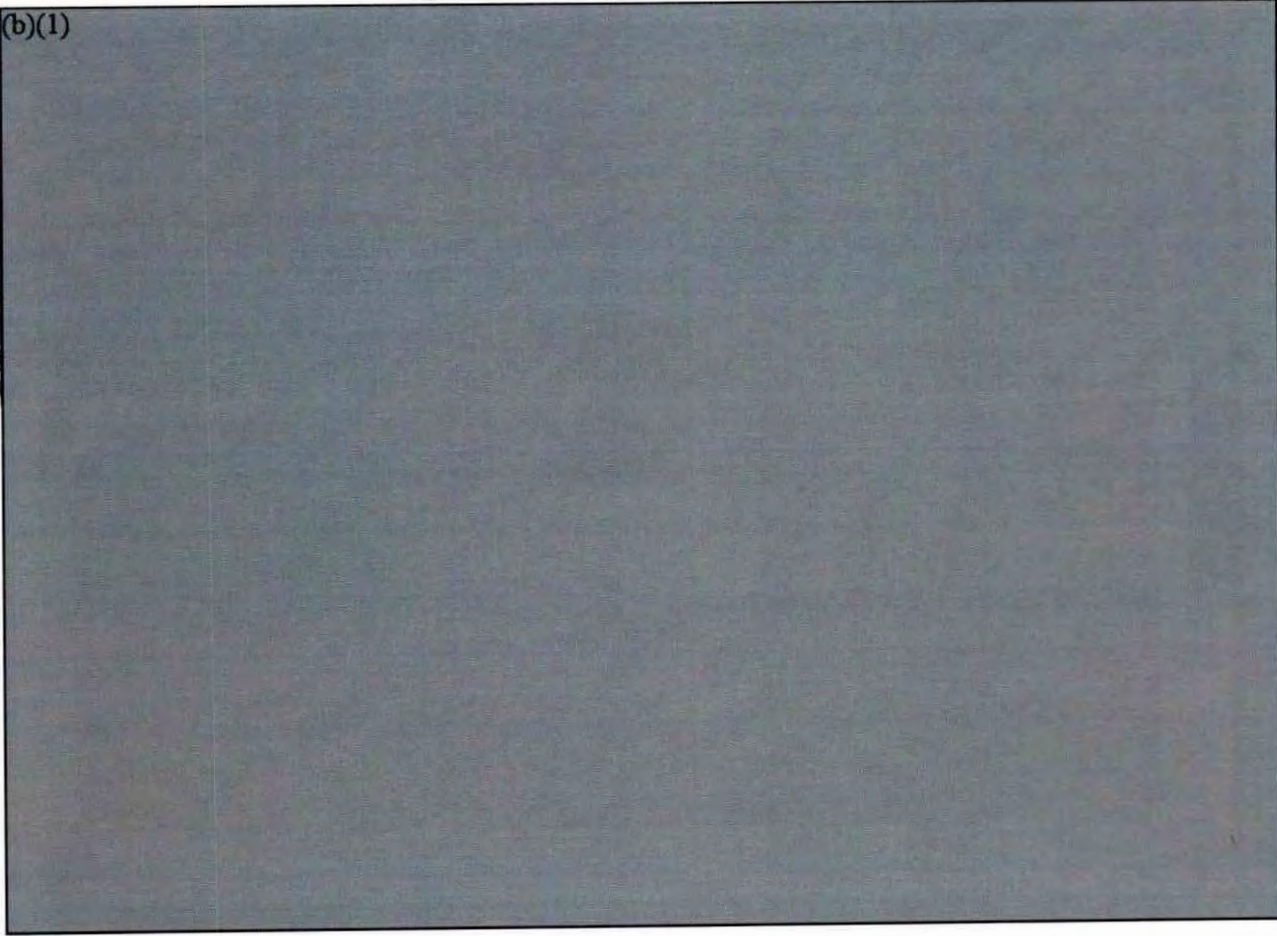
10a. (U) Performance Characteristics (Cont'd):

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate	
Operational Availability (Ao) (%)	(b)(1)				
Mean Time Between Failure (MTBF) (hrs)					
Mission Time Between Critical Failures (MTBCF) Hardware (hrs)					
Full-up Configuration (hrs)					
Self-Protect Configuration (hrs)					
Performance Monitoring/Fault Localization					
Probability of Fault Detection (%)					
Probability of Fault Localization (%)					
PM False Alarms per 100 Alerts					(Ch-2)
Fixed Barrier Mission Scenario					
Probability of secure detection and classification (%)					(Ch-3)
Exchange ratio (initial attack)					
Area Clearance Mission Scenario					
Probability of secure detection and classification (%)					
Secure search rate (NM2/hr)					(Ch-3)
Exchange ratio (initial attack)					
Arctic Mission					
Probability of Bastion Penetration					
Secure Sweep Rate (Nm2/Hr)					

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

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
(U) Probability of Secure Attack (given classification)	(b)(1)			
(U) Probability of Kill (given classification)				
(U) Probability of Bastion Escape				
(U) Tactical Speed (kts)				

(b)(1)



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11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	4335.0	4594.1	4655.7
Procurement	15686.3	7819.4	7651.3
Basic Ship Costs	(8083.6)		(4849.5)
GFE	(5952.8)		(2308.5)
Other Sailaway	(111.0)		(90.0)
OF/PD	(570.2)		(92.6)
Total Sailaway	(14717.6)		(7340.6)
OPN	(0.0)		(0.0)
AN/BSY-2 OPN	(968.7)		(310.7)
Total Other Wpn Sys	(968.7)		(310.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	98.6	27.5	25.1
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1990 Base-Year \$	20119.9	12441.0	12332.1
Escalation	1619.2	899.5	824.4
Development (RDT&E)	(-125.0)	(-19.5)	(-9.1)
Procurement	(1735.1)	(916.5)	(831.3)
Construction (MILCON)	(9.1)	(2.5)	(2.2)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	21739.1	13340.5	13156.5
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>12</u>	<u>3</u>	<u>3</u>
Total	12	3	3

(U) SEAWOLF has a three unit authorization. There is no intent to go beyond Low Rate of Initial Production (LRIP).

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

d. (U) Nuclear Costs --  
\$1043.5M

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12. (U) Unit Cost Summary:

	UCR Baseline (JUL 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1990 BY\$)	12441.0	12332.1	
(2) Quantity	3	3	
(3) Unit Cost	4147.000	4110.700	-0.88
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1990 BY\$)	7819.4	7651.3	
(2) Quantity	3	3	
(3) Unit Cost	2606.467	2550.433	-2.15

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	-122.5	+404.0	+3.5	+285.0
Quantity	-	-15562.8	-	-15562.8
Schedule	+25.3	+6354.0	-	+6379.3
Engineering	+161.3	-	-	+161.3
Estimating	+317.3	+923.3	-83.9	+1156.7
Other	-	-	-	-
Support	+54.6	-804.0	-	-749.4
Subtotal	+436.0	-8685.5	-80.4	-8329.9
Current Changes:				
Economic	-0.9	-30.5	-	-31.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.5	-207.4	-	-205.9
Other	-	-	-	-
Support	-	-15.4	-	-15.4
Subtotal	+0.6	-253.3	-	-252.7
Total Changes	+436.6	-8938.8	-80.4	-8582.6
Current Estimate	4646.6	8482.6	27.3	13156.5

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

(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	-	-12545.0	-	-12545.0
Schedule	+18.1	+4369.6	-	+4387.7
Engineering	+141.0	-	-	+141.0
Estimating	+108.0	+952.9	-73.5	+987.4
Other	-	-	-	-
Support	+52.3	-644.4	-	-592.1
Subtotal	+319.4	-7866.9	-73.5	-7621.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+1.3	-154.5	-	-153.2
Other	-	-	-	-
Support	-	-13.6	-	-13.6
Subtotal	+1.3	-168.1	-	-166.8
Total Changes	+320.7	-8035.0	-73.5	-7787.8
Current Estimate	4655.7	7651.3	25.1	12332.1

(U) Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.9
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
Advance Submarine Technology (Estimating)	+2.6	+3.1
Prior Year Adjustment (Estimating)	-1.1	-1.3
Integration of UYQ-70 (Estimating)	+2.4	+3.0
Program Adjustments (Estimating)	+0.3	+0.4
SSN 21 RDT&E Offset (Estimating)	-3.2	-4.0
RDT&E Subtotal	<u>+1.3</u>	<u>+0.6</u>

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

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-29.5
Economic adjustment for negative program change. (Economic)	N/A	-1.0
Re-estimate for SSN 21 Class Ship Cost Adjustment (SCA) (Estimating)	-8.4	-10.1
Administrative Realignment (Estimating)	-150.1	-200.0
Revised estimates for Outfitting and Post Delivery (Estimating)	-19.1	-25.7
Adjustment for Current and Prior Inflation. (Support)	+0.4	+0.5
Budget Submission Office (BSO) Realignment (Support)	+18.8	+25.8
Transfer of funds for In-Service Submarines (Support)	-47.5	-60.6
Acquisition Stability Reserve Funds for Propulsor (Support)	+14.7	+18.9
Revised ship construction cost estimate (Estimating)	+23.1	+28.4
Procurement Subtotal	<u>-168.1</u>	<u>-253.3</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1811.59	+84.53	+247.18	+2126.43	+53.77	+316.93	--	-254.93	+2573.91	4385.50

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1451.78	+124.50	-832.25	+2118.00	--	+238.63	--	-273.13	+1375.75	2827.53

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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	N/A	DEC 1983	DEC 1983	DEC 1983
Milestone II	N/A	MAY 1985	JUN 1985	JUN 1985
Milestone III	N/A	MAR 1990	JAN 1989	JAN 1989
FUE/IOC	N/A	NOV 1994	MAY 1995	JUL 1997
Total Cost	0	3875	21739.1	13156.5
Total Quantity	0	1	12	3
Prog Acq Unit Cost	0	3875	1811.59	4385.5

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

a. Procurement --  
 (U) SSN 23 CONSTRUCTION:  
 GENERAL DYNAMICS, GROTON, CT  
 N00024-96-C-2108, FPIF  
 Award: June 28, 1996  
 Definitized: June 28, 1996

Current Contract Price			Estimated Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager	
\$1222.2	\$1330.7	1	\$1220.2	\$1297.6	

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-3.5	\$-11.6
Cumulative Variances To Date (09/30/99)	\$-0.1	\$-6.6
Net Change	\$3.4	\$5.0

Explanation of Change:

(U) The change in cost and schedule variance is attributable to two-thirds of the ship being moved from Quonset Point, Rhode Island to Groton, Connecticut.

(U) Contract Comments:  
 All numbers include anticipated escalation.

The current contract price is higher than the initial contract price due to changes in escalation and labor rates. The Program Manager's Estimated Price At Completion (PMEPAC) is lower than the Current Contract Ceiling Price.

Reflects cost performance data as of 30 September 1999. A significant

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15. (U) Contract Information (Cont'd):

contract modification was signed 10 December 1999. This contract change has been briefed to the appropriate Congressional Committees. The PMEPAC will be adjusted to reflect the contract change in the 2000 Ship Cost Adjustment (SCA). As part of this contract change, the SEAWOLF SCA will request a transfer of \$74M from SCN to RDT&E. This SCA action has also been briefed to the appropriate Congressional Committees. Cost and schedule indices will change as the contract modification is incorporated into the performance baseline.

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

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

<u>Appropriation</u>	<u>Prior Years (FY81-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-05)</u>	<u>Total</u>
RDT&E	4584.1	41.3	10.3	10.9	4646.6
Procurement	8353.7	66.5	12.1	50.3	8482.6
MILCON	27.3	-	-	-	27.3
O&M	-	-	-	-	-
<b>Total</b>	<b>12965.1</b>	<b>107.8</b>	<b>22.4</b>	<b>61.2</b>	<b>13156.5</b>

b. Annual Summary -- SSN21 SUBMARINE

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Sailaway FY 1990 Dollars Nonrec</u>	<u>Sailaway FY 1990 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1981				20.7	15.2
1982				30.7	23.7
1983				29.9	24.1
1984				157.4	131.6
1985				334.1	288.1
1986				457.4	405.7
1987				435.9	398.1
1988				470.0	443.6
1989				516.7	508.2
1990				516.4	528.7
1991				511.0	542.0
1992				404.6	441.6
1993				161.0	179.8
1994				160.5	182.6
1995				139.8	162.1
1996				101.9	120.1
1997				73.3	87.5

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				55.2	66.4
1999				28.8	35.0
2000				33.6	41.3
2001				8.3	10.3
2002				4.7	6.0
2003				3.8	4.9
Subtotal				4655.7	4646.6

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				376.4	375.0
1988				251.2	257.6
1989	1		2483.9	2197.6	2322.2
1990		333.3		539.3	586.3
1991	1	119.9	2160.0	2016.7	2253.7
1992		192.7		676.0	775.0
1993				3.0	3.5
1994				1.5	1.8
1995				5.7	6.8
1996	1		2050.8	555.3	667.8
1997				539.2	654.0
1998				125.8	154.4
1999				27.7	34.5
2000				15.3	19.4
2001					
2002				8.4	11.0
2003				1.5	2.0
Subtotal	3	645.9	6694.7	7340.6	8125.0

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				0.6	0.6
1990				142.3	152.2
1991				17.7	19.3
1992					
1993				0.3	0.3

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

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				3.3	3.8
1995				1.9	2.2
1996				4.0	4.8
1997				40.4	48.5
1998				5.2	6.3
1999				18.9	23.1
2000				38.0	47.1
2001				9.6	12.1
2002				6.3	8.1
2003				14.7	19.1
2004				0.2	0.2
2005				7.3	9.9
Subtotal				310.7	357.6

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991				25.1	27.3
Subtotal				25.1	27.3

	Qty	Sailaway Dollars Nonrec	Sailaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	3	645.9	6694.7	12332.1	13156.5

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	2	2

(U) Percent Total Program Quantities Delivered: 66.7%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 11850

(U) Percent Total Program Expended: 90.1%

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18. (U) Operating and Support Costs:

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 2 overhauls and 6 SRAS. There are 42 months between depot level availabilities. (The source for the cost information PMS350 Total Ownership Cost Plan dated December 1998.)

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per SHIP	Avg Annual Cost Per SHIP
Mission Pay & Allowances	5.6	N/A
Unit Level Consumption	3.6	0.0
Intermediate Maintenance	3.1	0.0
Depot Maintenance	11.5	0.0
Contractor Support	1.2	0.0
Sustaining Support	12.8	0.0
Indirect Costs	5.0	N/A
Total	42.8	0.0

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# A-19 MLRS UPGRADE

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: MLRS Upgrade Program

DIRECTORATE FOR FREEDOM OF INFORMATION

AS OF DATE: Dec

AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

## INDEX

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1. (U) Designation and Nomenclature (Popular Name): MLRS Upgrade Program
2. (U) DoD Component: Army
3. (U) Responsible Office and Telephone Number:  

PROGRAM EXECUTIVE OFFICE	COL Barry M. Ward
TACTICAL MISSILES	Assigned: August 21, 1997
ATTN: SFAE-MSL-ML	DSN 746-1195; COMM 256-876-1195
RSA, AL 35898-5700	Barry.ward@m1.redstone.army.mil
4. (U) Program Elements/Procurement Line Items:  

RDT&E:	
(U)	PE 63778 Project 093, 784
PROCUREMENT:	
(U)	APPN 2032 ICN C65402 (Army)
(U)	APPN 2032 ICN C65900 (Army)
(U)	APPN 2032 ICN CA0257 (Army)

~~Classified by MLRS SCG, 8 October 1998  
Downgrade instructions  
Declassification: X3~~

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MLRS Upgrade Program, December 31, 1999

5. (U) References:

Launcher

SAR Baseline (Development Estimate):

(U) AAE Approved Acquisition Baseline (APB) dated March 23, 1998.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated March 24, 2000.

Tactical Rocket

SAR Baseline (Development Estimate):

(U) AAE Approved Acquisition Baseline (APB) dated March 23, 1998.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated March 24, 2000.

6. (U) Mission and Description:

(U) The Multiple Launch Rocket System (MLRS) Upgrade Program satisfies the need for a non-nuclear, all-weather, indirect, area fire weapon system to strike counterfire, air defense, armored formations, and other high-payoff targets at all depths of the tactical battlefield. Initial Operational Capability (IOC) of the basic system occurred in 1983. Primary missions of MLRS include the suppression, neutralization and destruction of threat fire support and forward area air defense targets. The MLRS launcher is a full-tracked, self propelled launcher/loader designed to launch the entire MLRS Family of Munitions (MFOM) tactical rocket/missile variants. The Improved Fire Control System (IFCS) and the Improved Launcher Mechanical System (ILMS) are modifications to the launch platform to produce the upgraded launcher. These two synchronized programs are the centerpieces of the next generation of the MLRS Weapon System. In concert with the application of these kits, the remanufacture of all carrier vehicles will convert the MLRS launcher fleet to the M270A1. The IFCS will correct present and future supportability problems in the current MLRS Fire Control System resulting from electronic component obsolescence in the existing design. The effort will result in reduced operation and support costs and will provide growth capabilities for existing and future MFOM weapon systems. The ILMS will decrease the stow to aim point time line, enhance effectiveness in engaging and supporting the force, and increase MLRS platform survivability.

The system is designed for quick reaction with the capability of firing the first round within minutes of receiving a fire mission and firing the complete load of 12 rounds in 60 seconds or less.

Simultaneously, MLRS rockets evolved as a result of the need for greater range and technological advances making guidance feasible. The Extended Range MLRS (ER-MLRS) rocket will enhance the capability of the existing rocket inventory by providing improvements in range, accuracy, effectiveness, and maneuver force

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MLRS Upgrade Program, December 31, 1999

6. (U) Mission and Description (Cont'd):

safety. The Guided Multiple Launch Rocket System (GMLRS) will provide longer range and improve accuracy with a lower submunition hazardous dud rate. Utilizing various components of the ER-MLRS, GMLRS will transform the ER-MLRS free flight rocket into a missile through the incorporation of a guidance and control package. GMLRS will provide greater accuracy, reduce the number of rockets required to defeat targets at maximum range, reduce the number of launchers required per fire mission, and directly contribute to reducing the logistics burden. The MLRS launcher will have the capability to support all future ATACMS versions, to include Block IA and Block II systems.

7. (U) Executive Summary:

(U) Launcher

A revised Acquisition Program Baseline (APB) incorporating the restructure of the program was approved by Headquarters, Department of the Army in March 2000.

The M270A1 restructure first in-process review was conducted on 15 December 1999. Emphasis was on software conversion to VxWorks by Science Application International Corporation (SAIC) and Allied Signal (now L3). Each company has completed their portion of the VxWorks conversion. VxWorks software has completed integration on the console and the launcher. Complete functionality under VxWorks has been demonstrated on the launcher on LRIP hardware. Lockheed Martin Corporation Missiles and Fire Control (LMMFC) has completed and incorporated all known level one and two Software Trouble Reports (STRs) and has made significant progress on level three and below STRs. A confidence demonstration was completed successfully on 28 February 2000.

Improved Launcher Mechanical System hydraulic testing by Vickers was completed in February 2000. Of the planned 10,000 systems cycles, all have been completed successfully with individual components having the following completed cycles: pump 12,247 cycles; reservoir 14,103 cycles; elevation motor 10,400 cycles; and azimuth motor 10,900 cycles. The azimuth motor had contaminants entered into the system for completion of testing in February 2000.

A Tri-Service software metrics workshop was completed at LMMFC with government and test community participation. Final recommended metrics for program management are under review.

The updated M270A1 Test and Evaluation Master Plan (TEMP) was completed by the Test and Evaluation Integrated Product Team with all parties concurring. The TEMP was approved by OSD on 3 March 2000.

M270A1 restructure activities continue on schedule. Inch pebble 1 (mini-milestone) (go to war) STRs were completed and closed. Inch pebble 2 (maintainability) STRs are ahead of schedule and all component faults have been inserted and tested on hardware. Inch pebble 3 (integration) activities are 67% complete and ahead of schedule.

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7. (U) Executive Summary (Cont'd):

M993A1 production continues on schedule by United Defense Limited Partnership at Red River Army Depot. The CENTURY motor governor throttle issue has completed root cause analysis. A correction has been verified on a launcher and the issue has been closed out.

M270A1 production at Camden, Arkansas is on schedule for first delivery in May 2000.

Tactical Rockets

The start of GMLRS Engineering, Manufacturing and Development (EMD) contract's Engineering Design Test (EDT) flight schedule changed from 21 July 2000 to 16 August 2000.

As of January 2000 the GMLRS EMD contract is behind in schedule and in cost. The contractor estimates an ultimate cost overrun of \$5.4M while the Program Management Office estimates it will be at least \$15.3M. Delays are primarily due to slower than expected software development and delivery problems from the subcontractors to the prime contractor. The contractor and the Project Office are working to solve these problems.

8. (U) Threshold Breaches:

Launcher

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No



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MLRS Upgrade Program, December 31, 1999

8. (U) Threshold Breaches (Cont'd):

Tactical Rocket

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

Launcher

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
M270A1 ESIT	JUL 98	JAN 1999	JAN 1999
Modified LRIP Review	OCT 98	MAY 1998	MAY 1998
M270A1 Operational Test (OT)			
Start	JAN 99	MAY 2001	MAY 2001
Complete	MAY 99	JUN 2001	JUN 2001
MS III	AUG 99	SEP 2001	SEP 2001
FUE	SEP 00	SEP 2001	SEP 2001

(U) Acronyms:

1. **ESIT** - Extended System Integration Test
2. **FUE** - First Unit Equipped
3. **LRIP** - Low Rate Initial Production
4. **MS** - Milestone

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

Launcher

b. Current Change Explanations -- None

Tactical Rocket

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
ER-MLRS IOC	SEP 99	MAR 1999	MAR 1999
GMLRS MS II EMD	MAR 98	JUL 1998	JUL 1998
GMLRS LRIP Review	AUG 01	AUG 2001	AUG 2001
GMLRS OT	JUL 03	JUL 2003	JUL 2003
GMLRS MS III	OCT 03	OCT 2003	OCT 2003
GMLRS IOC	APR 04	APR 2004	APR 2004

(U) Acronyms:

1. **EMD** - Engineering Manufacturing and Development
2. **GMLRS**- Guided Multiple Launch Rocket System
3. **IOC** - Initial Operational Capability

b. Current Change Explanations -- None

10. ~~(S)~~ Performance Characteristics:

Launcher

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Technical Development Characteristics:	(b)(1)			
Reaction Time				
Total Mission Cycle (Min)	AS AMENDED			
Mission Reliability				
MTBOMF (Hrs)	56	56 / 37	TBD	56

(U) Acronyms:

Mean Time Between Operational Mission Failure (MTBOMF)

AS ALIGNED

10b. (U) Performance Characteristics (Cont'd):  
Launcher

b. Current Change Explanations -- None

Tactical Rocket

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Technical Development Characteristics: Accuracy Range	(b)(1)			
ER-MLRS at Range 30-40 Km				
ER-MLRS Range Max (Km)	50	50 / 45	TBD	50
ER-MLRS Range Min (Km)	10	10 / 15	TBD	10
GMLRS Range Max	70	70 / 60	TBD	70
GMLRS Range Min	10	10 / 15	TBD	10
Effectiveness				
GMLRS Expected Fractional Damage	30%	30% / 30%	TBD	30%
Reliability				
ER-MLRS	0.97	0.97 / 0.95	TBD	.97
GMLRS	0.95	0.95 / 0.92	TBD	.95
Hazardous Dud Rate	0%	0% / <1%	TBD	<1%

AS ALIGNED

b. Current Change Explanations -- None

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MLRS Upgrade Program, December 31, 1999

11. (U) Total Program Cost and Quantity (Dollars in Millions):

Launcher

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	19.5	5.4	5.2
Procurement	1930.3	1947.1	1949.0
Launcher	(1759.2)		(1692.9)
Other Weapon System	(15.0)		(54.5)
Peculiar Support	(56.8)		(81.8)
Initial Spares	(99.3)		(119.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1998 Base-Year \$	1949.8	1952.5	1954.2
Escalation	262.0	254.5	242.0
Development (RDT&E)	(1.4)	(0.0)	(0.2)
Procurement	(260.6)	(254.5)	(241.8)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2211.8	2207.0	2196.2
b. (U) Quantity --			
Development (RDT&E)	N/A	0	0
Procurement	<u>857</u>	<u>857</u>	<u>857</u>
Total	857	857	857

(U) The original quantity of LRIP M270A1 launchers approved at the May 1998 LRIP Decision Review was 86. The current planned LRIP quantity is 150 which exceeds 10% of the total MLRS M270A1 launcher procurement. The Deputy Under Secretary of the Army for Operations Research directed restructure of the M270A1 test program and this necessitated procuring additional LRIP quantities in FY 2000 and FY 2001 prior to completion of Operational Test in June 2001, Milestone III in September 2001, and subsequent Full Rate Production beginning in FY 2002.

c. (U) Foreign Military Sales --  
There is one signed Norway case for the M270A1 Launcher.

d. Nuclear Costs -- None.

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MLRS Upgrade Program, December 31, 1999

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

Tactical Rocket

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	81.9	91.3	90.7
Procurement	1313.8	2111.9	2104.5
Tactical Rocket	(1313.8)		(2104.5)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1998 Base-Year \$	1395.7	2203.2	2195.2
Escalation	292.9	537.3	500.2
Development (RDT&E)	(3.4)	(3.6)	(3.1)
Procurement	(289.5)	(533.7)	(497.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	1688.6	2740.5	2695.4
b. (U) Quantity --			
Development (RDT&E)	N/A	0	0
Procurement	<u>43182</u>	<u>63456</u>	<u>62148</u>
Total	43182	63456	62148

(U) The original quantity of LRIP ER-MLRS approved at the April 1996 LRIP Decision Review was 4152. Actual ER-MLRS quantity procured was 4170.

c. (U) Foreign Military Sales --  
FMS cases for ER-MLRS procurement have been signed with Greece, Norway and Denmark. A case for Korea is pending approval.

There are no current FMS cases for the GMLRS rocket.

d. Nuclear Costs -- None.

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MLRS Upgrade Program, December 31, 1999

12. (U) Unit Cost Summary:

Launcher

	UCR Baseline (MAR 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1998 BY\$)	1952.5	1954.2	
(2) Quantity	857	857	
(3) Unit Cost	2.278	2.280	+0.09
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1998 BY\$)	1947.1	1949.0	
(2) Quantity	857	857	
(3) Unit Cost	2.272	2.274	+0.09

Tactical Rocket

	UCR Baseline (MAR 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1998 BY\$)	2203.2	2195.2	
(2) Quantity	63456	62148	
(3) Unit Cost	0.035	0.035	0.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1998 BY\$)	2111.9	2104.5	
(2) Quantity	63456	62148	
(3) Unit Cost	0.033	0.034	+3.03

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MLRS Upgrade Program, December 31, 1999

13. (U) Cost Variance Analysis:

Launcher

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	20.9	2190.9	-	2211.8
Previous Changes:				
Economic	-	-32.1	-	-32.1
Quantity	-	-	-	-
Schedule	-	+21.6	-	+21.6
Engineering	-	-	-	-
Estimating	-15.5	-34.0	-	-49.5
Other	-	-	-	-
Support	-	+92.3	-	+92.3
Subtotal	-15.5	+47.8	-	+32.3
Current Changes:				
Economic	-	-21.7	-	-21.7
Quantity	-	-	-	-
Schedule	-	+11.7	-	+11.7
Engineering	-	-	-	-
Estimating	-	-51.5	-	-51.5
Other	-	-	-	-
Support	-	+13.6	-	+13.6
Subtotal	-	-47.9	-	-47.9
Total Changes	-15.5	-0.1	-	-15.6
Current Estimate	5.4	2190.8	-	2196.2

(U) Summary (FY 1998 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	19.5	1930.3	-	1949.8
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-14.3	-17.8	-	-32.1
Other	-	-	-	-
Support	-	+72.4	-	+72.4
Subtotal	-14.3	+54.6	-	+40.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+10.8	-	+10.8
Engineering	-	-	-	-
Estimating	-	-59.3	-	-59.3
Other	-	-	-	-
Support	-	+12.6	-	+12.6
Subtotal	-	-35.9	-	-35.9
Total Changes	-14.3	+18.7	-	+4.4
Current Estimate	5.2	1949.0	-	1954.2

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MLRS Upgrade Program, December 31, 1999

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-21.7
Due to funding constraints in the FY 01 President's Budget for FY 2003 and FY 2004, 41 of the launchers shown will actually be purchased in FY 2009. This rescheduling resulted in procuring quantities later when cost will be higher. (Schedule)	+10.8	+11.7
Reduction of planned advance procurement (\$42.8M) and incorporation of additional estimating changes (\$8.7M). (Estimating)	-59.3	-51.5
Additional National Guard Units to be fielded in support of 3x6 require additional training and support costs. (Support)	+12.6	+13.6
Procurement Subtotal	<u>-35.9</u>	<u>-47.9</u>

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MLRS Upgrade Program, December 31, 1999

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

Tactical Rocket

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	85.3	1603.3	-	1688.6
Previous Changes:				
Economic	-0.8	-28.1	-	-28.9
Quantity	-	+1017.0	-	+1017.0
Schedule	-	+3.1	-	+3.1
Engineering	-	-	-	-
Estimating	+10.4	+0.2	-	+10.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+9.6	+992.2	-	+1001.8
Current Changes:				
Economic	-0.5	-38.6	-	-39.1
Quantity	-	-0.8	-	-0.8
Schedule	-	+0.2	-	+0.2
Engineering	-	-	-	-
Estimating	-0.6	+45.3	-	+44.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1.1	+6.1	-	+5.0
Total Changes	+8.5	+998.3	-	+1006.8
Current Estimate	93.8	2601.6	-	2695.4

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MLRS Upgrade Program, December 31, 1999

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

(U) Summary (FY 1998 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	81.9	1313.8	-	1395.7
Previous Changes:				
Quantity	-	+754.2	-	+754.2
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+9.5	+0.2	-	+9.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+9.5	+754.4	-	+763.9
Current Changes:				
Quantity	-	-0.9	-	-0.9
Schedule	-	+0.1	-	+0.1
Engineering	-	-	-	-
Estimating	-0.7	+37.1	-	+36.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.7	+36.3	-	+35.6
Total Changes	+8.8	+790.7	-	+799.5
Current Estimate	90.7	2104.5	-	2195.2

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.5
Revised estimate. (Estimating)	-0.7	-0.6
RDT&E Subtotal	<u>-0.7</u>	<u>-1.1</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-38.6
Decreased quantities from 62166 to 62148 resulting in a loss of 18 rockets through FY 2014. (Quantity)	-0.9	-0.8
Rescheduling of rocket procurement to later years. (Schedule)	+0.1	+0.2
Increased cost of submunitions and self destruct fuze. (Estimating)	+37.1	+45.3
Procurement Subtotal	<u>+36.3</u>	<u>+6.1</u>

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MLRS Upgrade Program, December 31, 1999

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):  
Launcher

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.58	-0.06	--	+0.04	--	-0.12	--	+0.12	-0.02	2.56

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.56	-0.06	--	+0.04	--	-0.10	--	+0.12	--	2.56

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	AUG 1999	N/A	SEP 2001
FUE/IOC	N/A	SEP 2000	N/A	SEP 2001
Total Cost	N/A	2211.8	N/A	2196.2
Total Quantity	0	857	N/A	857
Prog Acq Unit Cost	N/A	2.58	N/A	2.56

Tactical Rocket

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.04	--	--	--	--	--	--	--	--	0.04

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MLRS Upgrade Program, December 31, 1999

14b. (U) Unit Cost and Other History (Cont'd):  
Tactical Rocket

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.04	--	--	--	--	--	--	--	--	0.04

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAR 1998	N/A	JUL 1998
Milestone III	N/A	OCT 2003	N/A	OCT 2003
FUE/IOC	N/A	APR 2004	N/A	APR 2004
Total Cost	N/A	1688.6	N/A	2695.4
Total Quantity	0	43182	0	62148
Prog Acq Unit Cost	N/A	0.04	N/A	0.04

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

a. RDT&E --  
(U) GMLRS EMD:  
LMMFC, GRAND PRAIRIE, TX  
DAAH01-98-C-0033, CPAF  
Award: November 4, 1998  
Definitized: November 4, 1998

Initial Contract Price  
Target      Ceiling      Qty

\$121.1      N/A      0

Current Contract Price  
Target      Ceiling      Qty  
\$123.5      N/A      0

Estimated Price At Completion  
Contractor      Program Manager  
\$129.1      \$139.1

Previous Cumulative Variances      \$-1.0      \$-2.7  
Cumulative Variances To Date      \$-4.9      \$-0.7  
Net Change      \$-3.9      \$2.0

Explanation of Change:

None.

(U) Contract Comments:

The GMLRS's total costs are shared 50/50 between the U.S. and the European partners in accordance with the Memorandum of Agreement dated September 1998.

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MLRS Upgrade Program, December 31, 1999

15. (U) Contract Information (Cont'd):

b. Procurement --  
 (U) M270A1 Production:  
 LMMFC, Dallas, TX  
 DAAH01-98-C-0138, FFP w/CPFF Clins  
 Award: July 2, 1998  
 Definitized: July 2, 1998

		<u>Initial Contract Price</u>	
		<u>Target</u>	<u>Ceiling</u>
	<u>Qty</u>		
		\$63.0	N/A
	21		

			<u>Estimated Price At Completion</u>	
<u>Current Contract Price</u>			<u>Contractor</u>	<u>Program Manager</u>
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
\$128.5	N/A	45	\$128.5	\$128.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$	\$
Cumulative Variances To Date	\$	\$
Net Change	\$	\$

Explanation of Change:

None.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-14)</u>	<u>Total</u>
RDT&E	32.2	30.2	17.7	19.1	99.2
Procurement	359.0	147.4	204.6	4081.4	4792.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	391.2	177.6	222.3	4100.5	4891.6

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MLRS Upgrade Program, December 31, 1999

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

Launcher

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

<u>Appropriation</u>	<u>Prior Years (FY98-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-11)</u>	<u>Total</u>
RDT&E	3.3	2.1	-	-	5.4
Procurement	249.9	143.7	195.2	1602.0	2190.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	253.2	145.8	195.2	1602.0	2196.2

Tactical Rocket

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-14)</u>	<u>Total</u>
RDT&E	28.9	28.1	17.7	19.1	93.8
Procurement	109.1	3.7	9.4	2479.4	2601.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	138.0	31.8	27.1	2498.5	2695.4

b. Annual Summary -- Launcher

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1998 Dollars Nonrec	Flyaway FY 1998 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				0.1	0.1
1999				3.1	3.2
2000				2.0	2.1
2001					
2002					
2003					
Subtotal				5.2	5.4

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY 1998 Dollars Nonrec	Flyaway FY 1998 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	21	8.5	85.3	122.0	124.0
1999	24		106.0	122.2	125.9

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MLRS Upgrade Program, December 31, 1999

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

Launcher

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY 1998 Dollars Nonrec	Flyaway FY 1998 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	39		121.1	137.7	143.7
2001	66		156.0	184.0	195.2
2002	76	3.2	173.4	200.0	215.9
2003	95	3.2	141.9	171.7	189.0
2004	114		137.1	154.8	173.8
2005	81		136.1	147.9	169.4
2006	117		175.7	195.5	228.3
2007	110		158.3	183.3	218.4
2008	85		129.0	151.7	184.3
2009	29		110.6	121.8	151.0
2010			23.9	32.9	41.6
2011			23.6	23.5	30.3
2012					
2013					
2014					
Subtotal	857	14.9	1678.0	1949.0	2190.8

(U) Due to funding constraints in the FY 01 President's Budget for FY 2003, and FY 2004, 41 of the launchers shown will be purchased in FY 2009. This rescheduling resulted in procuring quantities later when cost will be higher.

Recurring Flyaway in FY 2010 and FY 2011 reflect funds to complete the fielding of prior procurement.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	857	14.9	1678.0	1954.2	2196.2

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MLRS Upgrade Program, December 31, 1999

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

b. Annual Summary -- Tactical Rocket

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Rollaway FY 1998 Dollars Nonrec	Rollaway FY 1998 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				12.7	12.8
1999				15.8	16.1
2000				27.3	28.1
2001				16.9	17.7
2002				17.5	18.6
2003				0.5	0.5
Subtotal				90.7	93.8

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Rollaway FY 1998 Dollars Nonrec	Rollaway FY 1998 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996	1638	8.7	36.1	44.8	44.6
1997	1908		45.0	45.0	45.3
1998	624		18.9	18.9	19.2
1999					
2000			3.5	3.5	3.7
2001		5.0	3.9	8.9	9.4
2002	684	1.8	35.6	37.4	40.4
2003	1332		64.9	64.9	71.4
2004	1614		72.1	72.1	80.9
2005	1518		70.6	70.6	80.8
2006	3960		141.7	141.7	165.5
2007	6108		202.0	202.0	240.7
2008	6108		200.6	200.6	243.8
2009	6108		199.8	199.8	247.6
2010	6108		199.3	199.3	251.9
2011	6108		198.9	198.9	256.5
2012	6108		198.7	198.7	261.4
2013	6108		198.7	198.7	266.6
2014	6114		198.7	198.7	271.9
Subtotal	62148	15.5	2089.0	2104.5	2601.6

(U) Funding in FY 2000 and 2001 is for production support and fielding of ER-MLRS procured in FY 1996-1998. The Guided MLRS begins production in FY 2002.

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MLRS Upgrade Program, December 31, 1999

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

Tactical Rocket

	Qty	Rollaway Dollars Nonrec	Rollaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	62148	15.5	2089.0	2195.2	2695.4

17. (U) Delivery/Expenditure Information:

Launcher

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 116.2

(U) Percent Total Program Expended: 5.3%

(U) The M270A1 Launcher LRIP Production Contract awarded to Lockheed Martin Missiles and Fire Control Systems, 1701 West Marshall Drive, Grand Prairie, Texas 75051-0003. Deliveries include 21 launchers by December FY 2000, and 24 launchers by November FY 2001.

Tactical Rocket

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	3138	3138

(U) Percent Total Program Quantities Delivered: 5.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 114.3

(U) Percent Total Program Expended: 4.2%

18. (U) Operating and Support Costs:

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MLRS Upgrade Program, December 31, 1999

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

Launcher

a. (U) Assumptions and Ground Rules --  
 The unit for tracking O&S costs is a firing battery of 9 launchers. The estimated costs assumes 78 Tactical Batteries. The reflected O&S costs were estimated in the August 1997 excursion Program Office Estimate (POE). The POE includes operating tempo, reliability/maintainability, maintenance concept, manning and logistics policies. This POE 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. The M270 Basic Launcher was the antecedent system for the M270A1.

Source: 27 August 1997 POE

b. (U) Costs -- (FY 98 Constant (Base-Year) Dollars in Millions)

Cost Element	MLRS Upgrade Avg Annual Cost Per Battery (FY98\$)	MLRS Basic (M270) Avg Annual Cost Per Battery (FY98\$)
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Military Personnel Direc	4.5	5.6
Replenishment Depot-Leve	0.3	0.5
Replen Consum (Spares)	0.1	0.1
POL	0.0	0.0
End Item Supplement	0.1	0.1
Transportation	0.0	0.0
Training	0.3	0.3
Other O & M	0.0	0.1
Total	5.3	6.7

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

Tactical Rocket

a. (U) Assumptions and Ground Rules --  
 The unit for tracking O&S cost is the rocket pod. The estimated average annual unit cost per rocket pod is \$152.00. This estimate, taken from the August 1997, POE was based upon an annual cost of \$2.12M per year for Stockpile Reliability. The total number of rocket pods planned for production is 13,987.

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

Cost Element		
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

AF-2 AEHF

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: Advanced EHF

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Advanced Extremely High Frequency (AEHF)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:  

SMC/MC	BGen Craig Cooning
2420 Vela Way	Assigned: November 30, 1998
Suite 1467-A8	DSN 833-4877; COMM 310-336-4877
El Segundo, CA 90245-4659	Craig.Cooning@losangeles.af.mil
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
 (U) PE 0603430F  
 PROCUREMENT:  
 (U) APPN 3020 ICN 33604F (Air Force)

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

DAF/PAG

00--0295

CONGRESSIONAL

00-C-0744

~~Classified by Milstar Security Classification Guide 5.2  
Downgrade instructions: Not Subject to Automatic Downgrade  
Declassify on: Originating Agency Determination Required~~

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Advanced EHF, December 31, 1999

5. (U) References:

SAR Baseline (Planning Estimate):

(U) DAE Approved Acquisition Program Baseline dated May 6, 1999.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated May 6, 1999.

6. (U) Mission and Description:

(U) The Advanced Extremely High Frequency satellite system provides survivable, jam-resistant, worldwide, secure communications for the strategic and tactical warfighter. Advanced EHF (AEHF) satellites will replenish the existing EHF system (Milstar) with additional capability and decreased launch costs. The program is utilizing as much commercial technology as possible and will ensure technology development sufficient for a medium launch vehicle-class satellite. The Advanced EHF capability will be available for first launch in 2006.

7. (U) Executive Summary:

(U) The AEHF Program is a follow-on program to replenish the Milstar I/II satellite constellation and to provide Ground Control Segment software upgrades. The program combines the Low Data Rate and Medium Data Rate functions of the Milstar II satellites into a single payload while providing greater capacity and throughput at lower cost. The AEHF satellites will be backward compatible to the Milstar I/II satellite system. The terminal program offices will upgrade Milstar terminals to be compatible with the extended data rates, which AEHF provides.

The two System Definition contracts were awarded August 23, 1999 to Lockheed/TRW and Hughes teams. These contracts will provide the Government with a System Requirements Review, a System Design Review, an end-to-end engineering assessment, a Milstar to AEHF transition plan, a Life Cycle Cost Estimate, and system cost drivers to aid the Government in final determination of operational requirements. At the end of the 18-month System Definition phase the Program Office will select a single AEHF contractor for the Engineering and Manufacturing Development/Production phase. The acquisition includes 5 satellites and associated ground control upgrades.

In a January 17, 1995 memo, the Defense Acquisition Executive (DAE) de-coupled the Advanced EHF and Milstar programs. The Milstar Acquisition Program Baseline was revised to only include the 2 Milstar block I and 4 Milstar block II satellites. The funding was realigned to the Advanced EHF program and extends the EHF survivable, protected communications capability well into the next century.

The AEHF Defense Acquisition Board (DAB) Readiness Meeting (DRM) for Milestone I was held on April 26, 1999. The DAE signed the Milestone I Acquisition Decision Memorandum on May 4, 1999 approving entry into Phase I, System

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Advanced EHF, December 31, 1999

7. (U) Executive Summary (Cont'd):

Definition.

The United States/Canada development and production Memorandum of Understanding (MOU) on AEHF cooperation was signed November 16, 1999. Implementation planning is underway. The Delegation of Disclosure Letter (DDL) has been approved and security procedures are being defined to accommodate a Canadian project officer in the program office.

The United Kingdom (UK) wants to continue discussions on joining the USA Advanced EHF system. Discussions between the two nations' security agencies have resulted in the exchange of unclassified Security Principles white papers describing the accreditation and certification process. In addition, ASD/C3I has continued the discussions with a goal of synchronizing the US/UK decision points, so as to allow the UK the opportunity to join the program.

The Joint Requirement Oversight Council (JROC) met December 13, 1999 and elected to consider the AEHF "Pathfinder" concept for a Milstar Flight 3 replacement. This concept explores the potential of accelerating (December 2004 launch) a "stripped down" version of AEHF as a mitigation of the Milstar Flight 3 loss, followed by delivery of four additional fully capable AEHF satellites. An Integrating Integrated Product Team (IIPT), Overarching Integrated Product Team (OIPT), and Defense Acquisition Executive (DAE) review will be scheduled to consider the merits of terminating the AEHF competition in favor of a sole source award to a team consisting of the contractors currently participating in the competition (the same team that currently produces the Milstar II).

This pre-Milestone II SAR for the System Definition program reports RDT&E funds only in accordance with Title 10, United States Code, Section 2432.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	APR 1999	APR 1999	APR 1999
Contract Award System Definition	OCT 1999	OCT 1999	AUG 1999
Milestone II/III (DAE)	FEB 2001	FEB 2001	FEB 2001
Contract Award EMD/Production	MAR 2001	MAR 2001	MAR 2001
Initial Operational Capability (IOC)	NOV 2007	NOV 2007	NOV 2007
Full Operational Capability (FOC)	MAR 2009	MAR 2009	MAR 2009

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Coverage	Provide global coverage	Provide / World-wide, 24 hrs/day coverage / between 65°S / latitude / to 65°N / latitude	N/A	World-wide, 24 hrs/day coverage between 65°S latitude to 65°N latitude

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

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Capacity	1.2 Gbps CMTW, 600 Mbps Strate- gic	1.2 Gbps/ Support CMTW, / at least 600 Mbps/ 500 Mbps Strate- / for CMTW gic / Scenario / and at / least / 350 Mbps / for / Strate- / gic / Scenario	N/A	Support at least 500 Mbps for CMTW Scenario and at least 350 Mbps for Strate- gic Scenario
Nuclear Protection	Provide assured communi- cations to surviva- ble nuclear forces exposed to the environ- ment speci- fied in NCGS-89- 06, and for those critical networks that support the follow- ing critical func- tio	Provide / Provide assured / assured communi- / communi- cations / cations to / to surviva- / surviva- ble / ble nuclear / nuclear forces / forces exposed / exposed to the / to the environ- / environ- ment / ment speci- / speci- fied in / fied in NCGS-89- / NCGS-89- 06, and / 06, and for / for those / those critical / critical networks / networks that / that support / support the / the follow- / follow- ing / ing critical / critical func- / func- tio / tio	N/A	Provide assured communi- cations to surviva- ble nuclear forces exposed to the environ- ment speci- fied in NCGS-89- 06, and for those critical networks that support the follow- ing critical func- tio

Anti-Jam Protection





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

<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
--------------------------------	---------------------------------------------	--------------------------	-------------------------



Access and Control

Provide users ability to plan, control, & reconfigure their apportioned re-sources; critical func-tions such as situa-tion monitor-ing, decision making,	Provide / users ability to plan, control, & reconfigure their apportioned re-sources; critical func-tions such as situa-tion monitor-ing, decision making, /	Provide / users ability to plan, control, & reconfigure their apportioned re-sources; critical func-tions such as situa-tion monitor-ing, decision making, /	N/A	Provide users ability to plan, control, & reconfigure their apportioned re-sources; critical func-tions such as situa-tion monitor-ing, decision making,
----------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------	-----	----------------------------------------------------------------------------------------------------------------------------------------------------------

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

	Planning Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
	force direction, force management, & plan	force / direction, / force management, & / planni		force direction, force management, & planni
Interoperability AEHF Interoperability	Support joint interoperable war-fighter communications among all military branches EHF terminals	Support / joint interoperable / war-fighter communications / among all military branches / EHF / termin-als	N/A	Support joint interoperable war-fighter communications among all military branches EHF terminals
MILSTAR Backward Compatible	Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system	Operate / with the Milstar system, / at all LDR and MDR terminal supported data rates, / throughout the Milstar transition to the AEHF system / system	N/A	Operate with the Milstar system, at all LDR and MDR terminal supported data rates, throughout the Milstar transition to the AEHF system

(U) AEHF Data Rates



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

<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
--------------------------------	---------------------------------------------	--------------------------	-------------------------



Affordability

Program funding & cost thresholds are set at the funding level for AEHF in the FY00 PB; mile-stone II ORD will reflect the requirements (KPP and non-KPP) which will be	Program funding / thresholds are set at the funding level for AEHF in the FY00 PB; mile-stone II ORD will reflect the requirements (KPP and non-KPP) which will be	Program funding / & cost / thresholds are set at the funding level for AEHF in the FY00 PB; mile-stone II ORD will reflect the requirements (KPP and non-KPP) which will be	N/A	Program funding & cost thresholds are set at the funding level for AEHF in the FY00 PB; mile-stone II ORD will reflect the requirements (KPP and non-KPP) which will be
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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

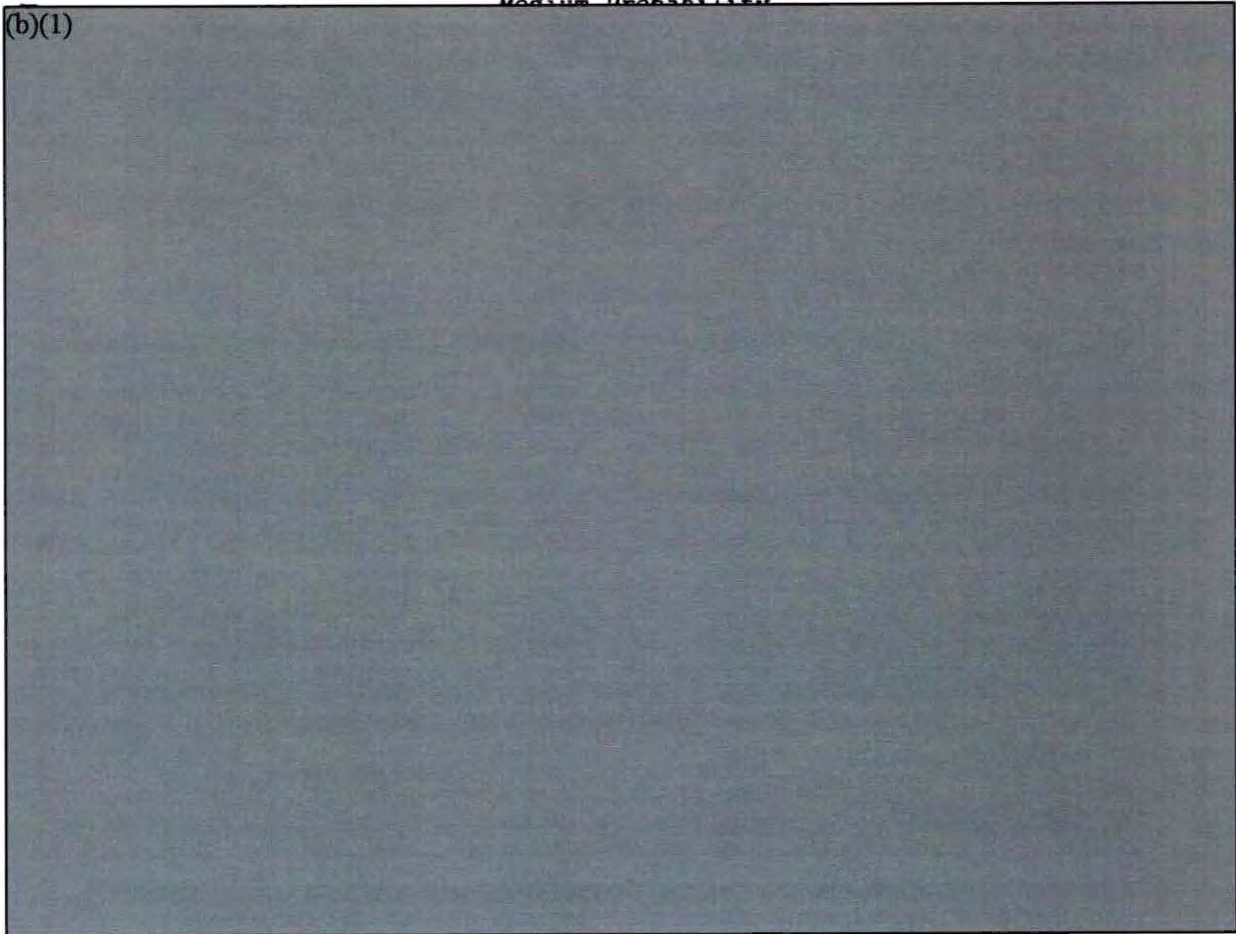
<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
met	met / met		met
within	within / within		within
this	this / this		this
base-	base- / base-		base-
line.	line. / line. To		line. To

(b) 1)

(U)AEHF System Jamming Threats

<u>Jammer Platform</u>	<u>Uplink-EIRP(dBw)</u>	<u>Jammer Platform</u>	<u>Downlink EIRP(dBw)</u>
	<u>Q-Band: 36-46 GHZ</u>	<u>Max. Alt. (ft)</u>	<u>K-Band: 18-26.5 GHZ</u>

Medium Probability



(b)(1)

Advanced EHF, December 31, 1999

10a. ~~(S)~~ Performance Characteristics (Cont'd):

(b)(1)

ACROUYN:

- CMTW - Combined Major Theater War
- HGEC - High Gain Earth Coverage
- HRCA - High Resolution Coverage
- LDR - Low Data Rate
- LGEC - Low Gain Earth Coverage
- MDR - Medium Data Rate
- MRAC - Medium Resolution Coverage
- NCGS - Nuclear Criteria Group Secretariat
- STAR - System Threat Assessment Report
- SOD - Standoff Distance

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. <del>(S)</del> Cost --	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	2471.1	2471.1	2229.6
Procurement	0.0	N/A	0.0
Total Flyaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	<u>0.0</u>	<u>N/A</u>	<u>0.0</u>
Total FY 1999 Base-Year \$	2471.1	2471.1	2229.6
 Escalation	 219.5	 219.5	 156.3
Development (RDT&E)	(219.5)	(219.5)	(156.3)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(N/A)</u>	<u>(0.0)</u>
Total Then Year \$	2690.6	2690.6	2385.9

(U) Industry design approaches are different and will result in a different mix of RDT&E and Procurement costs. Updated numbers will be provided in the MSII/III APB update.

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Advanced EHF, December 31, 1999

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

b. (U) Quantity --	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	2	2	2
Procurement	N/A	N/A	N/A
Total	2	2	2

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2690.6	-	-	2690.6
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-18.5	-	-	-18.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-286.2	-	-	-286.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-304.7	-	-	-304.7
Total Changes	-304.7	-	-	-304.7
Current Estimate	2385.9	-	-	2385.9

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Advanced EHP, December 31, 1999

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

(U) Summary (FY 1999 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2471.1	-	-	2471.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-241.5	-	-	-241.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-241.5	-	-	-241.5
Total Changes	-241.5	-	-	-241.5
Current Estimate	2229.6	-	-	2229.6

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) RDT&E		
Revised escalation indices. (Economic)	N/A	-23.2
Economic adjustment for negative program change. (Economic)	N/A	+4.7
Adjustment for Current and Prior Inflation. (Estimating)	+0.8	+0.8
Revised estimate to reflect differing mix of RDT&E and Procurement funding between the Service Cost Position/Acquisition Program Baseline (APB) and FY2001 President's Budget. This mix will be addressed at MS II/III. (Estimating)	-242.3	-287.0
RDT&E Subtotal	-241.5	-304.7

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	APR 1999	N/A	N/A	APR 1999
Milestone II	FEB 2001	N/A	N/A	FEB 2001
Milestone III	FEB 2001	N/A	N/A	FEB 2001
FUE/IOC	NOV 2007	N/A	N/A	NOV 2007
Total Cost	2690.6	N/A	N/A	2385.9
Total Quantity	N/A	N/A	N/A	N/A
Prog Acq Unit Cost	N/A	N/A	N/A	N/A

(U) Note:

Since this SAR is RDT&E only, program acquisition cost is not applicable. RDT&E funds will provide for two satellites.

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

a. RDT&E --

(U) System Definition:

Hughes Space and Comm, Los Angeles CA  
F04701-99-C0028, FFP  
Award: August 23, 1999  
Definitized: August 23, 1999

	Initial Contract Price		Qty
	Target	Ceiling	
	\$22.2	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$22.2	N/A	0	\$22.2	\$22.2

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.



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15. (U) Contract Information (Cont'd):

(U) <u>System Definition:</u>			Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Lockheed Martin, Sunnyvale, CA					
F04701-99-C0027, FFP			\$22.3	N/A	0
Award: August 23, 1999					
Definitized: August 23, 1999					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$22.3	N/A	0	\$22.3	\$22.3	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>Engineering Model:</u>			Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
TRW, Redondo Beach, CA					
F04701-97-C0025, CPFF			\$59.2	N/A	0
Award: May 21, 1997					
Definitized: May 21, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$61.9	N/A	0	\$61.9	\$61.9	

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.2	\$-0.4
Cumulative Variances To Date (12/31/99)	<u>\$-0.4</u>	<u>\$-0.2</u>
Net Change	\$-0.2	\$0.2

Explanation of Change:

(U) COMPETITION SENSITIVE SCHEDULE:

The favorable change in schedule variance is due to Configurable Onboard Router (COR), Receiver Boards with COR input, output, and controller boards working using bench equipment.

COST:

The unfavorable change in cost variance is due to test set Capital Fabrication (CAB FAB) receiver board late, impacting test progress; added resources to accelerate.

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15. (U) Contract Information (Cont'd):

(U) <u>Engineering Model:</u> Hughes Space and Comm., Los Angeles CA F04701-97-C0026, CPFF Award: May 21, 1997 Definitized: May 21, 1997			<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$64.6	N/A	0		
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$66.7	N/A	0	\$66.7	\$66.7	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$-1.2	\$-2.7	
Cumulative Variances To Date (12/31/99)			\$-3.3	\$-1.8	
Net Change			\$-2.1	\$0.9	

Explanation of Change:

(U) COMPETITION SENSITIVE

Cost:

The unfavorable change in cost variance is due to ASIC (Application Specific Integrated Circuit) fabrication and design verification requiring more time than originally planned.

Schedule:

The favorable change in schedule variance is due to improvements in the delivery of software.

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

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

<u>Appropriation</u>	<u>Prior Years (FY95-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-18)</u>	<u>Total</u>
RDT&E	177.2	95.5	246.4	1866.8	2385.9
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	177.2	95.5	246.4	1866.8	2385.9

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

b. Annual Summary -- Satellites

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1999 Dollars Nonrec	Flyaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				24.1	23.1
1996				31.7	31.0
1997				32.6	32.3
1998				36.3	36.2
1999				54.3	54.6
2000				93.8	95.5
2001				238.4	246.4
2002				495.3	519.8
2003				440.7	470.4
2004				312.8	340.6
2005				218.9	243.1
2006				143.3	162.3
2007				63.1	72.9
2008				4.1	4.8
2009				3.9	4.7
2010				3.8	4.6
2011				3.8	4.8
2012				4.2	5.3
2013				3.9	5.1
2014				3.7	4.9
2015				4.2	5.7
2016				4.0	5.5
2017				4.5	6.3
2018				4.2	6.0
Subtotal	2			2229.6	2385.9

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	2			2229.6	2385.9

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17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 208.9

(U) Percent Total Program Expended: 8.8%

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: F-22

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): F-22

2. (U) DoD Component: USAF

3. (U) Responsible Office and Telephone Number:

F-22 SYSTEM PROGRAM OFFICE	MGEN MICHAEL C. MUSHALA
AERONAUTICAL SYSTEMS CENTER	Assigned: January 17, 1996
WRIGHT-PATTERSON AFB	DSN 785-4167; COMM (937) 255-4167
WPAFB, OH 45433-7003	Michael.Mushala@ASC-YF.WPAFB.AF.MIL

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

RDT&E:

- (U) PE 0207138F
- (U) PE 0603109F (Shared)
- (U) PE 0603230F
- (U) PE 0604227F (Shared)
- (U) PE 0604239F
- (U) PE 0604250F (Shared) Project 643786, 643393

PROCUREMENT:

- (U) APPN 3011 ICN 10F022 (Air Force)

MILCON:

- (U) PE 0207219F
- (U) PE 0604239F

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FOR OPEN PUBLICATION

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

**SAF/PAS**

00 - - 0272

CONGRESSIONAL

~~Classified by: F-22 SCG, 19 Aug 96  
Downgrade instructions:  
Declassify on: X3~~

(THIS PAGE IS UNCLASSIFIED)

~~Reason for classification: E.O. 12958, Section 1.4(a)~~  
\*\*\* ~~SECRET~~ \*\*\*

00-C-0741

5. (U) References:

SAR Baseline (Development Estimate):

(U) Defense Acquisition Executive (DAE) approved Acquisition Program Baseline (APB) dated February 3, 1992.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated October 5, 1998.

6. (U) Mission and Description:

(U) The F-22 is the next-generation multi-mission air superiority fighter for introduction in the early 2000s to counter emerging proliferating world-wide threats. The F-22 is designed to penetrate enemy airspace and achieve a first-look, first-kill capability against multiple targets. F-22 Engineering and Manufacturing Development (EMD) is based on the Weapon System Specification formulated from data developed during the Demonstration/ Validation (Dem/Val) phase. The EMD program consists of design, fabrication, and development testing of 9 EMD flight test vehicles; design, fabrication, development testing, and delivery of 25 EMD flight qualified engines; update of the Dem/Val Avionics Flying Laboratory into a Flying Test Bed for use in developing and integrating the EMD avionics suite; and design and development of F-22 support and training systems. The F-22 program from the outset has placed balanced emphasis on affordability, performance, survivability, and reliability/maintainability. The F-22 is characterized by a low observable highly maneuverable airframe, a new engine capable of supersonic cruise without using afterburner, and advanced integrated avionics.

7. (U) Executive Summary:

(U) In April 1991, the Secretary of the Air Force announced Lockheed Martin Corporation and Pratt & Whitney as the winners of the Advanced Tactical Fighter (ATF) Engineering & Manufacturing Development (EMD) Source Selection and the ATF was re-designated the F-22. Milestone II approval was confirmed by an Acquisition Decision Memorandum (ADM) August 1, 1991 and contracts awarded on August 2, 1991.

In December 1992, a combination of government and contractor funding shortfalls led to a rephase of the F-22 program. At the same time, the Air Force reduced the number of EMD aircraft from 11 to 9 and the number of engines from 33 to 27. The resulting EMD program schedule slipped twelve months and the production program slipped one fiscal year. The air vehicle Preliminary Design Review (PDR) was completed on April 30, 1993. In August 1994, FY94 and FY95 funding reductions led to a second rephase of the program, slipping the EMD and production programs an additional eight months.

In 1994, The Air Force Chief of Staff directed the program to conduct a study of the cost and benefits of various levels of privatized depot management and maintenance. This study highlighted major investments in an organic depot

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7. (U) Executive Summary (Cont'd):

capability should be based on obtaining adequate operational use data. It further showed that, for the F-22, adequate operational experience on most subsystems would not be available until at least three years later than when organic depot investments were planned to begin. Consequently, one of the study's conclusions was that delaying initial investment in an organic depot capability by at least three years appeared prudent. As a result, the Air Force delayed activation of the organic depot by three years from December 2006 to December 2009.

In February 1995, The air vehicle Critical Design Review (CDR) was held. In October 1995, a third program rephase was required due to Congressional and DoD funding reductions in FY95 and FY96 which resulted in a three month slip to first flight, six month extension to EMD, and six month slips to production milestones.

In May 1996, SAF/AQ chartered a Joint Estimate Team (JET) to review the F-22 program cost. Projected cost growth for the PPV aircraft, coupled with EMD cost growth, prompted formation of this team. The DAB principals reviewed the restructured program on February 5, 1997 and subsequently the DAE issued an Acquisition Decision Memorandum (ADM) on February 11, 1997, approving the recommended program strategy. The restructured program included the deletion of 1 EMD engine (27 to 26), the PPV articles and utilization of two EMD aircraft and the first two aircraft produced after the EMD articles for dedicated Initial Operational Test & Evaluation (IOT&E), scheduled to begin in August 2002. In addition, the EMD program was extended by nine months, providing more time to complete the avionics development and test. A key part of the restructured program is to incentivize the contractors to lower the cost of EMD by sharing a portion of any underrun to the estimated cost with the contractors. Another integral part of this strategy is a contractor/government agreement on a Target Price Curve (TPC) for Low Rate Initial Production (LRIP) which leads to an affordable F-22 air vehicle Average Unit Production Price (AUPP). Key to achievement of this integrated strategy is the Affordability Incentive Program (AIP) in which the contractors make investments toward achieving the TPC and AUPP.

As a result of the May 1997 Quadrennial Defense Review (QDR), ramp rates for LRIP were adjusted. The QDR reduced the overall production quantity buy from 438 to 339 aircraft, slowed down the LRIP ramp rate, and limited maximum production to 36 aircraft per year versus 48 aircraft per year. A SAF/AQ memorandum, dated June 10, 1997, directed the program office to begin implementing the QDR recommendation, using an LRIP ramp rate of 2, 6, 10, 16, 24, 36, for Lots 1 through 6 [subsequently Production Representative Test Vehicles (PRTV) and Lots 1-5 and now PRTV, PRTV II, and LRIP Lots 1-4]. Additionally, the program office received guidance from Air Combat Command (ACC), August 7, 1997, restructuring the site activation profile based on the QDR production profile.

The National Defense Authorization Act for FY98 capped the EMD and production

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7. (U) Executive Summary (Cont'd):

program costs. SECAF advised the Congressional Defense Committees on January 14, 1998 that the USAF was adjusting the EMD cap upward and the production cap downward by \$352.6M for Diminishing Manufacturing Sources (DMS) redesign efforts. Selected parts and redesigns for the production articles for Lots 1-5 (subsequently PRTV-Lot 4 and now PRTV, PRTV II, and LRIP Lots 1-3) were procured ahead of the PRTV advanced procurement release as required in order to buy Out of Production Parts (OPP) and associated redesign efforts associated with producing the F-22. This will mitigate cost and schedule impacts to the F-22 program.

In March 1999, a replan was accomplished on the Engine EMD contract. This replan implemented several developmental cost reduction plans (DCRPs) including the deletion of one flight test engine (26 to 25), two (2) nozzles, two (2) gearboxes, and eight (8) anti-ice systems, and the conversion of the remaining EMD award fee to fixed fee. Additionally, acquisition strategy planning for the F-22 Lot 1 (was Lot 2) production effort, ten (10) production aircraft and twenty (20) associated engines, continued in 1999. On February 10, 1999, SAF/AQ reviewed the acquisition strategy and instructed the program office to proceed with preparations for the Lot 1 (was Lot 2) Advance Buy and the PRTV II (was Lot 1) awards.

In November 1999, the SPO established the Performance-based Agile Logistics Support (PALS) Executive Steering Group (ESG). The ESG provides effective planning between HQ AFMC and the F-22 System Program Office. The ultimate goal is to ensure a successful PALS ASP (10/00) and contract award (12/01).

In December 99, the F-22 program successfully completed a Defense Acquisition Executive (DAE) program review and awarded the PRTV II and Lot 1 Advance Buy contracts on December 30, 1999. The National Defense Appropriation Act for FY00, P.L.106-79, appropriated \$1.0B for F-22 program research, development, test and evaluation, and advance procurement. Approximately \$277M of the \$1.0B was used for advance buy of F-22 aircraft (Lot 1 (10)). The balance of the funds were used for award of the PRTV II (6) aircraft, an amount which represents only the FY00 increment of effort. An additional \$300M was appropriated for F-22 program termination liability or for other F-22 program contractual requirements in lieu of termination liability obligations. These funds are not available for expenditure until October 1, 2000 and currently reside in the OSD transfer account; therefore, they are not included in the FY01 President's budget. As a result of incrementally funding the six PRTV II aircraft, RDT&E requirements exist for additional funds in FY01 (\$404M) and FY02 (\$148M) to complete the effort. Award of a full funding contract for low-rate initial production cannot take place until successful completion of the FY00 Program Criteria as stated in ADM, December 22, 1999.

Flight testing at the Combined Test Force (CTF), Edwards AFB is currently being performed with both EMD aircraft 4001 and 4002.



8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	Yes
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Breaches in Low Rate Initial Production (LRIP), Low Rate Production Contract Award, and LRIP First Delivery were caused by the FY00 National Defense Appropriations Act, PL-106-79, renaming Lot 1 as PRTV II and Lot 2 as Lot 1.

The MILCON estimate represents the latest Service Cost Position (SCP) to include requirements through FY10. This new estimate breaks the current APB threshold. A Program Deviation Report (PDR) was submitted to update the objective/threshold.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I (DSARC)	OCT 1986	OCT 1986	OCT 1986
Dem/Val Contract Award (Airframe only)	OCT 1986	OCT 1986	OCT 1986
Early Operational Assessment Start	OCT 1986	OCT 1986	OCT 1986
Complete	MAR 1991	MAR 1991	MAR 1991
System Requirements Review	MAY 1987	MAY 1987	MAY 1987
System Design Review	NOV 1989	NOV 1989	NOV 1989
Prototype First Flight	JUN 1990	JUN 1990	AUG 1990
Milestone II (DAB)	JUN 1991	JUN 1991	JUN 1991
EMD Contract Award	AUG 1991	AUG 1991	AUG 1991
Preliminary Design Review Complete	OCT 1992	APR 1993	APR 1993
Critical Design Review Complete	OCT 1993	FEB 1995	FEB 1995
Engine Initial Flight Release	OCT 1994	APR 1997	MAY 1997

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

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
PPV Long Lead	JAN 1995	N/A	N/A
First Flight	SEP 1995	MAY 1997	SEP 1997
DT&E			
Start	SEP 1995	MAY 1997	SEP 1997
Complete	DEC 1999	AUG 2002	AUG 2002
PPV Contract Award	JAN 1996	N/A	N/A
Low Rate Initial Production (LRIP) Decision	OCT 1996	NOV 1999	DEC 2000(Ch-1)
Low Rate Production Contract Award	JAN 1997	DEC 1999	DEC 2000(Ch-1)
LRIP First Delivery	JAN 1999	MAR 2002	MAR 2003(Ch-1)
Dedicated IOT&E			
Start	JUN 1999	AUG 2002	AUG 2002
Complete	SEP 1999	FEB 2003	FEB 2003
Milestone III	DEC 1999	JUL 2003	AUG 2003
High Rate Production Contract Award	JAN 2001	NOV 2003	DEC 2003
Initial Operational Capability	SEP 2003	DEC 2005	DEC 2005
Organic Organizational Maintenance Capability	SEP 2003	N/A	N/A
Required Assets Availability (RAA)	OCT 2002	SEP 2005	SEP 2005
Organic Depot Activation	SEP 2003	N/A	N/A

b. Current Change Explanations --

(U) (Ch-1) The current estimates for Low Rate Initial Production (LRIP), Low Rate Production Contract Award, and LRIP First Delivery were modified by one year due to the FY00 National Defense Appropriations Act, PL-106-79, renaming Lot 1 as PRTV II and Lot 2 as Lot 1.

Low Rate Initial Production (LRIP)  
From Nov 99      To Dec 00

Low Rate Production Contract Award  
From Dec 99      To Dec 00

LRIP First Delivery  
From Mar 02      To Mar 03

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10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate		
Combat Radius (at optimum altitude)(nm) Sub & Supersonic Subsonic Mission Missile Load	(b)(1)	8cc	8cc / 4 AIM-120 + 2 / AIM-9	TBD	6 AIM-120C + 2 AIM-9#	(Ch-1)
Sortie Generation Rate (Wartime, per day) Days 1 to 6 C-141's for Deployment (#a/c)	(b)(1)	8	/ 8	TBD	(b)(1)	(Ch-1)
Radar Cross Section (RCS)	*	*	/ *	TBD	***	
Maneuverability (max power sustained G) (30000 ft) (mach) @0.9 Mach Supercruise Vmax/Opt Alt/Mil Power (Mn) Acceleration/.8-1.5/30K (sec)	(b)(1)			TBD	(b)(1)	
Radar Detection Range (RDR)	*	*	/ *	TBD		(Ch-2)
Mean Time Between Maintenance (MTBM) (hrs)	3.0	3.0	/ 3.0	TBD	3.0	(Ch-1)
USD(A) Risk Assessment Items: Mission Effectiveness (Compared to current operational F-15 at time of IOT&E)	2	2	/ 2	TBD	2***	
Direct on-and-off Maintenance Personnel (spaces per ac)	8.7	8.7	/ 8.7	TBD	7.8	(Ch-1)
Weight Empty Engine Thrust (.9 Mach @ 30K, Max)	(b)(1)			TBD	(b)(1)	(Ch-1)

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

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
(1.5 Mach @ 45K, Mil)	(b)(1)		TBD	(b)(1)
Fuel Consumption (specific fuel consumption)	(b)(1)			
(.9 Mach @45K @2850 lbs thrust)	(b)(1)		TBD	(Ch-1)
(1.5 Mach @45K @8390 lbs thrust)	(b)(1)		TBD	(Ch-1)
Warning Time *	*	*	/ *	***
Angle of Arrival (AOA) @ X Freq *	*	*	/ *	***

(U) \* Classification/control is beyond the level of this document.

(U) # Estimate reflects capability with a full primary mission load.

(U) ## Current Estimate is better than threshold.

(U) \*\*\* A mission scenario was assumed for estimating purposes. The current estimate will be updated when the scenario is refined.

b. Current Change Explanations --

(Ch-1) Fluctuations in the changed parameters from the last SAR resulted from completed tradeoff studies and incorporation of engineering changes.

Changes:

	FROM Dec 98	TO Dec 99
(b) Combat Radius - sub & supersonic	(b)(1)	(b)(1)
(b) C-141s for Deployment (#a/c)	(b)(1)	(b)(1)
Mean Time Between Maintenance hrs	(b)(1)	(b)(1)
Direct on-and-off Maintenance Personnel	(b)(1)	(b)(1)
(b) A/C Weight - Empty	(b)(1)	(b)(1)
Specific Fuel Consumption	(b)(1)	(b)(1)
(b) 0.9 Mach @ 45K @ 2850 lbf thrust	(b)(1)	(b)(1)
(b) 1.5 Mach @ 45K @ 8390 lbf thrust	(b)(1)	(b)(1)

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

(U) (Ch-2) This parameter was not previously shown in this document due to its classification. It has now been downgraded to ~~Secret~~ and can be included.

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	16560.0	19614.9	20973.6
Procurement	43510.0	28286.6	27137.7
Airframe	(21485.7)		(12039.4)
Engines	(5993.7)		(3953.0)
Avionics	(9250.6)		(5785.8)
Special Projects			(178.2)
Munitions			(63.6)
Total Nonrecurring			(933.7)
Total Flyaway	(36730.0)		(22953.7)
Other Weapon Systems	(1032.1)		(506.1)
Peculiar Support	(1896.1)		(3657.7)
Initial Spares	(3851.8)		(20.2)
Construction (MILCON)	200.0	139.2	196.6
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1990 Base-Year \$	60270.0	48040.7	48307.9
Escalation	38839.0	17892.5	13632.2
Development (RDT&E)	(2969.0)	(3067.5)	(3118.2)
Procurement	(35762.0)	(14750.3)	(10448.2)
Construction (MILCON)	(108.0)	(74.7)	(65.8)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	99109.0	65933.2	61940.1
 b. (U) Quantity --			
Development (RDT&E)	0	2	8
Procurement	<u>648</u>	<u>339</u>	<u>333</u>
Total	648	341	341

(U) Note: The current Low Rate Initial Production (LRIP) quantity is 52 aircraft. The previous development quantity was 15 articles, 9 non-fully configured and 6 fully configured units. The FY00 Appropriations bill increased the EMD aircraft quantity to 15 (8 of the 15 EMD aircraft are projected to be fully configured and used for IOT&E). The first 2 PRTV aircraft will also be used for IOT&E prior to fielding into Air Force inventory.

c. Foreign Military Sales -- None.

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

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (OCT 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1990 BY\$)	48040.7	48307.9	
(2) Quantity	341	341	
(3) Unit Cost	140.882	141.665	+0.56
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1990 BY\$)	28286.6	27137.7	
(2) Quantity	339	333	
(3) Unit Cost	83.441	81.495	-2.33

(U) \$300M of FY00 RDT&E funding (3600) was appropriated for F-22 program termination liability or for other F-22 program contractual requirements in lieu of termination liability obligations. These funds are not available for expenditure until October 1, 2000 and currently reside in the OSD transfer account; therefore, they are not included in the FY01 President's budget. The PAUC numbers reflect this action.

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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	19529.0	79272.0	308.0	99109.0
Previous Changes:				
Economic	-810.5	-9598.1	-49.5	-10458.1
Quantity	-520.9	-32114.1	-	-32635.0
Schedule	+1870.2	+4343.6	-	+6213.8
Engineering	+265.9	-17.9	+5.0	+253.0
Estimating	+2458.5	+2350.3	-39.5	+4769.3
Other	-	-	-	-
Support	+2.4	-4514.3	-	-4511.9
Subtotal	+3265.6	-39550.5	-84.0	-36368.9
Current Changes:				
Economic	-27.6	-615.6	-3.0	-646.2
Quantity	+1062.9	-1363.0	-	-300.1
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+49.9	+424.8	+41.4	+516.1
Other	-	-	-	-
Support	+212.0	-581.8	-	-369.8
Subtotal	+1297.2	-2135.6	+38.4	-800.0
Total Changes	+4562.8	-41686.1	-45.6	-37168.9
Current Estimate	24091.8	37585.9	262.4	61940.1

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

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	16560.0	43510.0	200.0	60270.0
Previous Changes:				
Quantity	-427.1	-15224.6	-	-15651.7
Schedule	+1415.9	+101.1	-	+1517.0
Engineering	+202.7	+52.9	+4.0	+259.6
Estimating	+2110.8	+2076.6	-46.1	+4141.3
Other	-	-	-	-
Support	+45.3	-2171.6	-	-2126.3
Subtotal	+3347.6	-15165.6	-42.1	-11860.1
Current Changes:				
Quantity	+856.5	-1089.9	-	-233.4
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+39.7	+307.6	+38.7	+386.0
Other	-	-	-	-
Support	+169.8	-424.4	-	-254.6
Subtotal	+1066.0	-1206.7	+38.7	-102.0
Total Changes	+4413.6	-16372.3	-3.4	-11962.1
Current Estimate	20973.6	27137.7	196.6	48307.9

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-27.6
Transfer of PRTV II aircraft to RDT&E. (Quantity)	+856.5	+1062.9
Adjustment for Current and Prior Inflation. (Estimating)	+10.1	+12.3
Revised estimate to realign with EMD funding cap (Estimating)	+4.6	+6.3
Shortfall funding to EMD cap (Estimating) (Support)	+25.0 +169.8	+31.3 +212.0
RDT&E Subtotal	+1066.0	+1297.2
(2) <u>Procurement</u>		
(Economic)	N/A	-615.6
(Estimating)	+17.7	+21.9
(Estimating)	+289.9	+402.9
(Support)	-256.7	-372.1
(Support)	+1.9	+2.3
(Quantity)	-1089.9	-1363.0



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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
(Support)	-169.6	-212.0
Procurement Subtotal	-1206.7	-2135.6

(3) MILCON

Revised escalation indices. (Economic)	N/A	-3.0
Estimate increases due to increased facility costs determined during site surveys and design reviews for Tyndall AFB and Langley AFB facilities. (Estimating)	+25.3	+32.6
Rephasing of MILCON costs to better align with F-22 site activation plan. (Estimating)	+13.4	+8.8
MILCON Subtotal	+38.7	+38.4

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
152.95	-32.56	+41.11	+18.22	+0.74	+15.50	--	-14.32	+28.69	181.64

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
122.33	-30.67	+15.19	+13.04	-0.05	+8.33	--	-15.30	-9.46	112.87

~~Section 1.5(a)~~  
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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	OCT 1985	OCT 1986	N/A	OCT 1986
Milestone II	DEC 1988	JUN 1991	N/A	JUN 1991
Milestone III	DEC 1991	DEC 1999	N/A	AUG 2003
FUE/IOC	N/A	SEP 2003	N/A	DEC 2005
Total Cost	3282	99109	N/A	61940.1
Total Quantity	N/A	648	N/A	341
Prog Acq Unit Cost	N/A	152.95	N/A	181.64

(U) \$300M of FY00 3600 was appropriated for F-22 program termination liability or for other F-22 program contractual requirements in lieu of termination liability obligations. These funds are not available for expenditure until 1 Oct 00 and currently reside in the OSD transfer account; therefore, they are not included in the FY01 President's budget. The PAUC numbers reflect this action.

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

a. RDT&E --	Initial Contract Price		
(U) F-22 EMD (LMAS):	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
LOCKHEED MARTIN CORP, Marietta, GA			
F33657-91-C-0006, CPAF	\$9550.1	N/A	11
Award: August 2, 1991			
Definitized: August 2, 1991			
Current Contract Price		Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>
\$14043.5	N/A	\$14596.3	\$14955.0
	<u>Qty</u>		
	9		
		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		\$-174.3	\$-53.6
Cumulative Variances To Date (11/30/99)		\$-247.6	\$-54.4
Net Change		\$-73.3	\$-0.8

Explanation of Change:

(U) The -\$73.3M unfavorable change in the cost variance through Nov 99 represents negative change since the December 98 SAR. During this reporting period, Airframe A&I, Forward and Aft Fuselage, Wing, CNI, and Overhead/Other Burdens experienced the most significant variances. The Airframe Analysis and Integration variance is in manufacturing computing costs centers, MRB Engineering, stores materials, traveled work to LMAS,

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15. (U) Contract Information (Cont'd):

freight from invoice timing, and distributed material from wing assembly disruptions. The Forward Fuselage variance is primarily due to parts growth at LMSW and outside production vendors resulting from configuration changes leading to some parts being scrapped or requiring rework. In addition, increased parts growth and replacements parts required for static and fatigue, increased raw material to support for EMD lot 3 and lot 4 fabrication, and composite material usage in assembly have driven the negative variance. The AFT Fuselage cost variance is driven primarily by the change activity. This activity resulted from the block II SSOR analysis/increased airframe loads requiring redesign and retrofit repairs. The Wing cost variance is primarily driven by an assembly disruption, out of sequence work required to recover from late delivery of side body castings. During the reporting period, the Communication, Navigation and Identification (CNI) systems experienced cost growth in hardware pre-delivery activities, software integration and subsystem test activities. Electronic Warfare efforts continue to be impacted by late hardware and longer than planned software integration and subsystem test efforts. Last, the Overhead/Other burdens variance was caused by a IAM Labor settlement at Boeing.

The cumulative cost variance of -\$247.6M is largely driven by the negative variance in Air Vehicle which has overruns in Airframe and Final Assembly as well as Avionics. The Airframe and Final Assembly variance is caused by raw material, outside production, non-recurring tooling changes, and labor costs needed to support design changes on the aft and forward fuselages. The wing was impacted by more machining work than expected and early producibility problems with the large structural castings used in the wing, such as flaw sizes larger than accounted for in the analysis. Late delivery of these castings has caused a cascade of work-a-rounds, increased traveled work, and driven the need for additional tooling to recover schedule. Avionics experienced front end electronics software slips, backplane redesign and rework, hardware predelivery and software integration and test cost growth in the Communication, Navigation and Identification (CNI) systems which added to the variance. The Electronic Warfare efforts also had higher than expected software integration costs due to late engineering releases, supplier overruns, and lower than expected software productivity as well as hardware and software integration and subsystem test efforts.

The -\$0.2M unfavorable schedule variance is caused by variances in the Wing, Radar, and CNI. Later deliveries, schedule recovery, and scheduled adjustments account for these minor variances.

The cumulative schedule variance of -\$54.2M reflects late deliveries of side-of-body castings and flaws in the wing assemblies, parts shortages for the ailerons, flaperons, and vertical leading edges. Software slips and backplane redesign for the communications and navigation systems, as well as late engineering releases, design changes and testing rework in the

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15. (U) Contract Information (Cont'd):

electronic warfare systems add to the total schedule variance.

[The cumulative cost variance does not include an unfavorable cost variance of \$181.2M which existed prior to the June 1995 cost growth baseline implementation and an unfavorable \$394.8M which existed prior to the March 1997 cost growth baseline implementation.]

[The cumulative schedule variance does not include an unfavorable schedule variance of \$59.4M which existed prior to the June 1995 cost growth baseline implementation and the unfavorable \$177.4M which existed prior to the March 1997 cost growth baseline implementation.]

The \$147.1M increase in the Current Contract Price since the December 1998 SAR reflects modifications to the contract for multiple engineering change proposals as well as results from award fee determinations.

(U) Contract Comments:

Note: The Contractor Estimated Price At Completion and the Program Manager Estimated Price At Completion amounts include production funding for DMS parts buy and Seek Eagle funding from Eglin AFB.

				Initial Contract Price		
				Target	Ceiling	Qty
(U) <u>EMD ENGINE (P&amp;W):</u>						
PRATT&WHITNEY - GOVT, WEST PALM BEACH FL						
F33657-91-C-0007, CPEF				\$1375.1	N/A	33
Award: August 2, 1991						
Definitized: August 2, 1991						
				Estimated Price At Completion		
				<u>Contractor</u>	<u>Program Manager</u>	
				\$2227.9	\$2224.3	
				<u>Cost Variance Schedule Variance</u>		
				\$-16.1	\$-13.9	
Previous Cumulative Variances				\$-17.8	\$-2.8	
Cumulative Variances To Date (11/30/99)				\$-1.7	\$11.1	
Net Change						

Explanation of Change:

(U) The Performance Measurement Baseline was updated to reflect the F119 EMD Restructure which was placed on contract on August 25, 1997.

Through November 1999, the cumulative unfavorable cost variance was -\$17.8M (-0.9%). This is a decline of -\$1.7M from the December 1998 SAR. The cumulative variance drivers include the nozzle, engine test, externals, compressor, and lube system WBS elements.

15. (U) Contract Information (Cont'd):

Through November 1999, the cumulative unfavorable schedule variance was -\$2.8M (-0.1%). This variance is an improvement of \$11.1M from the December 1998 SAR. The cumulative variance drivers include controls, engine test, compressor, fan, and high pressure turbine WBS elements.

[The cumulative cost variance does not include an unfavorable \$41.3M cost variance which existed prior to the August 1995 cost growth baseline implementation or an unfavorable \$34.8M cost variance which existed prior to the FY97 program restructure.]

[The cumulative schedule variance does not include an unfavorable \$21.4M schedule variance which existed prior to the August 95 cost growth baseline implementation or an unfavorable \$11.2M schedule variance which existed prior to the FY97 program restructure.]

The \$20.9M increase in the Current Contract Price since the December 1998 SAR reflects the replan of the EMD program and the results of the award fee determination.

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

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

<u>Appropriation</u>	<u>Prior Years (FY83-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-13)</u>	<u>Total</u>
RDT&E	19389.6	1945.1	1411.8	1345.3	24091.8
Procurement	879.4	284.5	2556.2	33865.8	37585.9
MILCON	21.1	18.6	25.3	197.4	262.4
O&M	-	-	-	-	-
Total	20290.1	2248.2	3993.3	35408.5	61940.1

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

b. Annual Summary -- Advanced Tactical Fighter

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983				24.8	20.0
1984				40.7	34.1
1985				104.8	90.8
1986				171.5	152.1
1987				320.6	297.2
1988				529.8	504.4
1989				801.7	800.1
1990				1093.6	1124.2
1991				893.4	953.3
1992				1463.4	1606.8
1993				1717.4	1925.2
1994				1806.0	2058.8
1995				1962.7	2280.6
1996				1820.9	2154.1
1997				1515.4	1815.4
1998				1667.2	2010.7
1999				1283.3	1561.8
2000				1578.8	1945.1
2001				1128.5	1411.8
2002				677.7	860.7
2003				246.5	318.5
2004				63.1	83.1
2005				61.8	83.0
Subtotal	8			20973.6	24091.8

(U) 1) The F-22 EMD program is currently Congressionally capped at \$18,688M. SECAF advised the Congressional Defense Committees on January 14, 1998 that the USAF was adjusting the cap upward by \$353M for OPP redesign efforts. The FY00 Appropriations bill adjusted the cap upward an additional \$1,575M by moving the PRTV II aircraft to RDT&E. An additional adjustment of \$173.1M for negative inflation adjusted the cap to \$20,442.5M.

2) \$300M of FY00 RDT&E funding (3600) was appropriated for F-22 program termination liability or for other F-22 program contractual requirements in lieu of termination liability obligations. These funds are not available for expenditure until October 1, 2000 and currently reside in the OSD transfer account; therefore, they are not included in the FY01 President's budget.

3) PE 0207138F is a new program element for F-22 Support. Included within

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

this PE are funds for post EMD support (EMD end in Sep 03). FY04 and FY05 3600 funding is for required Block 5 OFP upgrades. These funding increments are not considered part of the EMD Congressional funding cap.

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				6.2	7.5
1998				60.1	73.3
1999	2	48.8	468.5	647.8	798.1
2000			166.1	226.5	283.1
2001	10	123.1	1463.6	2010.6	2553.5
2002	16	140.1	1897.5	2342.1	3023.6
2003	24	200.1	2218.2	3290.7	4330.6
2004	36	155.5	2525.9	2975.8	3993.5
2005	36	49.2	2229.0	2623.3	3591.3
2006	36	42.0	2105.3	2500.4	3493.0
2007	36	34.4	1992.7	2330.3	3318.3
2008	36	31.1	1897.9	2474.6	3595.6
2009	36	43.7	1818.3	2046.6	3033.1
2010	36	31.1	1716.4	1981.7	2996.3
2011	29	34.6	1426.9	1451.4	2238.1
2012			30.1	84.2	132.5
2013				21.8	34.9
2014					
2015					
Subtotal	333	933.7	21956.4	27074.1	37496.3

(U) Procurement funding requirements remain within the congressionally directed cap of \$43,400M. SECAF advised the Congressional Defense Committees on January 14, 1998 that the USAF was adjusting the cap downward by \$353M for OPP redesign efforts. The FY00 Appropriations bill adjusted the cap downward an additional \$1,575M by moving the PRTV II aircraft to RDT&E. An additional adjustment of \$3.886B for negative inflation adjustments adjusts the cap to \$37,586M.

~~From Classification E.O. 12958, Section 1.5(a)~~  
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16b. (U) Program Funding Summary (Cont'd):

Appropriation: 3011 - Procurement of Ammunition, Air Force

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999			0.4	0.4	0.5
2000			1.1	1.1	1.4
2001			2.1	2.1	2.7
2002			3.3	3.3	4.3
2003			4.9	4.9	6.4
2004			7.1	7.1	9.5
2005			6.9	6.9	9.4
2006			6.7	6.7	9.4
2007			6.6	6.6	9.4
2008			6.5	6.5	9.4
2009			6.5	6.5	9.6
2010			6.4	6.4	9.7
2011			5.1	5.1	7.9
Subtotal			63.6	63.6	89.6

(U) Per Air Force guidance, funding for chaff and flares must be appropriated munitions. Funds were reprogrammed from 3010 to munitions in Sep 98.

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				3.9	4.6
1996				10.1	12.1
1997				3.6	4.4
1998					
1999					
2000				14.9	18.6
2001				20.0	25.3
2002				40.1	51.6
2003				13.3	17.4
2004				12.5	16.8
2005				9.7	13.2
2006				17.1	23.8
2007				16.2	23.0
2008				16.1	23.3
2009				16.0	23.7
2010				3.1	4.6
Subtotal				196.6	262.4

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~~Reason for Classification: E.O. 12958, Section 1.5(a)~~



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

(U) The MILCON estimate represents the latest Service Cost Position (SCP) to include requirements through FY10. This new estimate breaks the current APB threshold and requires a Program Deviation Report (PDR) to update the objective/threshold.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	341	933.7	22020.0	48307.9	61940.1

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	2	2
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.6%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 20024

(U) Percent Total Program Expended: 32.3%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

For purposes of this cost comparison, the F-22 concept of operations is assumed to be a 24 aircraft fighter squadron with a utilization rate of 332 flight hours per aircraft per year. The wartime scenario was used to estimate the manpower. The peacetime utilization rate for the weapon system was used to estimate the O&S cost. Training and combat coded squadrons were addressed as operationally the same for this O&S estimate. Total aircraft buy for the F-22 is 339. Total aircraft included in the F-22 O&S estimate is 283, the number of Primary Aircraft Inventory (PAI) aircraft.

The F-15C is antecedent to the F-22; both are two engine air-to-air fighters with similar operational concepts. The F-15C estimate was updated based on the latest fleetwide data for FY96 from the Visibility and Management of Operating and Support Costs (VAMOSOC) database. For purposes of this cost comparison, the F-15C concept of operation is a 24 aircraft fighter squadron with 297 PAI and a fleetwide utilization rate of 100,664 flying hours.

The F-22 estimate was based on a combination of AFI 65-503 Cost and Planning

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

Factors and information provided in the contractor's Affordability Analysis.

The Air Force is in the process of developing updated estimates of F-15C and F-22 to provide an equitable comparison of ownership costs. These estimates will be completed in time to support the Dec 00 DAB milestone.

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
Mission Pay & Allowances	15.0	26.2
Unit Level Consumption	28.6	35.7
Intermediate Maintenance	0.0	0.0
Depot Maintenance	1.4	8.8
Contractor Support	2.5	4.2
Sustaining Support	9.7	5.8
Indirect Costs	5.7	25.3
acts	N/A	N/A
Total	62.9	106.0

DD-5 NTW

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)B23)  
PROGRAM: NTW TBMD

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Navy Theater Wide (NTW) Theater Ballistic Missile Defense (TBMD)
2. (U) DoD Component: BMDO  
  
Joint Participants:  
U.S. Navy
3. (U) Responsible Office and Telephone Number:  
PEO Theater Surface Combatants      CAPT P. M. Grant III  
Attn: PMS 452      Assigned: May 22, 1998  
2531 Jefferson Davis Hwy      DSN N/A; COMM 703-769-6944  
Arlington, VA 22242-5160      grantpm@navsea.navy.mil
4. (U) Program Elements/Procurement Line Items:  
RDT&E:  
(U) PE 0603868C

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MAR 27 2000      **6**

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Downgrade instructions: Multiple Sources  
Declassify on: X1, X2, X3~~

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5. (U) References:

SAR Baseline (Planning Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated May 4, 1999.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated May 4, 1999.

6. (U) Mission and Description:

(U) The Navy Theater Wide (NTW) Theater Ballistic Missile Defense (TBMD) Program builds on the national investment in AEGIS cruisers, weapon systems, and Navy STANDARD Missile-2 (SM-2) Block IV missiles. The NTW TBMD System provides defense in depth from the threat of Theater Ballistic Missile (TBM) attack for U.S. and allied forces overseas, including vital areas, critical military assets, population centers, and large geographic regions. NTW TBMD takes advantage of available sea room and ship mobility to achieve intercepts on the target TBM in the ascent, mid-course, and terminal stages of exo-atmospheric flight. NTW supports U.S. political and military objectives, and reassures coalition allies without requiring permission or support. This program does not replace another system.

A follow-on NTW Block II system will be a major upgrade to Block I and will be baselined at a later date. For reference and comparison purposes, the threshold and objective Key Performance Parameters contained in the Naval TBMD Operational Requirements Document (ORD) for the future Block II system are included in the classified portion of this Selected Acquisition Report (SAR).

7. (U) Executive Summary:

(U) The SM-3 (NTW missile) and the SM-2 Block IV (long range Anti-Air Warfare (AAW)) share the same propulsion system in their first and second stages; therefore, it was a requirement of the NTW TBMD program to complete two safe SM-2 Block IV firings as a prerequisite to the Control Test Vehicle (CTV)-1A event. On July 1, and August 5, 1999 two SM-2 Block IV production qualification rounds were successfully fired at the White Sands Missile Range. Two additional SM-2 Block IV production qualification rounds were fired from USS O'KANE (DDG 77) on December 14 and 16, 1999 during Combat Systems Ship Qualification Trials (CSSQT). The success of the SM-2 Block IV firings demonstrated the safety of the propulsion system in an at sea environment, and validated the producibility of the first and second stage propulsion system. This significantly reduces risk to SM-3 development.

A Memorandum of Understanding (MOU) between the U.S. and the Government of Japan was signed August 16, 1999 announcing joint ballistic missile defense research. The agreement calls for the two countries to conduct analysis, preliminary design, and risk reduction within the Requirements, Analysis and Design (RA&D) phase for the SM-3 Block II guided missile.

The NTW program participated in the Theater Missile Defense Critical

7. (U) Executive Summary (Cont'd):

Measurements Program (TCMP-3A) flight experiment conducted at the Kwajalein Missile Range (KMR) on September 6, 1999. During this exercise, critical program data was obtained toward completing the NTW Block I Program Definition and Risk Reduction (PD&RR) exit criteria. Interoperability was again demonstrated with AEGIS baseline programs, and critical SM-3 missile and AEGIS SPY-1 radar high range resolution data was obtained for future use with weapon system and missile design trade studies.

The NTW TBMD program completed the first in a series of SM-3 guided missile flight tests with the successful launch of the AEGIS Lightweight Exo-Atmospheric Projectile (LEAP) Intercept (ALI) CTV-1A from USS SHILOH (CG 67) on September 25, 1999 at the Pacific Missile Range Facility (PMRF), Kauai, HI. The flight demonstrated the successful control and stability of the SM-3 missile through third stage separation.

Successful Third Stage Rocket Motor (TSRM) tests in October, November, and December 1999 finalized TSRM design development and verified performance in a flight representative environment.

The Department's guidance on Upper Tier programs directed the Navy to continue the evolutionary block approach, through an initial system flight test program (ALI), followed by three developmental increments of the Block I system (First Unit Equipped (FUE) for NTW Block IA/IB/IC in FY06/08/10). The existing NTW budget provides for completion of the ALI flight demonstration through FY02 and minimally sustains industrial base capability through FY05. The Department will make the decision at what level to fund the NTW program, based on ALI flight test performance. As a result of this guidance, the Navy submitted a Program Deviation Report (PDR) (January 21, 2000) that addresses both a cost and schedule breach for the overall program.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

8. (U) Threshold Breaches (Cont'd):

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The NTW TBMD program deviated from its currently approved Acquisition Program Baseline (APB) on January 21, 2000. In FY99, the Department of Defense embarked on an intensive review of the Theater High Altitude Area Defense (THAAD) and NTW programs. The purpose of the review was to define an Upper Tier Strategy that: 1) reduces overall programmatic risk; 2) delivers capability as early as possible; and 3) if possible, reduces program costs. The Upper Tier Strategy approved by the Department on December 8, 1999 satisfied those objectives and complied with Congressional guidance regarding management and funding of the Upper Tier programs. BMDO and the Navy are executing the NTW Block I program consistent with the approved evolutionary acquisition strategy. The existing NTW budget provides for completion of the ALI flight demonstration through FY02, and minimally sustains industrial base capability through FY05. The Department will make the decision at what level to fund the NTW program, based on ALI flight test performance.

9. (U) Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate	
DAB Program Review	APR 1999	APR 1999	APR 1999	
Milestone II (Block I) Review	NOV 2003	NOV 2003	TBD	(Ch-1)
Block I DT/OT				
Start	FEB 2006	FEB 2006	TBD	(Ch-1)
Complete	APR 2007	APR 2007	TBD	(Ch-1)
Milestone III (Block I)	JUL 2007	JUL 2007	TBD	(Ch-1)
FUE Block I	SEP 2007	SEP 2007	TBD	(Ch-1)

b. Current Change Explanations --

(U) (Ch-1) The existing NTW budget provides for completion of the ALI flight demonstration through FY02 and minimally sustains industrial base capability through FY05. The Department will make the decision at what level to fund the NTW program, based on ALI flight test performance.

10. (U) Performance Characteristics:

a. Performance --

Planning	Approved Program (APB)	Demon- strated	Current
----------	---------------------------	-------------------	---------



(U) A follow-on NTW Block II system will be treated as a major upgrade to Block I, and will be baselined at a later date. For reference and comparison purposes, the threshold and objective Key Performance Parameters contained in the Naval TBMD ORD for the future Block II system are included in this SAR.

Acronyms:

JCTN	Joint Composite Tracking Network
PSSEK	Probability of Single Shot Engagement Kill

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Planning <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	4218.0	4218.0	4675.0
Procurement	0.0	N/A	0.0
Total Sailaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	N/A	0.0
Total FY 1999 Base-Year \$	<u>4218.0</u>	<u>4218.0</u>	<u>4675.0</u>
Escalation	246.0	246.0	379.1
Development (RDT&E)	(246.0)	(246.0)	(379.1)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(N/A)	(0.0)
Total Then Year \$	<u>4464.0</u>	<u>4464.0</u>	<u>5054.1</u>

(U) The existing NTW budget provides for completion of the ALI flight demonstration through FY02 and minimally sustains industrial base capability through FY05. The Department will make the decision at what level to fund the NTW program, based on ALI flight test performance.

A follow-on NTW Block II system will be a major upgrade to Block I, and will be baselined at a later date. For reference and comparison purposes, the threshold and objective Key Performance Parameters contained in the Naval TBMD ORD for the future Block II system are included in Performance Characteristics (Section 10) of this SAR.

b. (U) Quantity --

Development (RDT&E)	N/A	0	N/A
Procurement	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Total	N/A	0	N/A

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.



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NTW TBMD, December 31, 1999

12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	4464.0	-	-	4464.0
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.3	-	-	+0.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.3	-	-	+0.3
Current Changes:				
Economic	-24.8	-	-	-24.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+614.6	-	-	+614.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+589.8	-	-	+589.8
Total Changes	+590.1	-	-	+590.1
Current Estimate	5054.1	-	-	5054.1

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

(U) Summary (FY 1999 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	4218.0	-	-	4218.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+0.1	-	-	+0.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+0.1	-	-	+0.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+456.9	-	-	+456.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+456.9	-	-	+456.9
Total Changes	+457.0	-	-	+457.0
Current Estimate	4675.0	-	-	4675.0

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices (Economic)	N/A	-24.8
Adjustment for current and prior inflation (Estimating)	+2.9	+2.9
Incorporation of additional scope as part of the evolutionary acquisition strategy (Estimating)	+454.0	+611.7
RDT&E Subtotal	+456.9	+589.8

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	APR 1999	N/A	N/A	APR 1999
Milestone II	NOV 2003	N/A	N/A	TBD
Milestone III	JUL 2007	N/A	N/A	TBD
FUE/IOC	SEP 2007	N/A	N/A	TBD
Total Cost	4464	N/A	N/A	5054.1
Total Quantity	0	N/A	N/A	0
Prog Acq Unit Cost	0	N/A	N/A	0

(U) The existing NTW budget provides for completion of the ALI flight demonstration through FY02 and minimally sustains industrial base capability through FY05. The Department will make the decision at what level to fund the NTW program, based on ALI flight test performance.

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

a. RDT&E --	Initial Contract Price		
(U) ALI SM-3:	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon Missile Sys Co., Tucson AZ	\$419.9	\$419.9	0
N00024-98-C-5364, CPAF			
Award: January 9, 1998			
Definitized: January 9, 1998			
	Estimated Price At Completion		
	<u>Contractor</u>	<u>Program Manager</u>	
	\$424.0	\$444.0	
	Current Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$432.5	\$432.5	0

15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-11.9	\$-15.6
Cumulative Variances To Date (12/31/99)	<u>\$-11.9</u>	<u>\$-15.6</u>
Net Change	\$0.0	\$0.0

Explanation of Change:

(U) Contract N00024-98-C-5364 is a CPAF contract to design, develop, and produce the guided missiles for the AEGIS Lightweight Exo-Atmospheric Projectile (LEAP) Intercept (ALI) portion of the NTW program. Variances for both cost and schedule were set at zero during the rebaselining period (March 1999 through May 1999). Current unfavorable variances are due to technical issues in Third Stage Rocket Motor (TSRM), and Solid Divert and Attitude Control Device (SDACS). The Contract Price of the STANDARD Missile (SM)-3 ALI contract increased due to the addition of SM-3 Flight Test Round (FTR)-0 to the scope of the contract

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

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-09)</u>	<u>Total</u>
RDT&E	1306.8	375.8	382.7	2988.8	5054.1
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1306.8	375.8	382.7	2988.8	5054.1

(U) The existing NTW budget provides for completion of the ALI flight demonstration through FY02 and minimally sustains industrial base capability through FY05. The Department will make the decision at what level to fund the NTW program, based on ALI flight test performance.

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

b. Annual Summary -- NTW TBMD

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1999 Dollars Nonrec	Flyaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				204.7	200.4
1997				307.1	304.2
1998				438.6	437.9
1999				361.3	364.3
2000				368.0	375.8
2001				369.1	382.7
2002				272.8	287.3
2003				199.9	214.3
2004				225.7	246.7
2005				382.7	429.7
2006				385.7	438.7
2007				386.1	447.9
2008				386.5	457.3
2009				386.8	466.9
Subtotal				4675.0	5054.1

(U) The existing NTW budget provides for completion of the ALI flight demonstration through FY02 and minimally sustains industrial base capability through FY05. The Department will make the decision at what level to fund the NTW program, based on ALI flight test performance.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				4675.0	5054.1

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1172.7

(U) Percent Total Program Expended: 23.2%

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NTW TBMD, December 31, 1999

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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# AF-21 TITAN IV

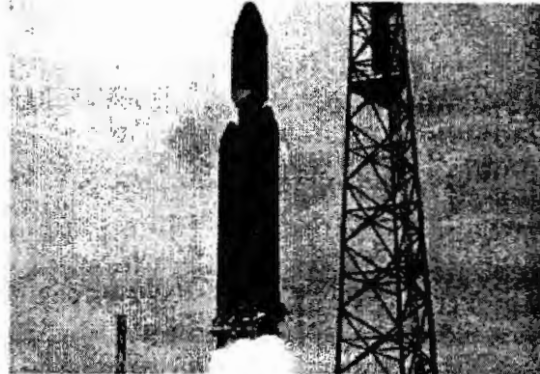
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: Titan IV

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Titan IV, Expendable Launch Vehicle (ELV)
2. DoD Component: USAF
3. Responsible Office and Telephone Number:  
Space and Missile Systems Center/CL Col Michael J. Dunn  
160 Skynet Street Assigned: May 15, 1999  
Suite 1215 DSN 833-3915; COMM (310)363-3915  
Los Angeles AFB, CA 90245-4659 mike.dunn@losangeles.af.mil
4. Program Elements/Procurement Line Items:  
RDT&E:  
PE 0304111F (Shared) Project 299998, 346503, 6569AJ  
PE 0305119F (Shared) Project 66624A  
PE 0305144F  
PE 0305171F (Shared)  
PROCUREMENT:  
APPN 3080 ICN 834600 (Air Force)  
APPN 3020 ICN MSBSTR (Air Force) (Shared) Project 23BSTR  
APPN 3020 ICN MSO299 (Air Force)  
MILCON:  
PE 0305119F

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00-C-0721

**5. References:**

SAR Baseline (Development Estimate):  
FY87 President's Budget, February 1986.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated May 26, 1994.

**6. Mission and Description:**

The Titan IV is a heavy-lift rocket booster that assures continued access to space for the nation's highest priority space systems. The Titan IV does not replace any defense programs. The Titan IV system evolved from the basic family of Titan systems, namely the Titan II, Titan III and 34D, which have contributed to national space objectives for more than 25 years. The Titan IVA vehicle configuration consists of a two stage liquid propellant core with a pair of large, attached Solid Rocket Motors (SRMs) which provide the initial boost stage for liftoff. Beginning with the twenty-fourth vehicle in the program, a new block change Titan IVB incorporating advanced technology and improved processes has become operational. The Titan IVB flies with Solid Rocket Motor Upgrades (SRMUs) and new avionics, both of which increase reliability and performance for larger payload requirements. Two upper stage configurations are used on Titan IV, the Inertial Upper Stage (IUS) and the Titan/Centaur. When configured with the Centaur and SRMU, Titan IV is capable of placing an 13,250-pound payload into Geosynchronous Earth Orbit (GEO). When configured with No Upper Stage (NUS) and SRMU, Titan IVB can place a 40,000-pound payload into a 100-nmi circular, polar orbit.

**7. Executive Summary:**

Titan IV was developed in direct response to a National Security Decision Directive. The initial contract for 10 Titan IV's with Centaur upper stages was awarded in February 1985. As a result of the January 1986 Space Shuttle accident, the Department of Defense (DoD) began a recovery plan that included the acquisition of 13 additional Titan IV's. The resulting 23-vehicle program was placed on contract in December 1987. The DoD later embarked on an increased capacity plan which included an additional launch pad at Cape Canaveral Air Station (CCAS), 18 additional Titan IV boosters, and associated facility enhancements. The 41-vehicle program was definitized in December 1989. The Titan IV was designated a Defense Acquisition Board program in July 1991. The first Titan IV was successfully launched in 1989 from CCAS.

On August 12, 1998, Titan IV mission A-20, the last A model vehicle, experienced intermittent electrical shorting approximately 40 seconds into the planned flight. The shorting caused a guidance system reset, leading to a catastrophic mission failure. Post mission analysis identified the most probable cause of the failure to be defects in the vehicle's wiring harness. This failure has led to continuing changes for 1999.

As a result of the catastrophic A-20 failure the program office performed a program-wide hardware and software process review with primary focus on the



7. Executive Summary (Cont'd):

Lockheed Martin harness manufacturing and quality reporting system. These results were included in the Titan Return-To-Flight (RTF) plan, developed in accordance with AFSPC OI 12-120112. It was approved on January 28, 1999 by SAF/AQ and PEO/Space. The Air Force Space Command Commander and the Director of the National Reconnaissance Office were briefed and also approved the RTF plan on January 29, 1999. This approval led to the Titan IV return to flight on April 9, 1999.

The Titan IV fleet returned to operational status with 2-launches in April 1999. Unfortunately, both missions failed to deliver the payload to correct operational orbit. The first mission, Titan IVB-27/DSP-19, occurred on 9 April 1999. The Titan IV vehicle successfully placed the payload and Inertial Upper Stage (IUS) into the normal park orbit. However, a malfunction during IUS portion of the mission placed the payload into an unacceptable orbit--the IUS is not part of the Titan launch system. Excessive application of thermal tape was later determined to be the root cause of the problem. This tape prevented the proper function of an electrical connector plug between the stages I and II of the IUS. The malfunction resulted in a loss of the satellite's mission due to the incorrect orbit.

The second mission, Titan IV B-32/Milstar 3, occurred on 30 April 1999. This mission resulted in placement of the satellite into an unusable orbit. The root cause of the mission failure was incorrect software data in the guidance system of the Centaur upper stage. Since the Centaur is considered part of the Titan IV program, this error was counted against the Titan IV performance reliability statistics. Other than this error, all of the equipment on the mission performed as designed. The result was a complete loss of the satellite mission.

As a result of the B-32 and other space launch failures, the Program Office has initiated an exhaustive review of Lockheed Martin's procedures, processes, quality, and mission assurance areas (including subcontractors). The emphasis was on ensuring that quality vehicles are shipped to the launch bases and that a "test-like-you-fly" approach is followed for all remaining missions.

On May 22, 1999, Titan IV B-12 with a National Reconnaissance Office payload was successfully launched from Vandenberg AFB.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	Yes
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

Schedule Breach: The Centaur Processing Facility project was on schedule for completion within the scheduled milestone time frame, but funds were removed by Secretary of the Air Force for Acquisition preventing the completion of the facility and resulting in the schedule breach of the Acquisition Program Baseline (APB). The next APB will delete this scheduled milestone.

Performance Breach: Currently the program's overall launch success rate is 25 out of 28 launches, or 89%. The current Approved Program Baseline (APB) designated an objective of 98% and a threshold of 96%. A Program Deviation Report has been submitted, and a proposed APB is in coordination.

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Initial Contract Award	FEB 1985	FEB 1985	FEB 1985
Production Start	OCT 1985	N/A	OCT 1985
System Preliminary Design Review	APR 1986	N/A	APR 1986
Critical Design Review	NOV 1986	NOV 1986	OCT 1986
Addition of 13 Vehicles	N/A	DEC 1987	DEC 1987
First Core Delivery to CCAFS	N/A	JAN 1988	JAN 1988
First Delivery to CCAFS	FEB 1988	N/A	APR 1988
Initial Launch Capability (ILC)			
Titan IV/IUS	OCT 1988	FEB 1989	FEB 1989
Titan IV/NUS (WTR)	N/A	OCT 1990	OCT 1990
Titan IV/Centaur	N/A	MAY 1993	SEP 1993
SLC-40	N/A	SEP 1992	FEB 1993

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9a. Schedule (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Centaur Structural Test	N/A	JUL 1989	APR 1991
SRMU Static Firing (PQM-1)	N/A	JUN 1992	JUN 1992
SRMU ILC	N/A	JUL 1996	JUL 1996
Centaur Processing Facility IOC	N/A	JAN 1997	N/A

Space Launch Complex 40 (SLC-40) is referred to as Launch Complex 40 (LC-40) throughout this document.

Due to programmatic changes, the Centaur Processing facility will not be completed.

b. Current Change Explanations --  
None

10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>	
System Reliability (%)	98	98 / 96	89	92	(Ch-1)
Payload to Geosynchronous Orbit (k-lbs) (Titan IV/Centaur)					
SRM	10.0	10.0 / 10.0	10.35	10.35	
SRMU	N/A	11.5 / 11.5	13.25	13.25	
Payload to Transfer Orbit (k-lbs)					
SRM	N/A	38.8 / 38.8	39.7	39.7	
SRMU	N/A	47.0 / 47.0	49.1	49.1	
Payload to Low Earth Polar Orbit (k-lbs) (Titan IV/NUS)					
SRM	N/A	31.1 / 31.1	31.7	31.7	
SRMU	N/A	38.8 / 38.8	40.0	40.0	

10b. Performance Characteristics (Cont'd):

b. Current Change Explanations --

(Ch-1): Due to two successful launches and one failure during the 1999 SAR reporting period, Titan IV demonstrated performance for system reliability has been decreased from 92% to 89% (25 of 28 launches have been successful). This takes into account that Titan IVB-27/DSP-19 launched successfully, but DSP-19 did not reach its designated orbit due to a malfunction of the Boeing built Inertial Upper Stage (IUS). Since IUS is not part of the Titan IV program, it was not counted as a failure against the Titan IV performance reliability statistics. Titan IVB-32 was counted against system reliability. The mission failed due to incorrect programming of the Centaur Upper Stage, which is part of the Titan IV program. The current estimate has also been decreased to reflect the reality that Titan IV can only achieve 92% reliability if it launches out the remainder of the 39 vehicle program without further failure (36 of 39 launches). A Program Deviation Report (PDR) has been submitted for breach of a program threshold. A new acquisition program baseline is in coordination.

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

a. Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	579.7	3194.0	3205.0
Procurement	1570.8	19868.4	10616.2
Flyaway	(1106.6)		(9149.2)
Other Wpn Sys	(464.2)		(1467.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	105.3	93.1
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1985 Base-Year \$	2150.5	23167.7	13914.3
 Escalation	 378.7	 14545.4	 4113.3
Development (RDT&E)	(61.4)	(1252.3)	(656.5)
Procurement	(317.3)	(13267.4)	(3428.8)
Construction (MILCON)	(0.0)	(25.7)	(28.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2529.2	37713.1	18027.6
 b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>10</u>	<u>65</u>	<u>39</u>
Total	10	65	39

Note 1: Vehicle Quantity History:

DEC 85 SAR	DEC 86 SAR	DEC 88 SAR	Aug 94 DAB	DEC 94 SAR	DEC 95 SAR
10	23	57	65	47	46
DEC 96 SAR	DEC 97 SAR	DEC 98 SAR			
41	40	39			

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

Note 2: No LRIP approved for this program.

c. Foreign Military Sales --  
None.

d. Nuclear Costs --  
None

12. Unit Cost Summary:

	UCR Baseline (MAY 1994 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1985 BY\$)	23167.7	13914.3	
(2) Quantity	65	39	
(3) Unit Cost	356.426	356.777	+0.10
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1985 BY\$)	19868.4	10616.2	
(2) Quantity	65	39	
(3) Unit Cost	305.668	272.210	-10.95

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	641.1	1888.1	-	2529.2
Previous Changes:				
Economic	-86.2	-1294.5	+7.0	-1373.7
Quantity	-237.3	+947.4	-	+710.1
Schedule	+795.1	+4478.5	+5.0	+5278.6
Engineering	+894.8	-3630.6	-	-2735.8
Estimating	+1799.9	+10273.6	+109.1	+12182.6
Other	-	-	-	-
Support	+45.6	+931.3	-	+976.9
Subtotal	+3211.9	+11705.7	+121.1	+15038.7
Current Changes:				
Economic	-1.1	-19.5	-0.1	-20.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+9.6	+575.6	+0.1	+585.3
Other	-	-	-	-
Support	-	-104.9	-	-104.9
Subtotal	+8.5	+451.2	-	+459.7
Total Changes	+3220.4	+12156.9	+121.1	+15498.4
Current Estimate	3861.5	14045.0	121.1	18027.6

Summary (FY 1985 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	579.7	1570.8	-	2150.5
Previous Changes:				
Quantity	-138.8	+2139.5	-	+2000.7
Schedule	+377.7	+1553.1	-	+1930.8
Engineering	+651.4	-2288.6	-	-1637.2
Estimating	+1532.5	+6256.5	+93.0	+7882.0
Other	-	-	-	-
Support	+195.8	+1069.0	-	+1264.8
Subtotal	+2618.6	+8729.5	+93.0	+11441.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+6.7	+382.1	+0.1	+388.9
Other	-	-	-	-
Support	-	-66.2	-	-66.2
Subtotal	+6.7	+315.9	+0.1	+322.7
Total Changes	+2625.3	+9045.4	+93.1	+11763.8
Current Estimate	3205.0	10616.2	93.1	13914.3

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

b. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised economic escalation indices. (Economic)	N/A	-1.1
	Continuing evaluation of total program funding from FY83 to FY99 resulted in further refinements. (Estimating)	+1.6	+2.0
	Increased hardware cost due to extension of SRMU requalification program. (Estimating)	+2.7	+3.9
	Estimate revised to account for Phillips Lab maintenance through FY00. (Estimating)	+1.0	+1.4
	Rephasing of integration to align with slipping schedule increased cost. (Estimating)	0.0	+0.2
	Adjustment for current and prior year escalation. (Estimating)	+0.4	+0.6
	Increased SEPM cost to support extended SRMU requalification program. (Estimating)	+1.0	+1.5
	RDT&E Subtotal	+6.7	+8.5
(2)	<u>Procurement</u>		
	Revised economic indices. (Economic)	N/A	-19.5
	Program funding was reimbursed \$51.5M in FY99 with the payback of funds taken for Cruise Missiles. (Estimating)	+35.4	+51.5
	Prior year accounting refinements. (Estimating)	+25.6	+29.1
	Increased mission integration costs resulted from FY03 program extension. (Estimating)	+1.8	+3.5
	Adjustment for current and prior year escalation. (Estimating)	+5.5	+8.5
	Increased hardware costs result from FY03 Program extension and the reallocation of program management costs to the launch vehicle element based on refined contractor reporting. (Estimating)	+127.4	+195.3
	Increased costs in Flight Support resulted from FY03 program extension and Special Termination Contract Clause (STCC) not receiving approval. (Estimating)	+186.4	+287.7
	Reduced support costs result from the reallocation of program management costs to the launch vehicle element based on refined contractor reporting. (Support)	-66.2	-104.9
	Procurement Subtotal	+315.9	+451.2
(3)	<u>MILCON</u>		
	Revised escalation indices. (Economic)	N/A	-0.1

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

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment for current and prior year escalation. (Estimating)	+0.1	+0.1
MILCON Subtotal	+0.1	0.0

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
252.92	-35.75	-169.86	+135.35	-70.15	+327.38	--	+22.36	+209.33	462.25

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
188.81	-33.69	-116.10	+114.83	-93.09	+278.18	--	+21.19	+171.32	360.13

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	N/A	N/A
Total Cost	N/A	2529.2	N/A	18027.6
Total Quantity	N/A	10	N/A	39
Prog Acq Unit Cost	N/A	252.92	N/A	462.25

Titan IV had no acquisition phase milestones.



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

a. RDT&E --			Initial Contract Price		
<u>Program R &amp; D:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
LOCKHEED MARTIN, DENVER, CO			\$62.3	N/A	0
FO4701-96-C-0035, CPFF/AF					
Award: July 1, 1996					
Definitized: July 1, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$278.7	N/A	0	\$267.6	\$267.6	
Previous Cumulative Variances			<u>Cost Variance</u> <u>Schedule Variance</u>		
Cumulative Variances To Date (12/31/99)			\$10.7	\$0.8	
Net Change			\$6.2	-\$2.3	

Explanation of Change:

The current contract target price increased from the last SAR to \$278.7M. This increase was due to the earned award fee in periods 4 and 5. The net change of \$6.2M to the favorable cumulative cost variance is primarily due to Alliant's underrun in subcontract performance and program management/system engineering from the 39-vehicle completion program. The net change of -\$2.3M to the unfavorable cumulative schedule variance is primarily a result of Pratt-Whitney material and engine build delays caused by reinspection of engine hardware and Alliant's slip in casting and case material requirements. An Integrated Baseline Review was completed on 20 Dec 99.

b. Procurement --			Initial Contract Price		
<u>Launch Base Ops:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
LOCKHEED MARTIN, DENVER, CO			\$1538.0	N/A	0
FO4701-95-C-0012, CPAF/FF					
Award: April 1, 1996					
Definitized: April 1, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1837.8	N/A	0	\$1816.7	\$1816.7	
Previous Cumulative Variances			<u>Cost Variance</u> <u>Schedule Variance</u>		
Cumulative Variances To Date (12/31/99)			\$14.6	-\$9.1	
Net Change			\$34.4	-\$1.9	

Explanation of Change:

The current contract target price is \$1,837.8M. The net increase from the 1998 SAR is \$3.9M. The following contractual requirements were definitized during CY99 for the net increase: (1) implementation of the payload

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15. Contract Information (Cont'd):

fairing operation, (2) SRMU upgrade set aside, and (3) Cape Canaveral Air Station (CCAS) base supply support. The favorable cumulative cost variance was due to favorable 1999 rate savings, computer depreciation and maintenance, Alliant Ammonium Perchlorate (AP) cost adjustments, and common support due to program synergy. The Unfavorable cumulative schedule variance was due to Titan IVB-28 SRMU ship-set fabrication assembly slip, Titan IVB-29 processing delays. An Integrated Baseline Review was completed 20 December 99.

<u>Unified Payload Int(UPI):</u>			Initial Contract Price		
LOCKHEED MARTIN, DENVER, CO			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F04701-98-C-0005, CPAF			\$283.4	N/A	0
Award: October 1, 1997					
Definitized: October 1, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$294.5	N/A	0	\$279.5	\$279.5	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$4.2	\$-2.4	
Cumulative Variances To Date (12/31/99)			<u>\$8.4</u>	<u>\$-3.3</u>	
Net Change			\$4.2	\$-0.9	

Explanation of Change:

The current contract target price increased from the last SAR to \$294.5M. This increase was due to 1998 earned award fee. The positive cumulative cost variance is due to fewer problems encountered on Titan IVD-28 vehicle configuration, experience gained from performance efficiency for Titan IVB-29 and Titan IVB-41, and cost savings from CSC computer cost allocation and incorporation of forward pricing rates. The Negative cumulative schedule variance is due to Titan IVB-29 manifest change, Titan IVB-41 flight analogous software test delays, and actuator anomaly investigation. A joint Earned Value Management System (EVMS) surveillance review was conducted in December of 1999.

<u>Production:</u>			Initial Contract Price		
Lockheed Martin, Denver, CO			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F04701-96-C-0001, FPIF			\$568.9	\$589.6	0
Award: April 1, 1996					
Definitized: April 1, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$2792.9	\$3152.5	0	\$2579.6	\$2579.6	

15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$128.5	\$-18.4
Cumulative Variances To Date (12/31/99)	<u>\$175.4</u>	<u>\$-34.4</u>
Net Change	\$46.9	\$-16.0

Explanation of Change:

The current reported contract target price is \$2,792.9M. The net increase from the 1998 SAR is \$1.1M. The following authorized requirements were definitized during CY99 for the net change: 1) reduction of Flow Control Valve Spares, 2) a new Payload Fairing in the Round Process for the TIVB-34, and 3) qualification testing for the Core Vehicle Automatic Destruct System (ADS) 5 Amp Hours (AH) Battery. The net change of \$46.9M to the favorable cumulative cost variance is due to favorable manpower performance as a result of program synergies, favorable rates savings, and subcontractor production and manufacturing efficiencies. The net change of -\$16.0M to the unfavorable cumulative schedule variance is attributed to material delays due to launch deferrals associated with the Moog actuators. Also, Alliant is behind schedule on SRMU engine and segment testing. An Integrated Baseline Review (IBR) for the 39 Completion effort was completed on 20 Dec 99.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY83-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
RDT&E	3718.2	59.4	52.7	31.2	3861.5
Procurement	11733.4	696.9	650.5	964.2	14045.0
MILCON	121.1	-	-	-	121.1
O&M	-	-	-	-	-
Total	15572.7	756.3	703.2	995.4	18027.6

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

b. Annual Summary -- TITAN IV (ELV)

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1985 Dollars Nonrec	Flyaway FY 1985 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983				170.7	162.2
1984				13.4	13.2
1985				201.7	205.7
1986				200.8	209.8
1987				115.6	126.2
1988				481.2	539.6
1989				396.9	466.6
1990				363.8	440.8
1991				179.7	225.9
1992				233.2	301.7
1993				136.9	180.8
1994				224.8	302.1
1995				116.1	159.0
1996				115.9	161.5
1997				55.0	77.7
1998				46.7	66.3
1999				55.1	79.1
2000				40.9	59.4
2001				35.8	52.7
2002				20.8	31.2
Subtotal				3205.0	3861.5

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1985 Dollars Nonrec	Flyaway FY 1985 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1983		111.0	117.0	274.7	269.8
1984		107.7	111.3	263.1	269.5
1985		74.7	66.3	165.7	174.6
1986		32.5	130.9	195.3	215.4
1987	2	82.1	238.3	380.7	438.0
1988	6	221.5	471.4	810.8	966.6
1989	5	246.3	400.3	737.6	918.3
1990	5	192.8	446.8	729.6	924.9
1991	5	260.9	262.6	606.9	791.9
1992	6	235.3	278.8	573.3	757.2
1993	6	294.3	293.3	647.7	872.7
1994	4	195.7	411.7	659.3	906.0
1995		151.0	221.9	419.1	581.3
1996		94.1	222.9	370.0	520.0

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1985 Dollars Nonrec	Flyaway FY 1985 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997		104.4	194.0	348.2	495.8
1998		145.7	351.8	555.1	797.9
1999		79.8	335.3	592.2	861.0
2000		74.1	319.6	472.6	696.9
2001		81.3	266.3	434.2	650.5
2002		79.1	236.8	368.0	560.9
2003		49.6	171.6	250.2	388.5
2004		2.8	1.6	5.0	7.9
2005		1.5	2.2	4.3	6.9
Subtotal	39	2918.2	5552.7	9863.6	13072.5

The NRO funds approximately 50% of missile procurement in the Titan IV program. There are no production quantities associated with the Launch Base Operations (LBO) contract (-0012).

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1985 Dollars Nonrec	Flyaway FY 1985 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986		0.5	3.6	4.7	5.1
1987		4.8	17.5	25.4	28.8
1988		28.0	39.3	75.7	89.0
1989		30.7	43.3	81.8	99.6
1990		17.7	57.5	85.1	106.7
1991		14.4	26.1	48.4	62.2
1992		114.4	35.7	166.9	220.6
1993		62.1	37.3	110.0	147.6
1994		32.6	73.5	110.9	152.0
1995		20.7	16.5	41.4	57.6
1996		0.9	1.2	2.3	3.3
Subtotal		326.8	351.5	752.6	972.5

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY 1985 Dollars Nonrec	Flyaway FY 1985 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990				44.1	55.8
1991				7.7	10.0
1992				16.0	21.2

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

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY 1985 Dollars Nonrec	Flyaway FY 1985 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				25.3	34.1
Subtotal				93.1	121.1

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	39	3245.0	5904.2	13914.3	18027.6

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	28	28

Percent Total Program Quantities Delivered: 71.8%

b. Total Expenditures To Date (In Millions of Dollars): \$ 14078.2

Percent Total Program Expended: 78.1%

Deliveries are considered complete when vehicle ownership is transferred and the DD250 is signed. For Titan IV, the DD 250 is considered signed when the vehicle has moved 1 inch in an upward direction from the launch pad.

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. The FY 1998 Titan IV Program Office Estimate (POE) annual O&S costs were estimated to be \$66.6M in base year dollars. With an estimated rate of four launches per year the average annual cost per launch in base year dollars is \$16.6M.

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

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
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Range Support	16.6	7.5
Total	16.6	7.5

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AF-14 JSTARS

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: Joint STARS

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Joint STARS

2. (U) DoD Component: USAF

Joint Participants:  
US Army

3. (U) Responsible Office and Telephone Number:

Joint STARS Program Office	Col Gary S. Connor
Electronic Systems Center	Assigned: May 20, 1999
75 Vandenberg Drive	DSN 478-5725; COMM (781)377-5725
Hanscom AFB, MA 01731-2119	gary.connor@hanscom.af.mil

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

RDT&E:

- (U) PE 0207581F
- (U) PE 0603770F
- (U) PE 0604270F Project 3894 (Shared)
- (U) PE 0604616F
- (U) PE 0604770D
- (U) PE 0604770F

PROCUREMENT:

- (U) APPN 3010 ICN 0207581F (Air Force)

MILCON:

- (U) PE 0604770F

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FOR OPEN PUBLICATION

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

~~Classified by: Joint STARS Classification Guide dated 10 Jun 98  
Downgrade instructions: Not subject to automatic Downgrade  
Classification: Originating Agency Determination Required (OADR)~~

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5. (U) References:

SAR Baseline (Production Estimate):

(U) AFAE Approved Acquisition Program Baseline (APB) dated October 24, 1996.

Approved Program:

(U) AFAE Approved Acquisition Program Baseline (APB) dated June 17, 1999.

6. (U) Mission and Description:

(U) The Joint Surveillance Target Attack Radar System (Joint STARS) is a Joint Army and Air Force Program, with the AF as the 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 plays a critical C2 battle management role providing precise real-time targeting information to direct attack aircraft, friendly artillery, and standoff missile batteries. Joint STARS unique capabilities can give the Joint Force Commander a near real-time look at enemy first and second echelon force buildups, force movements, and the enemy scheme-of-maneuver on the battlefield. This early information on the enemy 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. Joint STARS is also identified as one of the core assets that provides rapidly employable, information superiority. Joint STARS provides SAR/MTI coverage of ground activity, with target identification and intelligence support from RIVET JOINT and works in concert with AWACS to provide a collaborative situation awareness, battle management, and precision engagement capability for the Joint Force Commander. There is no antecedent system.

7. (U) Executive Summary:

(U) Congress authorized long lead for a 15th Joint STARS aircraft (FY00 Appropriations Bill), and full funding for this aircraft is part of the FY01 President's Budget (PB) Submittal. The aircraft is scheduled for induction to the Northrop Grumman Lake Charles facility on 1 Apr 00.

Two Joint STARS aircraft, crews and support personnel successfully deployed for 127 days in support of Operation ALLIED FORCE, proving our unique command and control strengths and capabilities. Data from the 93d Air Control Wing (ACW) demonstrates our outstanding performance in support of the air campaign: 83 of 86 combat sorties were accomplished with a Launch Reliability Rate of 99%, Mission Effectiveness Rate of 96% and Mission Capability Rate of 80%.

Since establishing a rebaselined production refurbishment schedule in Aug 98, Northrop Grumman is either on or ahead of schedule for aircraft delivery. As a result, in 1999 the Joint STARS Joint Program Office (JPO) delivered both its fifth and sixth production E-8Cs early. The fifth aircraft delivered to the AF

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Joint STARS, December 31, 1999

7. (U) Executive Summary (Cont'd):

on 13 Aug 99, 11 weeks ahead of its scheduled contract delivery date, and was successfully used in completing engine and communication enhancement testing. The sixth production aircraft delivered to the 93d ACW one month ahead of contract delivery date, on 1 Dec 99. The next Joint STARS aircraft is planned for early delivery in early Mar 00 (several days ahead of its scheduled 31 Mar 00 contract delivery date).

Two Joint STARS aircraft were retrofit with a 102C engine upgrade with modified diffuser case, providing the E-8C with 1250 pounds additional thrust per engine, and enabling the aircraft to climb faster and achieve improved on-station performance (the engine diffuser portion of this modification corrects an aircraft fuming problem). All operational aircraft were retrofit by 31 Jan 00 and the remaining aircraft will be delivered with the upgrade and diffuser case installed in line at the Northrop Grumman (NG) Lake Charles production facility.

On 24 Nov 99 the AF and Northrop Grumman, with assistance from a Third Party Neutral, settled requests for equitable adjustments (REAs) on Production Lots III and IV at a settlement value of \$79.8M. The Joint Motion for Entry of Judgement for the claim was filed at the Armed Services Board of Contract Appeals, and payment is planned for early Jan 00.

In accordance with Air Force Lightning Bolt 99-7 and USD (AT&L) strategies for competitive product support, we are building the contracting and program execution details for awarding, by Jul 00, a concept for integrating Joint STARS weapon system sustainment, called "Future Support." Under this program, Northrop Grumman will act as the integrator of all Joint STARS sustainment efforts, partnering with government and industry suppliers to achieve improved weapon systems availability at reduced operating cost.

The Computer Replacement Program (CRP) upgrade is on schedule and proceeding well. CRP replaces militarized signal and data processing elements on the E-8C with up-to-date commercial off-the-shelf elements. Upon approval of our CRP operational test plan by DOT&E in Dec 99, the Joint STARS Joint Test Force began formal system testing.

In May 99, the NATO Conference of National Armaments Directors approved the start of a two-year Project Definition phase for NATO Transatlantic Advanced Radar (NATAR) (formerly known as NATO Alliance Ground Surveillance) which is centered around the Joint STARS' RTIP sensor. The US is postured to send Joint STARS personnel overseas to support the multi-national project definition office (PDO) pending Congressional New Start approval.

The Joint STARS Joint Program Office is acting as the catalyst for a capabilities roadmap to meet the Joint Vision 2010 "system of systems" concept of a network-centric, ground moving target indicator (GMTI) capability. The objective is to provide the theatre commanders with an integrated and coherent picture of the ground battle by leveraging and fusing GMTI data from various platform types (fixed wing, UAV, satellites). This topic has the interest of the Chief of Staff of the Air Force.

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7. (U) Executive Summary (Cont'd):

Joint STARS is an AF and DoD Reduction in Total Ownership Cost (RTOC) pilot program, and as such we are actively identifying RTOC candidates for investment consideration.

"Lessons learned" from our performance in Operation ALLIED FORCE highlight the need for new engines, procurement of Joint Service Workstations (JSWS), augmented crew utilization and improved weapon system connectivity with command nodes. For re-engining, SAF/AQ approved our strategy for Northrop Grumman to conduct a competition for the Air Force and select a "best value" engine alternative employing leasing concepts (Congress designated Joint STARS as a "re-engine lease" pilot program). A re-engining pre-Acquisition Strategy Panel with SAF/AQ is scheduled for May 00. Funding is necessary in early FY02 to award the re-engining program. For JSWS, the Army is on track to deliver four units to USAFE by third quarter FY00 (JSWS is a "downsized, portable, subset of Common Ground Station equipment that enables viewing of Joint STARS products in SATCOM-equipped command centers). Finally, we plan to implement two "quick reaction" temporary modifications for two operational jets for evaluation. Our Personal Computer Improved Data Modem (PCIDM) upgrade provides immediate connectivity with F-16 (Blocks 40 and 50, close air support) fighters using initial off-the-shelf laptop/carry-on capability. Combat Readiness Exploitation WorkStation (CREWS) 2000 provides off-the-shelf displays in the forward crew rest areas, creating additional user workstations on the E-8C.

The Radar Technology Insertion Program is included in the Joint STARS Program Element and Research, Development, Test and Evaluation Descriptive Summary, however funding for the effort is not included in this SAR. DoD designated the RTIP program an Acquisition Category ID program on 7 Aug 98, with separate reporting requirements. RTIP achieved a favorable Milestone II decision at a 28 Jan 00 Defense Acquisition Board. Engineering, Manufacturing and Development contract award is planned for Apr 00.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone IIA	SEP 1985	SEP 1985	SEP 1985
FSD Contract Award	SEP 1985	SEP 1985	SEP 1985
First Test Flight	APR 1988	APR 1988	APR 1988
Milestone IIB	APR 1988	APR 1988	APR 1988
System CDR	NOV 1988	NOV 1988	NOV 1988
Contractor Flight Test Start	APR 1989	APR 1989	APR 1989
Operational Field Demo I	JUL 1990	JUL 1990	SEP 1990
System-level Perf. Verf.-start	SEP 1991	SEP 1991	OCT 1991
DT&E Start	JUN 1991	JUN 1991	OCT 1991
DAB Program Review, LRIP	MAR 1993	MAR 1993	MAY 1993
Software Support Facility Delivery (MSSF Phase I)	MAY 1996	MAY 1996	AUG 1996
DT&E Complete (FOFSD)	JUN 1995	JUN 1995	SEP 1995
MOT&E			
Start	JUN 1995	JUN 1995	NOV 1995
Complete	FEB 1996	FEB 1996	JUL 1996
Milestone III	JUN 1996	JUN 1996	SEP 1996
Full Rate Production Contract Award	JUN 1997	JUN 1997	JUN 1997
First Aircraft Delivery to ACC	FEB 1996	FEB 1996	JUN 1996
First Training Squad Ready for Trng	SEP 1996	SEP 1996	SEP 1996
Depot Support Date	JAN 1996	JAN 1996	MAY 1996
First SDS Installation (Group A)	FEB 1996	FEB 1996	FEB 1996
Required Assets Availability (RAA)	SEP 1996	SEP 1996	FEB 1997
Organic Support Capability	SEP 1997	SEP 1997	NOV 1997
IOC	SEP 1997	SEP 1997	DEC 1997

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

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Mature Reliability	SEP 1998	MAR 2002	MAR 2002
Follow-On OT&E Start	FEB 1998	FEB 1998	AUG 1997

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
MTI detection radial velocity (km/hr)	(b)(1)			
Min radial velocity range				
Radar Revisit Rate (sec)				
Probability of Detection (%) (Clear)				
Probability of Detection (%) (weather)				
MTI Position Accuracy, CEP (m) @ Range (km)				
Radar Range from platform (km)				
SAR Resolution (m)				
SAR CEP(m)				
Fix rate				
Air (%) (min)				
in 20				
in 30				
in 45				
Ground (%) (hrs)				
in 4				
in 8				
in 12				
Mission Reliability Rate				

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

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
(S) Sortie Wartime Generation Rate (D-1 to D+30) Effective time on station (ETOS%)	(b)(1)			

(b)(1)

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

(b)(1)



b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	3820.4	4053.4	4046.2
Procurement	5982.4	4767.2	4853.7
Recurring	(4570.5)		(3579.0)
Non-Recurring	(196.5)		(140.3)
Total Flyaway	(4767.0)		(3719.3)
Other Wpn Sys	(585.6)		(702.1)
Peculiar Support	(58.8)		(54.1)
Initial Spares	(571.0)		(378.2)
Construction (MILCON)	129.5	117.8	113.4
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1998 Base-Year \$	9932.3	8938.4	9013.3
 Escalation	 -170.2	 -401.6	 -416.2
Development (RDT&E)	(-465.8)	(-431.8)	(-432.0)
Procurement	(296.5)	(32.8)	(18.5)
Construction (MILCON)	(-0.9)	(-2.6)	(-2.7)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	9762.1	8536.8	8597.1

(U) The Program Manager's Current estimate reflects the approved FY01 President's Budget.

While the Radar Technology Insertion Program is included in the Joint STARS Program Element and Research, Development, Test and Evaluation Descriptive Summary, funding for the effort is not included in this SAR. DoD designated the RTIP program an Acquisition Category 1D program on 7 Aug 98, with separate reporting requirements.

b. (U) Quantity --

Development (RDT&E)	1	1	1
Procurement	<u>19</u>	<u>14</u>	<u>15</u>
Total	20	15	16

(U) The Low Rate Initial Production (LRIP) quantity approved at the Joint STARS' Milestone III Decision was 19 aircraft. The Quadrennial Defense Review (QDR) recommendation to reduce the Joint STARS fleet from 19 to 13 took effect with the FY 99 President's Budget (PB) in Jan 98.

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

The FY 00 PB approved a 14th procurement aircraft (as reflected in the 17 Jun 99 APB). The FY01 PB approved a 15th aircraft, a revised APB is in coordination at this time. The annual buy quantity is limited by available funding.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (JUN 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1998 BY\$)	8938.4	9013.3	
(2) Quantity	15	16	
(3) Unit Cost	595.893	563.331	-5.46
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1998 BY\$)	4767.2	4853.7	
(2) Quantity	14	15	
(3) Unit Cost	340.514	323.580	-4.97

(U) Funding for the Radar Technology Insertion Program (RTIP) is not included in this SAR (although it is included in the Joint STARS' Program Element and the Research, Development, Test and Evaluation Descriptive Summary). DoD designated the RTIP program an Acquisition Category 1D program on 7 Aug 98, with separate reporting requirements. The RTIP Milestone II Acquisition Decision Memorandum was signed on 19 Feb 00.

The latest approved Acquisition Program Baseline (APB) (17 Jun 99) reflects 14 procurement aircraft. The negative variances are a result of the addition of a fifteenth production aircraft. Funding for production aircraft P-15 was added to the Joint STARS program with the FY01 President's Budget. A revised APB including the additional aircraft is in coordination at this time.



13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
<b>Production Estimate</b>	3354.6	6278.9	128.6	9762.1
<b>Previous Changes:</b>				
Economic	-1.5	-20.4	-0.7	-22.6
Quantity	-	-1362.2	-	-1362.2
Schedule	-	-	-	-
Engineering	+348.6	+105.8	-8.2	+446.2
Estimating	-129.1	-287.2	-4.5	-420.8
Other	-	-	-	-
Support	-0.5	-51.0	-	-51.5
<b>Subtotal</b>	<b>+217.5</b>	<b>-1615.0</b>	<b>-13.4</b>	<b>-1410.9</b>
<b>Current Changes:</b>				
Economic	-3.7	+11.1	-	+7.4
Quantity	-	+247.9	-	+247.9
Schedule	-	-	-	-
Engineering	-	+26.2	-	+26.2
Estimating	+20.5	-15.7	-4.5	+0.3
Other	-	-	-	-
Support	+25.3	-61.2	-	-35.9
<b>Subtotal</b>	<b>+42.1</b>	<b>+208.3</b>	<b>-4.5</b>	<b>+245.9</b>
<b>Total Changes</b>	<b>+259.6</b>	<b>-1406.7</b>	<b>-17.9</b>	<b>-1165.0</b>
<b>Current Estimate</b>	<b>3614.2</b>	<b>4872.2</b>	<b>110.7</b>	<b>8597.1</b>

(U) Summary (FY 1998 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
<b>Production Estimate</b>	3820.4	5982.4	129.5	9932.3
<b>Previous Changes:</b>				
Quantity	-	-1164.4	-	-1164.4
Schedule	-	-	-	-
Engineering	+309.0	+91.8	-7.7	+393.1
Estimating	-123.7	-232.1	-4.0	-359.8
Other	-	-	-	-
Support	-0.5	-40.9	-	-41.4
<b>Subtotal</b>	<b>+184.8</b>	<b>-1345.6</b>	<b>-11.7</b>	<b>-1172.5</b>
<b>Current Changes:</b>				
Quantity	-	+234.3	-	+234.3
Schedule	-	-	-	-
Engineering	-	+25.0	-	+25.0
Estimating	+16.7	-2.3	-4.4	+10.0
Other	-	-	-	-
Support	+24.3	-40.1	-	-15.8
<b>Subtotal</b>	<b>+41.0</b>	<b>+216.9</b>	<b>-4.4</b>	<b>+253.5</b>
<b>Total Changes</b>	<b>+225.8</b>	<b>-1128.7</b>	<b>-16.1</b>	<b>-919.0</b>
<b>Current Estimate</b>	<b>4046.2</b>	<b>4853.7</b>	<b>113.4</b>	<b>9013.3</b>

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-3.7
	Funding received for Computer Replacement Program Single Lab Configuration. (Support)	+24.3	+25.3
	Funds increased due to reprogramming of Global Air Traffic Management from procurement to RDT&E. (Estimating)	+43.2	+47.7
	Congressional reduction to Link 16 Attack Support Upgrade program. (Estimating)	-16.6	-17.0
	Refinement of estimate primarily to the SATCOM and Advanced Development programs. (Estimating)	-10.7	-11.4
	Adjustment for Current and Prior Inflation. (Estimating)	+0.8	+0.8
	Refinement of estimate due to other Miscellaneous Adjustments. (Estimating)	0.0	+0.4
	RDT&E Subtotal	+41.0	+42.1
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-14.7
	Economic adjustment for negative program change. (Economic)	N/A	+25.8
	Adjustment for Current and Prior Inflation. (Estimating)	+7.3	+7.5
	Adjustment for Current and Prior Inflation. (Support)	+3.4	+4.2
	Total Quantity Variance associated with increase of 1 units.	+193.8	+205.0
	Quantity increase of 1 units (from 14 to 15 aircraft. (Quantity)	+234.3	+247.9
	Allocation to Engineering variance resulting from Quantity Change. (QR)(Engineering)	+20.0	+21.1
	Allocation to Estimating variance resulting from Quantity Change. (QR)(Estimating)	-60.5	-64.0
	Refinement of estimate associated with the addition of an aircraft. (QR)(Estimating)	+40.5	+42.9
	Refinement of estimate to reflect actual funding received. (QR)(Estimating)	+8.6	+9.1
	Kosovo contingency funds received and applied to Joint Service Work Stations (JSWS) and Personal Computer Improved Data Modem (PCIDM). (Engineering)	+5.0	+5.1
	Funds received for Over and Above production work (Lots III and IV). (Estimating)	+35.0	+35.3

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Funding received for the rate re-opener portion of the Prime Contractor's Requests for Equitable Adjustments (REAs). (Estimating)	+6.4	+6.6
Refinement of estimate to update actuals. (Estimating)	+13.7	+14.2
Adjustments for inflation and other Congressional actions. (Estimating)	+3.1	+3.0
Change in Initial Spares (primarily due to an FY01 funding reduction, partially offset by receipt of stock fund and P-15 spares. (Support)	-73.6	-97.6
Change in Other Weapon Systems is primarily due to decrease from reprogramming of Global Air Traffic Management (from procurement to RDT&E), partially offset by funds received for the Computer Replacement Program retrofit. (Support)	-26.2	-38.0
Change in Peculiar Support. (Support)	-0.1	-0.1
Correction to align flyaway and support. (Support)	0.0	0.0
(Estimating)	+56.4	+70.3
	-56.4	-70.3
Procurement Subtotal	+216.9	+208.3
(3) <u>MILCON</u>		
Elimination of a construction project (Estimating)	-4.4	-4.5
MILCON Subtotal	-4.4	-4.5

QR = Quantity related changes.

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
488.11	-0.95	+52.37	--	+29.53	-26.28	--	-5.46	+49.21	537.32

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
330.47	-0.62	+13.83	--	+8.80	-20.19	--	-7.48	-5.66	324.81

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	APR 1985	SEP 1985	SEP 1985	SEP 1985
Milestone III	N/A	SEP 1996	SEP 1996	SEP 1996
FUE/IOC	TBD	SEP 1997	DEC 1997	DEC 1997
Total Cost	1388.2	6741.9	9762.1	8597.1
Total Quantity	0	21	20	16
Prog Acq Unit Cost	0	321.04	488.11	537.32

(U) NOTE: The SAR Planning Estimate (PE) Total Cost of 1388.2 was based on the RDT&E program only.

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

(U) Ground Support Systems, RDT&E contract F19628-93-C-0067, is over 90 percent complete and is no longer being reported.

Low Rate Initial Production Lots I and II, Procurement contract F19628-92-C-0035, are over 90 percent complete and are no longer being reported.

The Computer Replacement Program (CRP), RDT&E contract F19628-90-C-0197, is over 90 percent complete and will no longer be reported in the SAR.

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15a. (U) Contract Information (Cont'd):

a. RDT&E -- (U) CRP:				Initial Contract Price		
Northrop Grumman Corp, Melbourne FL				<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F19628-90-C-0197, CPFF				\$132.1	N/A	1
Award: May 9, 1997						
Definitized: November 26, 1997						
	Current Contract Price			Estimated Price At Completion		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
	\$141.7	N/A	1	\$141.7	\$141.7	
				<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances				\$7.2	\$-0.6	
Cumulative Variances To Date (11/19/99)				<u>\$0.4</u>	<u>\$-2.4</u>	
Net Change				\$-6.8	\$-1.8	

Explanation of Change:

(U) This reflects the Computer Replacement EMD Program (CRP) for the Joint STARS F19628-90-C-0197 contract. This effort is incorporated into the contract on two CLINs: CLIN 40 Central Computers (General Purpose Computer (GPC) and System Monitoring and Control Computers (SM&C)) and Operator Work Station Advanced Digital Display Processor (OWS ADDP) replacement effort; and CLIN 41 Programmable Signal Processor (PSP), Operator Work Station Local Area Network (OWS/LAN), and Signal Pre-Processor/Pulse Compression Unit (SPY/PCU) replacement effort.

CLIN 40 was awarded 9 May 97, with an effective date of 31 March 97. CLIN 41 was awarded as a UCA on 21 May 97, negotiations were completed 15 Oct 97 and definitization on 26 Nov 97. CLINs 40 and 41 were modified on 31 July 98 to accomplish Single Software Baseline effort.

The Initial Contract Price on CLIN 40 contract target price of \$74.0M and CLIN 41 NTE of \$58.1M (total \$132.1M). CLIN 41 was definitized 26 November 1997 and changed from \$58.1M to \$53.4M (total \$127.5M). The Contract Change Proposal (CCP) for Single Software Baseline effort adjusted CLINs 40 and 41 contract prices by \$7.9M and \$0.7M respectively (total contract adjustment \$8.6M). The Contractor's and Program Manager's Current Estimated Cost of Completion changed from \$136.1 to \$141.7 due to contractor identified and reported cost growths in the material, overhead, and engineering labor rate accounts totalling \$5.6M.

The cost variance reflects program cost growth (labor, material and overhead). The schedule variance is attributed to delayed material receipt/application (i.e. Central Computers) and delayed test and evaluation and integrated logistics support tasks.

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15b. (U) Contract Information (Cont'd):

b. Procurement --			Initial Contract Price		
(U) <u>LRIP Lot III:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Northrop Grumman Corp, Melbourne FL			\$123.2	N/A	2
F19628-92-C-0035, FFP OPTION					
Award: May 10, 1994					
Definitized: August 2, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$762.6	N/A	2	\$762.6	\$762.6	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$4.5	\$6.6	
Cumulative Variances To Date (11/19/99)			<u>\$26.0</u>	<u>\$7.5</u>	
Net Change			\$21.5	\$0.9	

Explanation of Change:

(U) Initial Target amount represents long lead funding.

The increase in Current Contract Target Price and Estimated Price At Completion from \$722.0M to \$762.6M is attributable to Over and Above (O&A) aircraft refurbishment tasks, modifications, work requests and configuration updates.

The change in the cost variance is due to an overstatement of material values in several areas discovered at the completion of the contractor's Material Management Group's analysis of cumulative to date expenses.

(U) <u>LRIP Lot IV:</u>			Initial Contract Price		
Northrop Grumman Corp, Melbourne FL			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F19628-95-C-0169, FFP			\$168.6	N/A	2
Award: July 21, 1995					
Definitized: December 20, 1996					

Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$540.0	N/A	2	\$540.0	\$540.0	

Explanation of Change:

(U) Initial Target amount represents long lead funding.

The increase in Current Contract Target Price and Estimated Price at Completion from \$492.0M to \$540.0M is due to additional Over and Above (O&A) aircraft refurbishment tasks, modifications and JIMIS sustainment support efforts.

15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>LOT V:</u> Northrop Grumman Corp, Melbourne FL F19628-96-C-0021, FFP Award: June 19, 1996 Definitized: June 30, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$73.0	N/A	2

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$418.1	N/A	2	\$418.1	\$418.1

Explanation of Change:

(U) Initial Target amount represents long lead funding.

The increase in Current Contract Target Price and Estimated Price At Completion from \$409.0 to \$418.1M is due to the addition and definitization of the connectivity effort.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>Lot VI:</u> Northrop Grumman Corp, Melbourne FL F19628-97-C-0001, FPI Award: December 31, 1996 Definitized: May 5, 1998	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$226.5	N/A	1

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$247.8	\$252.6	1	\$247.8	\$247.8

Explanation of Change:

(U) Contract Type includes Fixed Price Incentive, Cost Plus Fixed Fee and Firm Fixed Price.

The increase in Current Contract Target Price and Estimated Price at Completion from \$226.5M to \$247.8M reflects additional modifications, including the Computer Replacement Program (CRP) Group B Engineering Change Proposal (CRP incorporated in-line with P-11) and definitization of the configuration update effort.

15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FPI contract.

(U) <u>Lot VII:</u> Northrop Grumman Corp, Melbourne FL F19628-98-C-0001, FPI Award: October 31, 1997 Definitized: N/A	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$72.1	N/A	2

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$387.4	\$404.3	1	\$387.4	\$387.4

Explanation of Change:

(U) F19682-98-C-0003 basic contract (reported in the last SAR) was signed on 31 Oct 97 for Lot VII (P-12 and P-13) with a dollar value of \$72.1M (long lead). Full Rate Production for Lot VII was definitized on 12 Aug 99 under the Lot VI contract vehicle (F19628-97-C-0001--FPI, CPFF, FFP contract types) in order to simplify processing of any future changes. Lot VII will now be reported under contract F19628-97-C-0001.

The increase in current contract price from \$81.5 to \$387.4 and estimated price at completion values reflect definitization of the Fixed Price Incentive (FPI) production contract and several additional modifications.

Cost and Schedule variance reporting is not required on this FPI contract.



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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY82-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
RDT&E	3127.0	76.0	77.1	334.1	3614.2
Procurement	4035.2	393.0	323.1	120.9	4872.2
MILCON	110.7	-	-	-	110.7
O&M	-	-	-	-	-
<b>Total</b>	<b>7272.9</b>	<b>469.0</b>	<b>400.2</b>	<b>455.0</b>	<b>8597.1</b>

b. Annual Summary -- JSTARS

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1998 Dollars Nonrec</u>	<u>Flyaway FY 1998 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1982				50.8	32.6
1983				46.6	31.3
1984				58.7	41.0
1985				67.4	48.6
1986				211.2	156.1
1987				388.9	300.2
1988				417.0	330.7
1989				276.3	229.6
1990				115.6	99.1
1991				261.6	232.6
1992				368.5	337.2
1993				335.3	313.2
1994				292.6	278.0
1995				161.7	156.5
1996				156.4	154.1
1997				204.9	204.5
1998				106.8	107.3
1999				73.4	74.4
2000				74.1	76.0
2001				74.0	77.1
2002				49.3	52.2
2003				35.6	38.3
2004				102.3	112.3
2005				117.2	131.3
<b>Subtotal</b>	<b>1</b>			<b>4046.2</b>	<b>3614.2</b>

(U) Funding for the Radar Technology Insertion Program (RTIP) is not included in this SAR (although it is included in the Joint STARS' Program Element and the Research, Development, Test and Evaluation Descriptive Summary).

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

DoD designated the RTIP program an Acquisition Category 1D program on 7 Aug 98, with separate reporting requirements. The RTIP Milestone II Acquisition Decision Memorandum was signed on 19 Feb 00.

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1998 Dollars Nonrec	Flyaway FY 1998 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992			77.2	145.0	137.2
1993	2	14.5	462.0	658.7	631.7
1994	2	6.0	584.7	551.5	537.7
1995	2	32.1	638.7	682.9	675.4
1996	2	15.3	352.1	503.6	504.1
1997	2	17.3	488.0	535.8	541.7
1998	1	17.2	183.3	350.4	356.4
1999	2	18.6	342.6	633.9	651.0
2000	1	9.7	224.4	377.5	393.0
2001	1	9.6	226.0	305.3	323.1
2002				35.3	37.9
2003				18.2	19.9
2004				14.6	16.3
2005				41.0	46.8
Subtotal	15	140.3	3579.0	4853.7	4872.2

(U) The latest approved Acquisition Program Baseline (APB) (17 Jun 99) reflects 14 procurement aircraft. Funding for production aircraft P-15 was added to the Joint STARS program with the FY01 President's Budget. A revised APB including the additional aircraft is in coordination at this time.

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY 1998 Dollars Nonrec	Flyaway FY 1998 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989				0.6	0.5
1990				0.4	0.4
1991				2.0	1.8
1992				20.1	18.8
1993				11.3	10.8
1994				25.1	24.4
1995				14.5	14.3
1996				6.9	6.9
1997				18.5	18.6
1998				14.0	14.2
Subtotal				113.4	110.7

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	16	140.3	3579.0	9013.3	8597.1

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	1	1
Procurement	6	6

(U) Percent Total Program Quantities Delivered: 43.8%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 6249.7

(U) Percent Total Program Expended: 72.7%

(U) Note 17 a: Procurement Deliveries:

Our first E-8C was delivered 4 Mar 96. Second aircraft was delivered on 12 Dec 96. Third aircraft was delivered on 25 Nov 97. Fourth aircraft was delivered on 18 Aug 98.

Since the last SAR we delivered our fifth and sixth procurement aircraft on 13 Aug 99 (11 weeks ahead of schedule) and 1 Dec 99 (30 days ahead of schedule) respectively.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

O&S Costs were based on refurbished Boeing 707 aircraft operating hours at 63 hours per aircraft per month powered by the TF-33B engine. The support concept priced assumes 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 organizational (off-equipment) maintenance, 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 using a Program Office developed Depot Level Repairables (DLR) cost estimating model which takes into account current Mean Time Between Failure (MTBF) projections for all components, latest acquisition price for each, and the current Repairable Support Division (RSD) surcharge expected to be levied against each depot return. The airframe costs were estimated using analogies to similar programs which use the same Planned Depot Maintenance (PDM) concept or a similar

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

(Aircraft DLRs/Contractor Owned and Managed Base Supply) airframe. The Operations and Support period for the current estimate has an eight year Ramp-Up (FY 96-04) and Steady State to FY 23. The Steady State costs presented below were extracted from an updated Service Cost Position, dated 22 Jul 96 adjusted for actuals through FY 99 and for projections through FY 23. This is representative of the latest CLS Brochure with a 14 aircraft baseline (estimate is prior to the issuance of the FY 01 PB with P-15 added).

There is no antecedent system.

b. (U) Costs -- (FY 1998 Constant (Base-Year) Dollars in Millions)

Cost Element	Steady State (SS) Annual Costs - First Year SS FY04	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	59.2	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	8.8	N/A
Contractor Support	57.4	N/A
Sustaining Support	68.7	N/A
Indirect Costs	34.6	N/A
Mission Personnel	69.8	N/A
	N/A	N/A
Total	298.5	N/A

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N-9 E-2C REPRO

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: E-2C AEW (HAWKEYE)

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): E-2C Hawkeye/Carrier Based Airborne Early Warning Command and Control System
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:  
 PEO(T) Aircraft Programs (PMA-231)      CAPT. Norvell L. Lilly  
 Bldg #2272, Suite 455, NAVAIRSYSCOM      Assigned: May 6, 1999  
 47123 Buse Road Unit IPT                      DSN 757-7363; COMM (301) 757-7363  
 Patuxent River, MD 20670-1547              lillynl@navair.navy.mil
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
 (U) PE 0204152N Project E0463, E2321  
 PROCUREMENT:  
 (U) APPN 1506 ICN 0195 (Navy)  
 MILCON:  
 (U) PE 0204611N

No Security Objection  
to Open Publication  
(AS AMENDED)  
00-0-0133  
MAR 28 2000  
*McNewell*  
Office of the Chief of  
Naval Operations  
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DEPARTMENT OF DEFENSE

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**5. (U) References:**

SAR Baseline (Production Estimate):

(U) The Acquisition Decision Memorandum for E-2C New Production Milestone III was approved 27 October 1994 by ASN RD&A. Approval was granted to begin E-2C Group II full rate production beginning with four aircraft in FY 95.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated February 17, 2000.

**6. (U) Mission and Description:**

(U) 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 provides area surveillance, intercept, search and rescue, communication relay, and strike/air traffic control. Principal subsystems include APS-125/138/139/145 radar and ATR-73 Passive Detection Systems which allow the E-2C to detect emitters/targets well beyond radar range.

Plans and funding were established for the E-2C Mission Computer Upgrade (MCU) in order to: (1) take advantage of improved sensor and communication capabilities resulting from the Update Development Program (UDP II), (2) exploit emerging Commercial Off-The-Shelf Technologies (COTS), and (3) address supportability issues occurring with the current antiquated tactical computer (which predates the E-2C aircraft). The replacement computer's hardware and software will be integrated into the onboard subsystems encompassing complex sensor inputs and outputs.

**7. (U) Executive Summary:**

(U) Studies initiated in the late 1980's confirmed the need for an upgrade to the current E-2C computer and possible upgrade approaches. Funding was identified and a Mission Computer Upgrade (MCU) Milestone IV/II was approved by ASN(RDA) in September 1994. An Engineering and Manufacturing Development (E&MD) contract for MCU development and integration was signed with Grumman Aerospace Corporation in November 1994. Successful first flight of an MCU equipped developmental test aircraft took place January 24, 1997. Low Rate Initial Production (LRIP) approval was granted in August 1997. Software issues have delayed Milestone III until FY 2001.

**MISSION COMPUTER UPGRADE (MCU):**

Systems testing beginning in December 1998 led to the realization that the software was less mature than desired. The time required to correct the software trouble reports identified led to the change in schedule reported in the June 1999 SAR. The Navy recognizes that an additional \$20.5 million is required to complete the MCU in FY 2000. An increase of \$12 million was provided by Congress in support of RMP/Computer Upgrades. The Navy is committed to fully funding the remainder of this requirement through a

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7. (U) Executive Summary (Cont'd):

combination of Above and Below Threshold Reprogramming actions.

The MCU program received verbal approval to proceed with the proposed rebaselined program during a 19 August 1999 brief to ASN(RD&A). The schedule changes extend the Milestone III date from May 2000 to May 2001 and increase costs by an additional \$20.5 million (the increase in cost does not cause a threshold breach to the E-2C program baseline). An independent tiger team commissioned by the PMA has validated the cost and schedule changes. Several changes and enhancements to our processes have been incorporated as a result of the tiger team's recommendations. Roles and responsibilities have been more clearly defined. A system-wide Configuration Control Board (CCB) has been established. A dedicated systems engineering discipline was added into the overall program effort via the E-2C Class Desk. Technical Performance Measures (TPM) were incorporated into EVM. Engineers and equipment to supplement overall integration effort were added. Software maturity and quality are being thoroughly addressed with more resources (time and personnel).

VAW-117 successfully performed a Puerto Rico counter-narcotics deployment. Overall they were very pleased with the performance and reliability of the MCU system. After incorporation of changes made at our rebaseline in August, the MCU program is on track to all projections and ready to begin Functional Qualification Test (FQT) in February 2000. The software, as of 31 December 1999, is 100% tested. We are currently performing our final Dry Run test in preparation for FQT. TECHEVAL is scheduled for July 2000 and OPEVAL for October 2000.

E-2C PRODUCTION:

From FY99 through FY03, the Navy plans to purchase a total of 21 E-2C airframes under a fully-funded, five year, firm-fixed-price multiyear procurement (MYP). The MYP buys out the remaining E-2C inventory requirement of 36 aircraft. In the fiscal year 1999 Defense Authorization and Appropriation Bills, Congress authorized the Secretary of the Navy to enter into a multiyear procurement contract for the E-2C aircraft. The MYP certification and notification letters were forwarded to Congress on February 22, 1999. The multiyear contract was awarded on April 26, 1999 and definitized on September 23, 1999. Logistics elements of the proposal were definitized in December 1999. The entire MYP contract, including FMS aircraft, is fully negotiated and priced.

The FY 2000 and FY 2001 President's Budgets do not include required funding for production support and nonrecurring line shutdown. These costs are included in the E-2C APB but were not programmed into the President's Budget pending a final decision on the follow-on AEW platform (Common Support Aircraft or E-2C Derivative). Since the E-2C was chosen as the follow-on AEW platform, a decision is pending to continue the production of the E-2C. If production is not continued, then line shutdown and production support costs will need to be reflected in the E-2C budget.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
IOC	APR 92	APR 92	APR 1992
Milestone III	JUN 94	JUN 94	OCT 1994
FRP Contract Award	JUN 94	JUN 94	DEC 1994
FOC	OCT 94	OCT 94	OCT 1994
FOT&E	JUN 97	JUN 97	JUN 1997
Organic Support Capability Date	JUN 98	JUN 98	JUN 1998
Service Depot Support Date	JUN 99	JUN 99	JUN 1999
Mission Computer Upgrade (MCS)			
Milestone II	SEP 94	SEP 94	SEP 1994
Navy Program Review	MAR 97	MAR 97	AUG 1997
- LRIP I			
First Flight of Production Representative Aircraft	SEP 98	SEP 98	NOV 1998
Initial Operational Capability (IOC)	JUN 99	JUN 99	OCT 1999
Milestone III	NOV 99	MAY 2001	MAY 2001

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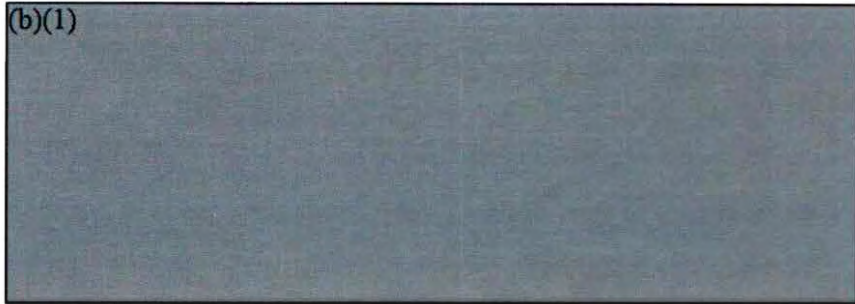
9b. (U) Schedule (Cont'd):

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Take off weight	55000	55000 / 55000	55000	55000
Length	57'6"	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	T56-A-427	T56-A- / T56-A-427	T56-A-427	T56-A-427
Crew	5	5 / 5	5	5
Speed (KIAS)				
Max Speed @13,500 ft (KIAS)	315	315 / 315	315	315
Cruise Speed @ 24,540 ft.	270	270 / 270	270	270
Time on Station @200 nm (hrs)	4.0	4.0 / 4.0	4.0	4.0
Service Ceiling (ft)	28100	28100 / 28100	28100	28100
Passive Detection System				
Range (nm)				
Azimuth (deg)				
Radar Detection Range (AN/APS-145) (nm)				
Overwater (C-141 target) (nm)				
Systems Accuracy (CEP to Target at 200 nm range) (nm)				
Mission Computer Upgrade (MCS)				
System Weight (lbs)	150	150 / 300	TBD	174
Load Time (sec)	45	45 / 270	TBD	243
In-flight Reload (sec)	20	20 / 144	TBD	20
Operational Availability	0.97	0.97 / 0.93	TBD	.97



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

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	205.7	379.7	366.5
Procurement	2422.0	2719.1	2546.6
Airframe & Changes	(1914.2)		(1888.0)
Engine & Accessories	(206.2)		(181.3)
Electronics	(87.5)		(161.4)
Armament & Other GFE	(5.6)		(10.0)
Nonrecurring			(28.4)
Total Flyaway	(2213.5)		(2269.1)
Other Weapons Sys Cost	(141.1)		(167.2)
Peculiar Support	(0.0)		(39.2)
Initial Spares	(67.4)		(71.1)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1994 Base-Year \$	2627.7	3098.8	2913.1
Escalation	560.2	488.8	280.1
Development (RDT&E)	(18.2)	(37.7)	(26.5)
Procurement	(542.0)	(451.1)	(253.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	3187.9	3587.6	3193.2

(U) Dollars values (both then-year and base-year) in the SAR and APB baselines and current estimate represent the dollar values of both the E-2C aircraft and MCU end-items. These two end-items have been consolidated into the one end-item as of April 1997.

b. (U) Quantity --

Development (RDT&E)	N/A	N/A	0
Procurement	<u>36</u>	<u>36</u>	<u>36</u>
Total	36	36	36

(U) There are no Low Rate Initial Production (LRIP) quantities approved for the E-2C reprocurd aircraft.

c. (U) Foreign Military Sales --

Sales to date are 4 for Israel for a total of \$178.8M, 13 for Japan for a total of \$860.1M, 6 for Egypt for a total of \$734.1M, 4 for Singapore for a total of \$318.3M, and 2 for France for a total of \$529.8M. FMS sales to Taiwan total \$201.5M in support of 4 direct commercial sale (DCS) aircraft.

International Cooperative Program

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

	<u>FY 92</u>	<u>FY 93</u>	<u>FY 94</u>	<u>Total</u>
	(\$ millions)			
SD FYDP (Nunn) PE 0603790D	0.225	0.350	0.800	1.375
<u>EGYPT</u>	<u>2.880</u>	<u>2.880</u>	<u>0.000</u>	<u>5.760</u>
Total	3.105	3.230	0.800	7.135

d. (U) Nuclear Costs --  
None.

12. (U) Unit Cost Summary:

	<u>UCR</u>	<u>Current</u>	<u>Percent</u>
	<u>Baseline</u>	<u>Estimate</u>	<u>Change</u>
	<u>(FEB 2000 APB)</u>	<u>(Dec 1999 SAR)</u>	
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1994 BY\$)	3098.8	2913.1	
(2) Quantity	36	36	
(3) Unit Cost	86.078	80.919	-5.99
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1994 BY\$)	2719.1	2546.6	
(2) Quantity	36	36	
(3) Unit Cost	75.531	70.739	-6.34

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13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	223.9	2964.0	-	3187.9
Previous Changes:				
Economic	-13.1	-236.7	-	-249.8
Quantity	-	-	-	-
Schedule	-	+19.3	-	+19.3
Engineering	+178.4	+129.2	-	+307.6
Estimating	-33.1	-117.7	-	-150.8
Other	-	-	-	-
Support	-1.0	+17.0	-	+16.0
Subtotal	+131.2	-188.9	-	-57.7
Current Changes:				
Economic	-0.5	-7.3	-	-7.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+17.5	-	+17.5
Estimating	+38.4	-24.8	-	+13.6
Other	-	-	-	-
Support	-	+39.7	-	+39.7
Subtotal	+37.9	+25.1	-	+63.0
Total Changes	+169.1	-163.8	-	+5.3
Current Estimate	393.0	2800.2	-	3193.2

(U) Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	205.7	2422.0	-	2627.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	+25.2	-	+25.2
Engineering	+154.7	+111.2	-	+265.9
Estimating	-28.6	-76.8	-	-105.4
Other	-	-	-	-
Support	-	+34.0	-	+34.0
Subtotal	+126.1	+93.6	-	+219.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+15.2	-	+15.2
Estimating	+34.7	-19.2	-	+15.5
Other	-	-	-	-
Support	-	+35.0	-	+35.0
Subtotal	+34.7	+31.0	-	+65.7
Total Changes	+160.8	+124.6	-	+285.4
Current Estimate	366.5	2546.6	-	2913.1

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-0.5
	Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.2
	Advanced Support Aircraft (ASA) and UHF Electronically Scanning Antenna (UESA) Plus-up. (Estimating)	+7.7	+8.4
	Below Threshold Reprogramming (BTR) and payment for lapsed liability contracts. (Estimating)	+1.9	+2.0
	Revised Estimate for Miscellaneous Budget Adjustments. Across-the-Board reductions, etc. (Estimating)	-1.0	-1.1
	Radar Modernization Program (RMP) Plus-ups. (Estimating)	+28.0	+31.2
	Small Business Innovative Research (SBIR)/Small Business Technology Transfer (STTR) and Navy adjustments for rate changes and Strategic Sourcing Plan (SSP) savings. (Estimating)	-2.1	-2.3
	RDT&E Subtotal	+34.7	+37.9
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-10.1
	Economic adjustment for negative program change. (Economic)	N/A	+2.8
	Minature Airborne Global Positioning System 2000 Receiver Plus-up. (Engineering)	+15.2	+17.5
	Adjustment for Current and Prior Inflation. (Estimating)	+3.8	+4.6
	Funds added to offset inflation adjustments for the E-2C APN-1 account. (Estimating)	+5.0	+6.4
	Advanced Procurement Recissions, Budget Submitting Office Realignment, and Across-the-Board Reductions, etc. (Estimating)	-2.2	-2.8
	Updated government furnished equipment prices and engine costs to reflect multiyear buy. (Estimating)	-25.8	-33.0
	Adjustment for Current and Prior Inflation. (Support)	+0.4	+0.4
	Change in Initial Spares due to additions of Cooperative Engagement Capability and Mission Computer Upgrade. (Support)	+14.5	+16.3

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Change in Peculiar Support to offset Current and Prior Inflation. (Support)	-0.2	-0.2
Increase due to government furnished equipment reprice and engine multiyear realignment. (Support)	+20.3	+23.2
Procurement Subtotal	<u>+31.0</u>	<u>+25.1</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
88.55	-7.16	--	+0.54	+9.03	-3.81	--	+1.55	+0.15	88.70

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
82.33	-6.78	--	+0.54	+4.07	-3.96	--	+1.58	-4.55	77.78

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	SEP 1994	SEP 1994
Milestone III	N/A	N/A	NOV 1999	MAY 2001
FUE/IOC	N/A	N/A	JUN 1999	OCT 1999
Total Cost	0	N/A	3187.9	3193.2
Total Quantity	0	0	36	36
Prog Acq Unit Cost	0	N/A	88.55	88.7

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

a. RDT&E --

(U) Mission Computer Upgrade:  
Northrop-Grumman Corp, Bethpage NY  
N00019-93-C-0205, CPIAF  
Award: November 30, 1994  
Definitized: November 30, 1994

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$161.2	N/A	0	\$161.2	\$161.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-2.8	\$-0.7
Cumulative Variances To Date (11/30/99)	<u>\$0.3</u>	<u>\$-0.1</u>
Net Change	\$3.1	\$0.6

Explanation of Change:

(U) The contractor's ability to correct Software Trouble Reports (STRs) that are being generated during Primary Mission Processor software dry-run testing and lower than planned charges for shared VAX support are the primary contributors to the favorable cost performance. The improvement in schedule performance is also related to the contractor's ability to correct STRs during the dry-run testing. However, the major contributor to the negative schedule variance continues to be the Flight Test control account. This is attributed to the integrated test team's effort to ensure sufficient software maturity and functionality prior to flight testing. In order to accomplish this goal, the team has delayed some flight test events to concentrate on execution of ground tests and assessment of software readiness for flight. These delays have affected the contractor's ability to take earned value for flight test events that were planned to have been successfully flown.

(U) FY 97 Production A/C:  
Northrop-Grumman Corp, Bethpage NY  
N00019-96-C-0049, FFP  
Award: April 4, 1996  
Definitized: August 6, 1997

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$241.5	N/A	4	\$241.5	\$241.5

Explanation of Change:

None.

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E-2C AEW (HAWKEYE), December 31, 1999

15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
b. Procurement -- (U) <u>FY 98 Production A/C:</u> Northrop-Grumman Corp, Bethpage NY N00019-96-C-0195, FFP Award: December 15, 1996 Definitized: October 31, 1997	\$186.6	N/A	3

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$186.6	N/A	3	\$186.6	\$186.6

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

The FY98 Congressional plus-up aircraft is not included on this contract. Contract award for the original three FY98 aircraft was in Dec 1996 and negotiated in conjunction with the FY97 aircraft buy as a second lot. Aircraft prices were finalized in August 1997 with funds obligated in October 1997. The plus-up aircraft funds were received in December 1997, which was too late to take advantage of a quantity buy of four aircraft. The plus-up aircraft is included on the FY99 MYP contract.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>FY98 PLUS/FY99 Prod. A/C:</u> Northrop-Grumman Corp, Bethpage NY N00019-97-C-0147, FFP Award: April 26, 1999 Definitized: September 23, 1999	\$1293.8	\$1293.8	22

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1293.8	\$1293.8	22	\$1293.8	\$1293.8

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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E-2C AEW (HAWKEYE), December 31, 1999

15. (U) Contract Information (Cont'd):

(U) Contract Comments:

Since the FY98 plus-up aircraft's funds were received in December 1997, which was too late to take advantage of a quantity buy on contract N00019-96-C-0195, this aircraft was included on the FY99-03 E-2C Multiyear procurement Contract (MYP). The entire MYP contract is fully negotiated and priced. The total cost of the MYP contract is \$1,420.5 million which includes \$1,293.8 million for USN aircraft plus \$126.7 million for FMS aircraft.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
RDT&E	292.4	36.3	18.7	45.6	393.0
Procurement	1569.8	395.5	334.0	500.9	2800.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1862.2	431.8	352.7	546.5	3193.2

b. Annual Summary -- E-2C HAWKEYE

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1994 Dollars Nonrec</u>	<u>Flyaway FY 1994 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				17.8	18.0
1995				48.1	49.7
1996				56.8	59.6
1997				55.9	59.4
1998				56.5	60.5
1999				41.8	45.2
2000				33.2	36.3
2001				16.8	18.7
2002				17.6	19.9
2003				10.7	12.3
2004				5.6	6.6
2005				5.7	6.8
Subtotal				366.5	393.0

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E-2C AEW (HAWKEYE), December 31, 1999

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				36.6	37.8
1995	4		251.2	276.4	289.6
1996	3		180.0	199.2	211.6
1997	4	1.4	259.9	277.6	297.4
1998	4	11.0	261.6	300.4	325.2
1999	3	8.5	183.3	372.6	408.2
2000	3	6.3	193.3	355.8	395.5
2001	5	1.2	303.6	295.8	334.0
2002	5		304.0	242.9	279.1
2003	5		303.8	186.9	218.9
2004				2.4	2.9
2005					
2006					
Subtotal	36	28.4	2240.7	2546.6	2800.2

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	36	28.4	2240.7	2913.1	3193.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	36	11

(U) Percent Total Program Quantities Delivered: 30.6%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1486.8

(U) Percent Total Program Expended: 46.6%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
ASSUMPTIONS ARE FOR FLEET SQUADRONS:

Flight Hours Per Aircraft Per Month	40.3
Number of Aircraft/Squadron	4.0
Consumption Rate, Gal/Hr	372.2
POL Cost, JP-5, Per Barrel, FY 97	\$33.18

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E-2C AEW (HAWKEYE), December 31, 1999

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

Date of estimate 9/98.

There is no antecedent program.

No current information is available at this time for the Mission Computer or Hawkeye 2000 contributions.

b. (U) Costs -- (FY 1994 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Squadron	Avg Annual Cost Per (Antecedent)
Mission Pay & Allowances	6.8	0.0
Unit Level Consumption	3.7	0.0
Intermediate Maintenance	1.9	0.0
Depot Maintenance	2.7	0.0
Contractor Support	0.0	0.0
Sustaining Support	1.2	0.0
Indirect Costs	5.7	0.0
Total	22.0	0.0

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A-8 CH-47F

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CLEARED  
FOR OPEN PUBLICATION

SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A) 823)  
PROGRAM: CH-47F (ICH)

MAR 31 2000 9

AS OF DATE: DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

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1. Designation and Nomenclature (Popular Name): CH-47F Improved Cargo Helicopter (ICH)
2. DoD Component: Army
3. Responsible Office and Telephone Number:

Office of the Project Manager	LTC William T. Crosby
Cargo Helicopters, ATTN: SPAE-AV-CH	Assigned: July 1, 1998
Building 5681, Redstone Arsenal	DSN 897-4607; COMM (256) 313-4607
Huntsville, AL 35898-5280	crosbyw@peoavn.redstone.army.mil
4. Program Elements/Procurement Line Items:

RDT&E:  
PE 0203744A Project D430

PROCUREMENT:  
APPN 2031 ICN AA0254 (Army)
5. References:

SAR Baseline (Development Estimate):  
DAE Approved Acquisition Program Baseline (APB) dated May 19, 1998.

Approved Program:  
DAE Approved Acquisition Program Baseline (APB) dated May 19, 1998.

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CH-47F (ICH), December 31, 1999

#### 6. Mission and Description:

The CH-47F program consists of a modification to the current CH-47D helicopter to extend airframe service life, introduce an open electronic architecture that is compatible with the Army XXI digitized battlefield, and reduce Operating and Support (O&S) cost. This heavy lift helicopter program will be based on a remanufacture approach. The airframe will be rebuilt, mission capability improved, and vibrations reduced through airframe stiffening to provide for long term O&S cost reductions (See Section 18 O&S cost). Continued support, coverage, and sustainment of Maneuver, Fire Support, Air Defense, and Survivability mission areas will be provided by the CH-47F. Its mission is transportation of ground forces, class III/class V supplies, and battle critical cargo in support of all future contingencies.

A Service Life Extension Program, the CH-47F will sustain the aging CH-47D fleet and bridge the gap until the development of a follow-on aircraft. It will be fielded as a direct replacement for 300 of the CH-47D fleet.

The CH-47F program will retain most of the subsystems currently on the CH-47D, and repair them as required. The mission payload and range requirements will be met through installation of the T55-GA-714A engines on all CH-47D aircraft prior to induction into the CH-47F program.

#### 7. Executive Summary:

The CH-47F program was the result of a U. S. Army study and analysis to complete definition of the operational requirement, and identification of low risk technical solutions to extend the service life of the CH-47D helicopter. Based on those results, the Army proceeded to structure a program based on low risk modifications and processes to meet this need. The airframe service life extension will be achieved through a second rebuild by the aircraft's original manufacturer. The Army XXI digital battlefield capability will be achieved through incorporation of existing avionics and electronic systems on a data bus which will provide a Joint Technical Architecture-Army compliant open system architecture for future growth.

The CH-47F provides the most cost effective solution to sustain the heavy lift capability. The program has the full support of the Department of the Army and many of the Commanders-in-Chief who depend on the CH-47D for support. Funding is available to complete development and begin the transition to production.

Army Systems Acquisition Review Council (ASARC) Milestone II approval was obtained on 18 December 1997. On 22 April 1998, the Overarching Integrated Product Team (OIPT) Chairman recommended the program for entry into Engineering and Manufacturing Development (EMD) with an Acquisition Category (ACAT) IC designation. On 6 May 1998, the Under Secretary of Defense (Acquisition and Technology) approved the program for entry into EMD with an ACAT IC designation. Milestone Decision Authority was delegated to the Army Acquisition Executive. The Acquisition Decision Memorandum was signed on 19 May 1998.

An EMD contract was awarded to Boeing Helicopters on 15 May 1998. Boeing has awarded a subcontract to Rockwell Collins for development of the avionics package. Engineering development and manufacturing preparation activities are progressing. Preliminary and Critical Design Reviews are complete. The Systems Integration Laboratory (SIL) is operational at the contractor's

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7. Executive Summary (Cont'd):

facility, and the first software drop was delivered on schedule, is installed, and is functional in the SIL with no software trouble reports being generated.

The program experienced a \$4.769M decrement in FY99 RDT&E funding. To maintain program schedule and milestones, the PM was able to realign contract incremental funding and Live Fire Testing schedule. To maintain the program's demanding schedule, funds must now be restored in FY00 and an additional \$.7M is required in FY01 to accommodate live fire re-alignment. Again, if the funds are restored as listed, all program milestones and test schedules will be maintained.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
ORD Approval	NOV 97	NOV 97	NOV 1997
Milestone II ASARC	NOV 97	NOV 97	DEC 1997
EMD Contract Award	MAR 98	MAR 98	MAY 1998
Critical Design Review (CDR)	SEP 99	SEP 99	SEP 1999
LRIP (#1) Contract Award	DEC 01	DEC 01	DEC 2001
IOT&E			
Start	FEB 02	FEB 02	FEB 2002
Finish	MAR 02	MAR 02	MAR 2002
LRIP (#2) Contract Award	MAR 03	MAR 03	MAR 2003

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CH-47P (ICH), December 31, 1999

9a. Schedule (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
LRIP (#1) First Delivery	MAY 03	MAY 03	MAY 2003
Milestone III ASARC	JAN 04	JAN 04	JAN 2004
Full Rate Production Contract Award	FEB 04	FEB 04	FEB 2004
First Unit Equipped	SEP 04	SEP 04	SEP 2004

First Unit Equipped will be a Heavy Lift Helicopter Company of 16 aircraft.

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
Self-deploy w/30 min fuel reserve (nm)	1260	1260 / 1056	N/A	1260
Transport 16,000 lbs of internal/external cargo (nm)	100	100 / 50	N/A	100
Transport combat equipped troops:				
Number of Troops	44	44 / 31	N/A	44
Range (nm)	150	150 / 100	N/A	150
Reliability:				
Mean Time Between Essential Maintenance Actions (MTBEMA) (flt hrs)	3.5	3.5 / 3.3	N/A	3.5
Maintenance:				
Total Maintenance Ratio (mmh/flt hr)	9.2	9.2 / 9.8	N/A	9.2

(1) Performance requirements are to be achieved at 4000 ft above sea level and 95 degrees Fahrenheit.

(2) Confidence level at Milestone III, for Reliability, is 70 percent. Confidence level after 1000 flight hours by FUE unit is 90 percent.

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CH-47F (ICH), December 31, 1999

10b. Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

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

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	136.3	136.3	133.4
Procurement	2387.3	2387.3	2463.2
Flyaway	(2167.4)		(2177.5)
Total Other Wpn Sys			(0.0)
Peculiar Support	(172.0)		(237.9)
Initial Spares	(47.9)		(47.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1997 Base-Year \$	2523.6	2523.6	2596.6
Escalation	591.8	591.8	484.8
Development (RDT&E)	(6.5)	(6.5)	(4.3)
Procurement	(585.3)	(585.3)	(480.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3115.4	3115.4	3081.4
b. Quantity --			
Development (RDT&E)	2	2	2
Procurement	300	300	300
Total	302	302	302

Two years of Low Rate Initial Production (LRIP) for up to 30 aircraft was approved at Milestone II. The FY01 President's Budget reflects revised quantities for FY03-FY05 with 17 in FY03, 27 in FY04, 29 in FY05, and 8 in FY14. This results in a total of 28 LRIP aircraft.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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12. Unit Cost Summary:

	UCR Baseline (MAY 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1997 BY\$)	2523.6	2596.6	
(2) Quantity	302	302	
(3) Unit Cost	8.356	8.598	+2.90
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1997 BY\$)	2387.3	2463.2	
(2) Quantity	300	300	
(3) Unit Cost	7.958	8.211	+3.18

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	142.8	2972.6	-	3115.4
Previous Changes:				
Economic	-1.9	-71.7	-	-73.6
Quantity	-	-	-	-
Schedule	-	-6.4	-	-6.4
Engineering	-	-	-	-
Estimating	-1.5	-7.8	-	-9.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-3.4	-85.9	-	-89.3
Current Changes:				
Economic	-0.6	-38.3	-	-38.9
Quantity	-	-	-	-
Schedule	-	+3.1	-	+3.1
Engineering	-	+18.4	-	+18.4
Estimating	-1.1	-	-	-1.1
Other	-	-	-	-
Support	-	+73.8	-	+73.8
Subtotal	-1.7	+57.0	-	+55.3
Total Changes	-5.1	-28.9	-	-34.0
Current Estimate	137.7	2943.7	-	3081.4

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CH-47F (ICH), December 31, 1999

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

Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	136.3	2387.3	-	2523.6
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.7	-	-	-1.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-1.7	-	-	-1.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+10.1	-	+10.1
Estimating	-1.2	-	-	-1.2
Other	-	-	-	-
Support	-	+65.8	-	+65.8
Subtotal	-1.2	+75.9	-	+74.7
Total Changes	-2.9	+75.9	-	+73.0
Current Estimate	133.4	2463.2	-	2596.6

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year    Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.6
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
Revised Program Estimate (Estimating)	-1.5	-1.4
RDT&E Subtotal	<u>-1.2</u>	<u>-1.7</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-38.3
Stretchout of annual procurement buy profile. (Schedule)	0.0	+3.1
Low Maintenance Rotor Head Installation (Improved Rotor Head Utilizes Dry Versus Oil Based Lubrication) (Engineering)	+10.1	+18.4
Change in Initial Spares (Support)	-0.1	-0.1
Change in Peculiar Support (Addition to Training Systems Development/Training Devices) (Support)	+65.9	+73.9
Procurement Subtotal	<u>+75.9</u>	<u>+57.0</u>

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CH-47F (ICH), December 31, 1999

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
10.32	-0.37	-0.01	-0.01	+0.06	-0.03	--	+0.24	-0.12	10.20

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
9.91	-0.37	--	-0.01	+0.06	-0.03	--	+0.25	-0.10	9.81

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	NOV 1997	N/A	DEC 1997
Milestone III	N/A	JAN 2004	N/A	JAN 2004
FUE/IOC	N/A	SEP 2004	N/A	SEP 2004
Total Cost	N/A	3115.4	N/A	3081.4
Total Quantity	0	302	0	302
Prog Acq Unit Cost	N/A	10.32	N/A	10.2

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

a. RDT&E --

CH-47F EMD:  
Boeing Helicopters, Philadelphia PA  
DAAH23-98-C-0069, CPIF  
Award: May 15, 1998  
Definitized: May 15, 1998

Target	Initial Contract Price		Qty
	Target	Ceiling	
\$76.1	N/A		2

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$76.1	N/A	2	\$76.3	\$76.3

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CH-47F (ICH), December 31, 1999

15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.1	\$0.2
Cumulative Variances To Date (12/31/99)	\$1.8	\$-0.8
Net Change	\$1.9	\$-1.0

Explanation of Change:

Boeing's work force continues to perform very well under this contract as demonstrated by the positive cost variance. However, due to downsizing in Philadelphia, Boeing has, thus far, been unable to properly resource the program in a few critical areas which is producing a slightly negative schedule variance. PM personnel have identified the affected areas and have worked closely with the Boeing team to resolve the staffing problems. Performance is improving.

Increase in PM's estimated price at completion is not an overrun. The increase is a result of two minor additions in scope to correct oversights during original contract negotiations. During ongoing Crew Station Working Group (CSWG) evaluations, the combined team of PM personnel, contractors, and Army users determined the need for a third grip to control the map cursor on the multi-functional displays. This addition, at this minor cost, is a credit to the IPT process and will significantly improve pilot efficiency.

The second addition to the program was to correct an oversight from the contract negotiations. During Alpha contracting, Boeing bid and negotiated Failure Modes, Effects and Criticality Analysis (FMECA) for only the new aircraft components. The Supportability IPT determined that to provide a supportable helicopter, we need system level FMECA to effectively maintain the fleet. The addition provides for system level FMECA data at a minimum cost.

PM was able to fund the two additional items within allocated budget due to efficiencies in other areas.

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CH-47F (ICH), December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-15)</u>	<u>Total</u>
RDT&E	65.6	28.2	37.2	6.7	137.7
Procurement	-	-	83.8	2859.9	2943.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>65.6</b>	<b>28.2</b>	<b>121.0</b>	<b>2866.6</b>	<b>3081.4</b>

b. Annual Summary -- ICH

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1997 Dollars Nonrec</u>	<u>Flyaway FY 1997 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996				4.3	4.3
1997				16.8	16.9
1998				20.5	20.8
1999				23.0	23.6
2000				27.2	28.2
2001				35.3	37.2
2002				6.2	6.6
2003				0.1	0.1
<b>Subtotal</b>	<b>2</b>			<b>133.4</b>	<b>137.7</b>

Appropriation: 2031 - Aircraft Procurement, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1997 Dollars Nonrec</u>	<u>Flyaway FY 1997 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
2001		28.9		79.1	83.8
2002	11		135.0	158.3	170.4
2003	17		153.6	191.6	210.2
2004	27		214.9	262.0	293.1
2005	29		218.1	254.0	289.9
2006	26		182.4	198.9	231.5
2007	26		178.3	194.3	230.7
2008	26		175.0	191.1	231.4
2009	26		172.3	188.3	232.6
2010	26		170.1	185.6	233.8
2011	26		168.1	183.8	236.2
2012	26		166.1	181.6	238.1
2013	26		156.2	141.6	189.4

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CH-47F (ICH), December 31, 1999

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

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2014	8		58.7	44.7	61.0
2015				8.3	11.6
Subtotal	300	28.9	2148.8	2463.2	2943.7

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	302	28.9	2148.8	2596.6	3081.4

17. Delivery/Expenditure Information:

a. Deliveries TO Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 40.5

Percent Total Program Expended: 1.3%

The amount shown above for expenditures represent disbursements as of 31 Jan 2000. Obligations for the CH-47F program are \$83.4 million as of 31 Jan 2000.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

Costs are based on 300 CH-47F aircraft accumulating a total of 49,404 hours per year over 20 years of operation. Reliability/Maintainability will show a 25 percent improvement (25 percent less cost for Reliability/Maintainability driven O&S cost elements).

The CH-47D costs are also based on 300 aircraft accumulating a total of 49,404 hours per year over 20 years of operation.

This information based on the 30 March 1998 approved Army Cost Position.

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CH-47F (ICH), December 31, 1999

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

b. Costs -- (FY 1997 Constant (Base-Year) Dollars in Thousands)

Cost Element	CH-47F Average Annual Per Aircraft	CH-47D Average Annual Per Aircraft
Mission Pay & Allowances	426.4	426.4
Unit Level Consumption	101.2	118.5
Intermediate Maintenance	83.9	104.6
Depot Maintenance	180.6	683.3
Contractor Support	0.0	0.0
Sustaining Support	183.0	183.0
Indirect Costs	0.0	0.0
Total	975.1	1515.8

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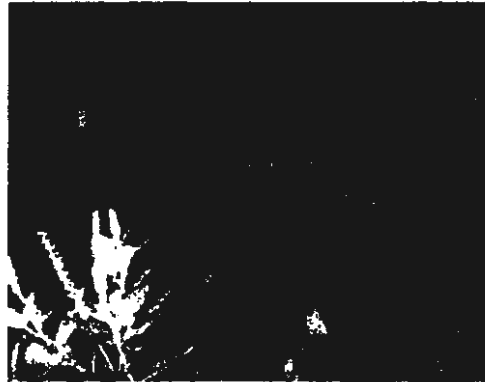
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: Javelin

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Javelin

2. (U) DoD Component: Army

Joint Participants:  
USMC

3. (U) Responsible Office and Telephone Number:

Department of Army	COL William D. Knox
PEO - Tactical Missiles	Assigned: August 22, 1996
ATTN: SFAE-MSL-AM	DSN 746-4266; COMM (256) 876-4266
RSA, AL 35898-5720	william.knox@msl.redstone.army.mil

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

RDT&E:  
(U) PE 64611

PROCUREMENT:  
(U) APPN 2032 ICN CA0269 (Army)  
(U) APPN 2032 ICN HO6102 (Army)  
(U) APPN 2032 ICN HO6300 (Army)  
(U) APPN 1109 ICN O38061 (Navy)

**CLEARED AS AMENDED**  
**FOR OPEN PUBLICATION**

MAR 27 2000 10 (sent)

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

~~Classified by Javelin, SCG, PEO Tactical Missiles, dated 9 May 96  
Downgrade instructions  
Declassify on: X3~~

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Javelin, December 31, 1999

5. (U) References:

SAR Baseline (Production Estimate):

(U) AAE Approved Acquisition Program Baseline (APB) dated September 18, 1997.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated December 14, 1999.

6. (U) Mission and Description:

(U) The Javelin system is a medium range, imaging infrared, fire-and-forget, manportable, antitank weapon system being developed for the U.S. Army and U.S. Marine Corps (USMC) to meet the Combat Developer's (CBTDEV's) requirements as specified in the Joint Service Operational Requirement (JSOR), dated 12 December 1988. Javelin will satisfy an operational requirement to provide increased reliability, survivability, higher hit/kill probability, and greater effective range against current and future armored threats. The JAVELIN tactical system is composed of two major items: a tactical round and a Command Launch Unit (CLU). Javelin training devices include the Missile Simulation Round (MSR), Basic Skills Trainer (BST), and the Field Tactical Trainer (FTT). The missile, sealed in a disposable launch tube assembly, is comprised of the seeker, guidance electronics, warhead and fuze, propulsion unit, and the control actuator system. The missile is classified as a "wooden round", i.e., having no field level repair and an expected minimum shelf life of ten years. The CLU consists of an integral visible day telescope and a long-wavelength infrared nightsight with wide and narrow fields of view. The CLU is used for battlefield surveillance, target acquisition, missile launch, and damage assessment. The Javelin may be used at the gunner's discretion in either top attack (the normal mode of operation) or direct mode (used for engaging targets under cover). The system is capable of defeating conventional and reactive armor in day/night engagements in excess of the design requirement of 2,000 meters. The Javelin soft launch capability enables firing from enclosures or covered fighting positions which reduce the gunner's vulnerability to counterfire. A secondary capability against helicopters and bunkers has been demonstrated but will not inhibit the primary mission of defeating armored targets. The Javelin will replace the Dragon.

7. (U) Executive Summary:

(U) This Selected Acquisition Report (SAR) is being submitted to document the significant accomplishments for the Javelin program during the calendar year (CY) 1999. During this reporting period, the Javelin Project Office was responsible for managing the joint Army/Marine Corps Javelin Weapon System. This included continuing the production, and fielding and deployment phases of the system.

Significant events that occurred during CY99 included: (1) Fielded First Unit Equipped (FUE) to the Marine Corps, while continuing to field to Army Units, (2) Experienced a Nunn-McCurdy breach in the December 1998 SAR due to quantity changes, (3) Submitted and received a new Approved Program Baseline (APB), (4) OSD(PA&E) concluded their Capabilities Based Munitions Requirements (CBMR)

Javelin, December 31, 1999

7. (U) Executive Summary (Cont'd):

study, which showed that the Javelin missile requirements were derived using the established guidelines, (5) Demonstrated successful firings in Military Operations on Urbanized Terrain (MOUT) scenarios, over difficult terrain features, and from a vehicle mounted support pedestal, (6) Completed two Foreign Military Sales (FMS) test cases, (7) Raytheon completed transition of the Command Launch Unit (CLU) production line to their Tucson, AZ facility, (8) Stopped production at the Lockheed-Martin all up round (AUR) missile facility in Troy, AL due to warhead initiation failures (production began again in February 2000), (9) Received congressional approval for Multiyear II contract, (10) Received and evaluated the Multiyear II contract proposal from the Joint Venture (JV), and (11) Completed environmental qualification testing on the new Enhanced Producibility Basic Skills Trainer (EPBST).

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

There is a PAUC breach of 12.7% and an APUC breach of 11% to the approved APB dated Dec 14, 1999. The cause of the unit cost breaches is a reduction in procurement quantity.

Javelin, December 31, 1999

9. (U) Schedule:

a. Milestones --

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
Joint Service Op Requirement Approved	APR 1986	APR 86	APR 1986
Milestone I (DSARC)	MAY 1986	MAY 86	MAY 1986
Proof of Principle Contract Award	AUG 1986	AUG 86	AUG 1986
Proof of Principle Complete	DEC 1988	DEC 88	DEC 1988
Milestone II (DAB)	JUN 1989	JUN 89	JUN 1989
FSD Contract Award	JUN 1989	JUN 89	JUN 1989
Pre-Prod Qual Test			
Start	JUN 1990	JUN 90	JUN 1990
Complete	DEC 1993	DEC 93	DEC 1993
Training Force Dev Test and Experimentation (FDT&E)			
Start	FEB 1993	FEB 93	FEB 1993
Complete	APR 1993	APR 93	APR 1993
Prototype Delivery	NOV 1992	NOV 92	NOV 1992
IOT&E			
Start	SEP 1993	SEP 93	SEP 1993
Complete	DEC 1993	DEC 93	DEC 1993
LRIP Decision (DAB)	JUN 1994	JUN 94	JUN 1994
LRIP I Contract Award	JUN 1994	JUN 94	JUN 1994
LRIP II Contract Award	MAR 1995	MAR 95	MAR 1995
First LRIP Delivery	OCT 1995	OCT 95	OCT 1995
Prod Verification Test			
Start	NOV 1995	NOV 95	NOV 1995
Complete	APR 1996	APR 96	APR 1996
LRIP III Contract Award	FEB 1996	FEB 96	FEB 1996
LRIP II Delivery	OCT 1996	OCT 96	OCT 1996
Limited User Test			
Start	APR 1996	APR 96	APR 1996
Complete	JUN 1996	JUN 96	JUN 1996
Live Fire Test			
Start	JUN 1996	JUN 96	JUN 1996
Complete	DEC 1996	DEC 96	DEC 1996
First Unit Equipped	JUN 1996	JUN 96	JUN 1996
IOC	OCT 1996	OCT 96	OCT 1996
Full Rate Production (ASARC)	MAY 1997	MAY 97	MAY 1997
Full Rate Production Contract Award	MAY 1997	MAY 97	MAY 1997
LRIP III Delivery	OCT 1997	OCT 97	OCT 1997
First Full Rate Production Delivery	OCT 1998	OCT 98	OCT 1998
Follow-on Operational Test and Evaluation			
Start	JAN 1999	N/A	N/A
Complete	APR 1999	N/A	N/A
Organic Depot Level Support Capability	JUL 2001	JUL 03	JUL 2003(Ch-1)
Milestone IIIB (DAB)	N/A	N/A	N/A

(U) ACRONYMS:

ASARC - Army Systems Acquisition Review Council

Javelin, December 31, 1999

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

- DAB - Defense Acquisition Board
- DSARC - Defense Systems Acquisition Review Council
- FDT&E - Force Development Testing & Experimentation
- FSD - Full Scale Development
- IOT&E - Initial Operational Test & Evaluation
- IOC - Initial Operational Capability
- LRIP - Low Rate Initial Production

b. Current Change Explanations --

(U) (Ch-1) Organic Depot Level Support Capability has been changed from Jul 01 to Jul 03 in accordance with DA directive to establish depot support 4 years after 2-Board CLU IOC (June 1999).

10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate						
Min range (m)	(b)(1)									
Degraded Full										
Max range (m)										
Hit probability (Ph/reliable rnd)										
Kill probability Given a reliable shot (Pk/s)										
Given engagement opportunity (Pk/e)										
System weight (lbs)						35	35 / 49.5	48.3	48.5	
Missile operational reliability						.92	.92 / .92	.84	.94	(Ch-1)
Cmd Launch Unit MTBOMF (hrs)						129	129 / 129	188	204	
Cmd Launch Unit MTTR (hrs)						<1.5	<1.5 / 1.5	.77	.77	

(U) ACRONYMS:

- MTBOMF - Mean Time Between Operational Mission Failures.
- MTTR - Mean Time To Repair.

Objectives/thresholds/current estimates are at MS III except P(k/e) and Missile operational reliability. Values shown are objectives representing desired performance and minimum acceptable thresholds.

1. (U) Full lethality must be met at both minimum and maximum range.

Javelin, December 31, 1999

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

2. (U) Probability of hit given a reliable round P(h/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 elevation angle (relative to target) given a shot with a reliable system.

3. (U) Probability of kill given a reliable shot P(k/s). A reliable shot is defined by a reliable launch and reliable flight. The P(k/s) must be attained against both stationary and evasively maneuvering targets at all ranges (min to max).

4. (U) Probability of kill given an engagement opportunity P(k/e). Values shown are defined at 1200 meters in fog oil or white phosphorous against a specific threat target.

5. (U) Missile Operational Reliability is established at system maturity which is three years after MSIII (May 00).

b. Current Change Explanations --

(U) (Ch-1) The Current Estimate for missile operational reliability changed from .92 to .94 based on stockpile reliability testing.

(U) As a result of the 5 Dec 90 DAB Program Review, a revised APB was approved increasing the system weight threshold to 49.5 pounds. Current estimate values are projected performance at the Full Rate Production ASARC and were updated following completion of Engineering Manufacturing Development (EMD) testing. Missile operational reliability and Command Launch Unit (CLU) MTBOMF current estimates include incorporation of corrective actions to problems identified during IOT&E.

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	877.0	877.7	871.3
Procurement	2914.1	3182.5	2923.0
Round Flyaway	(2018.1)		(1934.4)
CLU Flyaway	(516.8)		(604.4)
Total Flyaway	(2534.9)		(2538.8)
Other Weapon System Cos	(51.1)		(59.5)
Training Devices	(245.5)		(259.1)
Plant Closure	(16.6)		(16.6)
Total Other Wpn Sys	(313.2)		(335.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(66.0)		(49.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1997 Base-Year \$	3791.1	4060.2	3794.3
Escalation	134.9	70.3	25.5
Development (RDT&E)	(-109.7)	(-107.5)	(-106.9)
Procurement	(244.6)	(177.8)	(132.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	3926.0	4130.5	3819.8

(U) Values shown include USMC program.

b. (U) Quantity --

Development (RDT&E)	48	57	57
Procurement	<u>28453</u>	<u>26956</u>	<u>22358</u>
Total	28501	27013	22415

Note: Excludes 165 RDT&E prototypes from the SAR Baseline and 154 from the Current Estimate that are not considered fully configured.

(U) Previous quantities for RDT&E of 48 were erroneously reported. The correct number is 57.

A system is comprised of a round, a Command Launch Unit (CLU), four Training Devices and initial spares. The round is the designated unit of measure. Of the total procurement quantity shown above, 2585 rounds (FY94-703, FY95-872, and FY96-1010 or 9.1% of total) were produced during low rate initial production (LRIP).

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

d. (U) Nuclear Costs --

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

None.

12. (U) Unit Cost Summary:

	UCR Baseline (DEC 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1997 BY\$)	4060.2	3794.3	
(2) Quantity	27013	22415	
(3) Unit Cost	0.150	0.169	+12.67
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1997 BY\$)	3182.5	2923.0	
(2) Quantity	26956	22358	
(3) Unit Cost	0.118	0.131	+11.02

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	767.3	3158.7	-	3926.0
Previous Changes:				
Economic	+1.5	-97.4	-	-95.9
Quantity	-	+187.7	-	+187.7
Schedule	-	+16.9	-	+16.9
Engineering	+8.2	-	-	+8.2
Estimating	-6.8	+10.4	-	+3.6
Other	-	-	-	-
Support	-	+84.0	-	+84.0
Subtotal	+2.9	+201.6	-	+204.5
Current Changes:				
Economic	-	+15.6	-	+15.6
Quantity	-	-334.9	-	-334.9
Schedule	-	-31.8	-	-31.8
Engineering	-1.2	-	-	-1.2
Estimating	-4.6	+135.9	-	+131.3
Other	-	-	-	-
Support	-	-89.7	-	-89.7
Subtotal	-5.8	-304.9	-	-310.7
Total Changes	-2.9	-103.3	-	-106.2
Current Estimate	764.4	3055.4	-	3819.8

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

(U) Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	877.0	2914.1	-	3791.1
Previous Changes:				
Quantity	-	+184.4	-	+184.4
Schedule	-	-	-	-
Engineering	+8.5	-	-	+8.5
Estimating	-7.8	+10.3	-	+2.5
Other	-	-	-	-
Support	-	+73.7	-	+73.7
Subtotal	+0.7	+268.4	-	+269.1
Current Changes:				
Quantity	-	-280.3	-	-280.3
Schedule	-	-	-	-
Engineering	-1.2	-	-	-1.2
Estimating	-5.2	+89.5	-	+84.3
Other	-	-	-	-
Support	-	-68.7	-	-68.7
Subtotal	-6.4	-259.5	-	-265.9
Total Changes	-5.7	+8.9	-	+3.2
Current Estimate	871.3	2923.0	-	3794.3

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised estimate on Alternate Main Charge Warhead effort. (Engineering)	-1.2	-1.2
Reduced estimate to reflect actual costs for FY89, FY90 and FY91. (Estimating)	-5.2	-4.6
RDT&E Subtotal	<u>-6.4</u>	<u>-5.8</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-17.9
Economic adjustment for negative program change. (Economic)	N/A	+33.5
Total Quantity Variance associated with change in quantity of 4598 missiles from 26956 to 22358 missiles.	-324.9	-384.8
Quantity decrease of 4598 missiles from 26956 to 22358 missiles. (Quantity)	-276.3	-330.9
Allocation to Schedule variance resulting from Quantity Change. (QR) (Schedule)	0.0	-33.4
Allocation to Estimating variance resulting from Quantity Change. (QR) (Estimating)	-48.6	-20.5
Acceleration of annual USMC procurement buy profile. (Schedule)	0.0	-0.2



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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Stretchout of annual Army procurement buy profile. (Schedule)	0.0	+1.8
Adjustment for Current and Prior Inflation. (Estimating)	+5.3	+5.5
Revised estimate due to USMC decrease of 28 CLU quantities from 446 to 418. (Quantity)	-4.0	-4.0
Revised estimate for learning curve inefficiencies related to missile quantity decrease. (QR) (Estimating)	+132.8	+150.9
Change in Other Weapon System Costs. (Support)	+0.8	+0.8
Adjustment for Current and Prior Inflation. (Support)	+0.9	+1.0
Change in Initial Spares methodology from 15% of CLU hardware to 7%. (Support)	-56.8	-72.5
Acceleration of annual procurement buy profile for Training Devices. (Support)	-12.6	-16.0
Acceleration of Plant Closure. (Support)	-1.0	-3.0
Procurement Subtotal	-259.5	-304.9

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes									PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
0.14	--	+0.02	--	--	+0.01	--	--	+0.03	0.17	

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes									PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
0.11	--	+0.02	--	--	+0.01	--	--	+0.03	0.14	

Javelin, December 31, 1999

14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	MAY 1986	MAY 1986	MAY 1986
Milestone II	N/A	MAY 1989	JUN 1989	JUN 1989
Milestone III	N/A	JUN 1994	MAY 1997	MAY 1997
FUE/IOC	N/A	DEC 1995	OCT 1996	OCT 1996
Total Cost	N/A	3936.5	3926	3819.8
Total Quantity	N/A	70631	28501	22415
Prog Acq Unit Cost	N/A	0.06	0.14	0.17

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

a. Procurement -- Initial Contract Price  
 (U) Multiyear I: Target Ceiling Qty  
 TI/Martin Joint Venture, Tuscon AZ  
 DAAH01-97-C-0209, FFP \$745.0 N/A 6492  
 Award: May 31, 1997  
 Definitized: N/A

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$763.3	N/A	6745	\$763.3	\$763.3

Explanation of Change:

(U) The Multiyear I contract price changed from \$746.0M to \$763.3M. The \$17.3M increase was the result of exercising an option for 253 rounds. This brings the Year 3 total to \$393.9M & 4310 Rounds.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

This is a three year firm-fixed-price multi-service multi-year contract. Pricing data shown is for all three years of this contract. The annual Target (equals Ceiling) in millions and quantities are as follows: Program Year 1) \$192.4M & 1161 Rounds; Program Year 2) \$177.0M & 1274 Rounds; Program Year 3) \$393.9M & 4310 Rounds. Program Years 1, 2, & 3 are funded and awarded.

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Javelin, December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY86-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	760.4	0.5	0.5	3.0	764.4
Procurement	1490.5	444.0	409.1	711.8	3055.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>2250.9</b>	<b>444.5</b>	<b>409.6</b>	<b>714.8</b>	<b>3819.8</b>

b. Annual Summary -- AAWS-M

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1997 Dollars Nonrec</u>	<u>Flyaway FY 1997 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1986				73.7	55.1
1987				54.1	41.7
1988				36.8	29.5
1989				118.5	98.9
1990				157.8	136.7
1991				88.7	79.8
1992				132.9	122.3
1993				105.8	99.7
1994				49.2	47.2
1995				30.6	29.9
1996				2.2	2.2
1997				5.9	5.9
1998				7.4	7.5
1999				3.9	4.0
2000				0.5	0.5
2001				0.5	0.5
2002				0.5	0.5
2003				0.5	0.5
2004				0.9	1.0
2005				0.9	1.0
<b>Subtotal</b>	<b>57</b>			<b>871.3</b>	<b>764.4</b>

(U) Previous quantities for Research, Development, Test, and Eval of 48 were erroneously reported. The correct number is 57.

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

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997	141	0.7	28.7	37.7	38.2
1998	380	1.8	45.3	56.5	57.8
1999	741	5.2	65.8	80.2	83.2
2000	998	1.3	77.2	90.3	94.9
2001	293		24.0	28.3	30.2
2002			0.4	0.9	1.0
2003			0.5	1.0	1.1
2004				0.1	0.1
2005				0.1	0.1
Subtotal	2553	9.0	241.9	295.1	306.6

(U) Recurring flyaway dollars in FY02 and FY03 are transportation and program management support costs for FY00 and FY01 quantity deliveries.

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				19.1	18.3
1994	703	48.9	176.0	210.9	206.1
1995	872	9.7	177.0	211.2	210.0
1996	1010	1.7	175.9	200.3	200.8
1997	1020	3.3	164.3	194.9	197.4
1998	894	3.9	114.8	134.1	137.2
1999	3569	21.1	279.9	329.2	341.5
2000	2525	9.7	258.5	332.2	349.1
2001	3754	2.5	305.9	354.7	378.9
2002	4061		317.8	356.3	387.3
2003	1397		163.5	200.0	221.7
2004			0.6	17.2	19.5
2005					
2006		18.4	9.2	42.5	50.0
2007		7.5		7.5	9.0
2008		9.8		9.8	12.0
2009		8.0		8.0	10.0
Subtotal	19805	144.5	2143.4	2627.9	2748.8

(U) Recurring flyaway costs in FY04 and FY06 are transportation and program management support costs for FY02 and FY03 quantity deliveries. Due to funding shortfalls in FY04 of \$5M and in FY05 of \$4.2M these costs are displayed in FY06.

Javelin, December 31, 1999

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

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Army	19862	144.5	2143.4	3499.2	3513.2
Navy	2553	9.0	241.9	295.1	306.6
Grand Total	22415	153.5	2385.3	3794.3	3819.8

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	57	57
Procurement	3746	2595

(U) Percent Total Program Quantities Delivered: 11.8%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1767.9

(U) Percent Total Program Expended: 46.3%

(U) This includes the delivery of all LRIP 1,2,& 3 and 10 Multiyear I Program Year I rounds. Delivery of rounds has been delayed due to warhead initiation test failures.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The Javelin system support concept is consistent with existing Army policy as follows:

(1) Command Launch Unit (CLU) is a 3 level organic support concept. Unit level is responsible for visual inspection, exterior cleaning, battery replacement and troubleshooting thru the Built In Test (BIT) capability. Removal/replacement of components will be accomplished at the Direct Support (DS) level. Depot level capability will exist for complete overhaul/repair of the unit.

(2) Maintenance of the round is a "wooden round" concept.

(3) Contractor Logistics Support (CLS) of training devices will be used for the life of the system.

Interim Contractor Support (ICS) for 2-Board CLU supply support and maintenance above unit level will be utilized for the first 60 months. CLU repair will consist of complete repair of the CLU's economically repairable circuit cards, assemblies, and components. Missile repair (resulting from surveillance checks) will be performed by the system's prime contractor.

Javelin, December 31, 1999

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

Fielding began in June 1996. The CLU sustainment period covers 20 years of operation, maintenance, and modification. Military pay and allowances represent over 63% of the sustainment program costs not including contractor support costs. Sustainment for the antecedent system, DRAGON, also covers 20 years of operation, maintenance, and modification.

Mission Pay and Allowance includes crew pay and allowance, maintenance pay and allowance, and system project management. Unit Level Consumption consists of replenishment reparables, replenishment consumables, transportation, petroleum, oil, and lubricants plus ammunition/missiles. Intermediate Maintenance is field maintenance civilian labor. Depot Maintenance includes publications, civilian labor and material. Interim contractor support for the system and contractor logistics support for training devices make up the Contractor Support costs. Sustaining Support consists of system software maintenance, training device software maintenance, modifications/kits, system test and evaluation and demilitarization. Indirect Support includes system specific replacement training, costs associated with permanent change of station, and base operations.

Data source: Javelin - Project Office Estimate, updated December 1999, certified by AMCOM Cost Analysis, average over 13 years fully fielded (i.e. no ramp up or down) (sustainment years (FY 06 through FY 18)), Army only; Antecedent - DRAGON II Life Cycle Cost Estimate, dated August 1984, 20 years sustainment, Army only.

b. (U) Costs -- (FY 1997 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Year JAVELIN	Avg Annual Cost Per Year DRAGONII (ANTECEDENT)
Mission Pay & Allowances	71.4	103.8
Unit Level Consumption	11.4	26.0
Intermediate Maintenance	0.0	0.4
Depot Maintenance	0.4	24.2
Contractor Support	7.4	0.0
Sustaining Support	3.8	5.4
Indirect Costs	12.4	40.1
Total	106.8	199.9

N-5 CH-60S

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: CH-60S

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): CH-60S VERTICAL REPLENISHMENT HELICOPTER

2. DoD Component: Navy

3. Responsible Office and Telephone Number:

Program Executive Officer (PMA-299) CAPT Dale Milton  
Air ASW Assault and Special Mission Assigned: June 1, 1999  
Programs, 47123 Buse Rd., Unit # IPT DSN 757-5409; COMM 301-757-5409  
Patuxent River, MD 20670-1547 miltonda@navair.navy.mil

4. Program Elements/Procurement Line Items:

RDT&E:  
PE 0604212N (Shared) Project H1709, H2415  
PROCUREMENT:  
APPN 1506 ICN 024000 (Navy)

5. References:

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline (APB) dated July 8, 1998.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated July 8, 1998.

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DEPARTMENT OF DEFENSE

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(AS AMENDED)

00-C-0127  
MAR 27 2000  
Man Marshall

Office of the Chief of  
Naval Operations  
Dept. of the Navy

00-C-0825

**6. Mission and Description:**

The Fleet Combat Support (HC) mission is to maintain forward deployed fleet sustainability through rapid airborne delivery of materials and personnel and to support amphibious operations through search and rescue coverage. The primary roles of the aircraft are to conduct vertical replenishment (VERTREP), day/night ship-to-ship, ship-to-shore, and shore-to-ship external transfer of cargo; internal transport of passengers, mail and cargo, vertical onboard delivery (VOD); airhead operations, and day/night search and rescue (SAR). The aircraft secondary roles include torpedo and drone recovery, noncombatant evacuation operations (NEO), and Special Warfare Support.

**7. Executive Summary:**

The Mission Need Statement (MNS) for a HC Helicopter, serial number M059-88-94, was approved and validated in November 1994. An Analysis of Alternatives, the HC Cost and Operational Effectiveness Analysis (COEA), was approved by CNO and ASN (RDA) on May 10, 1996. An updated threat assessment has also been completed. Details can be found in the V-22 Osprey/CH-60S Seahawk/H-1 Upgrades Joint Systems Threat Assessment (JSTAR) (U) ONI-TA-024-98, January 1998.

Defense Acquisition Board approved Engineering Manufacturing Development (MSII) on July 8, 1998.

On January 8, 1999 the Secretary of Defense directed the U.S. Navy to develop and deploy an organic mine warfare capability. Airborne Mine Countermeasures (AMCM) sensors will be indigenous to the CH-60S helicopter to support the fleet's ability to counter the sea mine threat. The integration of all AMCM sensor systems will become a major element of the CH-60S program in FY00. AMCM sensor systems development and procurement are a series of ACAT II programs with lead management by PEO(MIW)/PMS 210. A revised CH-60S ORD which includes a new annex with OAMCM requirements has been approved by N85 and N88 and is currently being staffed at OPNAV for N8 approval. Addition of the AMCM RDT&E funds resulted in a deviation to the R&D cost shown in the current approved APB. The new Acquisition Program Baseline (APB) has been prepared to incorporate the additional cost for the AMCM and the increase of 72 additional aircraft (from 165 to 237 aircraft). The new APB is currently being staffed at OPNAV for N8 approval.

The CH-60S Lot I production contract was awarded on September 16, 1999. AMCM Phase II Tow Demonstration was completed satisfactorily on January 19, 2000. Tow envelope established to 6,000 lbs. A successful CH-60S First Flight was held January 27, 2000. Lot II Undefinitized Contract Award (UCA) will be awarded in March 2000. Definitization of Lot II and a priced option for Lot III are planned for award in the June 2000 time frame. The Navy anticipates a rate increase which has been submitted as a POM-02 issue.



8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

A deviation for Research, Development, Test and Evaluation funding was realized by adding the Airborne Mine Counter Measures (AMCM) component to this program. The Procurement deviation occurred as a result of adding 72 additional aircraft. A new Acquisition Program Baseline (APB) which includes these changes to program requirements is being staffed at OPNAV for N8 approval.

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
MS-II/LRIP	APR 1998	APR 1998	JUL 1998
Common Cockpit Critical Design Review	JUN 1998	JUN 1998	JUL 1998
LRIP First Flight	JUL 1999	JUL 1999	JAN 2000 (Ch-1)
Technical Evaluation Complete	MAR 2000	MAR 2000	AUG 2000
Operational Evaluation Complete	JUL 2000	JUL 2000	JAN 2001
MS-III (NAV SAE FRP)	SEP 2000	SEP 2000	MAR 2001
IOC	DEC 2001	DEC 2001	DEC 2001

AMCM milestones will be added upon approval of the new APB and revised CH-60S ORD which includes a new annex with OAMCM requirements.

9b. Schedule (Cont'd):

b. Current Change Explanations --

(Ch-1) The current estimate date for LRIP First Flight was changed from December 1999 to January 2000 to reflect actual date of event.

10. Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
*Airspeed-Vmax (KIAS)	175	175 / 150	TBD	175
*Amphibious SAR Mission Radius (nm)	150	150 / 50	TBD	150
*VERTREP Endurance (hrs)	3	3 / 2	TBD	3
*VERTREP, External (lbs)	5,500	5,500 / 5,500	TBD	5,500
*VOD (lbs)	5,500	5,500 / 5,500	TBD	5,500
MTBF (hrs)	20.3	20.3 / 20.3	TBD	20.3
MTR (hrs)	3.6	3.6 / 3.6	TBD	3.6
*CSAR Mission Radius (nm)	300	300 / 200	TBD	300
*SWS Mission Radius (nm)	300	300 / 200	TBD	300
*CV Plane Guard/SAR Mission Radius (nm)	200	200 / 100	TBD	200

ACRONYMS:

SAR - Search and Rescue  
 KIAS - Knots Indicated Airspeed  
 VERTREP - Vertical Replenishment  
 VOD - Vertical On Board Delivery  
 MTBF - Mean Time Between Failures  
 MTR - Mean Time to Repair  
 CSAR - Combat Search and Rescue  
 SWS - Special Warfare Support  
 CV - Carrier  
 KPPs - Key Performance Parameters

AMCM performance characteristics will be added upon approval of the new APB and revised CH-60S ORD which includes a new annex with Organic AMCM requirements.

10b. Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

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

a. Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	71.0	71.0	159.6
Procurement	2698.0	2698.0	3622.3
Flyaway	(2188.7)		(3142.0)
Non-Recurring Flyaway	(28.6)		(33.3)
Total Flyaway	(2217.3)		(3175.3)
Other Wpn System Costs	(7.2)		(9.4)
Other Support	(241.9)		(243.3)
Total Other Wpn Sys	(249.1)		(252.7)
Peculiar Support	(97.4)		(156.8)
Initial Spares	(134.2)		(37.5)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1998 Base-Year \$	2769.0	2769.0	3781.9
 Escalation	 385.0	 385.0	 550.9
Development (RDT&E)	(1.0)	(1.0)	(4.9)
Procurement	(384.0)	(384.0)	(546.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	3154.0	3154.0	4332.8
 b. Quantity --			
Development (RDT&E)	1	1	0
Procurement	<u>165</u>	<u>165</u>	<u>237</u>
Total	166	166	237

Two LRIP Lots are planned (6 aircraft in Lot I, and 20 aircraft in Lot II) which exceed 10% of the total buy of 165 aircraft. LRIP quantities were approved by the DAB.

The RDT&E aircraft represents a Sikorsky built CH-60S prototype as a proof-of-concept vehicle. This aircraft has been used to conduct a flight demonstration, Integrated Test, and Operational Assessment, including sea trials and will not become a fleet asset.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (JUL 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1998 BY\$)	2769.0	3781.9	
(2) Quantity	166	237	
(3) Unit Cost	16.681	15.957	-4.34
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1998 BY\$)	2698.0	3622.3	
(2) Quantity	165	237	
(3) Unit Cost	16.352	15.284	-6.53

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	72.0	3082.0	-	3154.0
Previous Changes:				
Economic	-0.2	-54.6	-	-54.8
Quantity	-	-	-	-
Schedule	-	-8.2	-	-8.2
Engineering	-	-	-	-
Estimating	-1.6	+92.9	-	+91.3
Other	-	-	-	-
Support	-	+3.5	-	+3.5
Subtotal	-1.8	+33.6	-	+31.8
Current Changes:				
Economic	-	-18.0	-	-18.0
Quantity	-	+1155.9	-	+1155.9
Schedule	-	-13.5	-	-13.5
Engineering	-	-	-	-
Estimating	+94.3	-45.4	-	+48.9
Other	-	-	-	-
Support	-	-26.3	-	-26.3
Subtotal	+94.3	+1052.7	-	+1147.0
Total Changes	+92.5	+1086.3	-	+1178.8
Current Estimate	164.5	4168.3	-	4332.8

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

Summary (FY 1998 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	71.0	2698.0	-	2769.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-1.6	+80.3	-	+78.7
Other	-	-	-	-
Support	-	-2.9	-	-2.9
Subtotal	-1.6	+77.4	-	+75.8
Current Changes:				
Quantity	-	+925.4	-	+925.4
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+90.2	-47.7	-	+42.5
Other	-	-	-	-
Support	-	-30.8	-	-30.8
Subtotal	+90.2	+846.9	-	+937.1
Total Changes	+88.6	+924.3	-	+1012.9
Current Estimate	159.6	3622.3	-	3781.9

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	0.0
Addition of Airborne Mine Countermeasures sensors to program requirements. (Estimating)	+90.2	+94.3
RDT&E Subtotal	+90.2	+94.3
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-26.3
Economic adjustment for negative program change. (Economic)	N/A	+8.3
Adjustment for Current and Prior Inflation. (Estimating)	+1.5	+1.6
Total Quantity Variance for 72 additional units changed the total aircraft from 165 to 237.	+1040.6	+1299.9
Quantity increase of 72 units from 165 to 237. (Quantity)	+925.4	+1155.9
Allocation to Schedule variance resulting from Quantity Change. (QR)(Schedule)	0.0	-13.9
Allocation to Estimating variance resulting from Quantity Change. (QR)(Estimating)	+115.2	+157.9

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Rephase of procurement buy quantities from FY00 thru FY07. (Schedule)		+0.4
Refinement of estimate for non-recurring cost requirements. (QR) (Estimating)	+1.1	+1.3
Additional costs for ancillary equipment as result of additional 72 aircraft. (QR) (Estimating)	+24.3	+29.6
Refinement of estimate based on learning curve rate effects for increased 72 aircraft. (QR) (Estimating)	-189.8	-235.8
Adjustment for Current and Prior Inflation. (Support)	+0.5	+0.5
Budget reduction for initial spares requirements. (Support)	-53.0	-59.1
Increased estimate for peculiar support equipment to meet the requirements for 72 additional aircraft. (QR) (Support)	+10.4	+13.6
Revised estimate for other weapons systems cost based on increased quantities. (QR) (Support)	+1.2	+1.6
Increased requirement for other support cost based on additional aircraft quantities. (QR) (Support)	+10.1	+17.1
Procurement Subtotal	<u>+846.9</u>	<u>+1052.7</u>

QR = Quantity related changes.

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes							PAUC Cur Est	
	Econ	Qty	Sch	Eng	Est	Oth	Spt		Total
19.00	-0.31	-0.81	-0.09	--	+0.59	--	-0.10	-0.72	18.28

14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
18.68	-0.31	-0.79	-0.09	--	+0.20	--	-0.10	-1.09	17.59

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	APR 1998	N/A	JUL 1998
Milestone III	N/A	SEP 2000	N/A	MAR 2001
FUE/IOC	N/A	DEC 2001	N/A	DEC 2001
Total Cost	N/A	3154	N/A	4332.8
Total Quantity	0	166	0	237
Prog Acq Unit Cost	N/A	19	N/A	18.28

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

a. RDT&E --

CH60S Production Lot I:

Sikorsky Aircraft Corp., Stratford CT  
 DAAJ09-97-C-0005, FFP  
 Award: September 16, 1999  
 Definitized: September 16, 1999

Initial Contract Price	Target		Ceiling		Qty
	Target	Ceiling	Target	Ceiling	
	\$79.2	\$0.0			6

Current Contract Price			Estimated Price At Completion		
Target	Ceiling	Qty	Contractor	Program Manager	
\$79.2	\$0.0	6	\$79.2	\$79.2	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

None.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY97-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-13)	<u>Total</u>
RDT&E	73.8	44.6	13.2	32.9	164.5
Procurement	142.4	318.7	250.4	3456.8	4168.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	216.2	363.3	263.6	3489.7	4332.8

b. Annual Summary -- CH-60S

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1998 Dollars Nonrec</u>	<u>Flyaway FY 1998 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1997				6.9	6.9
1998				29.5	29.7
1999				36.7	37.2
2000				43.4	44.6
2001				12.7	13.2
2002				14.6	15.5
2003				5.8	6.3
2004				5.3	5.8
2005				4.7	5.3
Subtotal				159.6	164.5

Appropriation: 1506 - Aircraft Procurement, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1998 Dollars Nonrec</u>	<u>Flyaway FY 1998 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1998	1	11.5	16.2	29.2	29.7
1999	5	2.4	105.4	109.6	112.7
2000	17		296.2	305.5	318.7
2001	15		192.9	236.2	250.4
2002	16		199.9	246.1	265.4
2003	24	19.4	295.6	359.1	394.7
2004	24		323.5	364.6	408.7
2005	20		261.2	290.1	331.7
2006	20		293.1	319.4	372.5
2007	20		291.6	313.7	373.2
2008	20		276.0	294.5	357.4
2009	20		240.4	259.4	321.0



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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1998 Dollars Nonrec	Flyaway FY 1998 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2010	20		238.5	256.7	324.1
2011	15		111.5	200.8	258.5
2012				18.9	24.8
2013				18.5	24.8
Subtotal	237	33.3	3142.0	3622.3	4168.3

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	237	33.3	3142.0	3781.9	4332.8

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	1	1
Procurement	0	0

Percent Total Program Quantities Delivered: 0.4%

b. Total Expenditures To Date (In Millions of Dollars): \$ 100

Percent Total Program Expended: 2.3%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

A life cycle cost estimate for the CH-60S program was required to provide information for the Milestone II/III acquisition decision to pursue full rate production. The report provides the Operating and Support portion of the life cycle cost estimate. Based on the Cost Analysis Requirements Document, this estimate represents the anticipated cost to support one hundred sixty-five CH-60S aircraft, with each aircraft operating twenty years. The estimate does not include Operating and Support cost for any pipeline or attrition aircraft. The estimate utilizes the Office of the Secretary of Defense Cost Analysis Improvement Group (OSD CAIG) Work Breakdown Structure for Operating and Support of Aircraft Systems. Personnel costs were estimated from the H-60 Program Office (PMA-299) Manpower Estimate Report of January 1998. Other estimating relationships were established from analogy to operating H-60 aircraft in the U.S. Navy inventory (HH-60H, SH-60B, SH-60F). This is based on average annual cost per squadron. This estimate was prepared during the CAIG Review in February 1998.

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CH-60S, December 31, 1999

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

b. Costs -- (FY 98 Constant (Base-Year) Dollars in Millions)

Cost Element	CH-60S VERTREP Average Annual Cost Per Squadron	HH-60H Average Annual Cost Per Squadron
Mission Pay & Allowances	5.3	4.9
Unit Level Consumption	3.1	2.6
Intermediate Maintenance	0.7	0.4
Depot Maintenance	0.9	1.9
Contractor Support	0.0	0.0
Sustaining Support	1.0	0.9
Indirect Costs	0.6	0.2
	N/A	N/A
Total	11.6	10.9

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A-7 CHEM DEMIL

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SELECTED ACQUISITION REPORT (RCS: DD-A&T)

PROGRAM: Chem Demil

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE  
AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Chemical Demilitarization Program

2. DoD Component: Army

3. Responsible Office and Telephone Number:

SFAE-CD-Z

APG, MD 21010-4005

Mr. James Bacon

Assigned: July 1, 1997

DSN 584-3447; COMM 410-436-3447

james.bacon@pmcd.apgea.army.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0708007D

PROCUREMENT:

APPN 0390 ICN N/A (DCA/DNA)

MILCON:

PE 0708007A

PE 0708007D

O&M:

PE 0708007D

DD-C-0845

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**5. References:**

CSD

SAR Baseline (Production Estimate):

DAE Approved Acquisition Program Baseline (APB) dated March 31, 1998.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated March 31, 1998.

NSCMD

SAR Baseline (Production Estimate):

DAE Approved Acquisition Program Baseline (APB) dated March 31, 1998

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated March 31, 1998.

**6. Mission and Description:**

**CHEMICAL DEMILITARIZATION PROGRAM (CDP)**

The Chemical Demilitarization Program (CDP) consists of the Chemical Stockpile Disposal Project (CSDP), the Alternative Technologies and Approaches Project (ATAP), and the Non-Stockpile Chemical Materiel Product (NSCMP). The CDP also provides funding for the Chemical Stockpile Emergency Preparedness Project (CSEPP) and the Assembled Chemical Weapons Assessment (ACWA) Program. Because ACWA was established and managed independently of the CDP, the ACWA portion of the Chemical Agents and Munitions Destruction, Army appropriation is not reflected as part of the Program Manager for Chemical Demilitarization current estimate. The Program structure reflected in the current CDP Acquisition Program Baseline dated March 31, 1998 contains two end items that reflect two major mission areas: Chemical Stockpile Disposal (CSD) and Non-Stockpile Chemical Materiel Disposal (NSCMD). Under this structure, the CSDP, ATAP, and CSEPP funding are reported as elements of the Program's CSD end item, and the NSCMP is reported as the NSCMD end item.

**CHEMICAL STOCKPILE DISPOSAL (CSD) END ITEM**

Chemical Stockpile Disposal Project (CSDP)

The CSDP mission is to demilitarize the unitary stockpile of lethal chemical agents and munitions stored at eight locations in the continental United States and at Johnston Atoll in the Pacific. The CSDP uses a reverse assembly process to separate the components of the chemical munitions and storage containers, followed by the incineration of each component.

Alternative Technologies and Approaches Project (ATAP)

The Project Manager for Alternative Technologies and Approaches was established

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**6. Mission and Description (Cont'd):**

in 1994, with responsibility for identifying alternative technology requirements and approaches, planning for the implementation of the requirements, and managing the activities of the various organizations involved. The Defense Acquisition Executive authorized the Army on January 17, 1997 to prepare an environmental impacts analysis (National Environmental Policy Act documentation) of the proposal to construct pilot plants to demonstrate the neutralization (hydrolysis) process for alternative technologies followed by either onsite or offsite post-treatment for nerve agent VX at Newport Chemical Depot, Indiana and mustard agent at Aberdeen Proving Ground (APG), Maryland.

**Chemical Stockpile Emergency Preparedness Project (CSEPP)**

The CDP provides funding for the CSEPP. The CSEPP is an effort complementary to the CSDP and ATAP to enhance protection of the civilian population, workers involved in the destruction effort, and environment during storage activities and destruction of the U.S. chemical weapons stockpile. The U.S. Army and the Federal Emergency Management Agency, in close cooperation, are assisting the eight continental United States chemical stockpile storage locations and adjacent communities in 10 states to enhance their chemical agent emergency response capabilities. The Commander of the Soldier and Biological Chemical Command has programmatic authority.

**NON-STOCKPILE CHEMICAL MATERIEL DISPOSAL (NSCMD) END ITEM**

**Non-Stockpile Chemical Materiel Product (NSCMP)**

Efforts accomplished under the NSCMP are: locating and identifying types and quantities of non-stockpile chemical materiel (NSCM); researching, developing, testing, and evaluating transportation and destruction equipment systems; planning and executing transportation and destruction operations; and preparing overarching project plans, schedules, and cost estimates. NSCM includes recovered chemical warfare materiel (CWM), former chemical weapons production facilities, binary chemical weapons, and miscellaneous CWM.

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**7. Executive Summary:**

This Selected Acquisition Report (SAR) details impacts to cost and schedule since last reported (December 1998 SAR). This report, together with the Annual Status Report on the Disposal of Chemical Weapons and Materiel for Fiscal Year (FY) 1999, provides a complete status of the CDP as of the submission of the FY 2001/2002 President's Budget dated February 7, 2000. Where possible, significant events that have occurred since that date are included in order to provide the most current and timely information available.

The CDP is continuing to make progress towards the elimination of U.S. chemical weapons and materiel and to comply with Chemical Weapons Convention (CWC) requirements. A number of significant milestones were accomplished this past year in the nation's demilitarization effort.

The Program Manager for Chemical Demilitarization (PMCD) implemented steps to ensure Year 2000 (Y2K) compliance at all chemical agent disposal facilities and transportable assessment systems, whether planned, being tested, operating, or under construction. All operating facilities transitioned into 2000 without incident.

**Chemical Stockpile Disposal Project (CSDP):**

The CSDP is continuing to destroy the U.S. chemical stockpile of unitary chemical agents and munitions, while ensuring maximum protection to the communities surrounding the disposal facilities, workers involved in the destruction effort, and the environment. As of March 19, 2000, Johnston Atoll Chemical Agent Disposal System (JACADS) and Tooele Chemical Agent Disposal Facility (TOCDF) together have destroyed 5,930 tons of chemical agent and 813,243 munitions, representing 18.8 percent of the original U.S. national chemical stockpile measured in tons of chemical agent.

**JACADS**

The JACADS mustard campaign was successfully completed on July 17, 1999. JACADS also completed processing of 35 Chemical Agent Identification Set (CAIS) items containing neat mustard agent on September 23, 1999. The PMCD has determined that JACADS will process the remaining CAIS (950 series) items recently received from Guam and stored at JACADS. CAIS processing will be completed during the initial closure activities.

Following reconfiguration of plant equipment for nerve agent VX processing, JACADS completed processing VX 155mm projectiles on March 10, 2000. Processing of 8-inch VX projectiles is scheduled to begin 3Q FY 00 (Apr-Jun). As of March 19, 2000, nerve agent VX contained in 42,678 projectiles has been processed.

In total, as of March 19, 2000, 1,807 tons of chemical agent have been successfully destroyed at JACADS, representing 88.9 percent of the Johnston Island stockpile. JACADS is scheduled to complete operations in 2Q FY 01 (Jan-Mar).

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**7. Executive Summary (Cont'd):**

JACADS closure planning is continuing. Two process action teams were formed: the first to discuss the alternate forms/approaches to personal protective equipment and the second to discuss alternate technologies for the disposal of secondary waste. The final closure plan will be submitted to the U.S. Environmental Protection Agency (EPA) Region IX in 4Q FY 00 (Jul-Sep).

On July 10, 1998, the U.S. Army appealed four of the operating conditions in the new JACADS Resource Conservation and Recovery Act permit, issued by the U.S. EPA on June 11, 1998. All concerns regarding this appeal were resolved in favor of the CSDP. The JACADS team has implemented the requirements contained in the final settlement agreement.

JACADS was evacuated on August 16-17, 1999, due to Hurricane Dora. Island repopulation was completed on August 22, 1999. The impact of Hurricane Dora included a loss of 3 weeks of mustard to VX changeover activities anticipated to be unrecoverable. The cost impact of this 3-week schedule slip is estimated at \$8.7M (TY).

**TOCDF**

Throughout 1999, the TOCDF has been processing GB-filled ton containers (TCs), M55 rockets, and projectiles. On August 22, 1999, TOCDF marked the completion of 3 years of safe operations. As of March 19, 2000, TOCDF has completed disposal of a combined total of 428,402 TCs and munitions containing 4,123 tons of nerve agent GB, representing 30.2 percent of the Desert Chemical Depot, Utah, stockpile. Operations at TOCDF are scheduled for completion by the 4Q FY 03 (Jul-Sep).

Legal challenges to the sustained operation of the TOCDF continue. The remaining allegation of the original judicial complaint, which was filed against the U.S. Army and the Systems Contractor by the Chemical Weapons Working Group (CWWG) et al in April 1996, was heard in federal court on June 17, 1999. The judge is not expected to rule on the case until Spring 2000. The Administrative hearing on petitioners' third request for agency action continues. A Scheduling Conference was held on February 17, 2000 to determine the hearing date. The hearing has been scheduled for October 2000.

**ANCDF**

The Anniston Chemical Agent Disposal Facility (ANCDF) continues to move forward with construction, toward systemization and operations. Construction at ANCDF is approximately 69 percent complete and is on track for the scheduled 2Q FY 02 (Jan-Mar) start of chemical agent operations. (This percentage-complete figure is based on progress payments made to the Systems Contractor based on the current negotiated contract value. Incorporation of contract modifications that increase the scope of work in the systems contract may result in lower percentage-complete figures in future reports.)

An Administrative Challenge contesting the issuance of the ANCDF environmental permits is pending. Resolution of the challenge is expected upon the issuance

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7. Executive Summary (Cont'd):

of the Hearing Officer's recommendation. The recommendation is scheduled to be issued at an April 2000 Environmental Quality Commission Meeting.

The Coosa River Basin Initiative submitted an amendment in March 1999 to add the U.S. Army and the Systems Contractor to their legal complaint originally filed against the Alabama Department of Environmental Management (ADEM) on September 23, 1998. The complaint alleges that ADEM did not properly follow procedures for issuing the ANCDF environmental permits. ADEM responded on March 8, 1999, and on March 16, 1999, the Department of Justice submitted the U.S. Army's response. Motions are ongoing, and the trial date has been set for May 2000.

These legal challenges have had no impact on the ongoing construction activities at ANCDF.

UMCDF

The Umatilla Chemical Agent Disposal Facility (UMCDF) continues to move forward with construction, toward systemization and operations. Construction at UMCDF is approximately 81 percent complete and is on track for the scheduled 2Q FY 02 (Jan-Mar) start of chemical agent operations. (This percentage-complete figure is based on progress payments made to the Systems Contractor based on the current negotiated contract value. Incorporation of contract modifications that increase the scope of work in the systems contract may result in lower percentage-complete figures in future reports.)

On September 15, 1999, during construction on the munitions demilitarization building (MDB), several workers experienced nausea and difficulty breathing. The building site was evacuated; however, a local investigation team found no indication of chemical agent release. After airflow was enhanced and additional monitoring equipment was installed, the MDB was reopened October 4, 1999. An independent laboratory in Boise, Idaho studied samples of clothing from workers present in the MDB during the incident. The study found chemical traces indicating the presence of pepper spray on the clothing. Subsequent analyses by other laboratories have failed to confirm this finding. The Army's Criminal Investigation Division and the Federal Bureau of Investigation have been brought in to further investigate this incident.

A hearing was held on June 1, 1999, on the appeal of the Environmental Quality Commission's denial of a petition to reconsider the UMCDF environmental permits, filed by the Group Against Social Predation (G.A.S.P.), the Sierra Club, and the Oregon Wildlife Foundation. The judge ruled in favor of the Environmental Quality Commission affirming the original UMCDF permit decisions from February 1997 and closing all pending motions on the original lawsuit filed in August 1997.

Approximately 650 workers left the UMCDF job site on January 3, 2000 out of concern for the handling of information regarding a trace amount of nerve agent GB (sarin) detected during routine monitoring operations in the chemical storage area on January 1, 2000. A leaking munition was detected in an area



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**7. Executive Summary (Cont'd):**

that contains previously detected leaking munitions stored in "over-packed" containers. This area is monitored daily for agent vapor. A large number (450) of workers, supervisors, engineers, and staff personnel remained on the job. All workers returned to work on January 4, 2000. The PMCD Field Office, Depot Commander, and several chemical munitions handlers met with Raytheon workers and conducted depot chemical operations awareness training on January 5-6, 2000.

On February 28, 2000, at approximately 1420 hours PST, a telephonic bomb threat was received regarding the UMCDP site. One previous threat had been received in May 1999. The government and contractor staffs (about 1,000 employees) immediately left the work site as a safety precaution. A search of UMCDP (under construction) revealed no explosive devices. Work resumed with the evening shift, and normal operations continued on February 29, 2000 as scheduled. The Depot Commander took appropriate actions in alerting Explosive Ordnance Disposal and the Federal Bureau of Investigation (FBI). During the week of March 6, 2000, the site was subjected to three bomb threats. UMCDP received another bomb threat on March 15, 2000. In each of these instances, the site was evacuated and subsequent searches revealed no explosive devices. In response to these threats, a temporary security guard service subcontract was initiated on March 15, 2000, to provide security guards on a 24 hours per day basis for 30 days. The FBI is continuing its investigation.

**PBCDF**

The Pine Bluff Chemical Agent Disposal Facility (PBCDF) continues to move forward with construction, toward systemization and operations. Construction at PBCDF is approximately 15 percent complete and is on track for the scheduled 4Q FY 03 (Jul-Sep) start of chemical agent operations. (This percentage-complete figure is based on progress payments made to the Systems Contractor based on the current negotiated contract value. Incorporation of contract modifications that increase the scope of work in the systems contract may result in lower percentage-complete figures in future reports.)

On February 12, 1999, the CWWG and other citizen groups filed an administrative appeal of the PBCDF environmental permits. In a preliminary hearing on April 15, 1999, the Arkansas Pollution Control and Ecology Commission (APC&EC) dismissed five of the nine issues specified in the appeal. The remaining issues were addressed by APC&EC in court hearings that concluded on September 30, 1999. Two of the remaining four issues were dismissed. Supplemental briefs were scheduled through December 1999; therefore, no decision will be made until sometime in the summer or fall of 2000. APC&EC has allowed construction to continue during the appeal process.

An environmental justice complaint against APC&EC was filed with the EPA on June 25, 1999, by Pine Bluff for Safe Disposal and the CWWG. The complaint is under consideration by the EPA Office of Civil Rights.

**PUCDF/BGPDF**

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**7. Executive Summary (Cont'd):**

Public Law (PL) 104-208 (FY 97 Defense Appropriation Act) established the Assembled Chemical Weapons Assessment (ACWA) program to identify and demonstrate not less than two alternatives to the baseline incineration process for destruction of assembled chemical weapons. It also suspended the obligation of funds for the construction of baseline demilitarization facilities at Pueblo Chemical Depot (PUCD), Colorado and Blue Grass Army Depot (BGAD), Kentucky, until 180 days after the Secretary of Defense submits a report to the congressional defense committees detailing the effectiveness of each alternative technology identified and demonstrated under the ACWA program and their ability to meet the applicable safety and environmental requirements. Consequently, the schedules for the Pueblo Chemical Agent Disposal Facility (PUCDF) and the Blue Grass Chemical Agent Disposal Facility (BGCDF) were placed on hold pending submission of the report.

The supplemental ACWA report containing the demonstration results was submitted to Congress on October 1, 1999. PL 105-261 (FY 99 Defense Authorization Act) authorizes further development of the demonstrated technologies to the pilot phase. In addition, PL 106-79 (FY 00 Defense Appropriation Act) provides funding to demonstrate three additional alternative technologies under the ACWA program. ACWA will demonstrate three additional technologies, and a subsequent assessment and report are scheduled for completion 2Q FY 01 (Jan-Mar).

While awaiting a technology decision, an Environmental Working Integrated Product Team (WIPT) has been formed to plan, develop, and implement various aspects of the environmental permitting process for a chemical agent disposal facility at PUCD, Colorado. The WIPT consists of representatives from PMCD, Project Manager for Chemical Stockpile Disposal, Program Manager for ACWA, PUCD, EPA, State of Colorado regulators, and a representative of the Pueblo County Commission.

A Notice of Intent (NOI) has been prepared to inform the public of the Army's intent to prepare an Environmental Impact Statement (EIS) for destruction of the stockpile stored at Pueblo Chemical Depot (PUCD). Publication of the NOI in the Federal Register will be accomplished after Congress has been notified. The EIS will analyze potential environmental impacts of design, construction, and operation of a facility to destroy the mustard stockpile at PUCD. The EIS process will begin with announcements in the local and regional newspapers and will kickoff a year long public involvement process required by the National Environmental Policy Act leading up to a Record of Decision (ROD).

Efforts are underway to plan for initiation of certain depot support projects at BGAD, Kentucky that are independent of the demilitarization technology.

The timely selection of destruction technologies for implementation at PUCDF and BGCDF is imperative to ensure compliance with CWC milestones.

**Alternative Technologies and Approaches Project (ATAP):**

The Project Manager for Alternative Technologies and Approaches is proceeding with implementation of neutralization-based chemical demilitarization pilot

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**7. Executive Summary (Cont'd):**

facilities at the two bulk-only agent storage locations: APG - Edgewood Area, MD and Newport Chemical Depot, IN.

**ABCDF**

The Aberdeen Chemical Agent Disposal Facility (ABCDF) systems contract was awarded to a team led by Bechtel National, Inc. on October 2, 1998. The ABCDF environmental permits were issued on February 22, 1999, and site preparation work began on April 5, 1999. Construction is scheduled to begin 3Q FY 00 (Apr-Jun).

The Program Manager's estimate for the accomplishment of the Alternative Technologies and Approaches ABCDF Milestone III (Operations) has slipped 16 months as a result of a 1-year deferral of \$13.1 million FY 00 military construction (MILCON) funds, a \$10.4 million 1-year deferral of FY 00 research and development funds, and a 1-year deferral of \$25 million in FY 01 MILCON funds.

**NECDF**

The Newport Chemical Agent Disposal Facility (NECDF) systems contract was awarded to Parsons Infrastructure & Technology Corporation on February 18, 1999. Early site preparation work, which did not require a Resource Conservation and Recovery Act permit, began on July 20, 1999. The NECDF environmental permits were issued on December 1, 1999. The groundbreaking ceremony will take place on April 8, 2000 and start of construction is scheduled for 3Q FY 00 (Apr-Jun).

**Non-Stockpile Chemical Materiel Product (NSCMP):**

The NSCMP continued to plan, prepare, and execute, in compliance with the CWC and other assigned missions, the disposal of U.S. Chemical Warfare Materiel (CWM) that is not part of the unitary chemical stockpile.

Preparation of the NSCMP Programmatic Environmental Impact Statement (PEIS) continued during 1999. The draft PEIS was released in October 1999 for a 90 day public comment period. The PEIS and ROD are expected to be completed 1Q FY 01 (Oct-Dec).

The NSCMP met the product milestone "100% Destroyed, Initially Declared Schedule 2 Production Facilities" in August 1999, well ahead of the product baseline date of May 2002. Accomplishment of the milestone also met the corresponding CWC requirement for 100 percent destruction.

The NSCMP met the product milestone "Initially Declared Category 1 Chemical Weapons (Binary) Excess Binary 'Other' or Non-Key Chemical Destroyed" in March 1999. Accomplishment of the milestone also met the corresponding CWC requirement.

Mobile Munitions Assessment System (MMAS) operational testing was completed in

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7. Executive Summary (Cont'd):

December 1999. Preparations are ongoing to use the MMAS to assess chemical weapons stored in overpack containers at Pine Bluff Arsenal (PBA), Arkansas, in 2000.

Rapid Response System (RRS) - Efforts continued in 1999 to meet the State of Utah, Division of Solid and Hazardous Waste, environmental permit compliance items for testing the Rapid Response System (RRS) at Deseret Chemical Depot, Utah. The RRS will be used to dispose of CAIS components.

Explosive Destruction System (EDS) - Developmental testing of the Explosive Destruction System (EDS) Phase 1 using chemical agent began in December 1999 at Porton Down, United Kingdom. Tests will be conducted with munitions containing phosgene and munitions containing mustard agent. Design of the EDS Phase 2 continued during 1999. The EDS will be used to dispose of CWM that is unsafe to transport and/or store.

Munitions Management Device, Version 1 (MMD-1) - Efforts continued during 1999 to meet the State of Utah, Division of Solid and Hazardous Waste, environmental permit compliance items for testing the Munitions Management Device, Version 1 (MMD-1) at Dugway Proving Ground, Utah. The MMD-1 was designed to dispose of chemical munitions that do not contain explosives.

Munitions Management Device, Version 2 (MMD-2) - Plans to fabricate the Munitions Management Device, Version 2 (MMD-2) were suspended in 1999 as a result of an independent analysis of total life cycle cost of the system and risks associated with completing the CWC requirements at PBA. A CWM disposal system tailored to meet requirements at PBA, Arkansas, is being developed. Development of the Munitions Assessment and Processing System, designed to meet requirements at APG, Maryland for disposal of explosively configured CWM, continued during 1999. EDS units will be acquired in lieu of MMD-2 units to complement the disposal of CWM at APG and PBA and to meet disposal needs for future recoveries.

Former Production Facilities (FPF) - Destruction of the former BZ Munitions fill facility at PBA, Arkansas (the only U.S. Schedule 2 facility), began in January 1999 and was completed in September 1999. Destruction of the Pilot Plant at APG, Maryland, a CWC Schedule 1 facility, was completed in February 2000. Destruction of the former VX production facility at Newport Chemical Depot, Indiana, also a Schedule 1 facility, which began in August 1998, continued through 1999.

Miscellaneous Chemical Warfare Materiel (CWM) - At Deseret Chemical Depot, Utah, 944 empty TCs were disposed of during 1999. Disposal of the remaining TCs for which the NSCMP is responsible at APG, Maryland, will be completed in 3Q FY 00 (Apr-Jun). Preparations to dispose of the empty TCs at PBA, Arkansas, continued during 1999.

Remediation Coordination and Support - NSCMP supported remediation operations at Camp American University, Spring Valley, Washington, D.C., from February 1999 through February 2000. Thirteen suspect chemical items were recovered.

7. Executive Summary (Cont'd):

Sixteen CAIS, found by a farmer on Guam in July 1999, were transported to Johnston Atoll in September 1999 for storage and subsequent disposal.\

**Other Programmatic Areas:**

The PMCD Public Outreach and Information Office (POIO) activities continued in communities surrounding the current and future continental U.S. chemical agent disposal facilities to promote public awareness and involvement. Activities, such as site tours, presentations, overviews, informational displays, and informative literature, were provided by the site outreach staff to specific stakeholder groups and the general public. Other activities included a series of public availability sessions with JACADS' Pacific area neighbors in Honolulu, Hawaii and Agan Heights, Guam. POIO continues its efforts to ensure that stakeholder groups and the general public remain apprised of programmatic activities.

The PMCD, the Department of the Army, and the Office of the Secretary of Defense conducted the seventh and eighth Environmental Forums on the U.S. Chemical Weapons Destruction Program. All forums are open to the public. Planning for a ninth forum is ongoing.

8. Threshold Breaches:

CSD

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

The Chemical Demilitarization Program (CDP) has deviated from its current

**8c. Threshold Breaches (Cont'd):**

approved Acquisition Program Baseline (APB), dated March 31, 1998. Specifically, the Program Manager's Current Estimate for accomplishment of the Chemical Stockpile Disposal end item Alternative Technologies and Approaches Project (ATAP) Milestone: "Milestone III (Operations)" has slipped 16 months (from Jan 04 to Jun 05). A Program Deviation Report was submitted to the Army Acquisition Executive in March 2000.

The FY00 Congressional appropriation cut \$41.5M of the CDP's Research Development Test and Evaluation (RDT&E) funds and \$94.1M of the CDP's military construction (MILCON) funds. Department of the Army direction was to not impact operational sites or risk breaching the Chemical Weapons Convention treaty deadline of April 29, 2007 at baseline incineration sites under construction. The ATAP share of the FY00 cuts was \$20.8M RDT&E, \$10.4M each at Aberdeen and Newport; and a MILCON cut of \$38.4M, \$13.1M at Aberdeen and \$25.3M at Newport. The FY 01 President's Budget restored all of the FY 00 cuts in later years, but deferred \$25M of Aberdeen FY 01 MILCON and \$15M of Newport FY01 MILCON. The funding cuts and deferrals at Aberdeen negatively impact the systems contractor's ability to achieve projected staffing levels, to procure long-lead items, and to accomplish critical path construction activities. This results in a schedule delay at Aberdeen of 16 months. A revised APB is being prepared for approval.

NSCMD

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

8c. Threshold Breaches (Cont'd):

The Chemical Demilitarization Program deviated from its current approved APB, dated March 31, 1998. Specifically, the Non-Stockpile Chemical Materiel Product approved program cost for Development RDT&E increased 65.3 percent (\$157.6M Base Year 94) over the Life Cycle Cost period (FY 94-FY 07). The increase is attributable to reprogramming of funds to address FY 98 and 99 reductions in funding and a transition of planned recovered materiel destruction efforts from an operations and maintenance effort to an extended RDT&E effort. The reprogramming is being accomplished within the current overall Non-Stockpile Chemical Materiel Product (NSCMP) and annual NSCMP cost ceilings. A Program Deviation Report was submitted to the Army Acquisition Executive in July 1999.

9. Schedule:

CSD

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
CHEMICAL STOCKPILE DISPOSAL PROJECT (CSDP)			
Chemical Weapons Convention			
Compliance CWC (Entry into Force is 04/29/97) /2			
1% U.S. Category 1 Chemical Weapons Destroyed	JAN 1994	JAN 1994	JAN 1994
20% U.S. Category 1 Chemical Weapons Destroyed	MAY 2002	MAY 2002	MAY 2002
45% U.S. Category 1 Chemical Weapons Destroyed	MAY 2004	MAY 2004	MAY 2004
100% U.S. Category 1 Chemical Weapons Destroyed	MAY 2007	MAY 2007	MAY 2007
CAMDS Testing	SEP 1979	SEP 1979	SEP 1979
DAB Program Review	MAR 1995	MAR 1995	MAR 1995
JOHNSTON ATOLL (JACADS)			
JACADS Construction	SEP 1985	SEP 1985	SEP 1985
Begin Operations	JUL 1990	JUL 1990	JUL 1990
Begin Closure	SEP 2000	SEP 2000	SEP 2000
TOOELE (TOCDF)			
Submit RCRA/CAA Permit Applications	OCT 1988	OCT 1988	OCT 1988
Systems Contract Award/Start Const.	OCT 1989	OCT 1989	OCT 1989
Begin Systemization	SEP 1993	SEP 1993	SEP 1993
Begin Operations	AUG 1996	AUG 1996	AUG 1996
Begin Closure	OCT 2003	OCT 2003	OCT 2003
ANNISTON (ANCDF)			
Submit Updated RCRA/CAA Permit Applications	FEB 1995	FEB 1995	FEB 1995
Systems Contract Award/Start Const.	FEB 1996	FEB 1996	FEB 1996
Begin Operations	JAN 2002	JAN 2002	JAN 2002
Begin Closure	NOV 2005	NOV 2005	NOV 2005

9a. Schedule (Cont'd):

CSD

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
UMATILLA (UMCDF)			
Submit Updated RCRA/CAA Permit Applications	SEP 1995	SEP 1995	SEP 1995
Systems Contract Award/Start Const.	FEB 1997	FEB 1997	FEB 1997
Begin Operations	FEB 2002	FEB 2002	FEB 2002
Begin Closure	JUN 2005	JUN 2005	JUN 2005
PINE BLUFF (PBCDF)			
Submit RCRA/CAA Permit Applications	JUL 1995	JUL 1995	JUN 1995
Begin Construction M+1	TBD	TBD	FEB 1999
Begin Operations M+54	TBD	TBD	AUG 2003
Begin Closure M+94	TBD	TBD	DEC 2006
PUEBLO (PUCDF)			
Submit Updated RCRA/CAA Permit Applications	OCT 1995	OCT 1995	OCT 1995
Begin Construction M+1	TBD	TBD	TBD
Begin Operations M+55	TBD	TBD	TBD
Begin Closure M+84	TBD	TBD	TBD
BLUE GRASS (BGCDF)			
Submit RCRA/CAA Permit Applications	DEC 1995	DEC 1995	DEC 1995
Begin Construction M+1	TBD	TBD	TBD
Begin Operations M+55	TBD	TBD	TBD
Begin Closure M+77	TBD	TBD	TBD
ALTERNATIVE TECHNOLOGIES AND APPROACHES			
PRODUCT			
ABERDEEN (ABCDF)			
Milestone 0	AUG 1994	AUG 1994	AUG 1994
Milestone I/II (Pilot Scale)	DEC 1996	DEC 1996	DEC 1996
Milestone III (Operations)	JAN 2004	JAN 2004	JUN 2005 (Ch-1)
NEWPORT (NECDF)			
Milestone 0	AUG 1994	AUG 1994	AUG 1994
Milestone I/II (Pilot Scale)	DEC 1996	DEC 1996	DEC 1996
Milestone III (Operations)	MAY 2004	MAY 2004	MAY 2004

ACRONYMS:

DAB - Defense Acquisition Board  
 CWC - Chemical Weapons Convention  
 EIF - Entry Into Force  
 RCRA - Resource Conservation and Recovery Act  
 CAA - Clean Air Act  
 CAMDS - Chemical Agent Munitions Disposal System  
 JACADS - Johnston Atoll Chemical Agent Disposal System  
 TOCDF - Tooele Chemical Agent Disposal Facility  
 ANCDF - Anniston Chemical Agent Disposal Facility  
 UMCDF - Umatilla Chemical Agent Disposal Facility  
 PBCDF - Pine Bluff Chemical Agent Disposal Facility



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

CSD

PUCDF - Pueblo Chemical Agent Disposal Facility  
BGCDF - Blue Grass Chemical Agent Disposal Facility  
ABCDF - Aberdeen Chemical Agent Disposal Facility  
NECDF - Newport Chemical Agent Disposal Facility

1. Schedule parameters for the Chemical Stockpile Disposal Project (CSDP) and the Alternative Technologies and Approaches Project (ATAP) have been included under the Chemical Stockpile Disposal (CSD) end item.

2. CWC Milestone Information

a. The CWC entered into force on April 29, 1997 for the nations that ratified the CWC prior to this date. The United States Congress ratified the CWC five days earlier, on April 24, 1997. While the start date for the CWC purposes is April 1997, the United States has met some CWC requirements earlier than April 1997.

b. The CWC groups chemicals by toxicity and commercial utility by segregation into separate schedules (Annex on Chemicals, Part B, Schedule of Chemicals). Part A of the Schedules lists toxic chemicals and Part B lists Precursors.

c. The CWC divides chemical weapons into three categories based on the schedule of chemicals described above:

- Category 1 - Chemical weapons on the basis of Schedule 1 chemicals and their parts and components.

- Category 2 - Chemical weapons on the basis of all other chemicals and their parts and components.

- Category 3 - Unfilled munitions and devices, and equipment specifically designed for use directly in conjunction with employment.

While the majority of the Category 1 Chemical Weapons are contained in the Chemical Stockpile Disposal Product, the Non-Stockpile Chemical Materiel Project has declared Category 1 Chemical Weapons also. The United States currently has no declared Category 2 Chemical Weapons.

3. "M" equals the date (month) that the environmental permit applications are approved by the state. "M+" is that date plus the cumulative number of months by phase (i.e., construction, operations, closure) after issuance of the environmental permits by the state.

9a. Schedule (Cont'd):

CSD

4. Public Law 104-208 (FY 97 Defense Appropriation Act) suspended the obligation of funds for the construction of baseline demilitarization facilities at Pueblo Chemical Depot and Blue Grass Army Depot until 180 days after the Secretary of Defense reports on the effectiveness of at least two alternative demilitarization technologies for assembled munitions identified and demonstrated under the Assembled Chemical Weapons Assessment (ACWA) program and their ability to meet the applicable safety and environmental requirements. The supplemental ACWA report containing the demonstration results was submitted to Congress on October 1, 1999. Objective and threshold dates for the Pueblo Chemical Agent Disposal Facility and the Blue Grass Chemical Agent Disposal Facility will be established pending a decision on the destruction technology to be implemented. "M" dates shown for these facilities assume an incineration-based disposal process.

b. Current Change Explanations --

(Ch-1) The slip in the Program Manager's estimate for this milestone is a result of a 1-year deferral of \$13.1 million FY 00 military construction (MILCON) funds, a \$10.4 million 1-year deferral of FY 00 research and development funds, and a 1-year deferral of \$25 million in FY 01 MILCON funds. An evaluation of the impact of this slip on program cost is being conducted.

MILESTONE	FROM	TO
ABERDEEN (ABCDF)		
Milestone III (Operations)	JAN 04	Jun 05

NSCMD

a. Milestones --

	<u>Production</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
NON-STOCKPILE CHEMICAL MATERIEL			
DISPOSAL PROJECT (NSCMD)			
Chemical Weapons Convention			
Compliance (Entry Into			
Force is 29 April 97)			
Initially Declared Category 1			
Chemical Weapons (Other than Binary)			
100% Destroyed (EIF + 10 yrs)	MAY 2007	MAY 2007	MAY 2007
Initially Declared Category 3			
Chemical Weapons			
Begin Destruction (EIF + 1 yr)	MAY 1998	MAY 1998	NOV 1997
100% Destroyed (EIF + 5 yrs)	MAY 2002	MAY 2002	MAY 2002

9a. Schedule (Cont'd):  
NSCMD

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Initially Declared Category 1 Chemical Weapons (Binary)			
Excess Binary "Other" or Non-key Chemical destroyed (EIF + 2 yrs)	MAY 1999	MAY 1999	MAR 1999 (Ch-1)
100% Destroyed (EIF + 10 yrs)	MAY 2007	MAY 2007	MAY 2007
Initially Declared Schedule 1 Production Facilities			
Begin Destruction (EIF + 1 yr)	MAY 1998	MAY 1998	APR 1998
100% Destroyed Period 3 (EIF + 10 yrs)	MAY 2007	MAY 2007	MAY 2007
Initially Declared Schedule 2 Production Facilities			
Begin Destruction (EIF + 1 yr)	MAY 1998	MAY 1998	FEB 1998
100% Destroyed (EIF + 5 yrs)	MAY 2002	MAY 2002	AUG 1999 (Ch-2)
Disposal of CWM (non CWC)	MAY 2007	MAY 2007	MAY 2007
Storage, Transportation, Disposal of CWM in Support of Remediation/ Emergency Operations	MAY 2007	MAY 2007	MAY 2007

**ACRONYMS:**

CWC - Chemical Weapons Convention  
CWM - Chemical Warfare Materiel  
EIF - Entry Into Force

- While the majority of the Category 1 Chemical Weapons are contained in the Chemical Stockpile Disposal Project, the Non-Stockpile Chemical Materiel Product has declared Category 1 Chemical Weapons also. The United States currently has no declared Category 2 Chemical Weapons.
- The date April 2007 reflects the proposed funding cut off of the chemical Agent and Munitions Destruction, Army (CAMD/A) funds for purposes of the APB.

**b. Current Change Explanations --**

(Ch-1) This milestone has been met. Destruction of the Excess Binary "Other" or Non-Key Chemical was completed.

MILESTONE	FROM	TO
Initially Declared Category 1 Chemical Weapons (Binary), Excess Binary "Other" or Non-Key Chemical Destroyed (EIF + 2 yrs)	JAN 99	MAR 99

9b. Schedule (Cont'd):

NSCMD

(Ch-2) This milestone was achieved when destruction of the former BZ munitions fill facility at Pine Bluff Arsenal Arkansas, was completed in August 1999.

MILESTONE	FROM	TO
Initially Declared Schedule 2 Production Facilities 100% Destroyed (EIF + 5 yrs.)	MAY 02	AUG 99

10. Performance Characteristics:

CSD

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
<b>CHEMICAL STOCKPILE DISPOSAL PROGRAM</b>				
Environmental Laws & Regulations	Meets or Exceeds State and/or Federal Rqmts	Meets or/ Exceeds / State / and/or / Federal / Rqmts /	Meets or Exceeds State and/or Federal Rqmts	TBD  Meets or Exceeds State and/or Federal Rqmts (Note 1)
Safety and Occupational Laws and Regulations	Meets or Exceeds State and/or Federal Reqmts	Meets or/ Exceeds / State / and/or / Federal / Reqmts /	Meets or Exceeds State and/or Federal Reqmts	TBD  Meets or Exceeds State and/or Federal Reqmts (Note 2)
Chemical Agent Release	0	0 / 0 /	TBD	0 (Notes 3&5)
Chemical Agent Exposure	0	0 / 0	TBD	0 Notes (4&5)

ACRONYMS

GB - Nerve Chemical Agent  
H/HD/HT - Mustard Blister Chemical Agent  
VX - Nerve Chemical Agent

1. "Meets environmental laws and regulations" means the facility is

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10a. Performance Characteristics (Cont'd):

CSD

operating in compliance with all conditions specified in environmental permits and applicable laws and regulations. The threshold is breached if violation of law or regulation warrants a stop-work order issued by the state or the Environmental Protection Agency.

2. "Meets safety and occupational health laws and regulations" means the facility is operating in compliance with the conditions specified in safety and occupational health laws and regulations. The threshold is breached if a violation warrants a stop-work order issued by the state.

3. a. Chemical Stockpile Disposal: The term "Chemical Agent Release" is defined as an event involving:

1. Confirmed agent release above the 72-hour general population time weighted average (TWA) measure at a perimeter monitoring station with the disposal facility as the identified source. The 72-hour general population TWA values are:

GB - 0.000003 mg/m3  
VX - 0.000003 mg/m3  
H/HD/HT - 0.0001 mg/m3

2. Confirmed point source (stack) agent release above the allowable stack concentration (ASC). The ASC values are:

GB - 0.0003 mg/m3  
VX - 0.0003 mg/m3  
H/HD/HT - 0.03 mg/m3

3. Clinical symptoms of agent exposure to one or more individuals.

b. Non-Stockpile Chemical Material Disposal: A "Chemical Release" is defined as an event involving a chemical release above the applicable federal, state, or local restriction, with the processing system (i.e., RRS, MMD, etc.) as the confirmed source of the chemical release.

4. A "Chemical Agent Exposure", as defined by DA PAM 40-173 and DA PAM 40-8, refers to an individual who exhibits clinical signs or symptoms of being exposed to chemical agent.

5. Number of events

10b. Performance Characteristics (Cont'd):  
CSD

b. Current Change Explanations -- None

NSCMD

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
<b>NON-STOCKPILE CHEMICAL MATERIEL DISPOSAL PROJECT</b>				
Environmental Laws & Regulations	Meets or Exceeds State and/or Federal Rqmts	Meets or Exceeds State and/or Federal Rqmts	Meets or Exceeds State and/or Federal Rqmts	TBD
Safety and Occupational Laws and Regulations	Meets or Exceeds State and/or Federal Reqmts	Meets or Exceeds State and/or Federal Reqmts	Meets or Exceeds State and/or Federal Rqmts	TBD
Chemical Agent Release	0	0 / 0		TBD
Chemical Agent Exposure	0	0 / 0		TBD

Note: Approved Program Demonstrated Performance and Current Estimate parameters are explained in the notes accompanying the CSD portion of this section. The performance parameters for the CSD and the NSCMD are identical.

b. Current Change Explanations -- None

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

CSD

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	720.0	720.0	728.0
Procurement	2442.3	2442.3	1948.3
Flyaway	(2442.3)		(1948.3)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	1521.4	1521.4	1585.0
Acquisition O&M	7583.1	7583.1	6646.1
Total FY 1994 Base-Year \$	12266.8	12266.8	10907.4
Escalation	1614.4	1614.4	954.5
Development (RDT&E)	(99.4)	(99.4)	(73.5)
Procurement	(174.1)	(174.1)	(58.8)
Construction (MILCON)	(144.7)	(144.7)	(147.0)
Acquisition O&M	(1196.2)	(1196.2)	(675.2)
Total Then Year \$	13881.2	13881.2	11861.9

German retrograde and Johnston Atoll leave are included in O&M funding.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	9	9	9
Total	9	9	9

The Program Manager's (PM's) current estimate does not include \$1.7B in Chemical Agent Munition Destruction, Army (CAMD,A) research, development, test, and evaluation funding associated with the Assembled Chemical Weapons Assessment (ACWA) Program.

Public Law 104-208 (Section 8065) required the conduct of a pilot program to identify and demonstrate not less than two alternatives to the baseline incineration process for the demilitarization of assembled chemical munitions. The ACWA Program was created to carry out this mission. The Under Secretary of Defense for Acquisition and Technology designated a separate PM for this program in Fiscal Year 1997. Because it is a separate Program Office, the ACWA portion of the CAMD,A appropriation is not reported as part of the Program Manager for Chemical Demilitarization current estimate.

Total quantity is defined as 9 (8 CONUS plants and Johnston Atoll).

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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

NSCMD

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	241.2	241.2	399.1
Procurement	70.2	70.2	73.0
Flyaway	(70.2)		(73.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	0.0	2.7
Acquisition O&M	892.9	892.9	681.7
Total FY 1994 Base-Year \$	<u>1204.3</u>	<u>1204.3</u>	<u>1156.5</u>
Escalation	224.8	224.8	165.2
Development (RDT&E)	(29.9)	(29.9)	(50.6)
Procurement	(12.4)	(12.4)	(10.0)
Construction (MILCON)	(0.0)	(0.0)	(0.4)
Acquisition O&M	(182.5)	(182.5)	(104.2)
Total Then Year \$	<u>1429.1</u>	<u>1429.1</u>	<u>1321.7</u>
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	6	6	6
Total	<u>6</u>	<u>6</u>	<u>6</u>
c. Foreign Military Sales --	None.		
d. Nuclear Costs --	None.		



12. Unit Cost Summary:

CSD

	UCR Baseline (MAR 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1994 BY\$)	12266.8	10907.4	
(2) Quantity	9	9	
(3) Unit Cost	1362.978	1211.933	-11.08
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1994 BY\$)	2442.3	1948.3	
(2) Quantity	9	9	
(3) Unit Cost	271.367	216.478	-20.23

NSCMD

	UCR Baseline (MAR 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1994 BY\$)	1204.3	1156.5	
(2) Quantity	1	1	
(3) Unit Cost	1204.300	1156.500	-3.97
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1994 BY\$)	70.2	73.0	
(2) Quantity	6	6	
(3) Unit Cost	11.700	12.167	+3.99

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13. Cost Variance Analysis:

CSD

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	819.4	2616.4	1666.1	8779.3	13881.2
Previous Changes:					
Economic	-19.1	-26.1	-15.0	-205.4	-265.6
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+5.3	-367.0	+14.7	-61.8	-408.8
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-13.8	-393.1	-0.3	-267.2	-674.4
Current Changes:					
Economic	-7.3	+2.1	-11.0	-15.2	-31.4
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+3.2	-218.3	+77.2	-1184.3	-1322.2
Other	-	-	-	+8.7	+8.7
Support	-	-	-	-	-
Subtotal	-4.1	-216.2	+66.2	-1190.8	-1344.9
Total Changes	-17.9	-609.3	+65.9	-1458.0	-2019.3
Current Estimate	801.5	2007.1	1732.0	7321.3	11861.9

Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	720.0	2442.3	1521.4	7583.1	12266.8
Previous Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+5.7	-314.9	+12.7	-53.4	-349.9
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+5.7	-314.9	+12.7	-53.4	-349.9
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+2.3	-179.1	+50.9	-891.2	-1017.1
Other	-	-	-	+7.6	+7.6
Support	-	-	-	-	-
Subtotal	+2.3	-179.1	+50.9	-883.6	-1009.5
Total Changes	+8.0	-494.0	+63.6	-937.0	-1359.4
Current Estimate	728.0	1948.3	1585.0	6646.1	10907.4

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

b. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-7.3
	Adjustment for Current and Prior Inflation. (Estimating)	+1.8	+2.0
	Adjustment for prior year actuals (Estimating)	-14.2	-15.7
	Miscellaneous Adjustment for Rounding (Estimating)	+1.7	+2.5
	Realignment of funds. (Estimating)	+13.0	+14.4
	RDT&E Subtotal	<u>+2.3</u>	<u>-4.1</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-9.3
	Economic adjustment for negative program change. (Economic)	N/A	+11.4
	Adjustment for Current and Prior Inflation. (Estimating)	+2.5	+2.8
	Realignment of funds. (Estimating)	-35.7	-41.4
	Realignment of funds from PUCDF & BGCDF to ACWA (Estimating)	-145.9	-179.7
	Procurement Subtotal	<u>-179.1</u>	<u>-216.2</u>
(3)	<u>MILCON</u>		
	Revised escalation indices. (Economic)	N/A	-11.0
	Adjustment for Current and Prior Inflation. (Estimating)	+2.6	+2.8
	Realignment of funds. (Estimating)	+48.3	+74.4
	MILCON Subtotal	<u>+50.9</u>	<u>+66.2</u>
(4)	<u>O&amp;M</u>		
	Revised escalation indices. (Economic)	N/A	-87.1
	Economic adjustment for negative program change. (Economic)	N/A	+71.9
	Adjustment for Current and Prior Inflation. (Estimating)	+7.4	+8.5
	Adjustment for prior year actuals (Estimating)	+4.0	+4.7
	Realignment of funds. (Estimating)	-8.9	-10.0
	Realignment of funds from PUCDF & BGCDF to ACWA (Estimating)	-893.7	-1187.5
	Airlift and lodging relating to Hurricane Dora (Other)	+0.2	+0.2

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

CSD

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Three week program extension at JACADS due to Hurricane Dora (Other)	+7.4	+8.5

O&M Subtotal	-883.6	-1190.8
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NSCMD

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	271.1	82.6	-	1075.4	1429.1
Previous Changes:					
Economic	-5.0	-1.9	-	-29.0	-35.9
Quantity	-	-	-	-	-
Schedule	-	-2.4	-	-	-2.4
Engineering	-	-	-	-	-
Estimating	+7.8	+4.1	-	-22.6	-10.7
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+2.8	-0.2	-	-51.6	-49.0
Current Changes:					
Economic	-1.5	-0.8	-	-4.1	-6.4
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+177.3	+1.4	+3.1	-233.8	-52.0
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+175.8	+0.6	+3.1	-237.9	-58.4
Total Changes	+178.6	+0.4	+3.1	-289.5	-107.4
Current Estimate	449.7	83.0	3.1	785.9	1321.7

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

NSCMD

Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	241.2	70.2	-	892.9	1204.3
Previous Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+6.1	+1.6	-	-19.1	-11.4
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+6.1	+1.6	-	-19.1	-11.4
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+151.8	+1.2	+2.7	-192.1	-36.4
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+151.8	+1.2	+2.7	-192.1	-36.4
Total Changes	+157.9	+2.8	+2.7	-211.2	-47.8
Current Estimate	399.1	73.0	2.7	681.7	1156.5

b. Current Change Explanations --

(Dollars in Millions)

Base-Year    Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-1.5
Adjustment for Current and Prior Inflation. (Estimating)	+0.6	+0.6
Reprogramming of funds due to increased test requirements and longer than expected testing of systems. (Estimating)	+151.2	+176.7
RDT&E Subtotal	<u>+151.8</u>	<u>+175.8</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-0.8
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
Reprogramming of funds due to change in disposal methodology. (Estimating)	+1.1	+1.3
Procurement Subtotal	<u>+1.2</u>	<u>+0.6</u>
(3) <u>MILCON</u>		

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Reprogramming to fund new requirements resulting from the change in disposal methodology. (Estimating)	+2.7	+3.1
<b>MILCON Subtotal</b>	<b>+2.7</b>	<b>+3.1</b>
<b>(4) O&amp;M</b>		
Revised escalation indices. (Economic)	N/A	-14.2
Economic adjustment for negative program change. (Economic)	N/A	+10.1
Adjustment for Current and Prior Inflation. (Estimating)	+1.0	+1.0
Reprogramming of funds due to changes in program schedule to accomplish disposal of chemical weapons materiel during the extended testing program and changes in disposal methodology at Aberdeen Proving Ground, MD, Pine Bluff Arsenal, AR, and other locations. (Estimating)	-193.1	-234.8
<b>O&amp;M Subtotal</b>	<b>-192.1</b>	<b>-237.9</b>

14. Unit Cost and Other History (Then-Year Dollars in Millions):  
CSD

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1542.36	-33.00	-0.01	--	--	-192.33	+0.97	--	-224.37	1317.99

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
290.71	-2.67	--	--	--	-65.03	--	--	-67.70	223.01

14c. Unit Cost and Other History (Cont'd):  
CSD

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	SEP 1995	MAR 1998	DEC 1999
Total Cost	N/A	11903	13881.2	11861.9
Total Quantity	N/A	9	9	9
Prog Acq Unit Cost	N/A	1322.56	1542.36	1317.99

NSCMD

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes									PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
238.18	-42.30	+1190.92	-2.40	--	-62.70	--	--	+1083.52	1321.70	

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes									PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
13.77	-0.45	-0.01	-0.40	--	+0.92	--	--	+0.06	13.83	

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	SEP 1995	MAR 1998	DEC 1999
Total Cost	N/A	1207.6	1429.1	1321.7
Total Quantity	N/A	1	6	6
Prog Acq Unit Cost	N/A	1207.6	238.18	220.28

Chem Demil, December 31, 1999

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

a. Procurement --			Initial Contract Price		
<u>TOCDF Sys Contractor:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
EG&G Defense Matl's, Tooele, UT			\$211.0	N/A	1
DACA87-89-C-0076, CPAF					
Award: July 21, 1989					
Definitized: July 21, 1989					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$996.7	N/A	1	\$1041.2	\$1099.8	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date			\$-7.4	\$-2.8	
Net Change			\$-11.6	\$-2.5	
			\$-4.2	\$0.3	

Explanation of Change:

The target price is the current contract value through MOD P00188 including fee.

The cost and schedule variances since the previous report are not significant.

<u>ANCDF Systems Contract:</u>			Initial Contract Price		
Westinghouse, Anniston, AL			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
DAA-09-96-C-0018, FFP/CPAF			\$575.8	N/A	1
Award: February 29, 1996					
Definitized: February 29, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$639.0	N/A	1	\$637.9	\$710.4	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date			\$-0.2	\$-1.7	
Net Change			\$0.2	\$-2.7	
			\$0.4	\$-1.0	

Explanation of Change:

This is a Cost Plus Award Fee (CPAF) contract with a Firm Fixed Price (FFP) element for construction. The target price is the current contract value through FFP MOD A00198 and CPAF MOD P0042.

The cost and schedule variances since the previous report are not significant.



15. Contract Information (Cont'd):

<u>UMCDF Systems Contract:</u>			Initial Contract Price		
Raytheon Demil Company, Umatilla, OR	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
DAAA09-97-C-0025, FFP/CPAF	\$566.8	N/A	1		
Award: February 10, 1997					
Definitized: February 10, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$650.5	N/A	1	\$648.6	\$773.5	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$2.5	\$-55.3	
Cumulative Variances To Date			\$5.0	\$-36.6	
Net Change			\$2.5	\$18.7	

Explanation of Change:

This is a CPAF contract with a FFP element for construction. The target price is the current contract value through FFP MOD A00031 and CPAF MOD P0040.

The cost variance since the previous report is not significant. The schedule variance relates to the Firm Fixed Price portion of the contract, construction activities. It is based on approved progress payments accepted by the U.S. Army Corps of Engineers. It is used to track schedule progress and measure potential impacts on the cost-plus portion of the contract. The contract was rebaselined in Mar 99, moving the completion of Construction from March 2000 to November 2000. Because CPAF Systemization activities were brought forward and overlapped, milestones in Section 9 were not affected.

<u>PBCDF Systems Contract:</u>			Initial Contract Price		
Raytheon Demil Company, Philadelphia, PA	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
DAAA09-97-C0098, FFP/CPAF	\$511.6	N/A	1		
Award: July 25, 1997					
Definitized: July 25, 1997					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$608.2	N/A	1	\$607.8	\$798.3	

15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date	<u>\$0.7</u>	<u>\$-0.4</u>
Net Change	\$0.7	\$-0.4

Explanation of Change:

This is a CPAF contract with a FFP element for construction. The target price is the current contract value through FFP MOD A00057 and CPAF MOD P0032.

The cost and schedule variances since the previous report are not significant. The difference between the Contractor's and the Program Manager's Estimated Price at Completion reflects additional information that reflects Program Manager assumptions about Facility Closure that differ from those of the contractor.

<u>ABCDF Systems Contract:</u>	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Bechtel National Inc., San Francisco, CA DAAA09-98-C-0080, CPAF Award: October 2, 1998 Definitized: October 2, 1998	\$305.6	N/A	1

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$319.8	N/A	1	\$650.5	\$

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date	<u>\$-16.7</u>	<u>\$-2.1</u>
Net Change	\$-16.7	\$-2.1

Explanation of Change:

The target price is the current contract value through MOD P00026.

The unfavorable cost variance is due to cost growth associated with the System Contractor's execution of contract requirements and known, unknown costs normally associated with a research and development, first of a kind pilot plant such as the Aberdeen Chemical Agent Disposal Facility program.

Due to the large differences between the Current Contract Price and the Contractor's Estimated Price at Completion, the Program Manager is reassessing the Estimated Price at Completion. The Government has initiated a should cost review to assess a new cost proposal recently received from the contractor. The Program Manager's Estimate at Completion will not be determined until the assessment process is completed.

15. Contract Information (Cont'd):

<u>NECDF System Contract:</u>			<u>Initial Contract Price</u>			
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Parsons Infra & Tech Grp, Pasadena CA				\$296.5	N/A	1
DAAA09-99-C-0016, CPAF						
Award: February 18, 1999						
Definitized: February 18, 1999						
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>			
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>		
\$309.9	N/A	1	\$311.8	\$313.8		
			<u>Cost Variance</u>	<u>Schedule Variance</u>		
Previous Cumulative Variances			\$0.0	\$0.0		
Cumulative Variances To Date			\$-4.9	\$-2.6		
Net Change			\$-4.9	\$-2.6		

Explanation of Change:

The target price is the current contract value through MOD P00026.

The cost and schedule variances represent two official submittals of the Cost Performance Report. The cost and schedule variances exceed a 10 percent unfavorable threshold. The unfavorable schedule variance is driven primarily by noncritical path items, such as the completion of the System Contractor's Office Building. The unfavorable cost variance relates to the Technical Data Package, Chemical Demilitarization Building, Supercritical Water Oxidation Building, and Project Controls. The project is assessing these unfavorable variances to determine their potential impact.

Contract Comments:

The contract was awarded on February 18, 1999. This contract is for the design, construction, equipment procurement and installation, systemization, operation, and closure of the facility.

<u>b. O&amp;M --</u>			<u>Initial Contract Price</u>			
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>JACADS Operator &amp; Maint.:</u>						
Raytheon Demil Company, Johnston Island				\$9.3	N/A	1
DAAA09-96-C-0081, CPAF						
Award: September 28, 1996						
Definitized: September 28, 1996						
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>			
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>		
\$451.2	N/A	1	\$442.5	\$451.2		

15b. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$1.0	\$-3.9
Cumulative Variances To Date	<u>\$-1.2</u>	<u>\$-3.2</u>
Net Change	\$-2.2	\$0.7

Explanation of Change:

This contract is negotiated yearly with the contractor. It was initially funded (\$9.3M) to reflect efforts required only in Fiscal Year 1996. The previous report (December 31, 1998) reported a Current Contract Price target and ceiling price of \$408.5M reflecting the cumulative value of Fiscal Years 1996-1999. The increase in this report from \$408.5M in the target and ceiling price to \$451.2M reflects the cumulative value of Fiscal Years 1996-1999, plus the negotiation of the Fiscal Year 2000 workload and the estimated cost of authorized unpriced work for Fiscal Year 2001. The target price is the current contract value through MOD P0063.

The unfavorable cost and schedule variances since the previous report are not significant.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years (FY88-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	416.8	193.8	195.4	445.2	1251.2
Procurement	1565.5	189.5	121.9	213.2	2090.1
MILCON	787.5	173.0	175.4	599.2	1735.1
O&M	3380.0	541.7	607.2	3578.3	8107.2
Total	6149.8	1098.0	1099.9	4835.9	13183.6

CSD

16a. Program Funding Summary (Cont'd):  
CSD

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

<u>Appropriation</u>	<u>Prior Years (FY88-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	261.5	156.2	135.2	248.6	801.5
Procurement	1539.6	184.9	105.7	176.9	2007.1
MILCON	787.5	173.0	172.3	599.2	1732.0
O&M	3172.5	503.9	559.7	3085.2	7321.3
Total	5761.1	1018.0	972.9	4109.9	11861.9

NSCMD

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

<u>Appropriation</u>	<u>Prior Years (FY92-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-07)</u>	<u>Total</u>
RDT&E	155.3	37.6	60.2	196.6	449.7
Procurement	25.9	4.6	16.2	36.3	83.0
MILCON	-	-	3.1	-	3.1
O&M	207.5	37.8	47.5	493.1	785.9
Total	388.7	80.0	127.0	726.0	1321.7

b. Annual Summary -- CSD

Appropriation: 0400 - RDT&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1994 Dollars Nonrec</u>	<u>Flyaway FY 1994 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1988				6.0	4.9
1989				20.0	17.8
1990				8.6	7.9
1991				5.6	5.3
1992				14.2	13.9
1993				6.5	6.5
1994				24.6	25.0
1995				9.1	9.4
1996				21.2	22.2
1997				22.0	23.5
1998				23.3	25.5
1999				90.1	99.6
2000				140.7	156.2
2001				120.5	135.2
2002				108.2	123.4
2003				97.6	113.3

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Chem Demil, December 31, 1999

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

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2004				5.2	6.2
2005				2.2	2.7
2006				2.1	2.6
2007				0.3	0.4
Subtotal				728.0	801.5

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988			117.3	117.3	96.4
1989			49.1	49.1	43.8
1990	1		78.4	78.4	72.2
1991			121.0	121.0	115.1
1992			155.2	155.2	151.8
1993			242.8	242.8	242.7
1994			47.8	47.8	48.7
1995			188.3	188.3	195.2
1996	1		215.0	215.0	225.6
1997			154.9	154.9	165.8
1998			65.7	65.7	72.0
1999			99.8	99.8	110.3
2000			166.6	166.6	184.9
2001	2		94.2	94.2	105.7
2002	1		88.4	88.4	100.9
2003	1		24.1	24.1	28.0
2004	3		17.7	17.7	21.0
2005			15.6	15.6	18.8
2006			1.2	1.2	1.5
2007			0.8	0.8	1.0
2008			3.2	3.2	4.1
2009			1.1	1.1	1.5
2010			0.1	0.1	0.1
Subtotal	9		1948.3	1948.3	2007.1

There are recurring flyaway dollars for years with no quantities due to the complexity of the program and the length of time it takes to procure a demilitarization facility.

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Chem Demil, December 31, 1999

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

Appropriation: 0500 - Military Construction, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				31.2	32.9
1996				12.2	13.0
1997				112.6	121.0
1998				79.6	86.5
1999				68.1	74.8
2000				154.5	173.0
2001				152.1	172.3
2002				197.5	227.7
2003				134.2	157.8
2004				80.9	97.0
2005				8.1	9.9
2006				85.6	106.8
Subtotal				1116.6	1272.7

Appropriation: 2050 - Military Construction, Army

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				18.1	16.0
1989				76.7	69.6
1990				6.4	6.0
1991				93.1	90.5
1992				144.6	143.8
1993				9.9	10.0
1994				119.6	123.4
Subtotal				468.4	459.3

Appropriation: 0100 - Operation & Maintenance, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				118.1	97.0
1989				131.5	117.3
1990				189.1	174.1
1991				181.2	172.3
1992				211.1	206.5
1993				261.3	261.1
1994				265.1	270.0
1995				332.2	344.4

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Chem Demil, December 31, 1999

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

Appropriation: 0100 - Operation & Maintenance, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				310.8	326.2
1997				393.1	420.9
1998				331.6	363.1
1999				379.7	419.6
2000				454.0	503.9
2001				498.7	559.7
2002				513.2	585.6
2003				448.1	520.4
2004				536.0	635.0
2005				554.1	669.5
2006				280.6	345.8
2007				130.8	164.4
2008				33.8	43.4
2009				64.1	83.9
2010				27.9	37.2
Subtotal				6646.1	7321.3

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	9		1948.3	10439.0	11402.6
Army				468.4	459.3
Grand Total	9		1948.3	10907.4	11861.9

b. Annual Summary -- NSCMD

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				5.6	5.7
1995				10.9	11.3
1996				29.4	30.8
1997				30.0	32.1
1998				33.6	36.8
1999				34.9	38.6
2000				33.9	37.6
2001				53.6	60.2
2002				51.4	58.7
2003				35.9	41.7

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Chem Demil, December 31, 1999

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

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2004				35.5	42.1
2005				28.7	34.7
2006				14.9	18.4
2007				0.8	1.0
Subtotal				399.1	449.7

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994			2.7	2.7	2.7
1995			3.2	3.2	3.3
1996	1		12.2	12.2	12.8
1997			2.5	2.5	2.7
1998			0.2	0.2	0.2
1999			3.8	3.8	4.2
2000	1		4.1	4.1	4.6
2001			14.4	14.4	16.2
2002	2		3.1	3.1	3.5
2003					
2004			7.6	7.6	9.0
2005					
2006	1		9.7	9.7	11.9
2007	1		9.5	9.5	11.9
Subtotal	6		73.0	73.0	83.0

There are recurring flyaway dollars for years with no quantities due to the complexity of the program and the length of time it takes to procure a demilitarization capability.

Appropriation: 2050 - Military Construction, Army

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001				2.7	3.1
Subtotal				2.7	3.1

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Chem Demil, December 31, 1999

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

Appropriation: 0100 - Operation & Maintenance, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				4.3	4.2
1993				6.3	6.3
1994				20.8	21.2
1995				10.9	11.3
1996				17.0	17.8
1997				29.4	31.5
1998				44.0	48.2
1999				60.6	67.0
2000				34.1	37.8
2001				42.3	47.5
2002				81.9	93.4
2003				49.0	56.9
2004				65.0	77.0
2005				71.8	86.7
2006				92.0	113.4
2007				52.3	65.7
Subtotal				681.7	785.9

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	6		73.0	1153.8	1318.6
Army				2.7	3.1
Grand Total	6		73.0	1156.5	1321.7

17. Delivery/Expenditure Information:

CSD

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	2	2

Percent Total Program Quantities Delivered: 22.2%

b. Total Expenditures To Date (In Millions of Dollars): \$ 4821.6

Percent Total Program Expended: 40.6%

N/A

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Chem Demil, December 31, 1999

17. Delivery/Expenditure Information (Cont'd):

NSCMD

NSCMD

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	1	1

Percent Total Program Quantities Delivered: 16.7%

b. Total Expenditures To Date (In Millions of Dollars): \$ 362.9

Percent Total Program Expended: 27.5%

N/A

18. Operating and Support Costs:

CSD

a. Assumptions and Ground Rules --

O & S costs are an integral part of the Chem Demil Program and as such are reported in sections 11, 12, 13, and 16 in this report.

b. Costs -- (FY 1994 Constant (Base-Year) Dollars in Millions)

Cost Element	Actual Annual Cost FY88-FY95	To Complete Program FY96-FY05
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	0.0	0.0

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

NSCMD

a. Assumptions and Ground Rules --

O & S costs are an integral part of the Chem Demil Program and as such are reported in sections 11, 12, 13, and 16 in this report.

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

Cost Element		
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	N/A	N/A

AF-5 B-1 CMUP

\*\*\* ~~SECRET~~ \*\*\*

SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: B-1B CMUP

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): B-1B Conventional Mission Upgrade Program (JDAM/Computer Upgrade/DSUP)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:  

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B-1 System Program Office	Assigned: June 1, 1997
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4. (U) Program Elements/Procurement Line Items:  

RDT&E:	
(U)	PE 0604226F Project
PROCUREMENT:	
(U)	APPN 3010 ICN 0101126F (Air Force)
O&M:	
(U)	PE 0101226F

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 DEPARTMENT OF DEFENSE

Classified by: ~~357-92 (SAC 007-92) I/II~~ REV 2, 23 Apr 97  
 Downgrade instructions: ~~Sec 1.4.2~~  
 Declassify on: ~~Source Data Marked "OADR", date of source~~ 23 Apr 97

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5. (U) References:

JDAM

SAR Baseline (Production Estimate):

(U) SAE Approved Acquisition Program Baseline (APB) dated February 9, 1999.

Approved Program:

(U) SAE Approved Acquisition Program Baseline (APB) dated February 9, 1999.

Computer Upgrade

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated January 25, 1995.

Approved Program:

(U) SAE Approved Acquisition Program Baseline (APB) dated September 18, 1998.

DSUP

SAR Baseline (Development Estimate):

(U) DAE approved Acquisition Program Baseline (APB) dated April 14, 1997.

Approved Program:

(U) SAE Approved Acquisition Program Baseline (APB) dated September 18, 1998.

6. (U) Mission and Description:

(U) (U) In the January 1992 publication of The Bomber Roadmap, the Secretary of the Air Force designated the B-1B as the backbone of the bomber force. In the August 1992 Mission Need Statement and the April 1993 Operational Requirements Document, HQ ACC specified the need for an improved conventional mission capability on the B-1B. This will primarily be accomplished via the Conventional Mission Upgrade Program (CMUP)-- three major upgrades to the aircraft.

(U) The first upgrade will enhance the capability of the B-1B Lancer to perform near precision attacks against all but heavily defended targets deep in enemy airspace during conventional operations. The requirement is satisfied with a material solution to provide the B-1B with improved lethality through the integration of near precision conventional weapons such as the Joint Direct Attack Munition (JDAM). As part of the advanced munitions integration, implementation of MIL-STD-1760 electrical interconnect system, communication upgrades and the Global Positioning System (GPS) is included. The upgrade is a modification program integrating predominantly non-developmental items to enhance aircraft conventional mission capabilities.

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6. (U) Mission and Description (Cont'd):

(U) The Computer Upgrade is the major element of the next step of the CMUP. This portion will upgrade B-1B offensive avionics hardware and software to provide improved conventional weapons carriage and employment capabilities. Six existing computers (Controls and Displays, Guidance and Navigation, Weapon Delivery, Critical Resources Function, and two Terrain Following) will be replaced with four new computers. The current Data Transfer System (DTS) will be replaced with a new DTS, and the avionics flight software will be converted/rehosted from JOVIAL to Ada. The objective is to increase memory capacity, throughput, input/output bandwidth, and growth potential; to improve reliability and maintainability; and to provide a weapons flexibility capability. Weapons flexibility will enable the B-1B to carry and deliver three different types of weapons (one type per weapons bay) on the same sortie employing a single software load.

(U) The existing ALQ-161 defensive system, designed and optimized for the strategic nuclear mission (i.e., low altitude penetration against specific air defense threats) has limited effectiveness in the B-1B's conventional mission. Therefore, the last phase of CMUP (Defensive System Upgrade Program (DSUP)) will remove most of the ALQ-161 system and replace it with an upgraded AN/ALR-56M radar warning receiver and the RF Countermeasures (RFCM) portion of the Navy's Integrated Defensive Electronic Countermeasures (IDECM) program, which includes a techniques generator and a fiber optic towed decoy. An NDI low band transmitter for on-board jamming will be installed to provide the requisite threat coverage. These new systems will significantly improve situational awareness and the survivability of the B-1B in the medium and high altitude regimes where most conventional missions will be conducted. These enhancements are required to maximize the effectiveness of the new weapons capability provided under CMUP. Additionally, these modifications will reduce annual O&S costs approximately \$50M per year.

(U) The B-1 currently fulfills conventional roles. CMUP modifications will not degrade its capability to re-role back to a nuclear platform should the need arise.

(U) For greater economy and efficiency, the B-1B program has chosen to pursue integrated "block" updates of software which combine development activities for capability upgrades and sustainment activities for deficiency corrections and increased reliability and maintainability. Once the content of a block is defined, it becomes an integrated effort, with activities dependent on each other. Therefore, the Acquisition O&M funds are included to capture the dependency of the development upgrades upon the sustainment activities.

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7. (U) Executive Summary:

(U) JDAM/1760/GPS/Communications - Production began February 1999 and continues to make good progress. Installation of modification kits is being accomplished by both a fly-in program and through scheduled programmed depot maintenance. Installation schedules were adjusted due to support equipment availability and higher than anticipated over and above installation rates discovered during installation of the first five kits.

(U) During Kosovo operations, B-1s experienced intermittent communication problems (weak/scratchy reception, broken/lost communication, range degradation). Government and contractor teams evaluated entire system and developed solutions. Final design of fix is underway. An Engineering Change Proposal to production contract will address manufacture and installation of required modifications.

(U) Production/installation of JDAM/1760/GPS/Comm portion of B-1 CMUP is well underway with no significant problems. B-1s with this modification were deployed in Operation Allied Force successfully. Expenditures for JDAM are projected to be 90% complete by March 30, 2000. This will be the last SAR for B-1 CMUP JDAM.

(U) Computer Upgrade - Computer Upgrade restructure was approved August 20, 1999. Contract modification issued to extend period of performance by the contractor on December 13, 1999. Avionics flight software (AFS) development is being impacted by Boeing engineers' strike that began February 9, 2000. Although Boeing is taking prudent action to mitigate affect, we anticipate impact to be greater than a day-for-day slip. AFS development was already starting to fall behind approved re-planned schedule. Since the strike only amplifies extent of slip, the magnitude cannot be fully assessed until it is settled. The APB change, reflecting restructured program is ready for signature. However, in light of the strike, it has been put on hold. We hope to submit the APB for final approval in conjunction with the DSUP re-baseline.

(U) Efforts continue on track for the Offensive Radar System, Central Integrated Test System (CITS), Electrical Multiplex (EMUX) and Preprocessor Flight Software (PFS) portion of the Computer Upgrade program.

(U) In addition to the previously reported Avionics Control Unit (ACU) Diminishing Manufacturing Source (DMS) issue, the contractor was forced to revise the current configuration of the new ACU to meet memory and throughput Technical Performance Measurements (TPMs). This new ACU is being used in Avionics Flight Software testing and will be used next year in Development Test and Evaluation. It will be used for the Computer Upgrade and DSUP Required Assets Available (RAA) kit requirements. Boeing and Lockheed Martin are working on the next phase of the design work to resolve DMS impacts to current ACU design to meet Full Rate Production requirements. The SPO continues to closely monitor this situation.



7. (U) Executive Summary (Cont'd):

(U) Defensive System Upgrade Program - The DSUP team is executing the approved restructure. The combined effects of the restructure and the FY00 congressional cut of \$15M delayed the MS III decision by 14 months from the original baseline. The team is in the process of updating the DSUP APB and program documentation to reflect the restructure. These documents will be forwarded for approval once the Block E program schedule has been stabilized--following the ongoing Boeing strike in Seattle. The government and Boeing teams are working together to jointly develop the restructure contract change proposal using the B-1 Teaming on Proposals (TOPs) process.

(U) During the restructure process, the DSUP team was tasked to examine the feasibility of implementing a separate Air Force fiber optic towed decoy (AFOTD) program to mitigate the risks associated with the IDECM ALE-55 FOTD. The results were briefed to a General Officer Steering Group (GOSG) on December 17, 1999. The GOSG decided to continue with the IDECM ALE-55 FOTD, but also to provide enough funding to keep the planning for an AFOTD risk reduction concept going until the risk associated with the ALE-55 is lower. This should occur in the summer timeframe.

(U) The Navy IDECM RFCM program is executing to its rebaselined schedule. The flight test program has been very successful since Jan 00. The Navy and Sanders restarted a series of fast deployment tests of the FOTD off the F/A-18E/F and F-16 to stress the launch envelope of the FOTD. The test will run through Mar 00.

8. (U) Threshold Breaches:

JDAM

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

8. (U) Threshold Breaches (Cont'd):

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

Computer Upgrade

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	Yes
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The Computer Upgrade program anticipates a breach to 6 schedule milestones and the O&M cost threshold due to an 8-1/2 month delay in Avionics Flight Software development. Impacts of the Boeing strike could further impact cost and schedule estimates.

8c. (U) Threshold Breaches (Cont'd):

DSUP

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	Yes
Average Procurement Unit Cost	Yes

c. (U) Explanation of Breach:

The Air Force was forced to restructure DSUP due to late GFE from the Navy IDECM RFCM program. Late delivery of GFE hardware and software from the IDECM program and Congressional funding reductions will cause a 14 month slip to completion of DSUP EMD. Probable breach to DSUP cost as well. Revised cost data will be complete in the April 2000 timeframe. Impacts of the Boeing strike could further impact cost and schedule estimates. No actual breaches have occurred to date.

9. (U) Schedule:

JDAM

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I	APR 1993	APR 1993	APR 1993
Milestone II	JAN 1995	JAN 1995	JAN 1995
Development Contract Award			
JDAM/1760	FEB 1995	FEB 1995	MAR 1995
GPS/Comm	FEB 1995	FEB 1995	MAR 1995
Critical Design Review			
JDAM/1760	APR 1996	APR 1996	MAY 1996
GPS/Comm	APR 1996	APR 1996	MAY 1996
Service Final DT&E			

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

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
JDAM/1760			
Start	AUG 1997	AUG 1997	AUG 1997
Complete	JUN 1998	JUN 1998	JUL 1998
GPS/Comm			
Start	AUG 1997	AUG 1997	AUG 1997
Complete	JUN 1998	JUN 1998	JUL 1998
Computer	N/A	N/A	
Low Rate Production Contract Award			
JDAM/1760	DEC 1996	DEC 1996	JUN 1996
GPS/Comm	FEB 1996	FEB 1996	MAY 1996
Low Rate Initial Production First Delivery			
JDAM/1760	SEP 1998	SEP 1998	APR 1998
GPS/Comm	NOV 1997	NOV 1997	NOV 1997
IOT&E			
JDAM/1760			
Start	AUG 1997	AUG 1997	AUG 1997
Complete	JUN 1998	JUN 1998	SEP 1998
GPS/Comm			
Start	AUG 1997	AUG 1997	AUG 1997
Complete	JUN 1998	JUN 1998	SEP 1998
Computer	N/A	N/A	
Milestone III - JDAM/1760	DEC 1998	DEC 1998	FEB 1999
Milestone III - GPS/Comm	JAN 1997	JAN 1997	JUL 1997
Full Rate Production Contract Award			
JDAM/1760	JAN 1999	JAN 1999	FEB 1999
GPS/Comm	JAN 1997	JAN 1997	JUL 1997
Organic Support Capability Date	N/A	N/A	
Service Depot Support Date	N/A	N/A	
Initial Operational Capability			
JDAM/1760	DEC 1998	DEC 1998	DEC 1998
GPS/Comm	DEC 1998	DEC 1998	DEC 1998

b. Current Change Explanations -- None

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

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I	APR 1993	APR 1993	APR 1993
Milestone II	JAN 1995	JAN 1995	JAN 1995
Development Contract Award	JAN 1996	MAY 1996	MAY 1996
Critical Design Review	JUN 1998	MAY 1998	JUN 1998
Service Final DT&E			
Start	JAN 2000	OCT 1999	OCT 2000 (Ch-1)
Complete	SEP 2000	OCT 2000	SEP 2001 (Ch-1)
Low Rate Production Contract Award	JAN 2000	JUL 1999	NOV 1999
Low Rate Initial Production 1st Delivery	JUL 2001	FEB 2001	MAY 2001
IOT&E			
Start	SEP 2000	OCT 1999	OCT 2000 (Ch-1)
Complete	JAN 2001	MAR 2001	MAR 2002 (Ch-1)
Milestone III	JAN 2001	APR 2001	JUN 2002 (Ch-1)
Full Rate Production Contract Award	JAN 2001	APR 2001	JUN 2002 (Ch-1)
Initial Operational Capability (IOC)	JAN 2003	N/A	N/A
Required Assets Available	N/A	DEC 2001	OCT 2002 (Ch-1)

(U) Notes:

Low Rate Production Contract award is defined as the contract award for the kitproof upgrade kit. Low Rate Initial Production First Delivery is defined as the delivery of the first kitproof upgrade kit. Full-rate production contract award is defined as the production contract award for follow-on upgrade kits. Required Assets Available (RAA) is defined as the date assets consisting of three modified aircraft, a total of three modified module/launchers, associated O-level support equipment, O-level spares, verified O-level maintenance and flight manuals, and source data to support training systems, programs and courses are delivered to the using command. In lieu of IOC, HQ ACC has agreed to use the RAA date.

b. Current Change Explanations --

(U) (Ch-1) The following schedule milestone estimates have changed due to contractor slip in Avionics Flight Software development and impacts of Boeing software engineers' strike. Current estimates are subject to change depending upon the length of the strike.

Service Final DT&E Start slipped from Jun 2000 to Oct 2000.  
 Service Final DT&E Complete slipped from May 2001 to Sep 2001.  
 IOT&E Start slipped from Jun 2000 to Oct 2000.  
 IOT&E Complete slipped from Nov 2001 to Mar 2002.  
 Milestone III slipped from Mar 2002 to Jun 2002.  
 Full Rate Production Contract Award slipped from Mar 2002 to Jun 2002.

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

Computer Upgrade

Required Assets Available slipped from May 2002 to Oct 2002.

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a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I	APR 1993	APR 1993	APR 1993
Milestone II	APR 1997	APR 1997	APR 1997
Development Contract Award	JUN 1997	JUN 1997	JUN 1997
Critical Design Review Complete	JUL 1998	JUL 1998	SEP 1998
Development Flight Test			
Start	MAR 2000	MAR 2000	FEB 2001
Complete	APR 2001	APR 2001	FEB 2002
IOT&E			
Start	JUN 2001	JUN 2001	FEB 2001
Complete	DEC 2001	DEC 2001	SEP 2002
Milestone III	MAR 2002	MAR 2002	MAY 2003 (Ch-1)
Full Rate Production Contract Award	APR 2002	APR 2002	NOV 2003 (Ch-1)
Required Assets Available	FEB 2002	FEB 2002	APR 2003

(U) Notes:

Required Assets Available (RAA) is substituted for Initial Operational Capability in the schedule. HQ ACC has agreed that RAA is defined as the date assets consisting of three modified aircraft, associated O-level support equipment, O-level spares, verified O-level maintenance and flight manuals and source data to support training is available (does not include training system devices).

b. Current Change Explanations --

(U) (Ch-1) Due to Production funding shortfalls (3010), Milestone III will change from Mar 2003 to May 2003 and Full Rate Production Contract Award will be delayed from Mar 2003 to Nov 2003. B-1 SPO will attempt to address funding shortfalls in future budget activities to avoid delaying production contract award. Current estimates could change depending upon the length of the Boeing strike and its affects on the Computer Upgrade program.

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10. (U) Performance Characteristics:

JDAM

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Accurate GPS-Aided Munition	Capability to airborne retarget GPS-aided munition (intent JDAM)	Capability/ Capabili ty to airborne/ employ 8 JDAMs / per launcher/	Capability to airborne retarget JDAM.	Capability to airborne retarget JDAM.
Mission Capable (MC) Rate (%)	75	75 / 65	TBD	67
Supportability CWIU MTBF (Hrs)	3000	3000 / 1000	TBD	2262

(U) Note: Basic performance factors for the B-1B (speed, weight, range, terrain following/avoidance performance) will not be significantly affected by the CMUP-JDAM integration effort.

1. Mission Capable (MC) Rate as expressed applies to the overall fleet aircraft wartime mission capable rate. The integration of the weapons upgrade modifications will not cause the fleet MC rate to degrade below the threshold value. For information only - the following reliability and maintainability parameters are specified in the weapons upgrade contract specifications: mean time between critical failure, mean time between unscheduled maintenance, maintenance manhours per flight hour, and max/mean repair time on equipment. These parameters will be used to support MC rate calculations.

2. OSD requested the addition of a supportability parameter that measures and tracks the weapon system upgrade reliability. The agreed to parameter is the mean time between failure (MTBF) of the Conventional Weapons Interface Unit (CWIU). This parameter was selected because this line replaceable unit (LRU) is the only conventional system carriage modification item that requires development. The specified values for the threshold and objectives are for system maturity. System maturity for the CMUP weapons upgrade occurs at IOC plus 15,000 operating flight hours.

10b. (U) Performance Characteristics (Cont'd):  
 JDAM

b. Current Change Explanations -- None

Computer Upgrade

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Weapons Flexibility	N/A	Capabil- / Capabil- ity to / ity to safely / safely monitor, / monitor, ferry, / ferry, carry, / carry, arm, / arm, release / release and / and jettison / jettison up to 3 / up to 3 differ- / differ- ent / ent conven- / conven- tional / tional weapon / weapon types (1 / types (1 type per / type per bay) / bay) with a / with a single / single software / software load. / load.	TBD	Capabil- ity to safely monitor, ferry, carry, arm, release and jettison up to 3 differ- ent conven- tional weapon types (1 type per bay) with a single software load.
Mission Capable (MC) Rate (%)	75	75 / 65	TBD	67%

(U) Mission Capable Rate as expressed applies to the overall fleet aircraft wartime mission capable rate. The integration of the weapons upgrade modification will not cause the fleet MC rate to degrade below the threshold value. For information only - the following reliability and maintainability parameters are specified in the weapons upgrade contract specifications: mean time between critical failure, mean time between unscheduled maintenance, maintenance manhours per flight hours, and max/mean repair time on equipment. These parameters will be used to support MC rate calculations



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10b. (U) Performance Characteristics (Cont'd):  
Computer Upgrade

b. Current Change Explanations -- None

DSUP

a. Performance --

Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
-------------------------------	--------------------------------------------	---------------------------	---------------------

(b)(1)



(U) (U) KPPs = Key Performance Parameters as stated in the Operational Requirements Document.

(U) The specified values for the threshold and objectives are for system maturity. System maturity for the DSUP occurs after accumulation of 16,520 flight hours.

b. Current Change Explanations -- None

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11. (U) Total Program Cost and Quantity (Dollars in Millions):  
 JDAM

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	332.6	332.6	327.7
Procurement	228.0	228.0	213.1
Recurring Flyaway	(215.7)		(203.2)
Total Other Wpn Sys			(0.0)
Peculiar Support	(5.7)		(4.3)
Initial Spares	(6.6)		(5.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>241.5</u>	<u>241.5</u>	<u>237.6</u>
Total FY 1999 Base-Year \$	802.1	802.1	778.4
Escalation	-9.9	-9.9	-8.4
Development (RDT&E)	(-9.3)	(-9.3)	(-6.4)
Procurement	(7.5)	(7.5)	(3.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(-8.1)</u>	<u>(-8.1)</u>	<u>(-5.4)</u>
Total Then Year \$	792.2	792.2	770.0
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>93</u>	<u>93</u>	<u>93</u>
Total	93	93	93

(U) The procurement quantity of 93 represents the number of operational aircraft being modified under the B-1 CMUP-JDAM program; however, as this is a modification program, the quantities specified in section 16b. represent procured modification kit quantities.

In the APB, Low Rate Production Contract Award is defined as the contract award for the kit proof upgrade kit. The Low Rate Initial Production First Delivery is defined in the APB as delivery of the first kit proof upgrade kit. The kit proof upgrade kit quantities are 2 for GPS and 6 for JDAM.

c. (U) Foreign Military Sales --  
 None

d. (U) Nuclear Costs --  
 None

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

Computer Upgrade

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	159.9	232.7	235.7
Procurement	174.5	153.7	127.2
Recurring	(152.4)		(119.5)
Nonrecurring	(14.8)		(1.8)
Total Flyaway	(167.2)		(121.3)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.8)		(2.7)
Initial Spares	(6.5)		(3.2)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>211.8</u>	<u>253.9</u>
Total FY 1995 Base-Year \$	334.4	598.2	616.8
Escalation	80.5	79.1	52.2
Development (RDT&E)	(23.2)	(22.7)	(15.9)
Procurement	(57.3)	(35.5)	(19.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(20.9)</u>	<u>(17.0)</u>
Total Then Year \$	414.9	677.3	669.0
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>103</u>	<u>103</u>	<u>101</u>
Total	103	103	101

(U) The procurement quantity of 101 represents 93 operational aircraft that are being modified under the B-1 Computer Upgrade program and 8 kits that are being produced for labs and trainers.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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

DSUP

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	303.0	303.0	381.5
Procurement	291.4	291.4	427.9
Recurring Flyaway	(262.8)		(391.7)
Nonrecurring Flyaway	(0.7)		(0.9)
Total Flyaway	(263.5)		(392.6)
Total Other Wpn Sys			(0.0)
Peculiar Support	(6.3)		(6.3)
Initial Spares	(21.6)		(29.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1996 Base-Year \$	<u>594.4</u>	<u>594.4</u>	<u>809.4</u>
Escalation	105.9	105.9	116.1
Development (RDT&E)	(30.0)	(30.0)	(22.9)
Procurement	(75.9)	(75.9)	(93.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	<u>700.3</u>	<u>700.3</u>	<u>925.5</u>

(U) RDT&E dollars do not include funds for Trainers, Air Force Mission Support Systems (AFMSS), AFOTEC, Group B (Techniques Generators and Fiber Optic Towed Decoy (FOTD) subsystem) and decoys. Trainers and AFMSS are separately managed ACAT III programs. Group B funds provided by Electronic Warfare Program element. AFOTEC costs funded under AFOTEC PE. Procurement costs do not include Fiber Optic Towed Decoy subsystem and decoys. Funding is provided by Electronic Warfare PE.

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>95</u>	<u>95</u>	<u>93</u>
Total	95	95	93

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

JDAM

	UCR Baseline (SEP 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1999 BY\$)	802.1	778.4	
(2) Quantity	93	93	
(3) Unit Cost	8.625	8.370	-2.96
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1999 BY\$)	228.0	213.1	
(2) Quantity	93	93	
(3) Unit Cost	2.452	2.291	-6.57

(U) The current estimate represents the number of operational aircraft being modified under the B-1 CMUP-JDAM program; however, as this is a modification program, the quantities specified in section 16b. represent procured modification kit quantities.

Computer Upgrade

	UCR Baseline (SEP 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	598.2	616.8	
(2) Quantity	103	101	
(3) Unit Cost	5.808	6.107	+5.15
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	153.7	127.2	
(2) Quantity	103	101	
(3) Unit Cost	1.492	1.259	-15.62

DSUP

	UCR Baseline (SEP 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	594.4	809.4	
(2) Quantity	95	93	
(3) Unit Cost	6.257	8.703	+39.09
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	291.4	427.9	
(2) Quantity	95	93	
(3) Unit Cost	3.067	4.601	+50.02

12c. (U) Unit Cost Summary (Cont'd):

DSUP

	UCR Baseline (SEP 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
c. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (TY\$)	700.3	925.5	
(2) Unit Cost	7.372	9.952	+35.00
d. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (TY\$)	367.3	521.1	
(2) Unit Cost	3.866	5.603	+44.93
e. (U) Changes from Previous SAR (SEP 1999)	Dollars/Qty	Percent	
(1) PAUC (BY\$)	2.037	+30.56	
(2) APUC (BY\$)	1.230	+36.49	
(3) PAUC Quantity	93	N/A	
(4) PAUC (TY\$)	2.487	+33.32	
(5) APUC (TY\$)	1.612	+40.39	
f. (U) Initial SAR Information			
Initial SAR Date (JUN 1997):			
(1) Program Acquisition Cost (BY\$)		593.7	
(2) Program Acquisition Cost (TY\$)		700.3	

g. (U) Unit Cost PAUC Changes --  
 DSUP program is being restructured due to late GFE deliveries from the Navy's IDECM RFCM program. The EMD program will be stretched approximately 14 months and the production program will be delayed until FY04. The cost of 14 additional months of EMD as well as cost increases in GFE and installation account for the change in PAUC.

(U) Unit Cost APUC Changes --  
 The increase in APUC is driven by cost increases in GFE and installation.

h. (U) Impact of Perf or Sched Changes --  
 The 14 month schedule slip increases cost to complete EMD approximately \$80M. Also delays initial fielding of DSUP by 14 months.

i. (U) Program Management & Control --  
 Examined four options to complete EMD and briefed results to the Vice Chief of Staff of the Air Force. He approved recommendation to restructure DSUP to match IDECM GFE delay.

j. (U) Cost Control Actions --

B-1B CMUP, December 31, 1999

**12j. (U) Unit Cost Summary (Cont'd):**  
DSUP

Delay of GFE and increases in GFE cost are beyond the cost control of the DSUP program. However, program is working with Navy in its efforts to control cost. Air Force is also examining the feasibility of an alternate decoy.

**k. (U) Contract Information (In Millions of Then-Year Dollars) --**

- (U) (1) Contractor(s): The Boeing Company
- (2) Contract Title: DSUP
- (3) Contract Number: F33657-97-C-0002
- (4) Actual Cost of Work Performed (ACWP) to date: 111.5
- (5) Percent contract completed (BCWP/target cost): 66.00
- (6) Variances:

	Cost Variance		Schedule Variance	
	(\$/%)		(\$/%)	
Baseline Report	\$0.0/	+0.28	\$0.0/	+0.88
Previous SAR	\$2.0/	+1.90	\$-2.2/	-2.00
Current Values	\$2.9/	+2.50	\$-1.6/	-1.40
Change from the Baseline Report	\$2.9/	+2.22	\$-1.6/	-2.28
Change from the Previous SAR	\$0.9/	+0.60	\$0.6/	+0.60

(U) Explanation of Variances --  
Behind schedule due to late GFE and some Group A development.

(U) Impact of Variances on Contract --  
Contract variances are minor--minimal impact to program.

(U) Impact of Variances on Unit Costs --  
Negligible. Unit cost variances driven by late GFE and increased cost in GFE and installation.

1. (U) Contracts exceeding Contract Cost Baseline Thresholds -- None.

m. General Comments -- None.

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B-1B CMUP, December 31, 1999

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

JDAM

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	323.3	235.5	-	233.4	792.2
Previous Changes:					
Economic	-	-	-	-	-
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-1.3	-10.1	-	-0.1	-11.5
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	-1.3	-10.1	-	-0.1	-11.5
Current Changes:					
Economic	-0.1	+1.8	-	-	+1.7
Quantity	-	-	-	-	-
Schedule	-	+0.4	-	-	+0.4
Engineering	-	-	-	-	-
Estimating	-0.6	-8.1	-	-1.1	-9.8
Other	-	-	-	-	-
Support	-	-3.0	-	-	-3.0
Subtotal	-0.7	-8.9	-	-1.1	-10.7
Total Changes	-2.0	-19.0	-	-1.2	-22.2
Current Estimate	321.3	216.5	-	232.2	770.0

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

(U) Summary (FY 1999 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	332.6	228.0	-	241.5	802.1
Previous Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	+0.4	-6.8	-	-	-6.4
Other	-	-	-	-	-
Support	-	-	-	-	-
Subtotal	+0.4	-6.8	-	-	-6.4
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-5.3	-5.7	-	-3.9	-14.9
Other	-	-	-	-	-
Support	-	-2.4	-	-	-2.4
Subtotal	-5.3	-8.1	-	-3.9	-17.3
Total Changes	-4.9	-14.9	-	-3.9	-23.7
Current Estimate	327.7	213.1	-	237.6	778.4

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year    Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.1
Adjustment for Current and Prior Inflation. (Estimating)	-4.3	-1.2
Reallocation of resources (Estimating) (Estimating)	-0.6	-0.7
	-0.4	+1.3
RDT&E Subtotal	<u>-5.3</u>	<u>-0.7</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-1.4
Economic adjustment for negative program change. (Economic)	N/A	+3.2
Stretchout of annual procurement buy profile. (Schedule)	0.0	+0.4
Adjustment for Current and Prior Inflation. (Estimating)	-6.4	-8.6
Production Contract definitized for less than estimated amount (Estimating)	-6.1	-9.6

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment for Current and Prior Inflation. (Support)	-3.3	-3.9
Change in Initial Spares (Support)	-1.1	-1.1
Change in Peculiar Support (Support) (Estimating)	+2.0	+2.0
	+6.8	+10.1
Procurement Subtotal	-8.1	-8.9
(3) <u>O&amp;M</u>		
Rephased effort (Estimating)	3.9	-1.2
(Estimating)	0.0	+0.1
O&M Subtotal	-3.9	-1.1

Computer Upgrade

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	183.1	231.8	-	-	414.9
Previous Changes:					
Economic	-13.4	-24.4	-	-7.1	-44.9
Quantity	-	-3.1	-	-	-3.1
Schedule	-	+0.9	-	-	+0.9
Engineering	+24.7	-30.0	-	-	-5.3
Estimating	+63.7	-20.9	-	+281.9	+324.7
Other	-	-	-	-	-
Support	-	+0.6	-	-	+0.6
Subtotal	+75.0	-76.9	-	+274.8	+272.9
Current Changes:					
Economic	0.8	-1.9	-	-0.9	-3.6
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-5.7	-4.3	-	-3.0	-13.0
Other	-	-	-	-	-
Support	-	-2.2	-	-	-2.2
Subtotal	-6.5	-8.4	-	-3.9	-18.8
Total Changes	+68.5	-85.3	-	+270.9	+254.1
Current Estimate	251.6	146.5	-	270.9	669.0

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	159.9	174.5	-	-	334.4
Previous Changes:					
Quantity	-	-2.6	-	-	-2.6
Schedule	-	-	-	-	-
Engineering	+21.7	-27.6	-	-	-5.9
Estimating	+59.3	-11.4	-	+256.6	+304.5
Other	-	-	-	-	-
Support	-	+0.2	-	-	+0.2
Subtotal	+81.0	-41.4	-	+256.6	+296.2
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	-	-	-	-	-
Estimating	-5.2	-4.3	-	-2.7	-12.2
Other	-	-	-	-	-
Support	-	-1.6	-	-	-1.6
Subtotal	-5.2	-5.9	-	-2.7	-13.8
Total Changes	+75.8	-47.3	-	+253.9	+282.4
Current Estimate	235.7	127.2	-	253.9	616.8

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.8
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
New Estimating Change (Estimating)	-1.0	-1.1
(Estimating)	-4.5	-4.9
RDT&E Subtotal	-5.2	-6.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-2.0
Economic adjustment for negative program change. (Economic)	N/A	+0.1
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
New Estimating Change (Estimating)	-1.0	-1.3
Change in Peculiar Support (Support) (Estimating)	-1.6	-2.2
(Estimating)	-3.4	-3.7
(Estimating)	-2.6	-2.8

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

Computer Upgrade

b. (U) Current Change Explanations --

(Dollars in Millions)

	Base-Year	Then-Year
(Estimating)	+2.6	+3.4
Procurement Subtotal	-5.9	-8.4
(3) O&M		
Revised escalation indices. (Economic)	N/A	-0.9
Adjustment for Current and Prior Inflation. (Estimating)	+0.6	+0.6
New Estimating Change (Estimating)	-3.3	-3.6
O&M Subtotal	-2.7	-3.9

DSUP

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	333.0	367.3	-	700.3
Previous Changes:				
Economic	-12.4	-24.3	-	-36.7
Quantity	-	-6.5	-	-6.5
Schedule	-	+1.2	-	+1.2
Engineering	-	-	-	-
Estimating	+2.4	+30.8	-	+33.2
Other	-	-	-	-
Support	-	+2.7	-	+2.7
Subtotal	-10.0	+3.9	-	-6.1
Current Changes:				
Economic	-1.3	-5.5	-	-6.8
Quantity	-	-	-	-
Schedule	+100.8	+14.1	-	+114.9
Engineering	-	-	-	-
Estimating	-18.1	+134.5	-	+116.4
Other	-	-	-	-
Support	-	+6.8	-	+6.8
Subtotal	+81.4	+149.9	-	+231.3
Total Changes	+71.4	+153.8	-	+225.2
Current Estimate	404.4	521.1	-	925.5

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

DSUP

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	303.0	291.4	-	594.4
Previous Changes:				
Quantity	-	-4.9	-	-4.9
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+3.4	+24.3	-	+27.7
Other	-	-	-	-
Support	-	+2.7	-	+2.7
Subtotal	+3.4	+22.1	-	+25.5
Current Changes:				
Quantity	-	-	-	-
Schedule	+92.5	-	-	+92.5
Engineering	-	-	-	-
Estimating	-17.4	+109.7	-	+92.3
Other	-	-	-	-
Support	-	+4.7	-	+4.7
Subtotal	+75.1	+114.4	-	+189.5
Total Changes	+78.5	+136.5	-	+215.0
Current Estimate	381.5	427.9	-	809.4

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-1.3
Adjustment for Current and Prior Inflation. (Estimating)	+0.7	+0.7
Stretch out of program due to late GFE (Schedule)	+92.5	+100.8
Congressional cuts and recissions (Estimating)	-16.2	-17.0
Estimating changes (Estimating)	-1.9	-1.8
RDT&E Subtotal	+75.1	+81.4
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-5.5
Stretchout of annual procurement buy profile. (Schedule)	0.0	+14.1
Revised estimate due to restructure of program. (Estimating)	+109.7	+134.5
Change in Initial Spares (Support)	+4.4	+5.8

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Change in Peculiar Support (Support)	+0.3	+1.0
Procurement Subtotal	<u>+114.4</u>	<u>+149.9</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):  
JDAM

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.52	+0.02	--	--	--	-0.23	--	-0.03	-0.24	8.28

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.53	+0.02	+0.01	--	--	-0.20	--	-0.03	-0.20	2.33

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	APR 1993	APR 1993	APR 1993
Milestone II	N/A	JAN 1995	JAN 1995	JAN 1995
Milestone III	N/A	JAN 1999	JAN 1999	FEB 1999
FUE/IOC	N/A	JUL 2001	DEC 1998	DEC 1998
Total Cost	N/A	672.9	792.2	770
Total Quantity	N/A	95	93	93
Prog Acq Unit Cost	N/A	7.08	8.52	8.28

(U) In the APB, HQ ACC agreed that IOC would be RAA. RAA was declared December 18, 1998.

**14a. (U) Unit Cost and Other History (Cont'd):**

Computer Upgrade

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.03	-0.48	+0.04	+0.01	-0.05	+3.09	--	-0.02	+2.59	6.62

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.25	-0.26	+0.02	+0.01	-0.30	-0.25	--	-0.02	-0.80	1.45

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	APR 1993	N/A	APR 1993
Milestone II	N/A	JAN 1995	N/A	JAN 1995
Milestone III	N/A	JAN 2001	N/A	JUN 2002
FUE/IOC	N/A	JAN 2003	N/A	MAY 2002
Total Cost	N/A	414.9	N/A	669
Total Quantity	N/A	103	N/A	101
Prog Acq Unit Cost	N/A	4.03	N/A	6.62

(U) Date shown as IOC is the RAA date. HQ ACC has agreed to use the RAA date in lieu of IOC.

DSUP

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Oty	Sch	Eng	Est	Oth	Spt	Total	
7.37	-0.47	+0.09	+1.25	--	+1.61	--	+0.10	+2.58	9.95

**14b. (U) Unit Cost and Other History (Cont'd):**

DSUP

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
3.87	-0.32	+0.01	+0.16	--	+1.78	--	+0.10	+1.73	5.60

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	APR 1993	N/A	APR 1993
Milestone II	N/A	APR 1997	N/A	APR 1997
Milestone III	N/A	MAR 2002	N/A	MAR 2003
FUE/IOC	N/A	FEB 2002	N/A	APR 2003
Total Cost	N/A	700.3	N/A	925.5
Total Quantity	N/A	95	N/A	93
Prog Acq Unit Cost	N/A	7.37	N/A	9.95

(U) The IOC date shown is the RAA date. HQ ACC has agreed to use the RAA date in lieu of IOC.

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

(U) Section b., Procurement, shows two parts of contract 2004 contained in JDAM enditem; JDAM launcher kits and GPS/Communications kits. These contracts are Firm Fixed Price and Fixed Price Incentive, respectively. The contracts contain different quantities. Cost and Schedule variance reporting in Section b. is not required on either FFP or FFI contract.

a. RDT&E --  
 (U) JDAM EMD:  
 The Boeing Company, Long Beach, CA  
 F33657-94-C-0001, CPAF  
 Award: March 16, 1995  
 Definitized: March 16, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$250.2	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$308.0	N/A	0	\$282.6	\$300.3



15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.1	\$-0.3
Cumulative Variances To Date (12/31/99)	<u>\$-5.1</u>	<u>\$0.0</u>
Net Change	\$-5.0	\$0.3

Explanation of Change:

(U) Hardware design complexities resulted in additional design documentation including drawings, technical data, and interface activities.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>Computer/WCMD:</u> The Boeing Company, Long Beach, CA F33657-96-C-2075, CPAF Award: January 30, 1997 Definitized: January 30, 1997	\$202.2	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$377.0	N/A	0	\$377.0	\$397.4

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$1.1	\$-3.0
Cumulative Variances To Date (11/26/99)	<u>\$-5.1</u>	<u>\$-0.9</u>
Net Change	\$-6.2	\$2.1

Explanation of Change:

(U) Cost variance primarily driven by increased development cost of the Data Transfer System. Schedule variance primarily driven by integration and test task being behind schedule in the computer hardware area along with underestimation of Avionics Flight Software development effort. Performance Measurement Baseline (PMB) was updated and revised baseline was reflected in the October 1999 CPR. The November CPR was the first CPR with performance reported against the rebaselined PMB.

(U) Contract Comments:

In previous SARs the initial contract price was listed at \$179.1M. This value was actually the initial contract cost; the initial contract price was \$202.2M.

Current contract price is \$377M. Contract price increased due to the following reasons:

- 1) Sustainment task (\$98M)
- 2) JSOW/JASSM Integration (\$47M)
- 3) Computer and WCMD Kitproof kits (\$8M)
- 4) Various small CCPs added to the contract such as JDAM LAR Fidelity, Conventional Bomb Module Test Set Lids, and Paperless Contract Delivery

15. (U) Contract Information (Cont'd):

System (\$2M)

5) Diminishing Manufacturing Sources for computer hardware (\$20M)

(U) <u>DSUP:</u> The Boeing Company, Long Beach, CA F33657-97-C-0002, CPAF Award: June 20, 1997 Definitized: June 20, 1997	<table border="0"> <tr> <th colspan="3" style="text-align: center;">Initial Contract Price</th> </tr> <tr> <th style="text-align: left;">Target</th> <th style="text-align: left;">Ceiling</th> <th style="text-align: left;">Qty</th> </tr> <tr> <td style="text-align: right;">\$216.5</td> <td style="text-align: center;">N/A</td> <td style="text-align: right;">0</td> </tr> </table>	Initial Contract Price			Target	Ceiling	Qty	\$216.5	N/A	0
Initial Contract Price										
Target	Ceiling	Qty								
\$216.5	N/A	0								

<table border="0"> <tr> <th colspan="3" style="text-align: center;">Current Contract Price</th> </tr> <tr> <th style="text-align: left;">Target</th> <th style="text-align: left;">Ceiling</th> <th style="text-align: left;">Qty</th> </tr> <tr> <td style="text-align: right;">\$217.2</td> <td style="text-align: center;">N/A</td> <td style="text-align: right;">0</td> </tr> </table>	Current Contract Price			Target	Ceiling	Qty	\$217.2	N/A	0	<table border="0"> <tr> <th colspan="2" style="text-align: center;">Estimated Price At Completion</th> </tr> <tr> <th style="text-align: left;">Contractor</th> <th style="text-align: left;">Program Manager</th> </tr> <tr> <td style="text-align: right;">\$217.2</td> <td style="text-align: right;">\$217.2</td> </tr> </table>	Estimated Price At Completion		Contractor	Program Manager	\$217.2	\$217.2
Current Contract Price																
Target	Ceiling	Qty														
\$217.2	N/A	0														
Estimated Price At Completion																
Contractor	Program Manager															
\$217.2	\$217.2															

Previous Cumulative Variances Cumulative Variances To Date (11/26/99) Net Change	<table border="0"> <tr> <th style="text-align: left;">Cost Variance</th> <th style="text-align: left;">Schedule Variance</th> </tr> <tr> <td style="text-align: right;">\$2.0</td> <td style="text-align: right;">\$-2.2</td> </tr> <tr> <td style="text-align: right;"><u>\$2.9</u></td> <td style="text-align: right;"><u>\$-1.7</u></td> </tr> <tr> <td style="text-align: right;">\$0.9</td> <td style="text-align: right;">\$0.5</td> </tr> </table>	Cost Variance	Schedule Variance	\$2.0	\$-2.2	<u>\$2.9</u>	<u>\$-1.7</u>	\$0.9	\$0.5
Cost Variance	Schedule Variance								
\$2.0	\$-2.2								
<u>\$2.9</u>	<u>\$-1.7</u>								
\$0.9	\$0.5								

Explanation of Change:

(U) Late GFE deliveries (IDECM and AFS) are starting to impact schedule.

(U) Contract Comments:

DSUP EMD contract is being restructured to add 11 months to the schedule to accommodate late delivery of GFE. Contract price is anticipated to increase by about \$56M with the restructure modification.

(U) <u>JDAM Production:</u> The Boeing Company, Long Beach, CA F33657-97-C-2004, FFP Award: February 16, 1999 Definitized: February 16, 1999	<table border="0"> <tr> <th colspan="3" style="text-align: center;">Initial Contract Price</th> </tr> <tr> <th style="text-align: left;">Target</th> <th style="text-align: left;">Ceiling</th> <th style="text-align: left;">Qty</th> </tr> <tr> <td style="text-align: right;">\$25.7</td> <td style="text-align: center;">N/A</td> <td style="text-align: right;">129</td> </tr> </table>	Initial Contract Price			Target	Ceiling	Qty	\$25.7	N/A	129
Initial Contract Price										
Target	Ceiling	Qty								
\$25.7	N/A	129								

<table border="0"> <tr> <th colspan="3" style="text-align: center;">Current Contract Price</th> </tr> <tr> <th style="text-align: left;">Target</th> <th style="text-align: left;">Ceiling</th> <th style="text-align: left;">Qty</th> </tr> <tr> <td style="text-align: right;">\$39.3</td> <td style="text-align: center;">N/A</td> <td style="text-align: right;">129</td> </tr> </table>	Current Contract Price			Target	Ceiling	Qty	\$39.3	N/A	129	<table border="0"> <tr> <th colspan="2" style="text-align: center;">Estimated Price At Completion</th> </tr> <tr> <th style="text-align: left;">Contractor</th> <th style="text-align: left;">Program Manager</th> </tr> <tr> <td style="text-align: right;">\$39.3</td> <td style="text-align: right;">\$39.3</td> </tr> </table>	Estimated Price At Completion		Contractor	Program Manager	\$39.3	\$39.3
Current Contract Price																
Target	Ceiling	Qty														
\$39.3	N/A	129														
Estimated Price At Completion																
Contractor	Program Manager															
\$39.3	\$39.3															

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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**15. (U) Contract Information (Cont'd):**

(U) <u>JDAM Prod (GPS/Comm):</u> The Boeing Company, Long Beach, CA F33657-97-C-2004, FPI Award: February 16, 1999 Definitized: February 16, 1999	<table border="0"> <tr> <th colspan="3">Initial Contract Price</th> </tr> <tr> <th><u>Target</u></th> <th><u>Ceiling</u></th> <th><u>Qty</u></th> </tr> <tr> <td>\$60.1</td> <td>\$66.6</td> <td>91</td> </tr> </table>	Initial Contract Price			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	\$60.1	\$66.6	91
Initial Contract Price										
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>								
\$60.1	\$66.6	91								

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$60.1	\$66.5	91	\$60.1	\$60.1

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FPI contract.

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-11)	<u>Total</u>
RDT&E	627.3	113.9	117.6	118.5	977.3
Procurement	152.1	66.9	8.1	657.0	884.1
MILCON	-	-	-	-	-
O&M	400.1	56.9	39.4	6.7	503.1
Total	1179.5	237.7	165.1	782.2	2364.5

JDAM

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

JDAM

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	320.8	0.5	-	-	321.3
Procurement	152.1	58.1	6.3	-	216.5
MILCON	-	-	-	-	-
O&M	232.0	0.2	-	-	232.2
Total	704.9	58.8	6.3	-	770.0

Computer Upgrade

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

<u>Appropriation</u>	<u>Prior Years</u> (FY95-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-06)	<u>Total</u>
RDT&E	150.0	44.8	41.5	15.3	251.6
Procurement	-	8.8	1.8	135.9	146.5
MILCON	-	-	-	-	-
O&M	168.1	56.7	39.4	6.7	270.9
Total	318.1	110.3	82.7	157.9	669.0

DSUP

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

<u>Appropriation</u>	<u>Prior Years</u> (FY97-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-11)	<u>Total</u>
RDT&E	156.5	68.6	76.1	103.2	404.4
Procurement	-	-	-	521.1	521.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	156.5	68.6	76.1	624.3	925.5

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B-1B CMUP, December 31, 1999

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

b. Annual Summary -- JDAM

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1999 Dollars Nonrec	Flyaway FY 1999 Dollars Rec	Total Program Base Year \$	Total Program Then-Year \$
1994			1.1	1.0	0.9
1995			54.8	56.5	54.2
1996			113.9	121.2	118.4
1997			90.5	95.9	94.9
1998			54.9	51.4	51.2
1999			6.9	1.2	1.2
2000				0.5	0.5
Subtotal			322.1	327.7	321.3

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1999 Dollars Nonrec	Flyaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994					
1995					
1996	8		8.7	11.0	10.9
1997	46		43.0	43.6	43.7
1998	68		55.4	56.9	57.4
1999	50		36.8	39.4	40.1
2000	34		53.9	56.2	58.1
2001	14		5.4	6.0	6.3
2002					
2003					
2004					
2005					
2006					
2007					
2008					
2009					
Subtotal	220		203.2	213.1	216.5

(U) The B-1 CMUP-JDAM program consists of a Global Positioning System (GPS) with a Communication upgrade (Comm) and a Mil-Std 1760 Weapon Interface Unit (1760) with rotary launcher modifications for JDAM carriage. Quantities are kit quantities (e.g. FY96 procures 6 JDAM/1760 launcher kits and 2 GPS/Comm kit). The GPS/Comm kit buy schedule (FY96-FY98) is 2,28,61 with installations (FY98-FY01) of 8,22,53,8. Installation funding is provided in the year install occurs. The 1760/JDAM buy schedule

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B-1B CMUP, December 31, 1999

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

JDAM

(FY96-FY01) 6,18,7,50,34,14 procures 129 rotary launcher kits and is an organizational/intermediate level installation. In FY02-FY04 there are no quantity buys as funding is for support and spares only.

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY 1999 Dollars Nonrec	Flyaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				81.2	78.0
1996				75.1	73.4
1997				43.8	43.4
1998				37.2	37.1
1999				0.1	0.1
2000				0.2	0.2
Subtotal				237.6	232.2

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	220		525.3	778.4	770.0

b. Annual Summary -- Computer Upgrade

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995			1.3	1.3	1.3
1996			14.3	14.3	14.8
1997			33.4	33.0	34.6
1998			44.8	43.7	46.1
1999			53.3	50.0	53.2
2000			47.2	41.6	44.8
2001			18.5	38.0	41.5
2002				13.8	15.3
Subtotal			212.8	235.7	251.6

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B-1B CMUP, December 31, 1999

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999					
2000	6	1.8	7.3	8.0	8.8
2001				1.6	1.8
2002	27		22.9	24.1	27.2
2003	35		41.6	43.6	50.1
2004	33		47.7	46.1	54.0
2005				2.8	3.4
2006				1.0	1.2
2007					
2008					
Subtotal	101	1.8	119.5	127.2	146.5

Appropriation: 3400 - Operation & Maintenance, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				5.2	5.4
1997				27.7	29.0
1998				58.2	61.3
1999				68.1	72.4
2000				52.7	56.7
2001				36.0	39.4
2002				6.0	6.7
Subtotal				253.9	270.9

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	101	1.8	332.3	616.8	669.0

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B-1B CMUP, December 31, 1999

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

b. Annual Summary -- DSUP

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				22.8	23.4
1998				61.3	63.3
1999				66.9	69.8
2000				65.0	68.6
2001				71.1	76.1
2002				71.1	77.4
2003				23.3	25.8
Subtotal				381.5	404.4

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000					
2001					
2002	2	0.9	0.9	1.8	2.0
2003	1		5.0	5.2	5.9
2004	9		41.8	33.4	38.4
2005	15		65.9	61.3	71.9
2006	19		80.7	82.8	99.0
2007	18		75.7	83.0	101.2
2008	19		78.8	81.0	100.9
2009	10		42.9	50.9	64.6
2010				18.7	24.2
2011				9.8	13.0
2012					
Subtotal	93	0.9	391.7	427.9	521.1

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	93	0.9	391.7	809.4	925.5

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17. (U) Delivery/Expenditure Information:

JDAM

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	67	67

(U) Percent Total Program Quantities Delivered: 30.5%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 698.4

(U) Percent Total Program Expended: 90.7%

(U) The Air Force projects the JDAM portion of B-1 CMUP program will be 90% expended by March 30, 2000. This will be the last SAR for the JDAM portion of B-1 CMUP.

Computer Upgrade

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 289.2

(U) Percent Total Program Expended: 43.2%

DSUP

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 141.8

(U) Percent Total Program Expended: 15.3%

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

JDAM

a. (U) Assumptions and Ground Rules --

This estimate was prepared by the B-1 SPO as part of the Current Estimate.

The B-1 CMUP-JDAM/GPS/Comm Cost Analysis Requirements Description and Service Cost Position estimate were used as the basis for this estimate. The HQ ACC/XPM Manpower Estimate Report was used with a "beddown" O&S Phase In of FY98-FY01 and Steady State FY02-FY26. A 1.48 Utilization Factor (Equip Op Hrs per Flying Hour) was used for 94 aircraft at 374/FH/Acft/Yr.

Per CAIG direction, O&S costs do not include software maintenance.

There is no antecedent system.

b. (U) Costs -- (FY 1997 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 94 B-1 Aircraft CMUP Modifications	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	52.1	0.0
Unit Level Consumption	31.8	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	32.7	0.0
Indirect Costs	5.9	0.0
Total	122.5	0.0

**Computer Upgrade**

a. (U) Assumptions and Ground Rules --

This estimate was prepared by the B-1B Program Office as part of the updated Service Cost Position for the approved Acquisition Program Baseline.

The B-1 CMUP-Computer Upgrade Cost Analysis Requirements Description and Service Cost Position estimate, which reflects a revised system architecture, were used as the basis for this estimate. The HQ ACC/XPM Manpower Estimate Report was reviewed and found to have no manpower adjustments for the Computer Upgrade. The Operation and Support has a Phase In of FY02-FY07 and Steady State FY08-FY26. A 1.48 Utilization Factor (Equipment Operation Hours per Flying Hour) was used for 95 aircraft at 374/Flying Hour (FH)/Acft/Yr.

Changes to the Computer Upgrade program now include conversion to Ada software. It is estimated the Ada software environment will significantly reduce maintenance costs in future years, after completion of the computer upgrade.

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B-1B CMUP, December 31, 1999

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

**Computer Upgrade**

The antecedent system is the B-1 Avionics Control Unit Complex consisting of the AP-101F Computers with Jovial J3B2 software.

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per 95 B-1 Acft and 8 Trainer CMUP Mods	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	5.0	5.8
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	30.3	70.3
Indirect Costs	N/A	N/A
Total	35.3	76.1

**DSUP**

a. (U) Assumptions and Ground Rules --

This estimate was prepared by the B-1B Program Office as part of the updated Service Cost Position, dated 20 Dec 96, for the approved Acquisition Program Baseline.

The B-1B CMUP - Defensive System Upgrade Cost Analysis Requirements Description and Service Cost Position estimate, which reflects a revised system architecture, were used as the basis for this estimate. The HQ ACC/XPM Manpower Estimate Report was reviewed and found to have a 33 manpower reduction for the Defensive System Upgrade. The Operation and Support has a phase in of FY04-FY09 and steady state FY10-FY26. A 1.48 utilization factor (Equipment Operation Hours per Flying Hour) was used for 95 aircraft at 508/Flying Hour/Aircraft/Year.

Changes with the Defensive System Upgrade include replacing 118 ALQ-161 boxes with 35 ALR-56M and IDECM boxes; a 4000 pound B-1B aircraft weight reduction; elimination of over 41,000 Technical Order pages; and in Support Equipment, the elimination of one Test Station Type, 31 Line Replaceable Unit Test Program Sets and 66 Shop Replaceable Unit Test Program Sets. It is estimated the Defensive System Upgrade will significantly reduce the B-1B Operating and Support costs.

The antecedent system is the B-1B ALQ-161 Defensive System.

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B-1B CMUP, December 31, 1999

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

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	B-1B CMUP-DSUP 95 B-1B Aircraft	Antecedent B-1B ALQ-161 Avg Annual Cost
Mission Pay & Allowances	36.2	58.8
Unit Level Consumption	42.0	1279.7
Intermediate Maintenance	0.0	N/A
Depot Maintenance	0.0	N/A
Contractor Support	0.0	N/A
Sustaining Support	109.9	546.8
Indirect Costs	3.0	3.9
	N/A	N/A
Total	191.1	1889.2

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5. (U) References:

SAR Baseline (Development Estimate):

(U) NAE Approved Acquisition Program Baseline (APB) dated September 27 1999.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated September 27, 1999.

6. (U) Mission and Description:

(U) The Tomahawk Land Attack Missile counters threats against U. S. Forces by destroying targets ashore including command, control and logistic systems; industrial and other high value targets; and ground and air defense systems. Tactical Tomahawk provides major modernization to the existing Tomahawk technology, increased responsiveness and flexibility, at a more affordable production unit cost.

Key elements of the Tactical Tomahawk design are an improved navigation and guidance computer; improved anti-jam Global Positioning System (GPS) capability; improved responsiveness and flexibility through two-way satellite communications for in-flight retargeting; a loiter capability; and the ability to send a single-frame, Battle Damage Indication Image (BDII) of overflowed areas prior to impact. Modern manufacturing techniques and Commercial Off-the-Shelf/Government Off-the Shelf/(COTS/GOTS) hardware will provide this improved capability at an affordable production cost and allow lower post-production support costs by extending the recertification interval from six years for the currently-fielded Block III to 15 years for Tactical Tomahawk. Tactical Tomahawk will maximize the use of existing Tomahawk Weapon System program and logistic support. There will be no change to the system's overall support concept.

7. (U) Executive Summary:

(U) As a result of lessons learned from recent conflicts, the Commanders In Chiefs (CINCs) requested a more flexible, more responsive missile that has all the capabilities as the current Tomahawk but with the ability to respond in a more tactical-mission role. On December 18, 1997, ASN(RD&A) approved the termination of the Tomahawk Baseline Improvement Program (TBIP) and initiated the Tactical Tomahawk program. At present Raytheon is in the Engineering and Manufacturing Development (EMD) phase of the Tactical Tomahawk program. Initial Operational Capability (IOC) is planned for 2003. Procurement of Tactical Tomahawk missiles will begin in FY02 with Low Rate Initial Production (LRIP), and continue through FY07 for a total of 1353 missiles.

The Tactical Tomahawk EMD contract is a cost share contract. The total cost share ratio varies depending on total cost and incentivizes a Target Cost of \$247.6M. At this cost, the government's share is \$141.6M and Raytheon's share is \$106M. The program Target Cost (\$247.6M) is based on the Contractor's

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7. (U) Executive Summary (Cont'd):

proposal and represents a 3-year program from contract award to Operational Assessment. The Program Manager evaluated the \$247.6M/3-year program as high risk. The Program Manager, supported by independent estimates from the Naval Center for Cost Analysis and Naval Air Systems Command, estimates the total contract completion cost to be \$327.6M and the required schedule to be 4 years. The share ratio at the Program Manager's estimate is \$165.6M in government costs and \$162M in Raytheon costs.

Due to significant changes to the program plan (changes in the engine developer) and the overly aggressive initial baseline for the program, Raytheon has requested an update to the program baseline. It is expected that the new baseline will indicate increased cost and schedule but will remain within the Program Manager's initial estimate and the Approved Program Baseline (APB).

Additionally, as a risk reduction initiative, FY03 production has been designated a second LRIP year.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II Development Contract Award	JUN 1998	JUN 1998	JUN 1998
Operational Assessment	OCT 2001	OCT 2001	JAN 2002 (Ch-1)
TECHEVAL			
Start	JAN 2002	JAN 2002	MAR 2002 (Ch-1)
Complete	SEP 2002	SEP 2002	NOV 2002 (Ch-1)
OPEVAL			
Start	OCT 2002	OCT 2002	JAN 2003 (Ch-1)
Complete	MAR 2003	MAR 2003	JUL 2003 (Ch-1)
LRIP Authorization	DEC 2001	DEC 2001	MAR 2002 (Ch-1)
Milestone III	JUN 2003	JUN 2003	SEP 2003 (Ch-1)
FRP Contract Award	JUL 2003	JUN 2003	DEC 2003 (Ch-1)
Initial Operational Capability	APR 2003	APR 2003	AUG 2003 (Ch-1)
LRIP 2	OCT 2002	OCT 2002	JAN 2003 (Ch-1)

b. Current Change Explanations --

(U) Change (1) The following schedule milestone estimates have been extended 3 months from the previous report as a result of Raytheon EMD schedule revision from a 40-month schedule to 43 months. This revision impacts completion of Operational Assessment, TECHEVAL, OPEVAL, LRIP-1 Authorization and Milestone III. The Full Rate Production Contract Award has been moved from July 2003 to December 2003 to accommodate the second LRIP scheduled for January 2003.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demon- strated Perf	Current Estimate
Accuracy Land Attack CEP (ft.)	(b)(1)			
ECCM Jam Resistance GPS/Navigation (dBW)				
Mission Reliability (%)				
Cruise Reliability (%)				
Range Operational (km)				



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TACTICAL TOMAHAWK, December 31, 1999

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

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	525.3	525.3	493.7
Procurement	1158.4	1158.4	1166.4
Flyaway	(860.0)		(880.6)
Other Weapon System Costs	(237.6)		(225.4)
Peculiar Support	(60.8)		(60.4)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1999 Base-Year \$	1683.7	1683.7	1660.1
Escalation	179.7	179.7	173.1
Development (RDT&E)	(6.3)	(6.3)	(7.7)
Procurement	(173.4)	(173.4)	(165.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	1863.4	1863.4	1833.2
b. (U) Quantity --			
Development (RDT&E)	12	12	12
Procurement	<u>1353</u>	<u>1353</u>	<u>1353</u>
Total	1365	1365	1365

(U) Current plans call for 12 Development and 135 LRIP units. Milestone Decision Authority (MDA) modified Acquisition Baseline on October 12, 1999 to provide for 2 LRIPs; one in 2002 (45 units); second LRIP in 2003 (90 units).

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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TACTICAL TOMAHAWK, December 31, 1999

12. (U) Unit Cost Summary:

	UCR Baseline (N/A)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1999 BY\$)	1683.7	1660.1	
(2) Quantity	1365	1365	
(3) Unit Cost	1.233	1.216	-1.38
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1999 BY\$)	1158.4	1166.4	
(2) Quantity	1353	1353	
(3) Unit Cost	0.856	0.862	+0.70

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	531.6	1331.8	-	1863.4
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-1.9	-11.0	-	-12.9
Quantity	-	-	-	-
Schedule	-	+23.8	-	+23.8
Engineering	-	-	-	-
Estimating	-28.3	-1.1	-	-29.4
Other	-	-	-	-
Support	-	-11.7	-	-11.7
Subtotal	-30.2	0.0	-	-30.2
Total Changes	-30.2	0.0	-	-30.2
Current Estimate	501.4	1331.8	-	1833.2

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TACTICAL TOMAHAWK, December 31, 1999

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

(U) Summary (FY 1999 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	525.3	1158.4	-	1683.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-4.1	-1.8	-	-5.9
Other	-	-	-	-
Support	-	-1.1	-	-1.1
Subtotal	-4.1	-2.9	-	-7.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+18.6	-	+18.6
Engineering	-	-	-	-
Estimating	-27.5	+3.8	-	-23.7
Other	-	-	-	-
Support	-	-11.5	-	-11.5
Subtotal	-27.5	+10.9	-	-16.6
Total Changes	-31.6	+8.0	-	-23.6
Current Estimate	493.7	1166.4	-	1660.1

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) RDT&E

Revised escalation indices. (Economic)	N/A	-1.9
Adjustment for Current and Prior Inflation. (Estimating)	+1.4	+1.4
Budget reductions due to ASN Assessment (-8.4M, FY99), Congressional reduction (-3.7M, FY00), Sponsor Reduction due to slow execution (-18M, FY01), etc. The requirement for replacement of funding is being evaluated by the Navy. (Estimating)	-28.9	-29.7
<b>RDT&amp;E Subtotal</b>	<b>-27.5</b>	<b>-30.2</b>

(2) Procurement

Revised escalation indices. (Economic)	N/A	-11.0
Realignment of annual procurement quantities to accommodate second LRIP (effects FY02-FY04). (Schedule)	+18.6	+23.8
Current support change associated with re-estimate of outyear requirements (Support)	-7.7	-12.8
Realignment of previously reported Flyaway and Support variances (Estimating)	+3.8	-1.1

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TACTICAL TOMAHAWK, December 31, 1999

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Realignment of previously reported Flyaway and Support variances (Support)	-3.8	+1.1
Procurement Subtotal	+10.9	0.0

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.37	-0.01	-0.01	+0.02	--	-0.02	--	-0.01	-0.03	1.34

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.98	-0.01	--	+0.02	--	--	--	-0.01	--	0.98

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	DEC 1997	N/A	DEC 1997
Milestone III	N/A	JUN 2003	N/A	SEP 2003
FUE/IOC	N/A	APR 2003	N/A	AUG 2003
Total Cost	N/A	1863.4	N/A	1833.2
Total Quantity	N/A	1365	N/A	1365
Prog Acq Unit Cost	N/A	1.37	N/A	1.34

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TACTICAL TOMAHAWK, December 31, 1999

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

a. RDT&E --	Initial Contract Price		
(U) <u>New Contract:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
RAYTHEON MISSILE SYSTEMS, TUCSON AZ	\$247.6	N/A	0
N00019-98-C-0177, CPFF			
Award: June 3, 1998			
Definitized: June 3, 1998			
Current Contract Price		Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>
\$247.6	N/A	\$290.0	\$327.6
	Qty		
	0		
		<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		N/A	N/A
Cumulative Variances To Date		\$-10.4	\$-9.3
Net Change		\$-10.4	\$-9.3

Explanation of Change:

(U) This is the first report with variances. Unfavorable net changes in cost and schedule is cumulative since start of program. Current data reflects slow ramp-up in personnel at start of EMD contract and impact resulting from resolution of technical issues.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY98-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-07)	<u>Total</u>
RDT&E	217.9	212.4	40.3	30.8	501.4
Procurement	-	-	-	1331.8	1331.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	217.9	212.4	40.3	1362.6	1833.2

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TACTICAL TOMAHAWK, December 31, 1999

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

b. Annual Summary -- TACTICAL TOMAHAWK AUR

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1999 Dollars Nonrec	Flyaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				70.9	70.7
1999				146.2	147.2
2000				208.4	212.4
2001				39.0	40.3
2002				21.2	22.3
2003				8.0	8.5
Subtotal	12			493.7	501.4

(U) The amounts shown for RDT&E in Section 16 will not track to the President's budget because the SAR reports cost for the Tactical Tomahawk All Up Round only, and the President's Budget includes costs for Mission Planning and Weapons Control System segments of the total Tomahawk Weapons System. Further, because of the unique cost sharing arrangement of the Tactical Tomahawk Engineering Development Contract, the SAR also includes an estimate of the contractor's contribution.

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1999 Dollars Nonrec	Flyaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	45		35.2	53.7	57.6
2003	90		50.7	78.3	85.5
2004	284		158.2	243.5	271.3
2005	342		190.5	216.1	245.5
2006	342		267.7	328.1	380.3
2007	250		178.3	246.7	291.6
Subtotal	1353		880.6	1166.4	1331.8

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1365		880.6	1660.1	1833.2

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TACTICAL TOMAHAWK, December 31, 1999

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 213

(U) Percent Total Program Expended: 11.6%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The Tactical Tomahawk will be maintained using the same maintenance philosophy and infrastructure as the current Tomahawk Block III. There is no antecedent system.

b. (U) Costs -- (FY 1999 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg. Annual Cost for TACTICAL TOMAHAWK	AVG. Annual Cost for N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	122.1	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Tech/Operational Support	188.6	N/A
Platform Maintenance	0.0	N/A
Theater Mission Planning	0.0	N/A
Mission Personnel	121.0	N/A
Demilitarization	21.0	N/A
OTL	159.4	N/A
Software Support	63.3	N/A
	N/A	N/A
Total	675.4	N/A

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A-11 FBCB2

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A) 823)  
PROGRAM: FBCB2

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Force XXI Battle Command Brigade and Below (FBCB2)
2. DoD Component: Army
3. Responsible Office and Telephone Number:  
PM FBCB2 COL Stephen Monks  
ATTN: SFAB-C3S-FB Assigned: December 30, 1998  
Bay 2, Building 2525 DSN 987-3247; COMM 732-427-3237  
Fort Monmouth, NJ 07703-5008 stephen.monks@c3small.monmouth.army  
.mil
4. Program Elements/Procurement Line Items:  
RDT&E:  
PE 0203759A Project D374  
PROCUREMENT:  
APPN 2035 ICN BS9736 (Army)  
APPN 2033 ICN GA0700 (Army) (Shared)  
APPN 2033 ICN GA0720 (Army) (Shared)  
APPN 2033 ICN GZ2400 (Army) (Shared)  
APPN 2035 ICN W61900 (Army)

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FBCB2, December 31, 1999

5. References:

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline (APB) dated December 21, 1999.

Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated December 21, 1999.

6. Mission and Description:

The Force XXI Battle Command Brigade and Below (FBCB2) is a Digital Command and Control System for the Army at Brigade and Below. It consists of hardware (CPU, Removable Hard Disk Drive (RHDD) display and keyboard) and software integrated onto the various platforms at Brigade and Below, as well as appropriate Division and Corps slices necessary to support Brigade operations. It is dependent upon a communications infrastructure called the Tactical Internet (TI) made up of existing Enhanced Position Location Reporting System (EPLRS) and Single Channel Ground and Airborne Radio System (SINCGARS) radios to pass Situational Awareness (SA) data and Command and Control (C2) messages. Block II capability depends upon implementing enhanced network capability through replacement of these radios with the Joint Tactical Radio System (JTRS) in the FY05 time frame. This program does not replace another system.

7. Executive Summary:

In FY93/94, the FBCB2 program experimentation began as a result of the lessons learned from Desert Storm. Automated situational awareness and automated battle command for lower echelons were key emerging concepts that led to the Brigade and Below Command and Control (BCE2). Hardware and software were quickly integrated with a voice communications capability and were delivered to Task Force (TF) 1-70 for use in National Training Center (NTC) 94-07. As a result, a streamlined process was initiated to institutionalize what came to be known as the Applique program, now known as FBCB2.

On January 10, 1995, the Joint Requirements Oversight Council (JROC) reviewed and validated the US Army's Mission Need Statement (MNS) for Horizontal Integration of Battle Command (HIBC) also known as Battlefield Digitization. The JROC retained the approval authority for future MNS related Operational Documents (ORDs).

In FY95-97, the Task Force XXI Army Warfighting Experiment (AWE) and efforts leading to it, developed and demonstrated the concept of operations for a digitized force. This culminated in Milestone I/II reviews and a decision held in two phases in July and November 1997. During the July 1997 Milestone I/II Phase I review, the program was recommended to be elevated from Acquisition Category (ACAT) III to ACAT II and the LRIP quantity of 3000 was approved. The M/S I/II decision authorized the Army to proceed to the FBCB2 Engineering and Manufacturing Development (EMD) phase, conditionally, contingent upon adequate FBCB2 performance in a Limited User Test (LUT). LUT #1 was conducted in August

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7. Executive Summary (Cont'd):

1998.

The Reliability Demonstration Test was conducted in May - August 1999. It supported adequate reliability growth to enter into Low Rate Initial Production (LRIP). The re-planned TRW EMD contract was reworked in July - October 1999.

The Defense Acquisition Executive (DAE) designated FBCB2 program as ACAT ID on September 8, 1999. The Chief of Staff, Army (CSA) in his letter to Congress named the FBCB2 program as one of the Army's top five priorities on September 10, 1999. The Operational Requirements Document (ORD) Version 5.2, change 2, was approved by HQ, TRADOC on July 23, 1999 and was validated by the JROC on November 23, 1999. The Test and Evaluation Master Plan (TEMP) Version 7.3.2.2 was approved by OSD on November 30, 1999. The LRIP ASARC was conducted on November 24, 1999 followed on November 30, 1999 by an OSD Overarching IPT (OIPT), and the DAE issued the FBCB2 Acquisition Decision Memorandum (ADM) on December 22, 1999 for the LRIP Authority. The LRIP letter contract was awarded in January 2000. The Field Test (FT) #2 occurred in the second quarter of FY00 and the Force Demonstration Test and Evaluation/Limited User Test (FDTE/LUT) #2 is scheduled for third quarter FY00.

This is the first Selected Acquisition Report for FBCB2.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
<b>BLOCK I</b>			
Milestone I/II	NOV 1997	NOV 1997	NOV 1997
Limited User Test 1 (LUT#1) (complete)	AUG 1998	AUG 1998	AUG 1998
Low Rate Initial Production (LRIP) ASARC/DAE Review	DEC 1999	DEC 1999	DEC 1999
Force Development Test & Experiment (FDTE)/Limited User Test (LUT#2)	APR 2000	APR 2000	APR 2000
Equip 4th ID at Ft Hood (complete)	DEC 2000	DEC 2000	DEC 2000
Initial Operational Test & Evaluation (IOT&E)	NOV 2001	NOV 2001	NOV 2001
Milestone III Decision Review	APR 2002	APR 2002	APR 2002
Full Rate Production Award	JUN 2002	JUN 2002	JUN 2002
<b>BLOCK II</b>			
PBO C3S Review	APR 2000	APR 2000	APR 2000
Award System Engineering and Integration Contract (Software V 4.0...n)	NOV 2000	NOV 2000	JAN 2001
Participate in Army JTRS IOT&E	SEP 2005	SEP 2005	SEP 2005
Deployment of Block II Software	SEP 2005	SEP 2005	SEP 2005

Note: Block II depends upon implementing enhanced network capability through replacement of SINGARS/EPLRS/NTDR with the JTRS, and use of standardized unit naming convention. Block II capability is anticipated in the FY 05 time frame; milestones will be definitized at the M/S III Decision Review.

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
<b>KPP #1 Situational Awareness (SA)</b>				
Picture Displays of force data rec'd at each echelon	100%	100% / 95%	TBD	100%
Data Accuracy - Display Platform/Dismounted Soldier of the Reported Position	10/1 meters	10/1 meters / 100/10 meters	TBD	100/1 meters
<b>KPP #2 Interoperability</b>				

10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
MCS/AFATDS/ASAS	Yes	Yes	/ Yes	TBD	Yes
CSSCS/FAAD C2I	Yes	Yes	/ Yes	TBD	Yes
Ability to push/pull information into/from ATCCS databases	Yes	Yes	/ Yes	TBD	Yes
FBCB2 must be interoperable with Navy, Air Force, and Marine Corps tactical systems	Yes	Yes	/ Yes	TBD	Yes
FBCB2 must be interoperable with Allied/Coalition tactical systems	Yes	Yes	/ Yes	TBD	Yes
KPP #3 Unit Task Reorganization (UTR) (Time to implement UTR within FBCB2 Network)	N/A		/		
<b>BLOCK I (IOT&amp;E)</b>					
Move a platoon to a new company (same brigade)	1 min	1 min	/ 5 min	TBD	1 min
Move a platoon to a new battalion (same brigade)	1 min	1 min	/ 5 min	TBD	1 min
Move a company to a new battalion (same brigade)	5 min	5 min	/ 10 min	TBD	5 min
Move a platoon to a new brigade	5 min	5 min	/ 15/60 / min	TBD	5 min
Move a company to a new brigade	5 min	5 min	/ 15/90 / min	TBD	5 min
Move a battalion to a new brigade	10 min	10 min	/ 2hrs/ / 4hrs	TBD	10 min
<b>BLOCK II (FY05)</b>					
Move a platoon to a new company (same brigade)	1 min	1 min	/ 5 min	TBD	1 min
Move a platoon to a new battalion (same brigade)	1 min	1 min	/ 5 min	TBD	1 min
Move a company to a new battalion (same brigade)	5 min	5 min	/ 10 min	TBD	5 min

10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Move a platoon to a new brigade	5 min	5 min / 10/30 / min	TBD	5 min
Move a company to a new brigade	5 min	5 min / 15/45 / min	TBD	5 min
Move a battalion to a new brigade	10 min	10 min / 30/120 / min	TBD	10 min
KPP #4 Information Exchange (time for information exchange between sender and receiver)				
BLOCK I (IOT&E)				
Alerts and Warnings	N/A 95% rc'd w/i 4 sec	N/A 95% rc'd/ w/i 4 sec	N/A 85% rc'd w/i 6 sec (Bn) 80% rc'd w/i 30 sec (Bde)	TBD 95% rc'd w/i 4 sec
Fire Support Information	95% rc'd w/i 8 sec	95% rc'd/ w/i 8 sec	80% rc'd w/i 30 sec	TBD 95% rc'd w/i 8 sec
Combat Reporting	90% rc'd w/i 15 sec	90% rc'd/ w/i 15 sec	80% rc'd w/i 30 sec	TBD 90% rc'd w/i 15 sec
Mission Planning Information	90% rc'd w/i 8 min	90% rc'd/ w/i 8 min	90% rc'd w/i 15 min	TBD 90% rc'd w/i 8 min
BLOCK II (FY05)				
Alerts and Warnings	95% rc'd w/i 4 sec	95% rc'd/ w/i 4 sec	90% rc'd w/i 6 sec	TBD 95% rc'd w/i 4 sec
Fire Support Information	95% rc'd w/i 8 sec	95% rc'd/ w/i 8 sec	90% rc'd w/i 15 sec	TBD 95% rc'd w/i 8 sec
Combat Reporting	90% rc'd w/i 15 sec	90% rc'd/ w/i 15 sec	90% rc'd w/i 30 sec	TBD 90% rc'd w/i 15 min
Mission Planning Information	90% rc'd w/i 8 min	90% rc'd/ w/i 8 min	90% rc'd w/i 15 min	TBD 90% rc'd w/i 8 min

10a. Performance Characteristics (Cont'd):

	Development	Approved	Demon-	Current
	<u>Estimate (SAR)</u>	Program (APB)	strated	<u>Estimate</u>
		<u>Obj/Threshold</u>	<u>Perf</u>	
Mean Time Between	910	910 / 700	TBD	910
Essential Function	hours	hours / hours		hours
Failure (MTBEFF)				

Notes:

15/60 is 15 minutes for key positions, 60 minutes for all other elements and echelons within new parent organization.

Achievement of Block II capability is outside FBCB2 purview. Block II depends upon implementing enhanced network capability through replacement of SINCGARS/EPLRS/NTDR with the JTRS, and use of standardized unit naming convention. Block II capability is anticipated in the FY 05 time frame; milestones will be definitized at the M/S III Decision Review.

The FBCB2 System shall provide a reliability of 700 hours Mean-Time-Between-Essential Function Failure (MTBEFF), which is the threshold value for IOT&E, when scored in accordance with approved failure definition scoring criteria (ORD requirement, paragraph 5.a). MTBEFF will be determined for each version of hardware.

b. Current Change Explanations -- None

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

a. Cost --	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	462.9	462.9	454.1
Procurement	1818.1	1818.1	1831.2
New Cost	(1337.3)		(1363.3)
Other Wpn Systems Costs	(357.0)		(341.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(123.8)		(126.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 2000 Base-Year \$	<u>2281.0</u>	<u>2281.0</u>	<u>2285.3</u>
 Escalation	 336.9	 336.9	 289.1
Development (RDT&E)	(1.6)	(1.6)	(1.9)
Procurement	(335.3)	(335.3)	(287.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	<u>2617.9</u>	<u>2617.9</u>	<u>2574.4</u>
 b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>59522</u>	<u>59522</u>	<u>59522</u>
Total	<u>59522</u>	<u>59522</u>	<u>59522</u>

Quantity of 59,522 includes Force XXI Battle Command Brigade and Below program quantities and quantities for other Army Weapons Systems; ABRAMS, BRADLEY and WAR RESERVES/FLOAT.

Note: The LRIP quantities approved at Milestone II are 1596 (1st year) and 1660 (2nd year) and 2124 (3rd year). These LRIP quantities represent more than 10% of the total planned buys to meet digitization goals and an effective and efficient production line.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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FBCB2, December 31, 1999

12. Unit Cost Summary:

	UCR Baseline (Dec 99 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 2000 BY\$)	2281.0	2285.3	
(2) Quantity	59522	59522	
(3) Unit Cost	0.038	0.038	0.00
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 2000 BY\$)	1818.1	1831.2	
(2) Quantity	59522	59522	
(3) Unit Cost	0.031	0.031	0.00

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	464.5	2153.4	-	2617.9
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	+0.5	-18.1	-	-17.6
Quantity	-	-	-	-
Schedule	-	-25.5	-	-25.5
Engineering	-	-	-	-
Estimating	-9.0	+31.7	-	+22.7
Other	-	-	-	-
Support	-	-23.1	-	-23.1
Subtotal	-8.5	-35.0	-	-43.5
Total Changes	-8.5	-35.0	-	-43.5
Current Estimate	456.0	2118.4	-	2574.4

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

Summary (FY 2000 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	462.9	1818.1	-	2281.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-8.8	+26.0	-	+17.2
Other	-	-	-	-
Support	-	-12.9	-	-12.9
Subtotal	-8.8	+13.1	-	+4.3
Total Changes	-8.8	+13.1	-	+4.3
Current Estimate	454.1	1831.2	-	2285.3

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	+0.5
Adjustment for Current and Prior Inflation. (Estimating)	-1.0	-1.0
Decreased estimate FY00 through FY02 covering Army digitization for aviation to be funded by other program participants. (Estimating)	-7.8	-8.0
RDT&E Subtotal	-8.8	-8.5
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-18.7
Economic adjustment for negative program change. (Economic)	N/A	+0.6
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
Rephase annual buy quantities from FY00 thru FY13. (Schedule)	0.0	-25.5
Increased estimate for non recurring cost and additional contract fixed costs. (Estimating)	+25.9	+31.6
Budget increase for initial spare requirement. (Support)	+3.2	+1.3

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

b. Current Change Explanations --

	(Dollars in Millions)
	<u>Base-Year</u> <u>Then-Year</u>
Refinement of estimate for program management and production support costs as result of rephasing of program buy quantities. (Support)	-16.1      -24.4
Procurement Subtotal	<u>+13.1</u> <u>-35.0</u>

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.04	--	--	--	--	--	--	--	--	0.04

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.04	--	--	--	--	--	--	--	--	0.04

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	NOV 1997	N/A	NOV 1997
Milestone III	N/A	APR 2002	N/A	APR 2002
FUE/IOC	N/A	N/A	N/A	N/A
Total Cost	N/A	2617.9	N/A	2574.4
Total Quantity	N/A	59522	N/A	59522
Prog Acq Unit Cost	N/A	0.04	N/A	0.04

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

a. RDT&E --			Initial Contract Price		
<u>EMD:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
TRW, Carson, CA			\$75.5	\$0.0	1
DAAB07-95-D-E604, CPIF					
Award: January 25, 1995					
Definitized: May 25, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$182.4	\$0.0	1	\$365.4	\$400.0	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (01/25/00)			\$0.0	\$0.0	
Net Change			\$-2.2	\$0.9	
			\$-2.2	\$0.9	

Explanation of Change:

The contract was replanned in FY99 and extended 2.5 years to include six additional test events. Cost and Schedule variances are not considered significant.

b. Procurement --			Initial Contract Price		
<u>LRIP:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
TRW, Carson, CA			\$	\$310.0	5952
DAAB07-00-D-E501, PPIF					
Award: January 25, 2000					
Definitized: N/A					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$	\$310.0	5952	\$310.0	\$310.0	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (01/25/00)			N/A	N/A	
Net Change			\$0.0	\$0.0	
			\$0.0	\$0.0	

Explanation of Change:

This is the initial report for the contract. Cost and schedule variances will be shown in the next report.

Contract Comments:

This contract is a letter contract with \$310.0M Ceiling.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY95-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-13)	<u>Total</u>
RDT&E	248.1	65.2	63.6	79.1	456.0
Procurement	-	61.7	63.5	1993.2	2118.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>248.1</b>	<b>126.9</b>	<b>127.1</b>	<b>2072.3</b>	<b>2574.4</b>

b. Annual Summary -- FBCB2

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 2000 Dollars Nonrec</u>	<u>Flyaway FY 2000 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				38.9	37.1
1996				51.3	49.8
1997				48.8	47.9
1998				61.7	61.1
1999				52.2	52.2
2000				64.4	65.2
2001				61.9	63.6
2002				36.1	37.7
2003				27.5	29.2
2004				11.3	12.2
<b>Subtotal</b>				<b>454.1</b>	<b>456.0</b>

Appropriation: 2035 - Other Procurement, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 2000 Dollars Nonrec</u>	<u>Flyaway FY 2000 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
2000	1441	5.1	40.3	60.5	61.7
2001	1743		44.8	61.3	63.5
2002	3540		85.9	109.4	115.1
2003	5131	5.1	122.0	163.8	175.6
2004	4500		104.0	142.4	155.7
2005	7199		165.6	214.6	239.5
2006	5000		117.1	157.0	178.7
2007	5329		118.7	158.7	184.2
2008	4446	5.1	112.1	157.1	186.0
2009	5535		116.9	156.3	188.7
2010	5188		108.0	145.1	178.7

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

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY 2000 Dollars Nonrec	Flyaway FY 2000 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2011	3490		72.1	103.0	129.6
2012	3490		70.9	101.7	130.3
2013	3490		69.6	100.3	131.1
Subtotal	59522	15.3	1348.0	1831.2	2118.4

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	59522	15.3	1348.0	2285.3	2574.4

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 265.6

Percent Total Program Expended: 10.3%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The concept of operations for the FBCB2 is for green suit unit and intermediate maintenance and contractor depot support. Green suit unit maintenance is limited to removal of failed LRU's identified through the use of BIT/BITE software, shipping them to intermediate support level for exchange and the installation of the new LRU. The extent of intermediate green suit maintenance has not yet been determined. Mission Pay and Allowances includes all MPA funded costs, including green suit maintenance, PMO and replacement personnel costs. Unit-Level Consumption costs consist of the cost of Replenishment Spares and Repair Parts. Depot maintenance will be provided by the system integration support contractor. Contractor support consists of the cost of Post Procurement Software Support (PPSS). Sustaining support is the cost of replenishment training and OMA funded system project management. The FBCB2 hardware will be replaced every three to five years using the Continuous Technology Refreshment, (CTR) concept. Annual CTR cost is shown in the "Other" category.

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

The FBCB2 APB was approved by the DAE December 21, 1999.

b. Costs -- (FY 2000 Constant (Base-Year) Dollars in Millions)

Cost Element	FBCB2 AVERAGE ANNUAL COST	NO ANTECEDENT SYSTEM AVERAGE ANNUAL COST
Mission Pay & Allowances	9.9	N/A
Unit Level Consumption	39.0	N/A
Intermediate Maintenance	0.0	N/A
Depot Maintenance	20.1	N/A
Contractor Support	5.5	N/A
Sustaining Support	2.1	N/A
Indirect Costs	0.0	N/A
Other	22.1	N/A
Total	98.7	N/A

A-13 IAV

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)  
PROGRAM: IAV

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Family of Interim Armored Vehicles (IAV)

2. DoD Component: Army

3. Responsible Office and Telephone Number:

PMO, Brigade Combat Team (BCT)  
ATTN: AMSTA-LC-X  
Warren, MI 48397-5000

COL Donald F. Schenk  
Assigned: February 7, 2000  
DSN 786-8442; COMM 810-574-8442  
schenkd@tacom.army.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PR 63653 (Shared)

5. References:

SAR Baseline (Planning Estimate):  
FY2001 President's Budget for RDT&E

Approved Program:

None.

6. Mission and Description:

(U) An immediate and urgent need exists for a Family of Interim Armored Vehicle (IAV) equipped air transportable Brigade Combat Team (BCT), capable of deployment to anywhere on the globe in a combat ready configuration. The range of tasks to be accomplished by the BCT requires IAVs that are air transportable, capable of immediate employment upon arrival in the area of

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01-1-0922

IAV, December 31, 1999

6. Mission and Description (Cont'd):

operations, and have the greatest degree of commonality possible. Force effectiveness is achieved by an organization built around mounted and dismounted infantry enabled by a family of internettted platforms and situational understanding. The IAV is centered on the Infantry Carrier Vehicle (ICV). The range of specific platform requirements will be met to the extent possible by applying Non Developmental Items (NDI) to the ICV. Planned IAV variants include the following: Mortar Carrier, Antitank Guided Missile Vehicle, Reconnaissance Vehicle, Fire Support Vehicle, Engineer Squad Vehicle, Commander's Vehicle, Medical Evacuation Vehicle, NBC Reconnaissance Vehicle, and the Mobile Gun System (MGS). When specific platform requirements cannot be met to an acceptable level by applying NDI to the ICV, a platform other than the ICV may be used. Commonality with the ICV has priority over individual system performance.

7. Executive Summary:

(U) After the announcement by the Army leadership in October of 1999 of a vision for the future that included a new brigade organizational and operational structure, the Army Materiel Command (AMC) began immediate action to achieve that vision. The Tank-automotive and Armaments Command (TACOM) was directed to make the vision a reality. Work began shortly thereafter, and a draft RFP was released for comments 30 Dec 99. On 18 Jan 00, the Program Manager's Office (PMO) for the Brigade Combat Team (BCT) was established. The PM office is located in Warren, Michigan with a Materiel Developer Cell in Ft. Lewis, Washington.

Knowledge of tactical armored vehicles and light, medium, and certain heavy armored track vehicles, as well as the Platform Performance Demonstration at Fort Knox, Kentucky, have shown that there are Non-Developmental Item (NDI) systems that could meet the Interim Armored Vehicle (IAV) system requirements. The solution to meeting the Program Objective will include the acquisition of Non-Developmental Items (NDI), NDI with some integration, traditional development and product improvement, and systems' integration. The Acquisition Strategy identifies how PMO BCT, as the office of primary responsibility for acquiring the Family of Interim Armored Vehicles, will obtain the best value solution for development (as required), production, fielding, and support of a full spectrum force of safe, reliable, supportable and effective systems organized in accordance with the BCT organizational and operational concept.

This is the initial Selected Acquisition Report (SAR) for the IAV Program.

There is currently \$100M in the FY00 Operation and Maintenance Army (OMA) Appropriation. A portion of the \$100M will be transferred to the IAV FY00 RDTE Budget line upon Congressional Approval.



8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
	AUG 2000	N/A	AUG 2000
MS II			
ICV - NDI			
LRIP Award	AUG 2000	N/A	AUG 2000
MS III Decision	TBD	N/A	TBD
PVT - Production Verification Test			
Start	TBD	N/A	TBD
Complete	TBD	N/A	TBD
LPTE - Live Fire Test & Eval			
Start	TBD	N/A	TBD
Complete	TBD	N/A	TBD
IOTE - Initial Operational Test & Eval			
Start	TBD	N/A	TBD
Complete	TBD	N/A	TBD
Follow-on T&E Events			
Start	TBD	N/A	TBD
Complete	TBD	N/A	TBD
ICV - NDI w/Integration			
Development	TBD	N/A	TBD
Production	TBD	N/A	TBD
Mobile Gun System			
Development	TBD	N/A	TBD
Production	TBD	N/A	TBD

9b. Schedule (Cont'd):

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
<b>Transportability:</b>					
Air Transportation	C-130	N/A	/ N/A	TBD	C-130
Surface Transportation (Highway, Ship & Rail)	H, S&R	N/A	/ N/A	TBD	H, S&R
<b>Reliability:</b>					
MMBOMF	1000	N/A	/ N/A	TBD	1000
<b>Weight (lbs):</b>					
Per Axle	13000	N/A	/ N/A	TBD	13000
Combat Capable Deployment	38000	N/A	/ N/A	TBD	38000
Cruising Range (miles)	300	N/A	/ N/A	TBD	300
Sustained Speed (MPH)	40	N/A	/ N/A	TBD	40
Hard Surface Slope Operation (%)	60	N/A	/ N/A	TBD	60
Wet Embankment Slope Operation (%)	30	N/A	/ N/A	TBD	30

MMBOMF - Mean Miles Between Operational Mission Failure

b. Current Change Explanations -- None

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

a. Cost --	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	335.4		335.4
Procurement	0.0		0.0
Total Sailaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0		0.0
Acquisition O&M	0.0		0.0
Total FY 2000 Base-Year \$	<u>335.4</u>	_____	<u>335.4</u>
 Escalation	 17.1		 17.1
Development (RDT&E)	(17.1)		(17.1)
Procurement	(0.0)		(0.0)
Construction (MILCON)	(0.0)		(0.0)
Acquisition O&M	(0.0)		(0.0)
Total Then Year \$	<u>352.5</u>	_____	<u>352.5</u>
 b. Quantity --			
Development (RDT&E)	N/A	N/A	0
Procurement	N/A	N/A	0
Total	N/A	N/A	<u>0</u>

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	352.5	-	-	352.5
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	352.5	-	-	352.5

Summary (FY 2000 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	335.4	-	-	335.4
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	-	-	-
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-	-	-
Total Changes	-	-	-	-
Current Estimate	335.4	-	-	335.4

b. Current Change Explanations -- None

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	AUG 2000	N/A	N/A	AUG 2000
Milestone III	TBD	N/A	N/A	TBD
FUE/IOC	TBD	N/A	N/A	TBD
Total Cost	352.5	N/A	N/A	352.5
Total Quantity	N/A	N/A	N/A	N/A
Prog Acq Unit Cost	N/A	N/A	N/A	N/A

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

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY98-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-03)	<u>Total</u>
RDT&E	-	-	109.3	243.2	352.5
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	-	-	109.3	243.2	352.5

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

b. Annual Summary -- IAV

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 2000 Dollars Nonrec	Flyaway FY 2000 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000					
2001				105.6	109.3
2002				160.4	168.8
2003				69.4	74.4
2004					
2005					
2006					
Subtotal				335.4	352.5

There is currently \$100M in the FY00 Operation and Maintenance Army (OMA) Appropriation. A portion of the \$100M will be transferred to the IAV FY00 RDTE Budget line upon Congressional Approval.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				335.4	352.5

17. Delivery/Expenditure Information:

a. Deliveries To Date - None.

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 0.0

Percent Total Program Expended: 0.0%

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

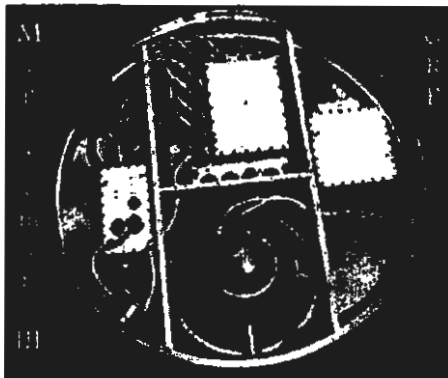
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: MIII GRP

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Minuteman III Guidance Replacement Program (MM III GRP)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:  
 OO-ALC/LMG  
 6031 GUM LANE  
 HILL AFB, UT 84056-5826  
 MAJ CLAY R. FRASIER  
 Assigned: August 7, 1999  
 DSN 775-2293; COMM (801) 775-2293  
 Clay.Frasier@hill.af.mil
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
 (U) PE 0101213F (Shared)  
 (U) PE 0604312F  
 (U) PE 0604851F  
 PROCUREMENT:  
 (U) APPN 3020 ICN LGM30G (Air Force)

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**FOR OPEN PUBLICATION**  
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 AND SECURITY REVIEW  
 DEPARTMENT OF DEFENSE

SAF/PAS  
 00--0236  
 CONGRESSIONAL  
 00-C-0720

~~Classified by: ICBM Security Classification Guide, 30 Sep 97  
 Downgrade instructions  
 Declassify on: (X-2)~~

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5. (U) References:

SAR Baseline (Development Estimate):

(U) Acquisition Decision Memorandum dated August 31, 1993.

Approved Program:

(U) AFAE Approved Acquisition Program Baseline (APB) dated June 8, 1999.

6. (U) Mission and Description:

(U) The Guidance Replacement Program (GRP) upgrades and extends the life of the Minuteman III guidance system through the year 2020. As a result of various arms control initiatives, the Minuteman III is projected to become the only land-based ICBM in the Triad when Peacekeeper is retired. The guidance electronics will be replaced since current electronic components continue to degrade and are projected to become unreliable and unsupportable as early as 2001. GRP replaces 1960's guidance system electronics and protects the option for future implementation of the Mark 21 RV/W87 warhead and an advanced inertial measurement unit (IMU), if required.

7. (U) Executive Summary:

(U) Nine Guidance Replacement Program (NS-50) Missile Guidance Sets (MGSs) were successfully produced under Low Rate Initial Production (LRIP) efforts in 1999 with one achieving Strategic Alert on August 4 1999. To date, this unit has accumulated over 4300 hours of continuous, anomaly free operations at Malmstrom AFB MT. The second deployed guidance set achieved Strategic Alert on January 28, 2000, also, at Malmstrom AFB. With this, the program is on track to meet the July 00 threshold Initial Operational Capability (IOC) requirement to have 10 NS-50 MGS equipped Minuteman III (MM III) missiles on alert for 720 hours each. The fifth LRIP NS-50 MGS successfully guided the first MM III Propulsion Replacement Program flight test on November 12, 1999 completing the third successful launch in three attempts of an NS-50 guided MM III.

Full Rate production go ahead was received from the Component Acquisition Executive (CAE) on December 17, 1999 after a successful Milestone III Decision Review held November 22, 1999 and delivery of the beyond LRIP report on December 16, 1999. To achieve MS III, the program successfully completed all Phase II exit criteria which included completion of the IOT&E report and delivery of LRIP units. In the April 28, 1999 IOT&E report, AFOTEC rated GRP operationally effective and suitable. Additionally to support the decision, the Independent Cost Estimate was completed and approved by the Air Force Cost Analysis Improvement Group on May 13, 1999. The Full Rate Production contract was awarded to TRW with Boeing as a major subcontractor under the ICBM Prime Integration Contract on December 17, 1999.

In the FY 01 budget, GRP production was realigned from 60 units per year to 80 units per year beginning in FY01, which reduces total program funding requirements by \$79M. This realignment increases production efficiency and aligns GRP deployment with the ICBM Propulsion Replacement Program (PRP). During FY00 budget deliberations, \$40M was added to the GRP procurement

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7. (U) Executive Summary (Cont'd):

funding. The FY00 Full Rate Production (FRP) contract procures 65 NS-50 MGSs and additional Peculiar Support Equipment (PSE) with the basic GRP appropriation and the plus-up. The PSE is required to support the new FY01 approved profile to produce (and sustain) eighty NS-50s per year.

A new Acquisition Program Baseline (APB) was approved on June 8, 1999, changing the First Article Delivery (FAD) objective/threshold dates to Jul/Sep 1999 and the Initial Operational Capability (IOC) APB objective/threshold dates to May/July 2000. The program deviated from the APB schedule milestone for FAD to the user in May 99 due to a delay in the deployment of the first NS-50 Missile Guidance Set (MGS). During nuclear certification of the second LRIP MGS at Malmstrom AFB on May 17, 1999, technicians observed unexpected movement of the Gyro Stabilized Platform (GSP) in the MGS. The investigation determined the cause to be in the Missile Guidance Set Test Set (MGSTS) software and a software fix was tested and implemented on July 7, 1999. The first NS-50 Missile Guidance Set (MGS) was installed in a launch facility at Malmstrom AFB on July 20, 1999. However, the asset failed during final start-up calibration due to a new problem in the Gyro Compass Assembly in the Gyro Stabilized Platform. The problem was traced to incorrect site coordinates used in the factory to generate the MGS parameter tape. The first two MGS's were returned to the factory and the correct site coordinates were used to generate new parameter tapes. On August 3, 1999, the first NS-50 MGS was re-installed in a launch facility at Malmstrom AFB, completed all calibrations and attained Strategic Alert at 2247 MDT on August 4, 1999, meeting all First Article Delivery APB milestone requirements.

During CY99, the Air Force contracted for 43 additional NS-50 MGS's under LRIP in January 99, GRP Engineering and Manufacturing Development (EMD) formally ended in May 99, Depot Installation, Checkout and Demonstration at the Boeing Guidance Repair Center was completed in June 99, and the Boeing LRIP contract was assigned to the ICBM Prime Integrating Contract, completing the integrated ICBM Acquisition Strategy to have one ICBM integrating contractor.

Additionally, experience during LRIP with suppliers and vendors highlighted a Full Rate Production challenge caused by Diminishing Manufacturing Resources. To date, suppliers providing 16.5% of the GRP Bill of Material (BOM) have exited the business and 62.7% of the BOM have been bought by other companies. Both Honeywell and Intersil (formerly Harris) announced they would not support GRP Application Specific Integrated Circuit (ASIC) wafer production beyond FY03. We are investigating impact of corporate decisions at this time.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I/II AFSARC	AUG 1993	AUG 1993	AUG 1993
Engineering and Manufacturing Development Contract Award	AUG 1993	AUG 1993	AUG 1993
Preliminary Design Review (PDR) Complete	SEP 1994	FEB 1996	FEB 1996
Critical Design Review (CDR) Complete	SEP 1995	JUN 1997	JUL 1997
AF QT&E Start	MAY 1995	MAY 1996	JUN 1996
Complete	MAY 1997	JAN 1998	FEB 1998(Ch-1)
Low Rate Initial Production (LRIP) Contract Award	JUL 1996	JAN 1998	MAR 1998
AF QOT&E Integration Demonstration Flight (IDF)	NOV 1996	JUL 1998	SEP 1998(Ch-2)
Milestone III AFSARC	MAY 1997	JUN 1999	NOV 1999(Ch-3)
First Asset Delivery (FAD) to User	SEP 1997	JUL 1999	AUG 1999(Ch-4)
Organic Support Capability	SEP 1997	N/A	N/A
Service Depot Support Date	SEP 1998	N/A	N/A
Initial Operational Capability (IOC)	MAR 1998	MAY 2000	JUL 2000(Ch-4)

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

b. Current Change Explanations --

(U) (Ch-1) AF QT&E Complete changed From "Apr 98" to "Feb 98" due to actual completion.

(Ch-2) AF QOT&E Integration Demonstration Flight (IDF) changed from "Oct 98" to "Sep 98" due to the actual date incorrectly annotated under Current Estimate.

(Ch-3) Milestone III AFSARC changed From "Jun 99" to "Nov 99" due to waiting for review of contract cost proposal to verify program affordability.

(Ch-4) First Article Delivery (FAD) to User changed From "May 99" to "Aug 99" and Initial Operational Capability (IOC) changed From "Jan 00" to "Jul 00" due to investigation to determine the cause of software problem of Missile Guidance Set Test Set (MGSTS).

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Accuracy (G&C) (Miss other than reentry - MOTR) (ft)	(b)(1)			
Weapon System Reliability (G&C)	(b)(1)			
Weapon System Availability (G&C)	(b)(1)			
Reaction Time (sec)	(b)(1)			

(U) \* Test program (two flight tests) demonstrated accuracy and weapon system reliability within NS-50 requirements. However, 8-10 flight tests are required to state the accuracy with statistical confidence. AFOTEC final report approved on April 28, 1999 stated system operationally effective and suitable.

\*\* Demonstrated availability with four MGS's on alert is greater than .99. However, 200-250 MGSs on alert are required to represent mature reliability and routine maintenance actions.

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

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	423.3	496.0	510.7
Procurement	1040.3	1516.5	1496.3
Total Fly-Away	(950.9)		(0.0)
Fly-Away Non Recurring			(385.3)
Fly-Away Recurring			(989.7)
Total Flyaway	(950.9)		(1375.0)
Total Weapon Other System	(6.8)		(8.8)
Peculiar Support	(47.9)		(66.6)
Initial Spares	(34.7)		(45.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1993 Base-Year \$	1463.6	2012.5	2007.0
Escalation	172.6	387.6	317.4
Development (RDT&E)	(29.0)	(35.9)	(33.1)
Procurement	(143.6)	(351.7)	(284.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	1636.2	2400.1	2324.4
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>652</u>	<u>652</u>	<u>652</u>
Total	652	652	652

Note: Excludes 11 RDT&E prototypes from the SAR Baseline and 10 from the Current Estimate that are not considered fully configured.

(U) The initial planned LRIP quantities were 46, the current planned LRIP quantities are 83.

This represents more than 10% of the total planned buy as approved by the Component Acquisition Executive per the Acquisition Strategy Panel.

The unit of measure for this program is the Missile Guidance Set for the Minuteman III missile.

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

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (JUN 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1993 BY\$)	2012.5	2007.0	
(2) Quantity	652	652	
(3) Unit Cost	3.087	3.078	-0.29
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1993 BY\$)	1516.5	1496.3	
(2) Quantity	652	652	
(3) Unit Cost	2.326	2.295	-1.33

(U) The current APB is dated 8 Jun 1999, however the 24 Feb 1999 APB rebaselined unit cost dollars.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	452.3	1183.9	-	1636.2
Previous Changes:				
Economic	-9.9	-72.5	-	-82.4
Quantity	-	-	-	-
Schedule	+63.7	+156.9	-	+220.6
Engineering	-26.0	+18.9	-	-7.1
Estimating	+70.9	+511.4	-	+582.3
Other	-	-	-	-
Support	-	+54.0	-	+54.0
Subtotal	+98.7	+668.7	-	+767.4
Current Changes:				
Economic	+0.1	-15.1	-	-15.0
Quantity	-	-	-	-
Schedule	-	-22.2	-	-22.2
Engineering	-	+1.8	-	+1.8
Estimating	-7.3	-32.3	-	-39.6
Other	-	-	-	-
Support	-	-4.2	-	-4.2
Subtotal	-7.2	-72.0	-	-79.2
Total Changes	+91.5	+596.7	-	+688.2
Current Estimate	543.8	1780.6	-	2324.4

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

(U) Summary (FY 1993 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	423.3	1040.3	-	1463.6
Previous Changes:				
Quantity	-	-	-	-
Schedule	+56.0	+26.0	-	+82.0
Engineering	-24.4	+15.4	-	-9.0
Estimating	+62.1	+398.0	-	+460.1
Other	-	-	-	-
Support	-	+35.6	-	+35.6
Subtotal	+93.7	+475.0	-	+568.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+1.5	-	+1.5
Estimating	-6.3	-16.8	-	-23.1
Other	-	-	-	-
Support	-	-3.7	-	-3.7
Subtotal	-6.3	-19.0	-	-25.3
Total Changes	+87.4	+456.0	-	+543.4
Current Estimate	510.7	1496.3	-	2007.0

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.1
Economic adjustment for negative program change. (Economic)	N/A	+0.2
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
New Estimating Change (Estimating)	-6.4	-7.4
RDT&E Subtotal	-6.3	-7.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-18.6
Economic adjustment for negative program change. (Economic)	N/A	+3.5
Acceleration of annual procurement buy profile. (Schedule)	0.0	-22.2
Adjustment for Current and Prior Inflation. (Engineering)	+1.5	+1.8
Congressional/SAF reductions (Estimating)	-16.8	-32.3
(Support)	+2.0	+2.3
(Support)	-3.6	-4.1

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(Support)		-2.1	-2.4
Procurement Subtotal		<u>-19.0</u>	<u>-72.0</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
--	--	--	--	--	--	--	--	--	--

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.51	-0.15	+0.01	+0.30	-0.01	+0.83	--	+0.08	+1.06	3.57

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
--	--	--	--	--	--	--	--	--	--

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.82	-0.13	-0.01	+0.21	+0.03	+0.73	--	+0.08	+0.91	2.73

14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	AUG 1993	N/A	AUG 1993
Milestone II	N/A	AUG 1993	N/A	AUG 1993
Milestone III	N/A	MAY 1997	N/A	NOV 1999
FUE/IOC	N/A	MAR 1998	N/A	JUL 2000
Total Cost	N/A	1636.2	N/A	2324.4
Total Quantity	N/A	652	N/A	652
Prog Acq Unit Cost	N/A	2.51	N/A	3.57

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

(U) NOTE: In October 1999, we assigned remaining Low Rate Initial Production (LRIP) effort (from Boeing) to the ICBM Prime Integrating Contractor, TRW. Boeing now performs as a subcontractor to TRW. To simplify contractor cost reporting only one Cost Performance Report is provided to the Government for both the Boeing LRIP contract and the assigned TRW LRIP contract.

This is the last SAR that will report the Boeing Contract - all data will be reported under the F42610-98-C-0001 (TRW IPIC) contract.

a. Procurement --  
 (U) MMIII GRP - Electronics:  
 Boeing, Anaheim, CA  
 F04704-93-C-0020, CPAF  
 Award: April 7, 1997  
 Definitized: April 7, 1997

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$270.2	\$0.0	83	\$270.2	\$270.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$1.6	\$0.5
Cumulative Variances To Date (12/31/99)	<u>\$-1.1</u>	<u>\$-3.4</u>
Net Change	\$-2.7	\$-3.9

Explanation of Change:

(U) The major contributor to the \$-2.7M cumulative unfavorable cost variance (out of \$130M cost of actual cost of work performed earned value to date) is due to, unplanned, increased cost of engineering support labor required for increased system level testing and to resolve equipment chassis casting production problems.



15. (U) Contract Information (Cont'd):

The cumulative unfavorable schedule variance of \$-3.9 is due to production material not being issued to the floor as early as planned. This has not impacted build schedule.

(U) Contract Comments:

The current contract price includes LRIP from the Boeing F04704-93-C-0020 contract and the assigned LRIP portion from the TRW F42610-98-C-0001 contract.

(U) <u>MMIII GRP LRIP IPIC:</u>			Initial Contract Price		
TRW INC., SAN BERNARDINO, CA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F42610-98-C-0001, CPAF			\$270.2	\$0.0	83
Award: October 14, 1999					
Definitized: October 14, 1999					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$270.2	\$0.0	83	\$270.2	\$270.2	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (12/20/99)			\$1.6	\$0.5	
Net Change			<u>\$-1.1</u>	<u>\$-3.4</u>	
			\$-2.7	\$-3.9	

Explanation of Change:

(U) Cost and schedule variances explained under the Boeing F04704-93-C-0020 contract.

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MMIII GRP, December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY93-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	543.8	-	-	-	543.8
Procurement	282.8	185.5	195.3	1117.0	1780.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	826.6	185.5	195.3	1117.0	2324.4

b. Annual Summary -- MM III GRP

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1993 Dollars Nonrec</u>	<u>Flyaway FY 1993 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1993				52.8	53.7
1994				81.6	84.5
1995				88.2	93.0
1996				103.4	111.1
1997				106.1	115.4
1998				70.0	76.6
1999				8.6	9.5
Subtotal				510.7	543.8

Appropriation: 3020 - Missile Procurement, Air Force

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1993 Dollars Nonrec</u>	<u>Flyaway FY 1993 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996	4	1.3	7.9	9.2	10.0
1997	10	21.9	19.4	57.5	63.1
1998	30	26.0	51.3	94.3	104.5
1999	39	25.7	57.4	93.9	105.2
2000	65	37.7	105.0	163.3	185.5
2001	80	40.9	117.6	169.1	195.3
2002	80	36.8	115.3	160.8	188.8
2003	80	45.1	115.5	169.3	202.9
2004	80	37.0	115.6	161.1	196.6
2005	80	35.0	115.5	159.0	198.0
2006	80	38.3	115.1	161.8	205.5
2007	24	37.7	54.1	95.0	123.0
2008		1.3		1.4	1.8
2009		0.6		0.6	0.8

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1993 Dollars Nonrec	Flyaway FY 1993 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal	652	385.3	989.7	1496.3	1780.6

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	652	385.3	989.7	2007.0	2324.4

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	12	9

(U) Percent Total Program Quantities Delivered: 1.4%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 646.9

(U) Percent Total Program Expended: 27.8%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The concept of operations is based on 500 deployed guidance systems which operate continuously. The only change in the Operating and Support (O&S) costs between the current (antecedent) guidance system (NS-20) and the NS-50 system is in the depot maintenance costs due to fewer recycles are estimated to occur on the NS-50 system. Calculations are based on historical guidance repair data, which has varied little since Minuteman III was fielded in the early 1970s. Personnel costs are based on the current manning levels associated with guidance system repair. These levels will not change because maintenance personnel have multiple tasks and qualifications that drive overall manning requirements. Repair costs are calculated as the number of projected annual repairs, multiplied by the unit repair cost. Unit level consumption costs are based on costs associated with deployment of missile wing personnel to missile sites to remove and replace guidance systems, and the annual user costs associated with maintaining guidance related maintenance support equipment. Repair and unit level consumption costs will decrease as a result of this modification. The increase in reliability of the electronics will result in fewer guidance system repairs and fewer maintenance actions by field personnel. NOTE: The calculated costs to repair the guidance set compares system level Missile Guidance System (MGS) repair. O&S data was

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MMIII GRP, December 31, 1999

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

extracted from the routine program office estimate dated May 1999.

b. (U) Costs -- (FY 1993 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Year-NS-50 System	Avg Annual Cost Per Year-NS-20 Antecedent
Mission Pay & Allowances	18.2	18.2
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	12.1	14.9
Contractor Support	0.0	0.0
Sustaining Support	8.0	8.0
Indirect Costs	2.9	2.9
Total	41.2	44.0

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AF-12 JDAM

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: JDAM

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Joint Direct Attack Munition (JDAM)

2. DoD Component: USAF

Joint Participants:  
USAF, Navy

3. Responsible Office and Telephone Number:

AAC/YU, Bldg 11	GM-15 OSCAR L. SOLER
Joint Direct Attack Munition	Assigned: January 2, 1996
102 West D Ave Suite 300	DSN 872-3526; COMM 904-882-3526
Eglin AFB, FL 32542-6807	solero@eglin.af.mil

4. Program Elements/Procurement Line Items:

RDT&E:  
PE 0604618F  
PE 0604618N

PROCUREMENT:  
APPN 1507 ICN 0550 (Navy)  
APPN 3011 ICN 353620 (Air Force)

Air Force and Navy RDT&E funding includes the Product Improvement Program (PIP).

Air Force and Navy Procurement funding does not include PIP funding. Navy Procurement funding includes BLU-109 warheads but not Joint Programmable Fuze (JPF).

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DEPARTMENT OF DEFENSE

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SAF/PAS

00--0281

CONGRESSIONAL

00-c-0725

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**5. References:**

**SAR Baseline (Development Estimate):**

DAE Approved Acquisition Program Baseline (APB) dated September 20, 1995.

**Approved Program:**

DAE Approved Acquisition Program Baseline (APB) dated February 22, 1999.

**6. Mission and Description:**

Operation DESERT STORM confirmed the need for, and Operation ALLIED FORCE confirmed the utility of a more accurate weapon delivery capability in adverse weather conditions from medium/high altitudes. Failure to satisfy this requirement will allow the enemy to continue to take advantage of the sanctuary of weather and/or prevent United States air power from prosecuting a conflict on its own terms. The JDAM is a joint Air Force and Navy munitions program to correct these shortfalls, with the Air Force as the Executive Service. JDAM will upgrade the existing inventory of general purpose bombs (MK-84, BLU-109, and MK-83/BLU-110) by integrating them with a tail guidance kit consisting of a Global Positioning System aided Inertial Navigation System (INS/GPS). JDAM will provide an accurate (13 meters) adverse weather capability. The primary platforms for the JDAM development are the B-1B, B-2A, B-52H, FA-18C/D and the F-22A (for the MK-83/BLU-110 only). The services will certify other aircraft (e.g. F-16C/D, F-14D, F-15E, FA-18E/F, S-3, P-3, AV-8B, F-117) to deliver JDAM when funding becomes available. The JDAM Product Improvement Program (PIP) will investigate and develop improvement options for the JDAM system.

**7. Executive Summary:**

On February 22, 1999, we received USD(A&AT) approval for adding a third Low Rate Initial Production (LRIP) lot for 2,527 units of MK-84 variant JDAMs, adjusting the IOT&E/OPEVAL objective date from December 1998 to October 1999 and adjusting the Milestone III objective date from February 1999 to November 1999.

Lot 1 Acceptance Test (LAT) was completed on the B-1B in March 1999.

On April 2, 1999, JDAM production schedule was accelerated from 200 to 300 units per month. Lot 2 was later accelerated to 450 per month. Lot 2A was exercised to meet the urgent warfighter requirements for Operation Allied Force. This action was in response to the Vice Chairman of the Joint Chiefs of Staff and per direction of the AFPEO for Weapons.

Lot 1 production delivery of 937 units was completed on April 15, 1999 and Lot 2 delivery of 2,202 units was completed on December 16, 1999.

The minutes from the June 10, 1999 JDAM Overarching Integrated Product Team (OIPT) approved award of Lot 4 as a fourth LRIP which would exceed the 10% rule and require notification to Congress.

On June 22, 1999, the AFPEO/WP provided authorization to procure additional

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**7. Executive Summary (Cont'd):**

quantities to fill the production gap created from acceleration of Lots 1, 2 and 2A. Lot 3, consisting of 1,308 units, was awarded on June 24, 1999.

On June 24, 1999, the Secretary of Defense delegated to the USD(A&T) authority and responsibility for JDAM Contract Terms and Conditions. The USD(A&T) then authorized the continuation of the JDAM Federal Acquisition Regulation/Defense Federal Acquisition Regulation Supplement (FAR/DFARS) Acquisition Reform Waivers.

The Milestone III JDAM Cost Analysis Requirements Description (CARD) was provided to the Air Force and Office of the Secretary of Defense (OSD) Cost Analysis Improvement Group (CAIG) on June 24, 1999 for their Independent Cost Estimate.

The JDAM Joint System Program Office was recognized for its contributions at the Operation Allied Force Appreciation Day held at Andrews Air Force Base on September 15, 1999.

Lot 3A, consisting of 861 units, was awarded on November 9, 1999. This lot was awarded to maintain an efficient production rate until the Lot 4 contract award.

On December 1, 1999, both the United States House of Representatives and the Senate were informed that JDAM would exceed the Congressional notification threshold for LRIP when it procured the fourth LRIP Lot.

Development Test of F-16C/D for MK-84 and BLU-109 JDAM variants was completed on December 21, 1999.

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**8. Threshold Breaches:**

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

The Milestone III decision for the 1000 lb (MK-83) tailkit on the F-22 was scheduled for September 2001. Test aircraft are unavailable to meet this schedule. A Program Deviation Report (PDR) has been submitted to USD (A&T) reflecting current estimate dates of To Be Determined (TBD) until the availability of the F-22 is known. The following milestones changed:

OT&E/OPEVAL Complete (1000 lb Kit /F-22) changed from March 2003 to TBD.  
 Milestone III (1000 LB on F-22) changed from January 2005 to TBD.  
 LRIP (1000 lb) changed from April 1999 to TBD.

Development delays involving design work on the new pin-lock tail actuator system (TAS) have resulted in a schedule breach for the following milestones:

Milestone III (2000 lb) changed from November 1999 to November 2000.  
 IOT&E/OPEVAL (Dedicated 2000 lb kit) Complete changed from October 1999 to September 2000.  
 Initial Operational Capability (F/A-18 C/D) changed from September 1999 to November 2000.



9. Schedule:

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Milestone 0	JUN 1992	JUN 1992	JUN 1992
Milestone I	OCT 1993	OCT 1993	OCT 1993
Dem/Val Contract Award	APR 1994	APR 1994	APR 1994
Critical Design Review Complete	AUG 1995	AUG 1995	AUG 1995
Milestone II	SEP 1995	SEP 1995	SEP 1995
Exercise EMD Contract Option	OCT 1995	OCT 1995	OCT 1995
DT&E/TECHEVAL			
Start (Flight Tests)	OCT 1995	OCT 1995	DEC 1995
Complete (2000 lb Kit)	DEC 1997	DEC 1997	JUN 1998
Complete (1000 lb Kit) - Weapon Only	FEB 1998	FEB 1998	AUG 1998
Operational Assessment			
Start	OCT 1995	OCT 1995	OCT 1995
Complete	MAR 1997	MAR 1997	JAN 1997
OT&E/OPEVAL Complete (1000 lb Kit/F-22)	MAY 2001	MAY 2001	TBD
Exercise Lot 1 Option	APR 1997	APR 1997	APR 1997
Lot 1 Production First Delivery	APR 1998	APR 1998	MAY 1998
Required Assets Availability (AF)	MAR 1999	MAR 1999	MAR 1999
Initial Operational Capability (FA-18)	SEP 1999	SEP 1999	NOV 2000(Ch-1)
Milestone III (1000 lb on F-22)	SEP 2001	SEP 2001	TBD
Milestone I JDAM PIP	SEP 1999	SEP 2002	SEP 2002
Milestone III (2000 lb)	APR 1998	NOV 1999	NOV 2000(Ch-1)
Exercise Lot 2 Option (LRIP)	APR 1998	APR 1998	JUN 1998
IOT&E/OPEVAL (Dedicated 2000 lb Kit)	N/A	OCT 1999	SEP 2000(Ch-1)
Complete			
LRIP (1000 lb)	DEC 1997	APR 1998	TBD
Award Lot 3 (LRIP)	N/A	JUN 1999	JUN 1999
OT&E/OPEVAL Complete (1000 lb Kit)	N/A	N/A	TBD
Milestone III (1000 lb)	N/A	N/A	TBD

Notes:

(1) The Required Assets Availability (RAA) Milestone date will be provided once ACC identifies what is required for RAA.

(2) LRIP 1 Decision was based on completion of Group 1 Threshold aircraft for DT&E/IOT&E.

Milestones and dates reflect the JDAM accelerated program.

Lot 1 Decision was based on sufficient testing on B-52H, F/A-18C/D, B-2A, B-1B, and F-16C/D.

ACRONYMS: AUR - All Up Round  
 LRIP - Low Rate Initial Production  
 RAA - Required Assets Availability

9b. Schedule (Cont'd):

b. Current Change Explanations --

(Ch-1) The JDAM program has encountered development delays involving design work on the new pin-lock Tail Actuator System (TAS). The tailkit requires the new TAS to lift F/A-18C/D captive carriage restrictions. The pin-lock TAS development encountered qualification problems in cold soak operations and material deficiencies in the fin shafts. These deficiencies appear resolved but flight tests are taking longer than expected. Obtaining the required captive carriage hours on the F/A-18C/D in the restricted environment is taking more sorties than estimated. A shortage of properly equipped test aircraft has also hampered completing the additional sorties. As a result, the following schedule milestones will not be met.

Milestone III (2000 lb) decision changed from November 1999 to November 2000.

IOT&E/OPEVAL (Dedicated 2000 lb Kit) Completion changed from October 1999 to September 2000.

Initial Operational Capability (F/A-18C/D) changed from September 1999 to November 2000.

A Program Deviation Report (PDR) was submitted to USD(AT&L) on 17 March 2000 requesting changes to the JDAM Acquisition Program Baseline.

10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Weather Capability Accuracy (CEP) (Meters)	Adverse	Adverse / Adverse	Adverse	Adverse
GPS Available,	13	13 / 13	9.5	13
Impact Angles > 60 Deg	Horizon- tal Targets	Horizon-/ tal Targets / Targets		Horizon- tal Targets
Inflight Re-targeting Capability (captive carry)	Yes	Yes / Yes	Yes	Yes
Carrier Operability	Yes	Yes / Yes	Yes	Yes
Warhead Compatibility	MK-82, MK-83	MK-82, / MK-83 / MK-84, / MK-83 / (F-22)	BLU-109, BLU-109, MK-84, MK-83	BLU-109, MK-84, MK-83
Aircraft Compatibility Bomber	B-1B, B-2	B-1B, / B-2 /	B-52H Yes	B-52H

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10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Fighter Attack	FA-18 C/D (MK-83), F-16 C/D, FA-18 E/F, F-117A, F-15E, P-3, S-3, F-14 A/B/D	FA-18 / FA-18C/ C/D / D, (MK-83), / AV-8B F-16 / C/D, / FA-18 / E/F, / F-117A, / F-15E, / P-3, / S-3, / F-14 / A/B/D /	Yes	FA-18C/ D, F-22A, AV-8B
Mission Reliability	.90	.90 / .90	.913	.90
JDAM PIP Accuracy (CEP) (Meters)	3	3 / 3	TBD	3
JDAM PIP Weather Capability	Adverse	Adverse / Adverse	TBD	Adverse
JDAM PIP Warhead Compatibility	MK-82, MK-83	MK-82, / BLU-109, MK-83 / MK-84	TBD	BLU-109, MK-84

Notes:

(1) Adverse weather is defined as natural/man-made conditions such as rain, haze, dust, smoke, fog, snow, ice, wind, and/or clouds that preclude the use of current inventory precision guided munitions.

(2) Assumes GPS quality hand-off from aircraft. In addition, the target location error (TLE) portion of the total system error is allocated to be 7.2 meters CEP. If TLE is larger than 7.2 meters CEP, the total system CEP will increase accordingly. For impact angles between 60 degrees and 35 degrees (with GPS available) accuracy degradation up to 19 meters CEP against horizontal targets is an objective.

(3) Inflight programming/targeting will be possible through MIL-STD-1553/1760 data bus interface to the weapon from existing aircraft stores management hardware and modified software.

(4) JDAM will be capable of operation on aircraft carriers to include withstanding 25 aircraft carrier catapult launches and arrested landings, and operating within the carriers' electromagnetic environments.

(5) Physical compatibility with the B-1B, B-2, FA-18C/D, AV-8B and B-52H were successfully demonstrated during actual fit test in EMD Phase 1. F-22A physical compatibility was also demonstrated using computerized physical fit analysis during this phase. Integration with the F-15E,

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10a. Performance Characteristics (Cont'd):

F-16C/D, F-117, FA-18E/F, F-14D, S-3, and P-3 will be addressed as follow-on integration efforts. The A-6E aircraft was deleted by Chief of Naval Operations (CNO) Letter, Serial Number N880D5/4UG59112, dated 2 February 1994. The F-111F has been deleted (Reference AF/XOR Message 260111Z January 1994).

(6) F-22 compatibility will be limited to internal carriage of the MK-83/BLU-110 configuration. The AV-8B is a funded, non-key performance parameter, threshold aircraft.

(7) Mission reliability commences when the aircrew accepts the loaded aircraft and ends at weapon impact. Mission reliability for the guidance kits does not include reliability for the fuze. Mission reliability, a component of Guidance Kit system reliability, is used because the other component of system reliability (10 year storage reliability) cannot be demonstrated during development and operational testing.

ACRONYMS: CEP - Circular Error Probable  
DEG - Degree  
GPS - Global Positioning System  
MSL - Mean Sea Level  
PIP - Product Improvement Program  
TBD - To Be Determined

b. Current Change Explanations -- None

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

a. Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	490.3	490.3	562.0
Procurement	2090.6	2090.6	1771.7
Hardware	(1638.9)		(1472.3)
Tooling & Test Equipmen	(7.9)		(0.0)
System Engineering & Pr	(40.5)		(0.0)
Containers	(39.9)		(21.4)
Warranty	(73.3)		(3.2)
Engineering Change Orde	(46.8)		(36.5)
Lot Acceptance Test	(15.8)		(0.0)
Nonrecurring Flyaway	(60.7)		(74.4)
Total Flyaway	(1923.8)		(1607.8)
Warhead	(65.4)		(32.4)
Product Support Cost	(79.8)		(115.1)
Total Other Wpn Sys	(145.2)		(147.5)
Peculiar Support	(21.6)		(16.4)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1995 Base-Year \$	2580.9	2580.9	2333.7
Escalation	811.4	811.4	292.7
Development (RDT&E)	(27.0)	(27.0)	(27.2)
Procurement	(784.4)	(784.4)	(265.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	3392.3	3392.3	2626.4

NOTE: This baseline does not include Navy funding for the Joint Programmable Fuze (JPF) (\$5.7M TY\$ for RDT&E) (\$51.6M TY\$ for Procurement). Navy Procurement funding includes BLU-109 (2,609 units for \$35.2M TY\$).

Air Force and Navy RDT&E funding includes the Product Improvement Program (PIP). Air Force and Navy Procurement funding does not include PIP funding.

The RDT&E cost increase is due to Navy funding for the Product Improvement Program (PIP). The decision to fully fund the PIP program was made during the PB00 budget cycle.

Tooling & Test Equipment and System Engineering/Program Management have been zeroed in the current estimate due to the structure of the JDAM contract. Contractually, JDAM has CLINs for hardware, containers and warranty. Tooling & Test Equipment and System Engineering/Program Management costs are included as part of the hardware costs.

This Acquisition Program Baseline (APB) includes JDAM PEs 0604618F and 0604618N for Research, Development, Test and Evaluation (RDT&E), and 0207583F (3011) and Appropriation 1507N, ICN 0550, for Procurement.

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

b. Quantity --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	630	630	620
Procurement	<u>87496</u>	<u>87496</u>	<u>87496</u>
Total	88126	88126	88116

Note: Excludes 81 RDT&E prototypes from the SAR Baseline and 81 from the Current Estimate that are not considered fully configured.

NOTE: The Low Rate Initial Production (LRIP) quantities approved in the Acquisition Decision Memorandum (ADM) at Milestone II were 425 units for Lot 1. Subsequent FY97 budget cycle decisions approved a buy-to-budget approach for determining annual quantities. With the lower than expected unit costs, LRIP quantities were 937 for Lot 1. A second LRIP lot (Lot 2) was approved in December 1997 for 2,202 tailkits. In December 1998, the OIPT approved LRIP Lot 2A. Lot 2A quantities were 2,527 tailkits. On June 22, 1999, the AFPEO/WP provided authorization to procure additional quantities to fill the production gap created from acceleration of Lots 1, 2 and 2A. Lot 3 was awarded on June 24, 1999 for 1,308 tailkits and Lot 3A was awarded on November 9, 1999 for 861 tailkits. Planned Lot 4 quantities are 8,163 tailkits.

c. Foreign Military Sales --

The JDAM Foreign Military Sales (FMS) team has been working very closely with SAF/IAM to get the Letter of Offer and Acceptance (LOA) to the Israeli Air Force (IAF). The LOA was projected to be released by April 30, 1999. Several issues impacted the release of the LOA to the IAF -- a strike by the Ministry of Defense of Israel, the Kosovo conflict, and most recently, requirements changes to the Letter of Request (LOR) by the IAF. All of these issues have been resolved and the LOA was officially released to the IAF in February 2000.

d. Nuclear Costs --

None.

12. Unit Cost Summary:

	UCR Baseline (SEP 1995 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	2580.9	2333.7	
(2) Quantity	88126	88116	
(3) Unit Cost	0.029	0.026	-10.34
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	2090.6	1771.7	
(2) Quantity	87496	87496	
(3) Unit Cost	0.024	0.020	-16.67

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	517.3	2875.0	-	3392.3
Previous Changes:				
Economic	-11.4	-237.9	-	-249.3
Quantity	+16.8	-	-	+16.8
Schedule	-	+66.9	-	+66.9
Engineering	-19.0	-	-	-19.0
Estimating	+93.5	-717.9	-	-624.4
Other	-	-	-	-
Support	-	+7.6	-	+7.6
Subtotal	+79.9	-881.3	-	-801.4
Current Changes:				
Economic	-0.4	-14.9	-	-15.3
Quantity	-	-	-	-
Schedule	-	+89.2	-	+89.2
Engineering	-	-	-	-
Estimating	-7.6	+0.0	-	-7.6
Other	-	-	-	-
Support	-	-30.8	-	-30.8
Subtotal	-8.0	+43.5	-	+35.5
Total Changes	+71.9	-837.8	-	-765.9
Current Estimate	589.2	2037.2	-	2626.4

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

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	490.3	2090.6	-	2580.9
Previous Changes:				
Quantity	+15.7	-	-	+15.7
Schedule	-	+41.7	-	+41.7
Engineering	-16.5	-	-	-16.5
Estimating	+77.9	-440.1	-	-362.2
Other	-	-	-	-
Support	-	+20.2	-	+20.2
Subtotal	+77.1	-378.2	-	-301.1
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+82.4	-	+82.4
Engineering	-	-	-	-
Estimating	-5.4	-	-	-5.4
Other	-	-	-	-
Support	-	-23.1	-	-23.1
Subtotal	-5.4	+59.3	-	+53.9
Total Changes	+71.7	-318.9	-	-247.2
Current Estimate	562.0	1771.7	-	2333.7

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-1.3
Economic adjustment for negative program change. (Economic)	N/A	+0.9
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
Navy funds decreased due to Below Threshold Reprogramming (BTR) (Estimating)	-1.5	-1.7
Navy funds decreased due to Product Improvement Program (PIP) restructuring (Estimating)	-8.2	-10.3
Revised estimate due to changes in estimating methodology (Navy). (Estimating)	-0.1	-0.3
Congressional reduction of funds (Air Force) (Estimating)	-0.4	-0.4
Congressional adjustments (Air Force) (Estimating)	+4.6	+4.9
Revised estimate due to changes in estimating methodology (Air Force) (Estimating)	+0.1	+0.1
RDT&E Subtotal	-5.4	-8.0
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-18.5



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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Economic adjustment for negative program change. (Economic)	N/A	+3.6
Restructuring of annual procurement buy profile. (Navy) (Schedule)	+36.7	+41.3
Restructuring of annual procurement buy profile. (Air Force) (Schedule)	+45.7	+47.9
Adjustment for Current and Prior Inflation. (Navy) (Estimating)	+0.3	+0.3
Revised estimate due to changes in estimating methodology. (Navy) (Estimating)	-0.3	-0.3
Adjustment for Current and Prior Inflation. (Air Force) (Estimating)	+1.0	+1.1
Revised estimate due to changes in estimating methodology. (Air Force) (Estimating)	-1.0	-1.1
Adjustment for Current and Prior Inflation. (Navy) (Support)	+0.1	+0.1
Change in Peculiar Support. (Navy) (Support)	-2.8	-3.8
Change in BLU-109 Warhead Cost. (Navy) (Support)	-13.9	-19.6
Adjustment for Current and Prior Inflation. (Air Force) (Support)	+0.1	+0.1
Change in Product Support Cost. (Air Force) (Support)	-6.6	-7.6
Procurement Subtotal	<u>+59.3</u>	<u>+43.5</u>

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.04	--	--	--	--	-0.01	--	--	-0.01	0.03

14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.03	--	--	--	--	-0.01	--	--	-0.01	0.02

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	OCT 1993	OCT 1993	N/A	OCT 1993
Milestone II	OCT 1995	SEP 1995	N/A	SEP 1995
Milestone III	JUL 1999	NOV 1999	N/A	NOV 2000
FUE/IOC	SEP 1999	SEP 1999	N/A	NOV 2000
Total Cost	681.5	3392.3	N/A	2626.4
Total Quantity	378	88126	N/A	88116
Prog Acq Unit Cost	1.8	0.04	N/A	0.03

NOTE: SAR Planning Estimate (PE) total cost and total quantity only reflect RDT&E values.

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

a. RDT&E --	Initial Contract Price		
JDAM:	Target	Ceiling	Qty
Boeing, St Charles, MO			
F08626-94-C-0003, CPAF	\$70.5	\$0.0	630
Award: October 11, 1995			
Definitized: October 11, 1995			
Current Contract Price		Estimated Price At Completion	
Target	Ceiling	Contractor	Program Manager
\$109.3	\$0.0	\$111.0	\$111.0
		Cost Variance	Schedule Variance
Previous Cumulative Variances		\$0.4	\$-0.7
Cumulative Variances To Date (12/31/99)		\$-4.2	\$-1.5
Net Change		\$-4.6	\$-0.8

Explanation of Change:

The unfavorable cost variance results from milestones not being accomplished on schedule due to delays in the Tail Actuator System (TAS) redesign and vibration issues.

15. Contract Information (Cont'd):

The unfavorable schedule variance results from milestones not being accomplished on schedule due to slipping flight test schedules resulting from the TAS redesign and vibration issues.

Contract Comments:

The current contract price changed from \$104.6M to \$109.3M due to a contract overrun and the following additional scope contract modifications: Product Improvement Program (PIP) extension, fuze studies, FMU-152/FZU-55 instrumentation, FZU-32 assemblies, design reviews, F-16 M2+ troubleshooting and ground testing, F-14 baseline weapon simulator and talkit support, tech order translation, JPF testing, LAR support, and B-2 aircraft weapons and electronics (AWF).

The difference between the current contract price and the estimated price at completion is the estimated cost overrun of \$1.7M.

Cost and Schedule Variances are based on Contract Performance Report (CPR) dated 31 Dec 1999.

b. Procurement --

JDAM:  
Boeing, St Charles, MO  
F08626-94-C-0003, FFP  
Award: April 30, 1997  
Definitized: April 30, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$19.4	\$	937

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$150.9	N/A	7835	\$150.9	\$150.9

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

The change in target price from \$19.4M to \$150.9M is based on the award of four additional lots -- Lot 2 for \$42.2M, Lot 2A for \$48.5M, Lot 3 for \$24.9M, and Lot 3A for \$15.9M. Quantities increased from 937 to 7,835 based on Lot 2 contract award for 2,202 units, Lot 2A for 2,527 units, Lot 3 for 1,308 units, and Lot 3A for 861 units.

15. Contract Information (Cont'd):

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY93-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-07)	<u>Total</u>
RDT&E	415.5	18.0	27.4	128.3	589.2
Procurement	198.4	266.8	242.8	1329.2	2037.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	613.9	284.8	270.2	1457.5	2626.4

b. Annual Summary -- JDAM

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1995 Dollars Nonrec</u>	<u>Flyaway FY 1995 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1993				23.8	23.2
1994				7.9	7.9
1995				22.8	23.1
1996				25.3	26.1
1997				21.9	22.8
1998				12.6	13.2
1999				10.6	11.2
2000				10.9	11.7
2001				24.0	26.2
2002				35.0	38.8
2003				29.3	33.0
2004				29.8	34.2
2005				17.7	20.7
Subtotal	114			271.6	292.1

The Joint Programmable Fuze (JPF) funding (\$5.7M TY\$) is not included in this Navy Funding Summary. JPF is not part of the JDAM program but is budgeted in the JDAM Navy RDT&E and Procurement PES.

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JDAM, December 31, 1999

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				21.9	21.5
1994				62.1	61.9
1995				62.0	62.9
1996				74.0	76.4
1997				31.2	32.7
1998				20.0	21.1
1999				10.8	11.5
2000				5.9	6.3
2001				1.1	1.2
2002				1.4	1.6
Subtotal	506			290.4	297.1

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	547	7.2	9.3	19.7	21.0
1999	745	7.1	14.0	33.2	35.7
2000	1864	8.1	37.0	70.6	77.1
2001	672	5.7	13.4	20.6	22.9
2002	782	5.7	13.9	20.4	23.0
2003	2331	6.0	40.5	47.4	54.6
2004	2628	5.8	44.5	51.1	60.0
2005	2674	5.5	44.8	51.1	61.2
2006	5955	5.5	99.0	105.9	129.4
2007	7298	6.8	121.3	129.9	161.8
Subtotal	25496	63.4	437.7	549.9	646.7

The Joint Programmable Fuze (JPF) funding (\$51.6M TY\$) is not included in this Navy Funding Summary. JPF is not part of the JDAM program but is budgeted in the JDAM Navy RDT&E and Procurement PEs. Navy Procurement funding includes BLU-109 (2,609 units for \$35.2M TY\$). Navy Procurement funding is actually provided under Appropriation 1508 - Procurement of Ammunition, Navy/Marine Corps, but software limitations preclude the SAR from correctly reflecting this fact.

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

Appropriation: 3011 - Procurement of Ammunition, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997	937	0.9	15.7	21.8	23.0
1998	1828	0.8	31.3	36.8	39.2
1999	3778	0.6	66.9	73.7	79.5
2000	8158	1.4	157.9	173.6	189.7
2001	9098	1.7	179.6	197.9	219.9
2002	8494	1.3	147.5	164.6	186.0
2003	8620	1.3	146.7	161.9	186.4
2004	8800	1.3	147.3	162.6	190.9
2005	8718	1.3	144.1	159.4	191.0
2006	3569	0.5	58.6	69.5	84.9
Subtotal	62000	11.1	1095.6	1221.8	1390.5

Note: FY98 procurement funding of \$39.2M includes \$0.3 SEEK EAGLE funds that are not included in the APB cost.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	25610	63.4	437.7	821.5	938.8
USAF	62506	11.1	1095.6	1512.2	1687.6
Grand Total	88116	74.5	1533.3	2333.7	2626.4

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	620	596
Procurement	3139	3179

Percent Total Program Quantities Delivered: 4.3%

b. Total Expenditures To Date (In Millions of Dollars): \$ 485.9

Percent Total Program Expended: 18.5%

Deliveries are as of December 31, 1999. Contractually, 620 RDT&E Guided Test Vehicles (GTVs) were planned to be delivered by June 30, 1999. Actual deliveries at that time were 580 GTVs. Kosovo actions took precedence. Missed deliveries did not affect flight test schedule.

Expenditures reflect program office records as of December 31, 1999.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

Operating and Support (O&S) costs include both Air Force and Navy dollars.

O&S costs were updated in November 1995 from the Defense Acquisition Board (DAB) Milestone II position to reflect the increase in Navy quantities from 12,000 to 25,496 units.

The Air Force JDAM O&S cost estimate is based on the use of an O&S cost model named the Financial O&S Estimate (FINOSEST) developed by the Air Force Cost Center in Washington, D.C. The model was used for the Milestone (MS) I, MS II, and source selection deliberations to calculate the estimated O&S costs for the JDAM program. FINOSEST calculates the O&S costs based on the association between known variables and the JDAM design (labor rates, failure rates, time to assemble, transportation costs, etc.).

The following are the assumptions that were used in forming the Air Force O&S cost estimate: Total Air Force JDAM inventory of 62,000 units. JDAM will have a 20 year extended repair warranty to cover all repairs. Air Force will have two levels of maintenance; Organizational and Depot Level. The JDAM kit has a 20 year operating life. Air Force will conduct 50 drops a year of JDAM kits. The 50 drops a year will require Telemetry (TM) and Flight Termination Systems (FTS). One half of a percent of the total JDAM failures will not be covered by the extended repair warranty. The extended repair warranty does not cover overseas transportation costs. Estimate does not take into account any Defense Business Operations Fund (DBOF) activities.

There is no antecedent system for the Air Force JDAM.

The cost drivers for the Air Force O&S cost estimate were Telemetry and Flight Termination Systems for the 50 yearly drops along with the Range Support costs for the drops.

The Navy O&S costs are based on the NAVAIR O&S cost model.

The following are the assumptions that were used in forming the Navy O&S cost estimate: Utilized NAVAIR-4.2.5 Air-Launched Missile Model. Twelve carriers deployed per year. Three hundred and fifty JDAMs per carrier. Fifty firings per year. Ten percent container failure rate per year. Contractual support identified for first two years of operations. Twenty year operating life.

The cost drivers for the Navy O&S cost estimate were Range Evaluation for practice bomb drops, Sustaining Engineering/Program Management, Transportation, and Organizational Maintenance Handling/Inspection.

There is no antecedent system for the Navy JDAM.

The Other category includes Integrated Logistics Support (ILS) functions such as quality surveillance and Naval Weapon Systems (NWS) handling/processing costs.

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

Contractor support costs for the Navy will begin in FY98 and continue for the first two years of operation. The Navy will use the contractor support as "tech rep" support for any Navy unique requirements at the Naval Weapon Stations and aboard the aircraft carriers.

Based on the 20 year extended repair warranty, the Air Force does not have a requirement for contractor support. The 20 year extended maintenance repair warranty begins with Lot 1 and will cover any repairs required.

b. Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Total Cost for 87,496 JDAM Units	Total Cost for Antecedent System
Mission Pay & Allowances	0.0	N/A
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.0	0.0
Indirect Costs	0.0	0.0
Mission Personnel	6.7	0.0
Sustaining Engineering	7.2	0.0
System & Inventory Manag	1.8	0.0
Contractor Support	0.6	0.0
AFMSS	14.4	0.0
Other	5.7	0.0
Support Costs	0.0	N/A
Consumable Material	2.7	N/A
TM/FTS	56.3	N/A
Range Support	45.3	N/A
Technical Data Managemen	0.2	N/A
Transportation	6.9	N/A
Non-Warranted Repair Cos	0.1	N/A
Total	147.9	0.0



N-1 AAV

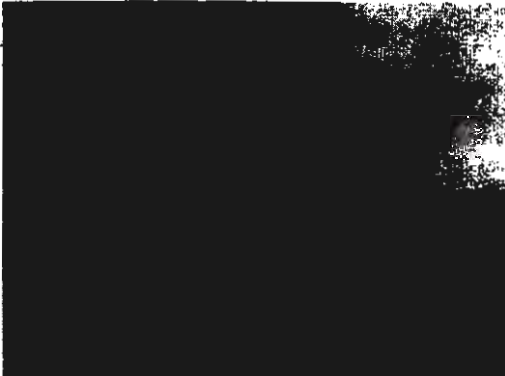
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: AAV

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Advanced Amphibious Assault Vehicle (AAV)

2. DoD Component: USMC

3. Responsible Office and Telephone Number:

DRPM AAA	COL BLAKE ROBERTSON
DEPT. OF THE NAVY U.S. MARINE CORPS	Assigned: August 6, 1998
991 ANNAPOLIS WAY	DSN ; COMM (703) 492-3300
WOODBIDGE, VA 22191-1215	bjr@aaav.usmc.mil

4. Program Elements/Procurement Line Items:

RDT&E:  
 PE 0603611M Project B0020  
 PE 060311M Project B0020

5. References:

SAR Baseline (Planning Estimate):  
Approved Acquisition Program Baseline dated March 17, 1995.

Approved Program:  
Approved Acquisition Program Baseline (APB) dated March 22, 2000.

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AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

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 00-C-0146  
 MAR 28 2000  
 [Signature]  
 Office of the Chief of  
Naval Operations  
Dept. of the Navy

00-C-0844

AAAV, December 31, 1999

**6. Mission and Description:**

The Advanced Amphibious Assault Vehicle (AAAV) Program will field a successor to the Marine Corps' current amphibious vehicle, the Assault Amphibious Vehicle Model 7A1 (AAV7A1). The AAAV will provide the principal means of tactical surface mobility for the Marine Air Ground Task Force (MAGTF) during both ship-to-objective maneuver and subsequent combat operations ashore as part of the Navy and Marine Corps Operational Maneuver from the Sea doctrine. The AAAV will provide the Marine Corps with the capability to execute the full spectrum of military missions from humanitarian operations to conventional combat operations. The AAAV replaces the AAV7A1 Vehicle.

The AAAV is a self-deploying, high water-speed, amphibious, armored, tracked vehicle capable of operating in all weather as well as Nuclear, Biological, and Chemical environments.

The Advanced Amphibious Assault Vehicle (AAAV) program is the only ACAT-ID program managed by the Marine Corps. The AAAV is the next generation of Marine Corps Assault Amphibious Vehicles being developed to satisfy the requirements of the 21st Century Marine Warfighters. Along with the Landing Craft Air Cushion (LCAC) and the MV-22 Osprey, the AAAV will provide the Marine Corps with the tactical mobility assets required to spearhead the Operational Maneuver From the Sea (OMFTS) concept. Acquisition of the AAAV is critical to the Marine Corps. The total AAAV requirement is for 1013 weapon systems. The AAAV program remains the Marine Corps number one priority ground system acquisition.

**7. Executive Summary:**

(U) The Direct Reporting Program Manager, Advanced Amphibious Assault (DRPM AAA) is responsible for the development, production, and life cycle management of the AAAV.

The AAAV Program was approved by the Defense Acquisition Board (DAB) via a Milestone I review in 1995, signifying the beginning of the Program Definition and Risk Reduction (PDRR) phase. In 1996, General Dynamics Land Systems was awarded the PDRR phase contract. Execution of the contract is at the AAAV Technology Center located in Woodbridge, VA. This facility houses the AAAV Program Office, General Dynamics and their subcontractors, and representatives from the Defense Contract Management Command. The AAAV PDRR contract is now 73.5% complete. The program remains within budget, on-schedule, and the technical issues are being resolved as they arise.

The AAAV Engineering and Manufacturing Development (EMD) Phase, commencing in FY01, will fabricate 10 vehicles for extensive reliability testing in 2003 and 2004. Low Rate Initial Production (LRIP) of approximately 100 vehicles is planned for 2004, 2005 and 2006. The AAAV Full Rate Production and Deployment Phase is scheduled for 2006 through 2012. A total of 1,013 AAAVs will be produced with initial operational capability (IOC) scheduled for 2006.

7. Executive Summary (Cont'd):

The first AAAPV PDRR prototype was built and assembled in 1999. It joined the LCAC and MV-22 in the Marine Corps Amphibious Triad Roll-out in June 1999. This prototype has been delivered to government in January 2000, ten months ahead of the Acquisition Program Baseline (APB) objective date. The second and third prototypes will complete assembly, shakedown testing, and delivery in FY00. Furthermore, the AAAPV weapons station (MK46) has been selected by the Navy for use on the LPD-17 class of ships and is being considered for the DDG51, DD21, LHD7, CVN77 and PC1 class of ships. During 1999, the AAAPV program office sponsored and managed 29 advanced technology projects representing a defense investment of over \$25M.

The AAAPV weapons station (MK46) had been nominated by the Department of the Navy to the Office of Secretary of Defense to compete for the 1999 David Packard Excellence in Acquisition Award. Since December 1998, the AAAPV has been a Department of the Navy Program Manager Oversight of Life Cycle Costs (PMOLCS) Pilot Program, which places responsibility for life cycle planning and Total Ownership Costs (TOC) on the Program Manager.

The AAAPV engine has completed 704 of the 1000 hours of durability testing required to fulfill one PDRR phase Exit Criterion. In December 1999 the vehicle's armor successfully passed its Exit Criterion and the vehicle demonstrated its Land Speed Exit Criterion of 64 KPH. The remaining Exit Criteria, such as the 20 knot water speed in sea state two, are planned to be achieved in the spring of FY2000, well ahead of the Milestone II DAB.

A significant priority in 1999 was the development, prototyping, and implementation of web based tools to effectively sustain AAAPV design, production, and life cycle support. "Virtual Integration and Assembly", winner of the 1999 Defense Modeling and Simulation Office Award for Acquisition, integrated production and support insights into design development. "Remote Expert" technology has been exploited to "virtually" co-locate the designer, builder, tester, and supporter. Electronic Problem Reporting and configuration management tools have also been developed and integrated into the AAAPV build, assembly, and test processes.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone I DAB Review	MAR 1995	MAR 1995	MAR 1995
Dem/Val Contract Award	FEB 1996	FEB 1996	JUN 1996
AAAV(P) Prototype Delivery	OCT 2000	OCT 2000	JAN 2000
Development Test (DT1)			
Start	OCT 2000	OCT 2000	JAN 2000
Complete	JUN 2001	JUN 2001	JUL 2000
Operational Test (OT1/EDA)			
Start	JUN 2001	JUN 2001	JUL 2000
Complete	OCT 2001	OCT 2001	OCT 2000
Milestone II DAB Review	JAN 2002	JAN 2002	JAN 2001
Award of E&MD Contract	FEB 2002	FEB 2002	FEB 2001
EMD Prototype Deliveries			
Start	OCT 2004	OCT 2004	OCT 2002
Complete	MAR 2005	MAR 2005	JUN 2003
Developmental Testing II			
Start	NOV 2004	NOV 2004	OCT 2002
Complete	SEP 2006	SEP 2006	MAR 2005
Award of LRIP	JUL 2005	JUL 2005	OCT 2003
LRIP Vehicle #1 Delivery	JAN 2007	JAN 2007	APR 2005
IOT&E			
Start	JAN 2007	JAN 2007	APR 2005
Complete	JUL 2007	JUL 2007	SEP 2005
Live Fire Testing (LFT&E)			
Start	JAN 2006	JAN 2006	MAY 2004
Complete	JAN 2007	JAN 2007	MAY 2005

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9a. Schedule (Cont'd):

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone III DAB Review	OCT 2007	OCT 2007	DEC 2005
IOC	DEC 2007	DEC 2007	FEB 2006
Full Rate Production Deliveries Start	JUL 2009	JUL 2009	SEP 2007
Organic Support Capability	MAY 2010	MAY 2010	FEB 2009
Service Depot Support	MAY 2010	MAY 2010	FEB 2009
FOC	MAY 2014	MAY 2014	AUG 2012

(U) The AAAV is Pre-Milestone II (EMD) and only the development costs (RDT&E) are reported in the Selected Acquisition Report (SAR) per Section 2432, Title 10, USC.

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>
High Water Speed (kts) (SS-3, 36 in SWH)	25	25 / 20	TBD	22
Forward Speed on a Hard Surface Road (kph)	72	72 / 69	72	72
Armor Protection Against (mm/m)	30/1000	30/1000 / 14.5/300	14.5/300	14.5/300
Carry Capacity (Marines)	18	18 / 17	TBD	17
Firepower (M) (MER)	2000	2000 / 1500	TBD	2000
Reliability (hrs) MTBOMF	95	95 / 70	TBD	95

1. SWH: Significant Wave Height
2. MER: Maximum Effective Range
3. MTBOMF: Mean Time Between Operational Mission Failure
4. The Performance Characteristics reflect Joint Requirements Oversight Council (JROC) approved key performance parameters, dated 27 February 1995.

10b. Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

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

a. Cost --	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	725.0	842.8	915.4
Procurement	0.0	N/A	0.0
Total Sailaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	<u>0.0</u>	<u>N/A</u>	<u>0.0</u>
Total FY 1993 Base-Year \$	725.0	842.8	915.4
 Escalation	 209.1	 222.9	 127.1
Development (RDT&E)	(209.1)	(222.9)	(127.1)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(N/A)</u>	<u>(0.0)</u>
Total Then Year \$	934.1	1065.7	1042.5
 b. Quantity --			
Development (RDT&E)	0	12	0
Procurement	<u>N/A</u>	<u>N/A</u>	<u>0</u>
Total	N/A	12	0

Note: Excludes 13 RDT&E prototypes from the SAR Baseline and 12 from the Current Estimate that are not considered fully configured.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	934.1	-	-	934.1
Previous Changes:				
Economic	-49.8	-	-	-49.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+49.8	-	-	+49.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+0.0	-	-	+0.0
Current Changes:				
Economic	-18.4	-	-	-18.4
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+107.6	-	-	+107.6
Estimating	+19.2	-	-	+19.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+108.4	-	-	+108.4
Total Changes	+108.4	-	-	+108.4
Current Estimate	1042.5	-	-	1042.5

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

Summary (FY 1993 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	725.0	-	-	725.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+98.5	-	-	+98.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+98.5	-	-	+98.5
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+85.1	-	-	+85.1
Estimating	+6.8	-	-	+6.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+91.9	-	-	+91.9
Total Changes	+190.4	-	-	+190.4
Current Estimate	915.4	-	-	915.4

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-19.6
Economic adjustment for negative program change. (Economic)	N/A	+1.2
Increase in number of PDRR prototypes from 1 to 3 and associated engineering, test and spares support; additional C4I variant requirements; AAAV survivability program; and upgrade to a 30mm cannon. (Engineering)	+85.1	+107.6
Adjustment for Current and Prior Inflation. (Estimating)	+3.8	+4.3
Refinement of prior current estimate (Estimating)	+3.0	+14.9
RDT&E Subtotal	+91.9	+108.4



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14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	MAR 1995	N/A	N/A	MAR 1995
Milestone II	JAN 2002	N/A	N/A	JAN 2001
Milestone III	OCT 2007	N/A	N/A	DEC 2005
FUE/IOC	DEC 2007	N/A	N/A	FEB 2006
Total Cost	934.1	N/A	N/A	1042.5
Total Quantity	0	N/A	N/A	0
Prog Acq Unit Cost	0	N/A	N/A	0

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

a. RDT&E --

DEM/VAL:  
GENERAL DYNAMICS, WOODBRIDGE, VA  
M6785496-C-0038, CPAF  
Award: June 13, 1996  
Definitized: June 13, 1996

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$217.0	N/A	0

Current Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$319.2	N/A	0

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$347.0	\$348.7

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-9.9	\$-4.8
Cumulative Variances To Date (12/31/99)	<u>\$-22.8</u>	<u>\$-4.3</u>
Net Change	\$-12.9	\$0.5

Explanation of Change:

Change in Current Contract Target Price. The contract was modified during 1999 to add test support and spares associated with the third prototype, and to start the AAAV C4I program in accordance with new requirements. The total value of the additional scope is \$59.7M.

Change in Estimated Price at Completion. The price has been changed to reflect the additional scope described above, plus the contract award and

15. Contract Information (Cont'd):

fixed fee. The difference between the Contractor Estimated Price and the Program Manager Estimated Price stems from different estimates of the cost variance at completion.

Changes in cost and schedule variances. The prime contractor is still operating under the original baseline approved in December 1996, plus additional scope to accommodate the 1996/7/8 Congressional enhancements which increased the number of PDRR prototypes from one to three, the additional AAAV C4I requirements, the AAAV survivability program, the upgrade of the AAAV cannon to 30mm, and associated engineering, test and spares support. The major reasons for the increase in cost variance were additional labor and material to manufacture and functionally integrate the first two prototypes. The overall schedule variance improved as the first prototype was delivered. The program is on schedule and within budget.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY95-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-07)	<u>Total</u>
RDT&E	279.2	114.2	137.9	511.2	1042.5
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	279.2	114.2	137.9	511.2	1042.5

b. Annual Summary -- AAAV

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1993 Dollars Nonrec</u>	<u>Flyaway FY 1993 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995				22.4	23.6
1996				30.0	32.1
1997				51.4	55.7
1998				61.5	67.2
1999				91.2	100.6
2000				102.3	114.2
2001				121.7	137.9
2002				155.2	178.6
2003				135.6	158.8
2004				86.6	103.4
2005				50.3	61.3
2006				3.6	4.5

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1993 Dollars Nonrec	Flyaway FY 1993 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2007				3.6	4.6
Subtotal				915.4	1042.5

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				915.4	1042.5

17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 309.1

Percent Total Program Expended: 29.6%

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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N-18 SSN 74

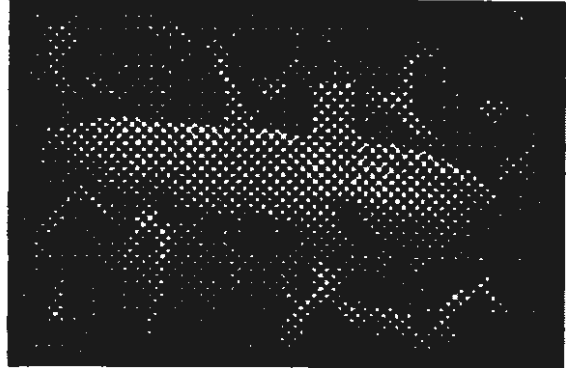
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)  
PROGRAM: VIRGINIA CLASS SUB

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): VIRGINIA CLASS SUBMARINE (SSN 774)
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:  
 VIRGINIA SUBMARINE PROGRAM OFFICE      CAPT PAUL SULLIVAN  
 PEO SUBMARINES                                      Assigned: September 11, 1998  
 2531 JEFFERSON DAVIS HIGHWAY              DSN 332-3700; COMM (703) 602-3700  
 ARLINGTON, VA 22242-5168                      SULLIVANPE@navsea.navy.mil
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
   (U)    PE 0603561N  
   (U)    PE 0603570N  
   (U)    PE 0604558N  
 PROCUREMENT:  
   (U)    APPN 1611 ICN 201300 (Navy)  
   (U)    APPN 1611 ICN 201310 (Navy)  
   (U)    APPN 1810 ICN 276200 (Navy) (Shared)  
   (U)    APPN 1810 ICN 902099 (Navy)

No Security Objection  
to Open Publication  
(AS AMENDED)  
00-C-0147  
MAR 28 2000  
Office of the Chief of  
Naval Operations  
Dept. of the Navy

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AS AMENDED  
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5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline dated June 30, 1995.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated October 27, 1997.

6. (U) Mission and Description:

(U) The VIRGINIA Class (SSN 774) Submarine Program is bringing forward a critical national security asset designed to flexibly address the unique multi-mission requirements of the post-Cold War era. Capable of performing traditional submarine missions, dominating the littoral battle space and adapting to future requirements, the VIRGINIA Class Submarine will satisfy any assigned role well into the Twenty-First Century. Intended to replace the fleet of SSN 688 Class submarines ending service in large numbers early next century, the VIRGINIA Class Submarine is characterized by state-of-the-art stealth, enhanced features for special operations forces, and cost effective Command, Control, Communication and Intelligence capability. With an array of armament including the MK48 (ADCAP) torpedo and cruise missile vertical launch capability, the VIRGINIA Class Submarine maintains total undersea superiority at an affordable cost.

7. (U) Executive Summary:

(U) As early as February 1991, a need for a new attack submarine class was identified to complement, yet be more affordable than SEAWOLF and to accommodate the impending end of service life of the SSN 688 class. Further impetus for the program was provided by nuclear submarine industrial base analyses. These studies concluded that the extensive design knowledge acquired through the SEAWOLF program needed to be captured and the nation's ability to build nuclear submarines needed to be preserved through low rate production of nuclear submarines if we were to sustain a credible submarine force in the future. In August 1992, the Under Secretary of Defense for Acquisition signed out the New Attack Submarine Acquisition Decision Memorandum approving Milestone 0. Following two years of extensive review of requirements and rigorous systems definition effort, the Defense Acquisition Board approved New Attack Submarine Milestone I with the signing of an Acquisition Decision Memorandum on August 18, 1994, initiating a program to develop and build a new attack submarine as a more cost effective follow-on to SEAWOLF with construction beginning at General Dynamics Electric Boat Division in FY98.

The VIRGINIA Class Submarine Program successfully passed Milestone II with the signing of an Acquisition Decision Memorandum (ADM) on June 30, 1995. A waiver from full-up, system-level live fire testing was approved jointly by USD (A&T) and DOT&E with notification letters sent to Congressional Defense Committees on June 29, 1995.

In the FY96 Authorization Act, Congress directed that a second nuclear

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7. (U) Executive Summary (Cont'd):

submarine builder would also be engaged in the VIRGINIA Class Submarine program and provisions for including Newport News Shipbuilding in the construction program were undertaken. The approach eventually determined to be most cost effective for including two constructors was a unique teamed construction plan under which each builder would fabricate selected modules for each ship and the two builders would alternate final assembly, integration, test, outfitting and delivery of completed submarines.

On May 9, 1996 the Integrated Process and Product Development 1996 Design/Build Contract with Electric Boat Corporation was definitized. Contract award for the NSSN Command, Control, Communications and Intelligence (C3I) System was executed April 24, 1996 to Lockheed Martin Federal Systems.

The program was reviewed for readiness to proceed with lead ship construction by an OIPT convened October 3, 1997. The ADM providing authorization to proceed was approved October 18, 1997. The acquisition program baseline (APB) was revised to reflect the co-construction teaming arrangement between Electric Boat (EB) and Newport News Shipbuilding (NNS) as approved in the FY98 Authorization and Appropriations Acts. The revised APB was approved on October 27, 1997.

On September 30th 1998, the IPPD 96 Design Build contract with Electric Boat was modified to include construction of the first four VIRGINIA Class Submarines. Funding was placed on the contract for SSN 774. In December of 1998, funding was placed on the contract for construction of SSN 775. In September 1998, SECNAV named the New Attack Submarine the VIRGINIA Class and assigned the first hull as VIRGINIA (SSN 774). Later in the year, SECNAV named the second ship of the class the TEXAS (SSN 775).

During this period:

The ship's configuration, including spaces, machinery, piping, and electrical arrangements were completed on the design contract. SSN 774 construction is 24% complete, and SSN 775 is 16% complete.

Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Since APB Change 1 in OCT 1997, procurement costs in BY95\$ have increased by 11.8%. The threshold of 11% has been breached with the submission of the President's Budget in February 2000. The total procurement increase in BY95\$ is \$5.2B. Of the \$5.2B of growth, 73% was attributed to deflationary OSD indices over the last three years. The remaining 27% is attributed to schedule changes (FY97,98 and 99), technology insertion being added to the base line cost in FY98 and NNS strike settlement costs and Cost to Complete additions in FY99. A Program Deviation Report (PDR) and a request for a revised Acquisition Program Baseline (APB) will be submitted.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone 0	AUG 1992	AUG 1992	AUG 1992
Milestone I	AUG 1994	AUG 1994	AUG 1994
Milestone II	JUN 1995	JUN 1995	JUN 1995
New Attack Submarine Integrated Product and Process Development Contract Award	OCT 1995	OCT 1995	JAN 1996
Program Review (LRIP)	SEP 1997	SEP 1997	JAN 1997
Organizational Support (by Fast Cruise)	APR 2004	APR 2004	APR 2004
Lead Ship Delivery	JUN 2004	JUN 2004	JUN 2004
LFT&E Shock Tests	OCT 2004	MAY 2005	MAY 2005
Initial Operational Test & Evaluation Start	JUL 2004	JUL 2004	JUL 2004
Complete	OCT 2004	JUN 2007	JUN 2007
IOC (Lead Ship)	OCT 2005	JAN 2006	JUN 2006
Intermediate Support (by IOC)	OCT 2005	JAN 2006	JAN 2006

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

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone III	OCT 2007	OCT 2007	OCT 2007
Depot Shipyard Support	AUG 2015	AUG 2015	AUG 2015
Related Programs			
NSSN COMMAND AND CONTROL SYSTEM			
FY95 Open Architecture Demo Complete	OCT 1995	OCT 1995	SEP 1995
C&CS Module Start Fabrication	JUN 1999	JUN 1999	JUN 1999
GFE C&CS Delivered to Shipyard	DEC 2000	DEC 2000	DEC 2000
LBTS Integration and Test Complete	APR 2002	APR 2002	APR 2002
C&CS Module delivered to ship	MAY 2002	MAY 2002	MAY 2002
NSSN Reactor Plant			
Reactor Vessel in Yard	(b)(1)		
Start Pre-fill Testing			
Power Unit Landed			
Start Alpha Trials			
MK-48 ADCAP Torpedo Modification Program			
LRIP			
MS III			
IOC Block IV			

from the

(U) \*The VIRGINIA Class Submarine Program is tracking and reports the six year earlier delivery of the MK-48 ADCAP weapon system, for associated weapons system coordination purposes only.

b. Current Change Explanations --

(U) N/A

10. (U) Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Radiated Noise				
Broadband Noise				
5 and 10 knots	Figure	Figure / Figure	TBD	Figure
(prior to	A.1	A.1 / A.1		A.1
installation of	(Except	(Except / (Except		
hull coating)	in Port	in Port / in Port		
	and	and / and		
	casualty	casualty/ casualty		
		/ as noted		
		/ below)		



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

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Greater than or equal to 15 knots	Figure A.1 (All horizontal aspects)	Figure / Figure A.1 (All/ A.1 horizon- / aspect aspects) / only).	TBD	Figure A.1

(C) Narrowband Noise

(C) Transient Noise

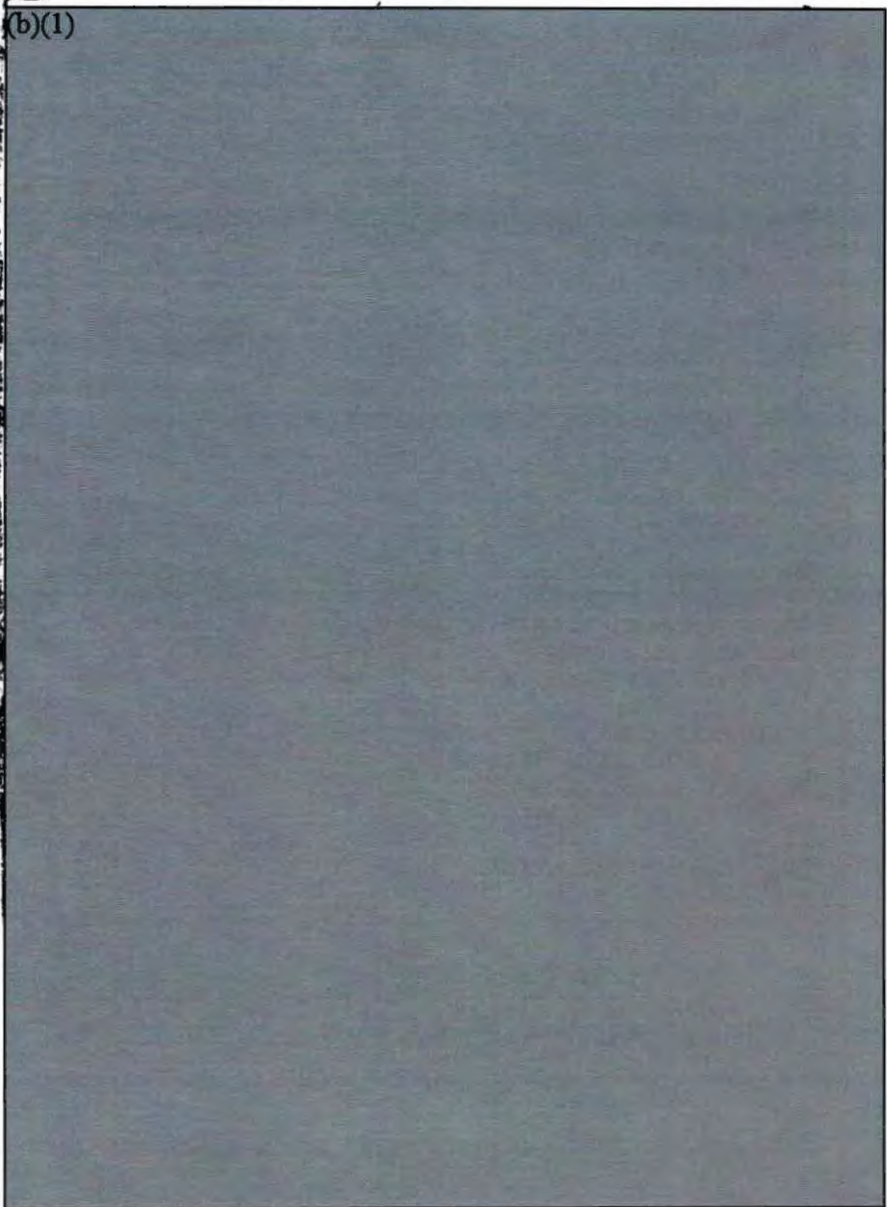
(C) Exceptions: Weapons Launch

(C) Active Target Strength (less than or equal to)

(C) High Frequency (15-30 kHz) Stern Aspect (dB)

(C) Mid Frequency (2-15 kHz) Quarter Aspect (dB)

(C) Low Frequency, Bow/ Stern (400Hz) (dB)



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

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Electromagnetic Quieting (less than or equal to)	(b)(1)			
1 DC Electric (amp-meter)				
1 DC Magnetic (gamma-ft <sup>3</sup> ) (million)				
1 AC Electric (amp-meter)				
1 Flank Speed (knots) (greater than or equal to)				
1 Torpedo Launch Rate (Torpedoes in one minute)				
1 Payload (standard size weapons) (including weapons stored in torpedo tubes and vertical launch tubes)				
1 Vertical Launch Missiles Cells				
1 Test Depth (ft)				
1 Endurance (days) (greater than or equal to)				
1 Operational Availability (%)				
1 Covert Strike Warfare (STW)				
1 Covert Surveillance Intelligence Collection/Surveillance Covert Indication and Warning (ISW), and Electronic Warfare (EW)				

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

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
1 Special Warfare (NSW)	(b)(1)			
2 Mine Warfare (MIW)				
3 Anti-Submarine Warfare (ASW)				
4 Anti-Surface Ship Warfare (ASUW)				
5 Battle Group Support				
6 90-Day Basic Functions				

b. Current Change Explanations -- None

(U) The program will perform trade analyses to determine and obtain the proper balance between cost and performance throughout the life of the program.

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	3405.0	3408.1	3656.2
Procurement	42228.1	43932.0	49132.7
Flyaway	(42130.9)		(49018.7)
Other Wpn System Costs	(16.5)		(110.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(80.7)		(3.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1995 Base-Year \$	45633.1	47340.1	52788.9
Escalation	25447.7	18682.0	12888.6
Development (RDT&E)	(409.0)	(299.1)	(221.5)
Procurement	(25038.7)	(18382.9)	(12667.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	71080.8	66022.1	65677.5

(U) Low Initial Rate Production (LRIP) quantity of 14 exceeds 100, which is normal for shipbuilding programs.

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	30	30	30
Total	30	30	30

c. (U) Foreign Military Sales --  
None

d. (U) Nuclear Costs --  
\$11,766M (TY\$).

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12. (U) Unit Cost Summary:

	UCR Baseline (OCT 1997 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	47340.1	52788.9	
(2) Quantity	30	30	
(3) Unit Cost	1578.003	1759.630	+11.51
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	43932.0	49132.7	
(2) Quantity	30	30	
(3) Unit Cost	1464.400	1637.757	+11.84

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	3814.0	67266.8	-	71080.8
Previous Changes:				
Economic	-223.0	-11743.5	-	-11966.5
Quantity	-	-	-	-
Schedule	-	+854.9	-	+854.9
Engineering	+104.1	+1090.8	-	+1194.9
Estimating	+183.1	+3687.7	-	+3870.8
Other	-	-	-	-
Support	-	+118.0	-	+118.0
Subtotal	+64.2	-5992.1	-	-5927.9
Current Changes:				
Economic	-11.5	-1740.5	-	-1752.0
Quantity	-	-	-	-
Schedule	-	+153.1	-	+153.1
Engineering	+2.4	-	-	+2.4
Estimating	+8.6	+1943.1	-	+1951.7
Other	-	+280.0	-	+280.0
Support	-	-110.6	-	-110.6
Subtotal	-0.5	+525.1	-	+524.6
Total Changes	+63.7	-5467.0	-	-5403.3
Current Estimate	3877.7	61799.8	-	65677.5

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	3405.0	42228.1	-	45633.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	+88.6	-	+88.6
Engineering	+95.0	+797.9	-	+892.9
Estimating	+146.2	+4214.5	-	+4360.7
Other	-	-	-	-
Support	-	+104.6	-	+104.6
Subtotal	+241.2	+5205.6	-	+5446.8
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+2.2	-	-	+2.2
Estimating	+7.8	+1570.5	-	+1578.3
Other	-	+216.3	-	+216.3
Support	-	-87.8	-	-87.8
Subtotal	+10.0	+1699.0	-	+1709.0
Total Changes	+251.2	+6904.6	-	+7155.8
Current Estimate	3656.2	49132.7	-	52788.9

(U) Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

b. (U) Current Change Explanations --

(Dollars in Millions)

(1) RDT&E	<u>Base-Year Then-Year</u>	
	Base-Year	Then-Year
Revised escalation indices. (Economic)	N/A	-11.5
Acquisition Stability Reserve Funding to support Light Weight Planar Array (LWPA) (Engineering)	+2.2	+2.4
Adjustment for Current and Prior Inflation. (Estimating)	+2.1	+2.2
Adjustment for Small Business Innovative Research, NWCf rate adjustments, and various undistributed reductions (Estimating)	-3.8	-4.1

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Congressional increase for Non Propulsion Electronic Systems (NPES) (Estimating)	+7.4	+8.0
Revised estimate to reflect lower OSD indices (Estimating)	+2.1	+2.5
RDT&E Subtotal	<u>+10.0</u>	<u>-0.5</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-1754.8
Economic adjustment for negative program change. (Economic)	N/A	+14.3
Stretchout of annual procurement buy profile. Ship moved from FY06 to FY10. (Schedule)	0.0	+153.1
Adjustment for Current and Prior Inflation. (Estimating)	+119.6	+126.9
Cost to Complete funds to offset Ship Cost Adjustment (SCA) shortfalls (Estimating)	+311.0	+329.1
SSN 23 Workload Savings Adjustment (Estimating)	-42.0	-45.0
Government Wide across the board reduction (Estimating)	-1.7	-1.8
Navywide Outyear Adjustment (Estimating)	+1015.0	+1185.7
Adjustments to reflect final Budget Controls (Estimating)	-1435.5	-1650.0
Newport News Shipbuilding (NNS) Memorandum of Understanding (MOU) rate savings (Estimating)	-21.4	-24.5
Curriculum Development for crew training (Estimating)	+13.3	+15.4
Revised estimate to reflect lower OSD approved indices (Estimating)	+1727.2	+2136.2
NNS Strike Settlement costs (Other)	+216.3	+280.0
Reprogramming for Reactor Overhaul (ROH) (CVN68) (Estimating)	-82.9	-87.5
Logistics support adjustments (Support)	-119.9	-152.0
Realignment of previously reported Sailaway & Support Variances (Support)	+32.1	+41.4
Realignment of previously reported Sailaway & Support Variances (Estimating)	-32.1	-41.4
Procurement Subtotal	<u>+1699.0</u>	<u>+525.1</u>

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2369.36	-457.28	--	+33.60	+39.91	+194.08	+9.33	+0.25	-180.11	2189.25

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2242.23	-449.47	--	+33.60	+36.36	+187.69	+9.33	+0.25	-182.24	2059.99

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	AUG 1994	AUG 1994	N/A	AUG 1994
Milestone II	JUN 1995	JUN 1995	N/A	JUN 1995
Milestone III	OCT 2007	OCT 2007	N/A	OCT 2007
FUE/IOC	OCT 2005	OCT 2005	N/A	JUN 2006
Total Cost	N/A	71080.8	N/A	65677.5
Total Quantity	N/A	30	N/A	30
Prog Acq Unit Cost	N/A	2369.36	N/A	2189.25

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

a. RDT&E --

(U) Design Studies IPPD:  
Gen Dyn, EB Corp, Groton, CT  
N00024-95-C-2103, CPFF  
Award: February 21, 1995  
Definitized: February 21, 1995

Initial Contract Price		
Target	Ceiling	Qty
\$439.2	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$522.1	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$522.1	\$522.1

Explanation of Change:

(U) This is a level of effort contract and does not invoke Earned Value Measurement.

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15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this CPFF contract.

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>Nuclear Components:</u>					
Bechtel Plant Machinery, Pittsburg PA					
N00024-96-C-4051, CPFF			\$105.6	N/A	0
Award: December 15, 1995					
Definitized: December 15, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$278.5	N/A	0	\$263.0	\$272.3	

Explanation of Change:

(U) Increase in target price from \$218.5 to \$278.5 reflects the modification of the contract for FY99 component buy.

Cost and Schedule variance reporting is not required on this CPFF contract.

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>Nuclear Components:</u>					
Bechtel Plant Machinery, Pittsburgh PA					
N00024-99-C-4006, CPFF			\$118.3	N/A	
Award: December 9, 1998					
Definitized: December 9, 1998					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$239.8	N/A		\$234.4	\$234.4	

Explanation of Change:

(U) Increase in target price from \$118.3 to \$239.8 reflects the modification of the contract for FY99 component buy.

Cost and Schedule variance reporting is not required on this CPFF contract.

15b. (U) Contract Information (Cont'd):

b. Procurement --			Initial Contract Price		
(U) IPPD96 Contract:			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Gen Dyn, EB Corp, Groton, CT			\$1587.2	N/A	0
N00024-96-C-2100, CPFF					
Award: January 29, 1996					
Definitized: May 9, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1587.2	N/A	0	\$1469.6	\$1469.6	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (12/31/99)			\$-39.4	\$-14.5	
Net Change			\$-84.2	\$-15.7	
			\$-44.8	\$-1.2	

Explanation of Change:

(U) The cost and schedule variance changes include the adjudication of High Frequency Conformal Array (HFCA), Non Propulsion Electronic System (NPES) and Exterior Communications System (ECS) efforts. The increase in Program Managers Estimate at Completion (PMEAC) reflects the increase in the Contract Budget Baseline (CBB). CPI decline was arrested Fall 99.

(U) SSN774:			Initial Contract Price		
Gen Dyn, EB Corp, Groton, CT			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00024-96-C2100A, CPFF			\$1028.0	N/A	1
Award: September 30, 1998					
Definitized: September 30, 1998					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1028.9	N/A	1	\$1101.1	\$1119.2	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (12/31/99)			\$0.0	\$0.0	
Net Change			\$-16.9	\$-6.3	
			\$-16.9	\$-6.3	

Explanation of Change:

(U) Cost and schedule variance changes reflect impacts related to: computer and engineered component cost, Newport News Shipbuilding (NNS) labor rate, overhead cost and NNS labor rates overhead cost increases.

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VIRGINIA CLASS SUB, December 31, 1999

15. (U) Contract Information (Cont'd):

(U) SSN 775:			Initial Contract Price		
Gen Dyn, EB Corp, Groton, CT			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00024-96-C2100B, CPFF			\$1083.7	N/A	1
Award: December 8, 1998					
Definitized: December 8, 1998					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1080.4	N/A	1	\$980.9	\$1011.8	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (12/31/99)			\$0.0	\$0.0	
Net Change			\$-14.8	\$-4.7	
			\$-14.8	\$-4.7	

Explanation of Change:

(U) Cost and schedule variance changes reflect impacts related to: computer and engineered component cost, Newport News Shipbuilding (NNS) labor rate, overhead cost and NNS labor rates overhead cost increases.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY92-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-20)	<u>Total</u>
RDT&E	2484.0	286.8	237.5	869.4	3877.7
Procurement	6268.0	746.7	1711.2	53073.9	61799.8
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	8752.0	1033.5	1948.7	53943.3	65677.5

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VIRGINIA CLASS SUB, December 31, 1999

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

b. Annual Summary -- VIRGINIA CLASS SUBMARINE

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Sailaway FY 1995 Dollars Nonrec	Sailaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				23.9	22.8
1993				68.0	66.3
1994				367.5	365.3
1995				449.8	455.7
1996				416.4	429.0
1997				435.6	454.2
1998				363.8	382.4
1999				290.6	308.3
2000				267.0	286.8
2001				217.8	237.5
2002				171.3	189.7
2003				156.4	176.1
2004				145.6	167.3
2005				132.5	155.3
2006				89.5	107.0
2007				53.3	65.0
2008				7.2	9.0
Subtotal				3656.2	3877.7

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1995 Dollars Nonrec	Sailaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996		161.6		764.5	790.3
1997		298.1		744.1	775.7
1998	1	837.7	2021.4	2542.0	2682.3
1999	1	53.6	1955.2	1887.2	2019.7
2000				686.2	746.7
2001	1		1885.1	1545.0	1711.2
2002	1		1796.8	1740.2	1964.0
2003	1		1718.4	1697.9	1953.9
2004	1		1725.7	1693.0	1987.4
2005	1		1711.0	2002.2	2397.2
2006	1		1669.2	2540.0	3102.1
2007	2		3201.9	3684.0	4589.1
2008	3		4616.0	4542.2	5771.3
2009	3		4533.3	4493.8	5823.9
2010	3		4480.1	4113.8	5438.4
2011	3		4500.6	4240.3	5717.6
2012	2		2995.5	3570.9	4911.4

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VIRGINIA CLASS SUB, December 31, 1999

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1995 Dollars Nonrec	Sailaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2013	3		4437.7	3392.4	4759.2
2014	3		4419.8	2720.1	3892.2
2015				93.5	136.4
2016				95.2	141.7
2017				82.6	125.4
2018				66.6	103.2
2019				58.8	92.9
2020				22.2	35.8
<b>Subtotal</b>	<b>30</b>	<b>1351.0</b>	<b>47667.7</b>	<b>49018.7</b>	<b>61669.0</b>

(U) The totals reflected for the FY98 and FY99 Ships include Cost-To-Complete (CTC) funds specifically: \$259.7(FY98) and \$69.3(FY99). These funds will not be received until the outyears \$119M(FY01), \$180M(FY02), and \$30M(FY03)

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Sailaway FY 1995 Dollars Nonrec	Sailaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002				22.6	25.2
2003				45.5	51.7
2004				19.2	22.3
2005				26.7	31.6
2006					
<b>Subtotal</b>				<b>114.0</b>	<b>130.8</b>

	Qty	Sailaway Dollars Nonrec	Sailaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
<b>Grand Total</b>	<b>30</b>	<b>1351.0</b>	<b>47667.7</b>	<b>52788.9</b>	<b>65677.5</b>

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 4491

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VIRGINIA CLASS SUB, December 31, 1999

17b. (U) Delivery/Expenditure Information (Cont'd):

(U) Percent Total Program Expended: 6.8%

(U) Total expenditures as of 01 Feb 00.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
As of date: 01 Feb 00. Operations and Support (O&S) costs are developed at the ship level, on an annual cost per ship basis by cost category and appropriation, with total and annual average cost over the submarine's expected service life. Costs are estimated for all categories listed in the CAIG O&S Cost Estimating Guide using historical data from operating submarine classes. Maintenance and Personnel costs are the major contributors to the total O&S Program. The source of this cost estimate is the VIRGINIA Class Total Ownership Cost Baseline. Antecedent data is not available.

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per Ship	N/A
Mission Pay & Allowances	6.2	0.0
Unit Level Consumption	3.4	0.0
Intermediate Maintenance	2.1	0.0
Depot Maintenance	12.1	0.0
Contractor Support	0.4	0.0
Sustaining Support	5.3	0.0
Indirect Costs	0.0	0.0
Indirect Support	5.4	0.0
Total	34.9	0.0

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AF-4. AWACS RSIP

\*\*\* ~~SECRET~~ \*\*\*

SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: E-3 AWACS RSIP

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): E-3 AWACS Radar System Improvement Program (RSIP)
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:  

ESC/AW	COL BRADLEY W. BUTLER
3 EGLIN STREET	Assigned: June 21, 1999
HANSCOM AFB, MA 01731-2115	DSN 478-6899; COMM (781) 377-6899
	Brad.Butler@hanscom.af.mil
4. (U) Program Elements/Procurement Line Items:  
RDT&E:  
(U) PE 0207417F (Shared) Project 67411L (Shared)  
PROCUREMENT:  
(U) APPN 3010 ICN 11411L (Air Force)

**CLEARED**  
FOR OPEN PUBLICATION  
**AS AMENDED**  
MAR 14 2000 4

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

BAF/PAS

00 - - 0279

CONGRESSIONAL

00-C-0724

~~Classified by E-3 SECURITY CLASSIFICATION GUIDE, 24 June 1997  
Downgrade instruction: Subject to Automatic Downgrade  
Declassify on: Originating Agency Determination Required (OADR)~~

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5. (U) References:

SAR Baseline (Production Estimate):

(U) AFAE Approved Acquisition Program Baseline (APB) dated March 6, 2000.

Approved Program:

(U) AFSAE Approved Acquisition Program Baseline (APB) dated March 6, 2000.

6. (U) Mission and Description:

(U) The purpose of the RSIP modification is to provide Air Combat Command (ACC) with new and improved capabilities for the E-3 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 against the projected operational environment of the 1990's and into the next century.

The RSIP program 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 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:

(1) Replaces the existing Radar Data Correlator (RDC) and Digital Doppler Processor (DDP) with the Surveillance Radar Computer (SRC).

(2) Modifies the existing Radar Control Maintenance Panel (RCMP) with dual Cathode Ray Tube (CRT) displays and a new keyboard and cursor control.

(3) Completes minor redesigns of the receiver, the Stable Local Oscillator (STALO), the Synchronizer, and the antenna phase control electronics, and replaces the analog to digital converter.

(4) Replaces the existing Surveillance Radar Computer Program (SRCP) with a new SRCP.

7. (U) Executive Summary:

(U) The Milestone II approval to start EMD occurred in December 1988. EMD contracts were awarded in September 1989 to Northrop Grumman (formerly Westinghouse) for the radar upgrade, and to Boeing for system integration and testing. Test flights conducted in February-March 1990 successfully demonstrated the RSIP pulse compression waveform concept. Radar algorithm simulations in June 1990 confirmed the viability of the RSIP two-slant signal processing technique. The 8.6 dB lab radar demo was successfully completed in September 1992, and the government verified test results showing a 10.34 dB improvement in the laboratory environment. Also in 1992, NATO formally joined the program by way of a Cooperative International R&D Agreement.

In November 1993, Test System-3 (TS-3) Installation & Check Out (I&CO) was completed, and the first Development Test and Evaluation flight occurred. The qualification phase of the DT&E flight test program began in November 1994;



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

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Increased Facilities Management due to plus up for FOT&E, Software Support, and IDECM restructure. (Support)	+108.3	+136.8
Adjustment for current and prior year inflation. (Support)	+2.0	+5.5
Procurement Subtotal	+219.7	+5.6

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
94.58	-16.59	+19.83	+1.93	-2.51	+1.09	--	-12.58	-8.83	85.75

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
88.75	-16.21	+14.99	+2.20	-2.51	+0.93	--	-12.58	-13.18	75.57

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	DEC 1991	MAR 1992	N/A	MAY 1992
Milestone III	DEC 1998	JAN 2000	N/A	MAR 2000
FUE/IOC	N/A	SEP 2000	N/A	SEP 2000
Total Cost	3974.4	94583	N/A	46988.6
Total Quantity	0	1000	N/A	548
Prog Acq Unit Cost	0	94.58	N/A	85.75

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

Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	4883.3	49076.3	-	53959.6
Previous Changes:				
Quantity	-	-14908.1	-	-14908.1
Schedule	-153.6	+832.0	-	+678.4
Engineering	-	-124.1	-	-124.1
Estimating	+123.5	+35.4	-	+158.9
Other	-	-	-	-
Support	-	-4140.0	-	-4140.0
Subtotal	-30.1	-18304.8	-	-18334.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	+8.5	-	+8.5
Engineering	-	+28.8	-	+28.8
Estimating	-19.6	+72.1	-	+52.5
Other	-	-	-	-
Support	-	+110.3	-	+110.3
Subtotal	-19.6	+219.7	-	+200.1
Total Changes	-49.7	-18085.1	-	-18134.8
Current Estimate	4833.6	30991.2	-	35824.8

b. Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.2
Congressional reductions, rate adjustments and funding realignment to improvements project. (Estimating)	-20.4	-25.6
Adjustment for current and prior year inflation. (Estimating)	+0.8	+1.0
RDT&E Subtotal	<u>-19.6</u>	<u>-24.8</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-329.7
Increase due to shifting 3E purchases from FY02 to FY10. (Schedule)	+8.5	+32.6
Increase due to addition of Escape System Ordnance, ALE-50 Dispensers and Protectors, etc. (Engineering)	+28.8	+35.3
Increase due to new contractor FPRA rates adjustment (Estimating)	+51.7	+99.6
Adjustment for current and prior year inflation. (Estimating)	+20.4	+25.5

12. Unit Cost Summary:

	UCR Baseline (OCT 1997 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1990 BY\$)	34030.8	35824.8	
(2) Quantity	548	548	
(3) Unit Cost	62.100	65.374	+5.27
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1990 RYS)	29147.5	30991.2	
(2) Quantity	548	548	
(3) Unit Cost	53.189	56.553	+6.32

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	5832.6	88750.4	-	94583.0
Previous Changes:				
Economic	-204.1	-8555.1	-	-8759.2
Quantity	-	-31895.2	-	-31895.2
Schedule	-143.4	+1170.6	-	+1027.2
Engineering	-	-1409.6	-	-1409.6
Estimating	+113.7	+384.6	-	+498.3
Other	-	-	-	-
Support	-	-7036.7	-	-7036.7
Subtotal	-233.8	-47341.4	-	-47575.2
Current Changes:				
Economic	-0.2	-329.7	-	-329.9
Quantity	-	-	-	-
Schedule	-	+32.6	-	+32.6
Engineering	-	+35.3	-	+35.3
Estimating	-24.6	+125.1	-	+100.5
Other	-	-	-	-
Support	-	+142.3	-	+142.3
Subtotal	-24.8	+5.6	-	-19.2
Total Changes	-258.6	-47335.8	-	-47594.4
Current Estimate	5574.0	41414.6	-	46988.6

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

F/A-18E/F

**AS AMENDED**  
(Policy)

Cost data in this SAR reflects ~~the~~ Defense ~~planning~~ ~~Guidance~~ following the Quadrennial Defense Review (QDR) which reduced total F/A-18E/F procurement from 1,000 to 548.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>1000</u>	<u>548</u>	<u>548</u>
Total	1000	548	548

Note: Excludes 0 RDT&E prototypes from the SAR Baseline and 7 from the Current Estimate that are not considered fully configured.

LRIP quantities approved at the 1992 DAB were 12 aircraft in FY97, 12 in FY98, and 18 in FY99. The current LRIP quantities are 12 aircraft in FY97, 20 in FY98, and 30 in FY99. This quantity was approved during the LRIP DAB in March 1997 and was below the 10% guideline for LRIP quantities. The Quadrennial Defense Review (QDR) subsequently reduced the total procurement to a range of 548 to 785 aircraft. Due to the overall aircraft quantity reduction caused by the QDR, the LRIP quantities are above the current 10% guideline. The final quantity will be determined based on future decisions for the Joint Strike Fighter. Consequently, the LRIP quantities remain as approved during the March 1997 DAB.

c. Foreign Military Sales -- None.

d. Nuclear Costs --  
N/A

10a. Performance Characteristics (Cont'd):

3 external tanks: 2 AIM-9 + 4 MARK 83 LD + FLIR/TIN and Low Drag Pylons

Note: Launch: Catapult WOD (C-13 Catapult:TCGW) (kts) should read  
Launch: Catapult WOD (C-7 Catapult:MaxTOGW) (kts).

b. Current Change Explanations --

(Ch-1): Changes to Key Performance Parameters (KPPs) current estimates are based on latest configuration changes and current flight-derived performance database.

(Ch-2): Current estimate reflects weight status #89 as of January 15, 2000. Previous SARs reported specification (SPEC) weight.

(Ch-3): Due to stable aircraft configuration, F/A-18E/F BIT performance has remained constant since entering OPEVAL. Soon the program will enter a developmental test period with several configuration changes to OPEVAL configuration. It is anticipated that BIT performance will degrade initially then improve as corrective actions are taken.

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

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	4883.3	4883.3	4833.6
Procurement	49076.3	29147.5	30991.2
Recurring Flyaway	(36450.2)		(23282.4)
Non-Recurring	(368.1)		(727.8)
Ancillary	(3858.5)		(2611.2)
Total Flyaway	(40676.8)		(26621.4)
Total Other Wpn Sys			(0.0)
Peculiar Support	(4301.9)		(3598.9)
Initial Spares	(4097.6)		(770.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1990 Base-Year \$	53959.6	34030.8	35824.8
Escalation	40623.4	13451.9	11163.8
Development (RDT&E)	(949.3)	(949.3)	(740.4)
Procurement	(39674.1)	(12502.6)	(10423.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	94583.0	47482.7	46988.6

Pre-development funding of \$36.6M in FY90 base year dollars is reflected in the Development (RDT&E) current estimate. The \$36.6M (BY\$) was not a part of the E&MD estimate and is not to be included in the approved \$4.883B development cap.

10a. Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>	
Specific Excess Power (Max Thrust, .9M, 1G, 10kft) (fps)	650	650 / >600	TBD	648	(Ch-1)
Acceleration (.8M to 1.2M at 35kft) (sec)	60	60 / <70	TBD	65	(Ch-1)
Additional Internal Fuel Capacity (lbs) (greater than C/D)	N/A	3000 / 3000	TBD	4090	(Ch-1)
SUITABILITY PARAMETERS (Specified in F/A-18E/F ORD)					
Mean Flight Hours Between Maintenance Actions	0.6	N/A / N/A	TBD	N/A	
Mean Flight Hours Between Failures 1/ Mean Time Between Operational Mission Failure (MTBOMF) (Replaces MFHBF)	2.0	N/A / N/A	TBD	N/A	
Maintenance Hours per flight hour (O&I-Level Unsched)	N/A	> 3.2 / > 2.6	TBD	7.2	(Ch-1)
Direct Maintenance Manhours per Flight Hour (DMMH/FH) (Replaces MH/FH)	12.0	N/A / N/A	TBD	N/A	
OTHER PARAMETERS (desired to achieve maximum performance)	N/A	< 5.0 / < 9.0	TBD	.59	(Ch-1)
Built-In Test (All Avionics) 1/ Fault Detection (%)	75	75 / 65	TBD	99	
Fault Isolation (%)	90	90 / 85	TBD	99.5	(Ch-3)
False Alarm Rate (%)	30	30 / 45	TBD	16	(Ch-3)
Speed (Mach) Fighter Escort Mission Configura- tion @10,000 ft with Intermediate Rated Thrust	.98	.98 / .96	TBD	.96	
Empty Weight (lbs)	29950	29950 / 31950	TBD	30163	(Ch-2)

Note: Interdiction Mission Radius (NM) payload with:  
2 external tanks: 2 AIM-9 + 4 MARK 83 LD + FLIR/TIN

9b. Schedule (Cont'd):

(Ch-3) Navy Support Date and D-Level Maintenance Capability were changed from Dec 2003 to Mar 2004. During a Jan 2000 in-depth analysis of depot capability requirements and funding stream adjustments, the NSD date was rephased. This analysis utilized the revised lead times for depot support equipment and the projected costs to maintain the previously forecasted dates. It was deemed to be cost effective to rephase the NSD and Depot level capability dates by three months. The minor adjustment will not adversely impact the projected fleet requirements.

10. Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demon- strated Perf</u>	<u>Current Estimate</u>	
KEY PERFORMANCE PARAMETERS (KPPs) (Specified in F/A-18E/F ORD and validated by JROC)					
Deck Spot Factor (F/A-18A/B/C/D =1.2)	1.4	1.4 / <1.5	TBD	1.46	
Fighter Escort Radius (internal fuel) (Nm)	425	N/A / N/A	TBD	N/A	
Fighter Escort Radius (F/A-18E) (internal fuel) (Nm)	N/A	425 / 410	TBD	462	(Ch-1)
Interdiction Mission Radius (Nm)					
2 external tanks (retained)	400	400 / 390	TBD	444	(Ch-1)
3 external tanks (retained)	450	450 / 430	TBD	496	(Ch-1)
Combat Ceiling (max thrust) (ft)	>50000	>50000 / 50000	TBD	52,300	(Ch-1)
Carrier Suitability (Tropical Day Conditions)					
Launch: Catapult WOD (C-13 Catapult:TCGW) (kts)	25	25 / <30	TBD	28	(Ch-1)
Recovery: WOD (MK-7 MOD 3) (kts)	10	10 / <15	TBD	8	(Ch-1)
Approach Speed (kts)	140	140 / <150	TBD	142	
Recovery Payload (lbs)	9000	9000 / 9000	TBD	9794	(Ch-2)
Usable Load Factor (Subsonic; Nz) (G's)	+7.5	+7.5 / +7.5	TBD	+7.5	

9. Schedule:

a. Milestones --

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
Milestone IV/II	MAR 1992	MAR 1992	MAY 1992
Production Readiness Review (Airframe)	APR 1995	APR 1995	AUG 1995
First Engine to Test	APR 1993	APR 1993	MAY 1993
Preliminary Design Review (Airframe)	APR 1993	APR 1993	JUN 1993
Critical Design Review (Airframe)	JAN 1994	JAN 1994	JUL 1994
Preliminary Flight Qualification (Engine)	MAR 1995	MAR 1995	SEP 1995
First Flight	OCT 1995	OCT 1995	NOV 1995
Long Lead Release for LRIP	DEC 1995	DEC 1995	MAR 1996
LRIP Decision Milestone	N/A	MAR 1997	MAR 1997
Limited Production Qualification (Engine)	OCT 1996	MAR 1997	APR 1997
LRIP Contract Award	JAN 1997	JAN 1997	MAY 1997
Full Production Qualification (Engine)	OCT 1997	AUG 1998	DEC 1998
LRIP First Delivery	DEC 1998	DEC 1998	DEC 1998
Milestone III	JAN 2000	JAN 2000	MAR 2000
Full Rate Production Contract Award	JAN 2000	JAN 2000	APR 2000 (Ch-1)
DT&E			
DT-IIA	OCT 1995	OCT 1995	NOV 1995
DT-IIB	NOV 1996	NOV 1996	DEC 1996
DT-IIC	NOV 1997	NOV 1997	DEC 1997
DT-IID	JUL 1998	JUL 1998	OCT 1998
DT-IIE	OCT 1998	OCT 1998	APR 1999
IOT&E			
OT-IIA	MAR 1997	NOV 1997	NOV 1997
OT-IIB	DEC 1997	DEC 1997	JUN 1998
OT-IIC	MAR 1999	MAR 1999	MAY 1999
FOT&E			
DT-III	FEB 2000	FEB 2000	APR 2000
OT-III	FEB 2000	FEB 2000	MAY 2000 (Ch-2)
O-Level Maintenance Capability (OPEVAL)	MAR 1999	MAR 1999	MAY 1999
IOC	SEP 2000	SEP 2000	SEP 2000
I-Level Maintenance Capability			
WRA TPS and Modified TPSS (IOC)	SEP 2000	SEP 2000	SEP 2000
New SRA TPS (IOC + one year)	SEP 2001	SEP 2001	SEP 2001
Material Support Date	OCT 2002	OCT 2002	APR 2003
Navy Support Date	OCT 2003	OCT 2003	MAR 2004 (Ch-3)
D-Level Maintenance Capability	OCT 2003	OCT 2003	MAR 2004 (Ch-3)

b. Current Change Explanations --

(Ch-1) Full Rate Production (FRP) Contract Award was changed from March 2000 to April 2000 to accommodate the required notification of Congress following the FRP milestone decision by ASN (RDA) scheduled in March 2000.

(Ch-2) OT-III was changed from June 2000 to May 2000 based on the original 16E Systems Configuration Set (SCS) schedule. Beginning of Follow-on operational test of ATFLIR rephased to best accommodate LRIP-I decision.



7. Executive Summary (Cont'd):

Acquisition Contracting (AAC) for full rate production aircraft. The LRIP III full funding contracting was signed February 16, 1999 and the full rate production AAC contract was signed March 19, 1999. Currently, the program is continuing the briefing path to Milestone III Navy Program Review. All exit criteria for Navy Program Review have been satisfied. Purpose for the review is to obtain full funding authority for MYP and FRP. Approval for FRP is expected in April 2000 following appropriate certifications to Congress. MYP was approved October 1999 and definitization of the MYP contract is expected April 2000 following FRP approval consistent with section 121 of the FY2000 Defense Authorization Act and 10USC2306.

Operational test period (OT-IIC) was successfully completed in November 1999. The F/A-18E/F was found to be operationally suitable and operationally effective. The final report was submitted by COMOPTEVFOR on February 14, 2000.

Program projection indicates the completion of EMD under the original cost estimate of \$4.88B (FY90\$). The current production cost of the F/A-18E/F is 116% of the F/A-18C/D when normalized for production rates and inflation. This estimate is well below the 125% Congressional cost limit.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

**5. References:**

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline dated 11 June 1992.

Approved Program:

NAE Approved Acquisition Program Baseline (APB) dated October 24, 1997.

**6. Mission and Description:**

The F/A-18E/F will be the second major model upgrade since F/A-18 aircraft program inception. The F/A-18E (single seat) and the F/A-18F (two seat) will be a high performance, twin engine, mid-wing, multi-mission tactical aircraft designed to replace F/A-18C (single seat), F/A-18D (two seat), A-6 and F-14 aircraft as they reach the end of service life and retire. The F/A-18E/F will be designed primarily to meet current Navy and Marine Corps fighter escort, interdiction, fleet air defense and close air support mission requirements. Enhancements will include the increased range, improved survivability, and improved carrier suitability required for the F/A-18 to continue its key strike fighter role against the advanced threat of the late 1990's and beyond.

**7. Executive Summary:**

The F/A-18E/F program is currently on cost, on schedule, and meeting all performance requirements.

Aircraft is currently 401 pounds below (better than) SPEC weight.

The airframe EMD contract is 99% complete and possesses a cost performance index (CPI) of 99% and a schedule performance index (SPI) of 100%. The airframe LRIP I contract is 95% complete and possesses a CPI of 102% and an SPI of 98%. The airframe LRIP II/III contract is 38% complete and possesses a CPI of 108% and an SPI of 98%. The engine EMD contract is 99% complete and possesses a CPI of 92% and an SPI of 100%. The engine LRIP I contract is 99% complete and possesses a CPI of 102% and an SPI of 99%. The engine LRIP II/III contract is 29% complete and possesses a CPI of 101% and an SPI of 101%.

The FY2000 Presidents Budget includes the proposed Multi-Year Procurement (MYP) covering the purchase of 222 F/A-18E/F aircraft. This report is based on the FY2001 Congressional Budget submission reflecting the purchase of 219 F/A-18E/F aircraft due to a reduction of 3 aircraft in FY02. MYP covers the procurement of F/A-18E/F in FY2000 through FY2004 under a single, five year fixed price incentive fee type contract, and supporting the first 5 years of Full-Rate Production (FRP). MYP is structured to achieve significant savings (7.4%) while providing unprecedented quantity flexibility for emergent requirements.

To date, the Navy has taken delivery of all the LRIP I aircraft (12 F/A-18E/F) and 4 LRIP II aircraft. LRIP I aircraft delivery completed in December 1999. The first LRIP II aircraft delivered December 1999. The Navy Program Review III Acquisition Decision Memorandum (ADM) was signed by ASN (RDA) on January 29, 1999. This ADM authorized full funding for LRIP III aircraft and Advanced

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: F/A-18E/F

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): F/A-18E/F Naval Strike Fighter (HORNET)

2. DoD Component: Navy

3. Responsible Office and Telephone Number:

PROGRAM EXECUTIVE OFFICER	RADM (SEL) J.B. GODWIN, III, USN
TACTICAL AIRCRAFT PROGRAMS (PMA 265)	Assigned: April 18, 1997
47123 BUSE ROAD, UNIT #IPT	DSN 757-7677; COMM (301) 757-7677
PATUXENT RIVER, MD 20670-1547	godwinjb@navair.navy.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0204136N

PROCUREMENT:

APPN 1506 ICN 014500 (Navy)

APPN 1506 ICN 060510 (Navy)

No Security Objection  
to Open Publication

(AS AMENDED)

00-00130

MAR 27 2000

*John Newell*  
Office of the Chief of  
Naval Operations  
Dept. of the Navy

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

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ATACMS/BAT, December 31, 1999

18b. (U) Operating and Support Costs (Cont'd):  
ATACMS BLK II/IIA

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

Cost Element	Avg Annual Cost for Total Blk II Qty	Avg Annual Cost Per Antecedent
Intermediate Maintenance	0.0	0.0
Depot Maintenance	1.2	0.0
Contractor Support	1.3	0.0
Sustaining Support	2.8	0.0
Indirect Costs	0.0	0.0
Total	6.2	0.0

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18. (U) Operating and Support Costs:  
BAT/BAT P3I

a. (U) Assumptions and Ground Rules --

The submunition is considered a certified round; therefore, O&S cost will be minimal. It will consist of stockpile reliability tests for recertification and minimal depot maintenance. Based on the Level of Repair Analysis (LORA) and the associated Economic Analysis, contractor logistic support (CLS) is planned for the BAT. There is no antecedent system.

Average Annual Cost reflects average annual cost for total BAT quantity (15707).

Cost estimate dated February 2000.

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

Cost Element	Avg Annual Cost for Total BAT Qty	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.3	0.0
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.7	0.0
Sustaining Support	2.5	0.0
Indirect Costs	0.0	0.0
Total	3.5	0.0

ATACMS BLK II/IIA

a. (U) Assumptions and Ground Rules --

ATACMS Block II will be fired from the Multiple Launch Rocket System (MLRS) M270A1 launcher within the MLRS organizational units. Manning/crew support is provided by the MLRS organizational unit. ATACMS Block II will be a certified round. Maintenance will be determined on the basis of a Stockpile Reliability Program (SRP). There is no antecedent system.

Average Annual Cost reflects average annual cost for total ATACMS Block II quantity (1206).

Cost estimate dated February 2000.

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

Cost Element	Avg Annual Cost for Total Blk II Qty	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.8	0.0
Unit Level Consumption	0.1	0.0

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ATACMS/BAT, December 31, 1999

16b. (U) Program Funding Summary (Cont'd):  
ATACMS BLK II/IIA

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2009	93		87.2	87.2	123.9
2010	98		88.8	88.9	128.8
2011	120		95.4	95.5	141.2
2012	149		112.9	102.9	155.2
2013				5.4	8.3
2014				4.6	7.2
Subtotal	1206	2.1	1229.6	1244.2	1669.2

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1212	2.1	1229.6	1523.0	1991.6

17. (U) Delivery/Expenditure Information:

BAT/BAT P3I

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1153.4

(U) Percent Total Program Expended: 29.2%

ATACMS BLK II/IIA

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 232.7

(U) Percent Total Program Expended: 11.7%

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ATACMS/BAT, December 31, 1999

16b. (U) Program Funding Summary (Cont'd):  
BAT/BAT P31

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2012	1937		120.1	113.3	170.8
2013				6.8	10.5
Subtotal	15707	44.2	1823.9	1873.8	2504.0

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	15805	44.2	1823.9	3210.4	3956.6

b. Annual Summary -- ATACMS BLK II/IIA

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				8.8	9.8
1996				47.2	53.5
1997				58.3	66.8
1998				71.7	82.8
1999				33.4	38.9
2000				36.4	43.0
2001				23.0	27.6
Subtotal	6			278.8	322.4

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	24		44.5	46.7	55.1
2000	48		69.4	71.1	85.1
2001	55	2.1	75.0	79.5	96.7
2002	67		90.5	92.8	114.8
2003	104		120.6	121.8	153.6
2004	94		96.1	97.3	125.2
2005	91		85.1	86.3	113.3
2006	84		88.1	88.2	118.1
2007	88		88.2	88.2	120.4
2008	91		87.8	87.8	122.3

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ATACMS/BAT, December 31, 1999

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

b. Annual Summary -- BAT/BAT P3I

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1984				5.2	4.2
1985				18.4	15.2
1986				37.8	32.2
1987				34.2	30.0
1988				46.0	42.0
1989				46.3	44.0
1990				40.7	40.1
1991				70.2	71.9
1992				115.6	121.1
1993				106.8	114.5
1994				111.6	121.9
1995				94.6	105.3
1996				120.8	136.9
1997				82.7	94.8
1998				121.3	140.1
1999				79.8	93.0
2000				84.4	99.7
2001				57.2	68.5
2002				48.0	58.4
2003				9.4	11.7
2004				5.6	7.1
Subtotal	98			1336.6	1452.6

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY Dollars Nonrec	Flyaway FY Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	304	10.8	68.9	80.0	94.5
2000	609	14.8	104.5	119.4	142.9
2001	741	1.3	109.7	111.0	135.0
2002	871	8.9	110.5	119.4	147.7
2003	1352	8.4	167.4	176.0	222.0
2004	1222		147.9	148.3	190.8
2005	1209		148.6	149.3	196.0
2006	1092		145.0	145.7	195.1
2007	1144		152.1	152.7	208.5
2008	1183		149.6	150.3	209.3
2009	1209		146.2	146.9	208.7
2010	1274		144.6	145.3	210.5
2011	1560		108.8	109.4	161.7

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ATACMS/BAT, December 31, 1999

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

Total Program

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

<u>Appropriation</u>	<u>Prior Years</u> (FY84-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-14)	<u>Total</u>
RDT&E	1459.0	142.7	96.1	77.2	1775.0
Procurement	149.6	228.0	231.7	3563.9	4173.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1608.6	370.7	327.8	3641.1	5948.2

BAT/BAT P3I

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

<u>Appropriation</u>	<u>Prior Years</u> (FY84-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-13)	<u>Total</u>
RDT&E	1207.2	99.7	68.5	77.2	1452.6
Procurement	94.5	142.9	135.0	2131.6	2504.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1301.7	242.6	203.5	2208.8	3956.6

ATACMS BLK II/IIA

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

<u>Appropriation</u>	<u>Prior Years</u> (FY95-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-14)	<u>Total</u>
RDT&E	251.8	43.0	27.6	-	322.4
Procurement	55.1	85.1	96.7	1432.3	1669.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	306.9	128.1	124.3	1432.3	1991.6

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15. (U) Contract Information (Cont'd):

factory test equipment, manufacturing, and test support.

b. Procurement --  
 (U) ATACMS Blk II/BAT LRIP I:  
 Lockheed Martin Missiles, Dallas TX  
 DAAH01-99-C-0121, FPI  
 Award: June 4, 1999  
 Definitized: June 4, 1999

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$134.2	\$147.7	24		

			Estimated Price At Completion	
			<u>Contractor</u>	<u>Program Manager</u>
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
	\$134.2	\$147.7	24	\$134.2

			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$0.0	\$0.0
Cumulative Variances To Date (11/21/99)			<u>\$0.3</u>	<u>\$0.0</u>
Net Change			\$0.3	\$0.0

Explanation of Change:

(U) The favorable cost variance is due to the fact that staffing for Level-of-Effort activity is running below the initial requirements.

(U) Contract Comments:

Contract Target Price does not include FFP portion of the contract (\$4.3M).

(U) ATACMS Blk II/BAT LRIP II:  
 Lockheed Martin Missiles, Dallas TX  
 DAAH01-99-C-0121, FFP  
 Award: December 23, 1999  
 Definitized: February 29, 2000

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$204.9	N/A	48		

			Estimated Price At Completion	
			<u>Contractor</u>	<u>Program Manager</u>
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
	\$204.9	N/A	48	\$204.9

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

15. (U) Contract Information (Cont'd):

(U) BAT THC:  
 Northrop Grumman Corp., Hawthorne CA  
 DAAH01-98-C-0105, FPIF  
 Award: May 1, 1998  
 Definitized: May 1, 1998

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
			\$75.0	\$84.5	88
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$84.5	\$95.1	88	\$84.5	\$84.5	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
			\$0.3	\$-2.8	
Cumulative Variances To Date (11/19/99)			<u>\$-2.1</u>	<u>\$-4.0</u>	
Net Change			\$-2.4	\$-1.2	

Explanation of Change:

(U) The unfavorable schedule variance is due primarily to the delay in hardware deliveries from the seeker subcontractor, resulting from engineering issues involving completion of the proof of station validation. The unfavorable cost variance is primarily due to the additional non-recurring effort to resolve subassembly integration.

(U) Contract Comments:

The Current Contract Price (Target and Ceiling) and Estimated Price at Completion (Contractor and Program Manager) include authorized unpriced work.

(U) P3I BAT Continued Dev:  
 Northrop Grumman Corp., Linthicum Heights MD  
 DAAH01-99-C-0154, CPIF  
 Award: July 28, 1999  
 Definitized: July 28, 1999

			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
			\$139.7	\$0.0	0
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$139.7	\$0.0	0	\$139.7	\$139.7	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
			\$0.0	\$0.0	
Cumulative Variances To Date (01/23/00)			<u>\$0.3</u>	<u>\$-3.3</u>	
Net Change			\$0.3	\$-3.3	

Explanation of Change:

(U) The favorable cost variance is attributed to a delay in processing interdivisional labor transfers. The unfavorable schedule variance is driven by delays in the receipt of material for subsystem development,

15. (U) Contract Information (Cont'd):

(U) Contract Comments:

The increase in the Estimated Price at Completion is due to growth in the subcontracted portions of this effort.

This is a final report for this contract. The period of performance, which was extended at no cost to the government, is essentially complete. The remaining effort consists of contract close out activity and the receipt of long-lead production and subcontract material from the warhead and electronic safe and arm device (ESAD) subcontractors.

(U) <u>ATACMS Blk II Cont Dev:</u>			Initial Contract Price		
Vought Systems, Dallas, TX	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
DAAH01-95-C-0001, CPIF	\$155.2	N/A	0		
Award: July 12, 1995					
Definitized: July 12, 1995					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$186.3	N/A	0	\$186.3	\$191.7	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (11/21/99)			\$-4.4	\$-4.1	
Net Change			\$-6.8	\$-3.0	
			\$-2.4	\$1.1	

Explanation of Change:

(U) The favorable change in the schedule variance is primarily due to the recovery of activities which were previously behind schedule. These include design development and qualification testing for the global positioning system antenna and special tooling/special test equipment for the submunition dispenser. The unfavorable change in the cost variance is primarily due to the additional effort required by the contractor in several areas, including Functional Configuration Audit/Physical Configuration Audit, post-flight support investigation for test failure, detonation switch qualification and sequencer interface unit (SIU) redesign and qualification.

(U) Contract Comments:

The contractor developed a "Grass Roots Estimate at Completion" which shows a contract cost growth, due to a component redesign and requalification, and the incorporation of unfavorable rate adjustments resulting from a lower than anticipated business base.

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ATACMS/BAT, December 31, 1999

14b. (U) Unit Cost and Other History (Cont'd):  
ATACMS BLK II/IIA

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Fst	Oth	Spt	Total	
1.00	-0.13	+0.02	+0.09	--	+0.42	--	-0.02	+0.38	1.38

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAY 1995	N/A	MAY 1995
Milestone III	N/A	SEP 2000	N/A	MAY 2001
FUE/IOC	N/A	SEP 2000	N/A	OCT 2001
Total Cost	N/A	2301.1	N/A	1991.6
Total Quantity	N/A	1806	N/A	1212
Prog Acq Unit Cost	N/A	1.27	N/A	1.64

(U) The ATACMS Block II Program began SAR reporting in Dec 94.

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

a. RDT&E --

(U) BAT P31 DEM/VAL:  
Northrop-Grumman Corp., Hawthorne CA  
DAAH01-93-C-A014, CPIF  
Award: October 18, 1993  
Definitized: October 18, 1993

Initial Contract Price		
Target	Ceiling	Qty
\$81.8	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$125.0	N/A	0	\$125.4	\$125.4

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$0.7	\$-7.3
Cumulative Variances To Date (08/31/99)	\$-0.3	\$-3.6
Net Change	\$-1.0	\$3.7

Explanation of Change:

(U) The favorable change in schedule variance is due to an accounting adjustment on labor cost accounts in preparation for the pending closeout of the contract. The unfavorable change in cost variance is due to the subcontracts and higher than anticipated contract labor cost.

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ATACMS/BAT, December 31, 1999

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):  
BAT/BAT P3I

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.10	-0.02	+0.03	+0.02	+0.02	+0.10	--	--	+0.15	0.25

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.07	-0.02	+0.01	+0.02	--	+0.08	--	--	+0.09	0.16

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	FEB 1985	N/A	FEB 1985
Milestone II	N/A	MAY 1991	N/A	MAY 1991
Milestone III	N/A	DEC 1996	N/A	N/A
FUE/IOC	N/A	DEC 1995	N/A	N/A
Total Cost	N/A	2986.6	N/A	3956.6
Total Quantity	N/A	30993	N/A	15795
Prog Acq Unit Cost	N/A	0.1	N/A	0.25

(U) The BAT program began SAR reporting in Sep 91 after a successful Milestone II decision in May 91. Milestone III and FUE/IOC are no longer applicable as they will be tracked by the ATACMS Block II program.

ATACMS BLK II/IIA

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.27	-0.15	+0.15	+0.11	+0.01	+0.27	--	-0.02	+0.37	1.64

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ATACMS/BAT, December 31, 1999

13b. (U) Cost Variance Analysis (Cont'd):  
ATACMS BLK II/IIA

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Allocation to Schedule variance resulting from Quantity Change. (QR)(Schedule)	0.0	-23.5
Allocation to Estimating variance resulting from Quantity Change. (QR)(Estimating)	-94.5	-112.3
Stretchout of annual procurement buy profile by one year (FY 14). (QR)(Schedule)	0.0	+47.6
Increase in Schedule Variance due to termination of Block IIA. (QR)(Schedule)	+5.2	+8.1
Adjustment for Current and Prior Inflation. (Estimating)	+0.7	+0.8
Revised program estimate due to termination of ATACMS Block IIA. (QR)(Estimating)	+56.6	+77.8
Change in learning curve assumptions due to rephasing of annual buy. (QR)(Estimating)	+70.3	+95.7
Revised program estimate to reflect reprogramming actions to align funds for contract requirements. (Estimating)	+7.5	+9.0
Revised program estimate to reflect negotiated cost of low rate production contracts. (Estimating)	+52.3	+63.9
Revised program estimate to reflect budget decrease as a result of cost reduction initiatives (TACMS 2000). (Estimating)	-8.7	-11.0
Refinement of estimate to delete Initial Spares for Block IIA. (QR)(Support)	-1.9	-2.8
Refinement of estimate to delete Peculiar Support for Block IIA. (QR)(Support)	-0.7	-1.0
Refinement of estimate to delete Other Weapon System for Block IIA. (QR)(Support)	-5.1	-7.6
Procurement Subtotal	<u>-258.3</u>	<u>-367.7</u>

QR = Quantity related changes.

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ATACMS/BAT, December 31, 1999

13a. (U) Cost Variance Analysis (Cont'd):  
ATACMS BLK II/IIA

(U) Summary (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	385.4	1210.3	-	1595.7
Previous Changes:				
Quantity	-	-	-	-
Schedule	+10.3	-	-	+10.3
Engineering	-	-	-	-
Estimating	+43.9	+300.4	-	+344.3
Other	-	-	-	-
Support	-	-8.2	-	-8.2
Subtotal	+54.2	+292.2	-	+346.4
Current Changes:				
Quantity	-	-340.0	-	-340.0
Schedule	-	+5.2	-	+5.2
Engineering	+13.1	-	-	+13.1
Estimating	-173.9	+84.2	-	-89.7
Other	-	-	-	-
Support	-	-7.7	-	-7.7
Subtotal	-160.8	-258.3	-	-419.1
Total Changes	-106.6	+33.9	-	-72.7
Current Estimate	278.8	1244.2	-	1523.0

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-2.7
Economic adjustment for negative program change. (Economic)	N/A	+20.4
Redesign and qualification of components to accomplish approved cost reduction initiatives (TACMS 2000). (Engineering)	+13.1	+15.7
Adjustment for Current and Prior Inflation. (Estimating)	+0.4	+0.4
Revised program estimate due to termination of ATACMS Blk IIA program. (QR) (Estimating)	-174.3	-237.8
RDT&E Subtotal	-160.8	-204.0
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-24.6
Economic adjustment for negative program change. (Economic)	N/A	+95.2
Total Quantity Variance associated with decrease of 600 Block IIA units.	-434.5	-718.8
Quantity decrease of -600 Block IIA units from 1806 to 1206. (Quantity)	-340.0	-583.0

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13b. (U) Cost Variance Analysis (Cont'd):  
 BAT/BAT P3I

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised program estimate to reflect negotiated cost of low rate production contracts. (Estimating)	+157.7	+208.2
Refinement of estimate for Other Weapon System (data, training, and support equipment). (Support)	-2.0	-2.5
Procurement Subtotal	<u>+184.4</u>	<u>+252.6</u>

QR = Quantity related changes.

ATACMS BLK II/IIA

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	488.5	1812.6	-	2301.1
Previous Changes:				
Economic	-37.2	-226.9	-	-264.1
Quantity	-	-	-	-
Schedule	+17.1	+80.2	-	+97.3
Engineering	-	-	-	-
Estimating	+58.0	+383.2	-	+441.2
Other	-	-	-	-
Support	-	-12.2	-	-12.2
Subtotal	+37.9	+224.3	-	+262.2
Current Changes:				
Economic	+17.7	+70.6	-	+88.3
Quantity	-	-583.0	-	-583.0
Schedule	-	+32.2	-	+32.2
Engineering	+15.7	-	-	+15.7
Estimating	-237.4	+123.9	-	-113.5
Other	-	-	-	-
Support	-	-11.4	-	-11.4
Subtotal	-204.0	-367.7	-	-571.7
Total Changes	-166.1	-143.4	-	-309.5
Current Estimate	322.4	1669.2	-	1991.6

13b. (U) Cost Variance Analysis (Cont'd):  
 BAT/BAT P3I

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-2.1
	Adjustment for Current and Prior Inflation. (Estimating)	+0.9	+1.0
	Funding realignment associated with termination of Block IIA. (QR) (Estimating)	+9.5	+11.9
	RDT&E Subtotal	<u>+10.4</u>	<u>+10.8</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-25.4
	Economic adjustment for negative program change. (Economic)	N/A	+76.0
	Total Quantity Variance associated with decrease of 3731 units (termination of submunitions for Block IIA).	-289.6	-492.9
	Quantity decrease of -3731 units from 19438 to 15707. (Quantity)	-150.2	-292.2
	Allocation to Schedule variance resulting from Quantity Change. (QR) (Schedule)	0.0	-49.4
	Allocation to Engineering variance resulting from Quantity Change. (QR) (Engineering)	-9.8	-11.5
	Allocation to Estimating variance resulting from Quantity Change. (QR) (Estimating)	-129.6	-139.8
	Stretchout of annual procurement buy profile by one year (FY 14) due to termination of Block IIA. (QR) (Schedule)	0.0	+66.6
	Increase in Schedule Variance due to termination of Block IIA. (QR) (Schedule)	+1.3	+1.9
	Adjustment for Current and Prior Inflation. (Estimating)	+1.2	+1.4
	Refinement of estimate for contractor system engineering/program management costs. (Estimating)	+33.4	+43.8
	Change in learning curve assumption due to termination of Block IIA submunitions which resulted in rephasing of annual buy. (QR) (Estimating)	+68.1	+75.8
	Revised program estimate to reflect reprogramming actions to Block II to align funds for contract requirements. (Estimating)	-4.2	-5.0
	Revised program estimate for inclusion of submunition budget for Block IIA. (QR) (Estimating)	+218.5	+304.7

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ATACMS/BAT, December 31, 1999

13. (U) Cost Variance Analysis:  
BAT/BAT P3I

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	731.6	2255.0	-	2986.6
Previous Changes:				
Economic	-43.9	-294.1	-	-338.0
Quantity	-0.8	-732.1	-	-732.9
Schedule	+45.7	+253.8	-	+299.5
Engineering	+280.4	+59.0	-	+339.4
Estimating	+428.8	+719.0	-	+1147.8
Other	-	-	-	-
Support	-	-9.2	-	-9.2
Subtotal	+710.2	-3.6	-	+706.6
Current Changes:				
Economic	-2.1	+50.6	-	+48.5
Quantity	-	-292.2	-	-292.2
Schedule	-	+19.1	-	+19.1
Engineering	-	-11.5	-	-11.5
Estimating	+12.9	+489.1	-	+502.0
Other	-	-	-	-
Support	-	-2.5	-	-2.5
Subtotal	+10.8	+252.6	-	+263.4
Total Changes	+721.0	+249.0	-	+970.0
Current Estimate	1452.6	2504.0	-	3956.6

(U) Summary (FY 1991 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	702.1	1569.9	-	2272.0
Previous Changes:				
Quantity	-0.7	-435.2	-	-435.9
Schedule	+33.5	-10.1	-	+23.4
Engineering	+237.3	+39.2	-	+276.5
Estimating	+354.0	+534.2	-	+888.2
Other	-	-	-	-
Support	-	-8.6	-	-8.6
Subtotal	+624.1	+119.5	-	+743.6
Current Changes:				
Quantity	-	-150.2	-	-150.2
Schedule	-	+1.3	-	+1.3
Engineering	-	-9.8	-	-9.8
Estimating	+10.4	+345.1	-	+355.5
Other	-	-	-	-
Support	-	-2.0	-	-2.0
Subtotal	+10.4	+184.4	-	+194.8
Total Changes	+634.5	+303.9	-	+938.4
Current Estimate	1336.6	1873.8	-	3210.4

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ATACMS/BAT, December 31, 1999

11d. (U) Total Program Cost and Quantity (Cont'd):  
ATACMS BLK II/IIA

None.

12. (U) Unit Cost Summary:

BAT/BAT P3I

	UCR Baseline (Mar 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1991 BY\$)	3072.8	3210.4	
(2) Quantity	15805	15805	
(3) Unit Cost	0.194	0.203	+4.64
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1991 BY\$)	1656.6	1873.8	
(2) Quantity	15707	15707	
(3) Unit Cost	0.105	0.119	+13.33

ATACMS BLK II/IIA

	UCR Baseline (Mar 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1991 BY\$)	1523.1	1523.0	
(2) Quantity	1212	1212	
(3) Unit Cost	1.257	1.257	0.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1991 BY\$)	1244.2	1244.2	
(2) Quantity	1206	1206	
(3) Unit Cost	1.032	1.032	0.00

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11c. (U) Total Program Cost and Quantity (Cont'd):  
 BAT/BAT P3I

None.

d. (U) Nuclear Costs --  
 None.

ATACMS BLK II/IIA

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	385.4	278.9	278.8
Procurement	1210.3	1244.2	1244.2
Recurring Flyaway	(1092.3)		(1229.6)
Nonrecurring Flyaway	(89.6)		(2.1)
Total Flyaway	(1181.9)		(1231.7)
Other Weapon System	(22.0)		(8.8)
Peculiar Support	(3.6)		(1.4)
Initial Spares	(2.8)		(2.3)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1991 Base-Year \$	1595.7	1523.1	1523.0
Escalation	705.4	468.5	468.6
Development (RDT&E)	(103.1)	(43.5)	(43.6)
Procurement	(602.3)	(425.0)	(425.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2301.1	1991.6	1991.6
b. (U) Quantity --			
Development (RDT&E)	0	6	6
Procurement	<u>1806</u>	<u>1206</u>	<u>1206</u>
Total	1806	1212	1212

(U) ATACMS Block II unit of measure is a missile.

The ATACMS Block II Continued Development decision (Acquisition Decision Memo, 15 May 95) provided for an LRIP I and LRIP II quantity of 150 which exceeded the 10% guideline established in 10 U.S.C. 2400 (FASTA). However, the current LRIP quantity has changed from 85 to 72 which does not exceed the 10% guideline.

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

d. (U) Nuclear Costs --

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10b. (U) Performance Characteristics (Cont'd):  
ATACMS BLK II/IIA

b. Current Change Explanations --

(U) (Ch-1) - These performance characteristics are no longer applicable since the ATACMS Block IIA Program was terminated in the FY 01 President's Budget.

11. (U) Total Program Cost and Quantity (Dollars in Millions):  
BAT/BAT P3I

a. (U) Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	702.1	1416.2	1336.6
Procurement	1586.2	1656.6	1873.8
	(1553.6)		(1823.9)
Non-Recurring	(0.0)		(44.2)
Total Flyaway	(1553.6)		(1868.1)
Other Weapon Systems	(16.3)		(5.7)
	(16.3)		(0.0)
Total Other Wpn Sys	(32.6)		(5.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1991 Base-Year \$	2288.3	3072.8	3210.4
Escalation	698.3	679.7	746.2
Development (RDT&E)	(29.5)	(134.8)	(116.0)
Procurement	(668.8)	(544.9)	(630.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2986.6	3752.5	3956.6
b. (U) Quantity --			
Development (RDT&E)	0	98	98
Procurement	<u>30993</u>	<u>15707</u>	<u>15707</u>
Total	30993	15805	15805

(U) BAT/BAT P3I unit of measure is a submunition.

The BAT Milestone II decision (Acquisition Decision Memo, 15 May 91) provided for an LRIP quantity of 3650 submunitions which exceeded the 10% guideline established in 10 U.S.C. 2400 (FASTA). However, the current LRIP quantity has changed from 1150 to 913 which does not exceed the 10% guideline.

c. (U) Foreign Military Sales --

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10a. (U) Performance Characteristics (Cont'd):  
 ATACMS BLK II/IIA

	Development	Approved Program (APB)	Demonstrated	Current	
	Estimate (SEP)	Obj (Threshold)	Perf	Estimate	
Off-Axis Launch (+/-deg)	(b)(1)				
Reliability (Missile inflight including dispense)	.91	.91 / .91	.87	.91	
System Availability (prelaunch)	.75	.75 / .75	TBD	.75	
BLOCK IIA ATACMS					
Maximum Range (km)	500	N/A / N/A	TBD	N/A	(Ch-1)
Minimum Range (km)	70	N/A / N/A	TBD	N/A	(Ch-1)
Payload (No. BAT P3I Submunitions)	6	N/A / N/A	TBD	N/A	
Accuracy	(b)(1)				
w/GPS (meters at all ranges)	(b)(1)	N/A / N/A	TBD	N/A	(Ch-1)
Meters from min range to 107 km	(b)(1)	N/A / N/A	N/A	N/A	
w/o GPS (meters min range to 107 km)	(b)(1)	N/A / N/A	TBD	N/A	(Ch-1)
Mils at ranges beyond 107 km	(b)(1)	N/A / N/A	TBD	N/A	(Ch-1)
Off-Axis Launch (+/-deg)	(b)(1)	N/A / N/A	TBD	N/A	(Ch-1)
Reliability (Missile Inflight)	(b)(1)	N/A / N/A	TBD	N/A	(Ch-1)
System Availability (prelaunch)	(b)(1)	N/A / N/A	TBD	N/A	(Ch-1)

**AS AMENDED**

**AS AMENDED**

(U) TBDs in Demonstrated Performance signify test data is not available.

ATACMS Block II numerical requirements for Accuracy were reinstated during the JROC process as CEPs, even though as defined, they are not appropriate for a Block II system. The project's technical interpretation of Block II dispense of submunitions over the target area, though reflecting CEP in the ORD, is measured as SEP.

Demonstrated performance reflects test flights to date.

10a. (U) Performance Characteristics (Cont'd):  
 BAT/BAT P3I

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate	
ATACMS Block II Kills/Missile Load	N/A	(b)(1)			AS AMENDED
ATACMS Block IIA (Armor)	N/A	N/A / N/A	TBD	N/A	(Ch-1)
ATACMS Block IIA (TEL/MRL)	N/A	N/A / N/A	TBD	N/A	(Ch-1)

(U) TBDs in Demonstrated Performance signify test data is not available. Information provided in Demonstrated Performance column reflects test articles to date.

Reliability (Operational) - Threshold value is based on a fully matured system. Demonstrated Performance value meets expected operating reliability based on the reliability growth curve.

b. Current Change Explanations --

(U) (Ch-1) - These performance characteristics are no longer applicable since the ATACMS Block IIA Program was terminated in the FY 01 President's Budget.

ATACMS BLK II/IIA

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate	
BLOCK II ATACMS Kills/Launcher Load	(b)(1)				AS AMENDED
Maximum Range (km)	200	200 / >145	145	160	
Minimum Range (km)	25	25 / 35	41	32	
Payload (No. BAT/BAT P3I Submunitions)	13	13 / 12	13	13	
Accuracy w/ GPS (meters at all ranges)	(b)(1)				
Meters from min range to 107 km w/o GPS (meters from min range to 107 km)	(b)(1)				
Mils at ranges beyond 107 km	(b)(1)				AS AMENDED



10. (U) Performance Characteristics:

BAT/BAT P3I

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
<b>BAT</b>				
Weight (lbs)	44	44 / 44	40.64	44
Length (stowed) (ins)	36	36 / 36	36	36
Diameter (stowed) (ins)	5.5	5.5 / 5.5	5.5	5.5
Reliability (Operational)	.90	.90 / .86	.80	.90
Useful Life (yrs)	20	20 / 10	TBD	20
Lethality				
Rolled Homogeneous Armor (mm RHA)	N/A	N/A / N/A	N/A	N/A
Rolled Homogeneous Armor (RHA) Penetration (Incl residual) (mm)	N/A	(b)(1)		
Range Targets	(b)(1)			
Residual Penetra- tion (mm)	N/A	N/A / N/A	N/A	N/A
Residual Penetra- tion Behind Range Targets (mm)	N/A	(b)(1)		
Additional Pene- tration (mm)	(b)(1)	N/A / N/A	N/A	N/A
Kills/Launcher Load Large Cruise ATACMS	(b)(1)	N/A / N/A	N/A	N/A
ATACMS	(b)(1)			
<b>BAT PRE-PLANNED</b>				
<b>PRODUCT IMPROVEMENT</b>				
Weight (lbs)	N/A	44 / 44	TBD	44
Length (stowed) (ins)	N/A	36 / 36	TBD	36
Diameter (stowed) (ins)	N/A	5.5 / 5.5	TBD	5.5
Reliability (Oper- ational)	N/A	.90 / .86	TBD	.90
Useful Life (yrs)	N/A	20 / 10	TBD	20
Kills/Launcher Load				

AS AMENDED

AS AMENDED

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ATACMS/BAT, December 31, 1999

9a. (U) Schedule (Cont'd):  
ATACMS BLK II/IIA

	<u>Development</u>	<u>Approved</u>	<u>Current</u>	
	<u>Estimate (SAR)</u>	<u>Program (APB)</u>	<u>Estimate</u>	
Start	DEC 1999	AUG 2000	AUG 2000	
Complete	MAR 2000	DEC 2000	DEC 2000	
Long Lead Contract Award for Production	N/A	NOV 2000	NOV 2000	
LRIP First Delivery	JUN 2000	MAR 2001	MAR 2001	
Organic Support Capability	SEP 2000	MAR 2001	APR 2001	
Service Depot Support	SEP 2000	MAR 2001	APR 2001	
MS III	SEP 2000	MAY 2001	MAY 2001	
First Full Rate Production Contract Award	JAN 2001	MAY 2001	MAY 2001	
IOC	SEP 2000	OCT 2001	OCT 2001	
First Full Rate System Delivery	N/A	SEP 2002	NOV 2002	
BLOCK IIA ATACMS				
Milestone IV P3I Review	MAR 1998	N/A	N/A	
EMD Contract Award	APR 1998	N/A	N/A	(Ch-1)
LRIP Contract Award	JAN 2002	N/A	N/A	(Ch-1)
MS III	FEB 2002	N/A	N/A	(Ch-1)
Service Depot Support	DEC 2003	N/A	N/A	(Ch-1)
Organic Support Capability	DEC 2003	N/A	N/A	(Ch-1)
IOC	MAY 2003	N/A	N/A	(Ch-1)

b. Current Change Explanations --

(U) (Ch-1) - These milestones are no longer applicable since the ATACMS Block IIA Program was terminated in the FY 01 President's Budget.

Since the following milestones have no value for Development Estimate, Approved Program, and Current Estimate, they are no longer reported:

MILESTONE

Block IIA Milestone Review  
LRIP Decision  
Production Contract Award  
LRIP First Delivery  
First Full Rate System Delivery

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ATACMS/BAT, December 31, 1999

9a. (U) Schedule (Cont'd):  
BAT/BAT P3I

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
BAT/ATACMS BL II LRIP DAB	N/A	FEB 1999	FEB 1999
LRIP Program Review (DAB)	NOV 1994	N/A	N/A
EMD/LRIP I Contract Award	NOV 1994	N/A	N/A
Milestone III	DEC 1996	N/A	N/A
Production Contract Award	JAN 1997	N/A	N/A
Submunition Readiness Date (IOC)	DEC 1995	N/A	N/A
First Production Unit Delivery	JAN 1998	N/A	N/A
BAT P3I			
P3I Phase I Study Award	N/A	OCT 1993	OCT 1993
P3I Continued Development Contract Award	N/A	MAY 1999	JUL 1999
Block II/P3I Production Cut-In Decision (less MRL/TEL capability)	N/A	JUN 2002	JUN 2002
Block II/P3I Production Cut-In	N/A	NOV 2002	NOV 2002
Block II/P3I BAT Continued Production Decision	N/A	NOV 2004	NOV 2004 (Ch-1)

b. Current Change Explanations --

(U) (Ch-1) - The milestone "Block II/P3I BAT Continued Production Decision" is added.

ATACMS BLK II/IIA

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
BLOCK II ATACMS			
DA IPR	MAR 1995	MAY 1995	MAY 1995
Continued Development Contract Award	MAY 1995	JUN 1995	JUL 1995
Preliminary Design Review	MAY 1996	OCT 1996	OCT 1996
Hardware Critical Design Review	FEB 1997	MAR 1997	APR 1997
Software Critical Design Review	MAY 1997	JUN 1997	APR 1997
Pre-production (PPT)			
Start	MAY 1997	NOV 1997	NOV 1997
Complete	NOV 1997	MAR 1998	APR 1998
EMD OT Option Award	JAN 1998	MAR 1998	MAR 1998
Production Qualification Tests (PQT)			
Start	DEC 1997	JUN 1998	AUG 1998
Complete	JUL 1998	JAN 1999	DEC 1998
PEO LRIP Decision	DEC 1998	N/A	N/A
Block II/BAT LRIP ASARC	N/A	JAN 1999	JAN 1999
Block II/BAT LRIP DAB	N/A	FEB 1999	FEB 1999
LRIP Contract Award	JAN 1999	FEB 1999	JUN 1999
Developmental Testing (DT)			
Start	JUL 1998	APR 1999	MAR 1999
Complete	DEC 1998	JUN 2000	JUN 2000
Operational Tests (OT)			

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8c. (U) Threshold Breaches (Cont'd):

ATACMS BLK II/IIA

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

BAT/BAT P3I

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
BAT			
Milestone 0	JUN 1984	JUN 1984	JUN 1984
Milestone I	FEB 1985	FEB 1985	FEB 1985
Milestone II	MAY 1991	MAY 1991	MAY 1991
Preliminary Design Review	MAY 1991	MAY 1991	MAY 1991
EMD/FSD Contract Award	JUN 1991	JUN 1991	JUN 1991
Critical Design Review Complete	MAR 1992	MAY 1992	MAY 1992
Prototype Production			
Start	DEC 1992	N/A	APR 1993
Complete	SEP 1994	N/A	SEP 1995
Design Verification Test			
Start	JAN 1993	MAY 1993	JUN 1993
Complete	NOV 1993	OCT 1995	APR 1996
First Prototype Unit Delivery	OCT 1993	OCT 1994	OCT 1994
Contractor Development Test			
Start	NOV 1993	FEB 1996	JUL 1996
Complete	SEP 1994	DEC 1997	JAN 1998
Long Lead Program Review	DEC 1993	N/A	N/A
Long Lead Contract Award for LRIP	JAN 1994	N/A	N/A
BAT/ATACMS BL II LRIP ASARC	N/A	JAN 1999	JAN 1999

7. (U) Executive Summary (Cont'd):

The ATACMS Block II/BAT program is progressing satisfactorily. The Low Rate Initial Production (LRIP II) contract was awarded to Lockheed Martin Missiles and Fire Control - Dallas on December 23, 1999. During developmental testing (DT-1 and DT-2), test anomalies occurred; therefore, an additional DT flight test (DT-3) is planned for June 2000. This flight will include a full load of tactical BATs in their final production configuration. Operational testing is scheduled to begin in May 2000 (ground phase) and August 2000 (flight phase).

The P3I BAT program is within cost and on schedule for production cut-in in fiscal year (FY) 03.

The ATACMS Block IIA Program was terminated in the FY 01 President's Budget, February 7, 2000, for higher priority requirements. Due to the termination of Block IIA, the P3I BAT quantity was reduced by 3731 submunitions.

8. (U) Threshold Breaches:

BAT/BAT P3I

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

As a result of the Block IIA termination, procurement funds for the P3I BAT (Block IIA submunitions) were added to the BAT procurement line in FY 06-13. These funds are excess to the BAT requirement and will be deleted when the budget is revised. The addition of these funds caused Procurement and APUC breaches to the BAT/P3I BAT end item.

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ATACMS/BAT, December 31, 1999

5. (U) References:

BAT/BAT P3I

SAR Baseline (Development Estimate):

(U) Acquisition Decision Memorandum (ADM), dated May 15, 1991, approval to enter Engineering and Manufacturing Development (EMD).

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated March 14, 2000.

ATACMS BLK II/IIA

SAR Baseline (Development Estimate):

(U) AAE Acquisition Decision Memorandum (ADM) dated May 15, 1995.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated March 14, 2000.

6. (U) Mission and Description:

(U) The ATACMS Block II/BAT system supports the Army's deep fires doctrine, which calls for the delay, destruction and/or disruption of threat forces at ranges in excess of 100 kilometers. The BAT is a top attack submunition with acoustic and infrared (IR) seekers working in tandem for autonomous attack of moving armor. The Preplanned Product Improvement (P3I) BAT adds cold, stationary armor, heavy multiple rocket launchers, and surface to surface missile transporter erector launchers to the target set through seeker and warhead improvements. BAT and P3I BAT submunitions are carried deep into enemy territory by variants of the ATACMS missile, then dispensed to attack and destroy targets. The missile and submunition have a low sustainment cost as they are certified rounds (a predictable and acceptable level of reliability over a specified certification period). The ATACMS Block II missile system, a version of the currently fielded and combat-proven ATACMS Block I missile, will carry 13 BAT or P3I BAT submunitions. The ATACMS Block II and BAT Programs do not replace another system.

7. (U) Executive Summary:

(U) The BAT program was established in 1984 as a special access program and progressed through proof of principle to a successful Milestone II decision in May 1991. The ATACMS Block II was designated as the BAT carrier in December 1993 when the Army terminated participation in the Tri-Service Standoff Attack Missile (TSSAM) program. The P3I BAT received approval to continue Program Definition and Risk Reduction (PDRR) with ATACMS Block IIA (an extended range version of the Block II missile) as the carrier in February 1993. The ATACMS Block II Continued Development Program was approved in May 1995. The ATACMS Block II/BAT program received approval for system-level entry into Low Rate Initial Production (LRIP) in February 1999. The P3I BAT Continued Development Program was approved in July 1999.

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: ATACMS/BAT

AS OF DATE: December 31, 1999

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ATACMS/BAT

1. (U) Designation and Nomenclature (Popular Name): Army Tactical Missile System (TACMS)/BAT

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:

Project Manager	COL R. Kelley Griswold
Army TACMS-BAT Project Office	Assigned: September 2, 1998
ATTN: SFAE-MSL-AB	DSN 746-1141; COMM 256-876-1141
Redstone Arsenal, AL 35898-5650	Kelley.Griswold@msl.redstone.army.mil

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

RDT&E:

- (U) PE 20302A (Shared) Project D685 (Shared), D686 (Shared)
- (U) PE 63754A Project D600
- (U) PE 64754A (Shared) Project D636
- (U) PE 64768A Project D2NT, D641, D686, D687, D688

PROCUREMENT:

- (U) APPN 2032 ICN CA025A (Army)
- (U) APPN 2032 ICN CA6100 (Army)
- (U) APPN 2032 ICN CA6105 (Army)
- (U) APPN 2032 ICN CA6110 (Army)

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LPD 17 Class, December 31, 1999

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

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Millions)

Cost Element	AVG ANNUAL COST PER LPD CLASS HULL	
Mission Pay & Allowances	15.7	N/A
Unit Level Consumption	5.5	N/A
Intermediate Maintenance	0.3	N/A
Depot Maintenance	11.8	N/A
Contractor Support	0.0	N/A
Sustaining Support	2.9	N/A
Indirect Costs	1.5	N/A
Total	37.7	N/A

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1996 Dollars Nonrec	Sailaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	1		799.0	600.2	632.9
2000	2		1566.4	1414.6	1516.6
2001	2		1494.5	1444.6	1576.5
2002	2		1453.6	1464.0	1627.8
2003	2		1499.7	1612.7	1828.5
2004	2		1592.2	1534.0	1774.1
2005				120.4	142.0
2006				122.2	147.0
2007				104.5	128.3
2008				71.7	89.8
2009				37.0	47.3
Subtotal	12		9596.0	9596.0	10602.6

	Qty	Sailaway Dollars Nonrec	Sailaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	12		9596.0	9693.6	10700.1

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 461.4

(U) Percent Total Program Expended: 4.3%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
 The costs include all personnel, equipment, supplies, software and services including support associated with operating, modifying, maintaining, supplying, training and supporting the LPD 17 Program. The primary source of data was the Visibility and Management of Operating and Support Costs (VAMOSOC) data base. LSD 41 VAMOSOC data was adjusted for differences in: ship size, crew size, propulsion & fuel consumption, and weapons systems to develop LPD 1 estimates. (Cost estimate dated April 1996.) There is no antecedent system.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY90-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	83.4	2.6	0.3	11.2	97.5
Procurement	1724.7	1516.6	1576.5	5784.8	10602.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1808.1	1519.2	1576.8	5796.0	10700.1

b. Annual Summary -- LPD 17 CLASS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Sailaway FY 1996 Dollars Nonrec</u>	<u>Sailaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				0.6	0.5
1991				5.4	4.9
1992				1.3	1.2
1993				10.8	10.3
1994				28.7	28.0
1995				10.9	10.8
1996				9.1	9.2
1997				4.2	4.3
1998				12.5	12.9
1999				1.2	1.3
2000				2.5	2.6
2001				0.3	0.3
2002				0.9	1.0
2003				9.2	10.2
Subtotal				97.6	97.5

(U) Program funding shown in 16b does not include \$21.3 million of life of type non-acquisition development funds for in-service ship product improvements that is included in the LPD 17 program element budget.

Appropriation: 1611 - Shipbuilding and Conversion, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Sailaway FY 1996 Dollars Nonrec</u>	<u>Sailaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996	1		1190.6	977.7	995.7
1997					
1998				92.4	96.1

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15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-47.3	\$-10.7
Cumulative Variances To Date (12/26/99)	<u>\$-67.2</u>	<u>\$-1.3</u>
Net Change	\$-19.9	\$9.4

Explanation of Change:

(U) The majority of unfavorable cost variance change is primarily a result of subcontractor non recurring engineering effort and increase in overhead.

The majority of favorable schedule variance change is primarily a result of a replanned baseline and improved delivery for material hardware.

(U) Contract Comments:

The PM's estimated price at completion takes these variances into consideration.

(U) <u>LPD 18:</u> AVONDALE INDUSTRIES INC., NEW ORLEANS LA N0024-97-C-2202, CPAF Award: December 18, 1998 Definitized: December 18, 1998	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$390.8	N/A	1

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$412.7	N/A	1	\$412.7	\$450.7

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (12/26/99)	<u>\$0.5</u>	<u>\$0.0</u>
Net Change	\$0.5	\$0.0

Explanation of Change:

(U) The cost variance is not significant since production has not yet begun and only 2% of the funds have been expended.

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
896.82	-68.17	-0.01	--	--	+63.03	--	--	-5.15	891.67

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
890.33	-68.06	+0.01	--	--	+61.27	--	--	-6.78	883.55

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	JAN 1993	JAN 1993	N/A	JAN 1993
Milestone II	JUL 1995	JUN 1996	N/A	JUN 1996
Milestone III	OCT 2003	AUG 2007	N/A	JUL 2008
FUE/IOC	(b)(1)		N/A	(b)(1)
Total Cost	59.1	10761.8	N/A	10700.1
Total Quantity	0	12	N/A	12
Prog Acq Unit Cost	0	896.82	N/A	891.68

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

a. Procurement --  
 (U) LPD 17:  
 AVONDALE IND. INC., NEW ORLEANS LA  
 N00024-97-C-2202, CPAF  
 Award: December 17, 1996  
 Definitized: December 17, 1996

	Initial Contract Price		
	Target	Ceiling	Qty
	\$641.4	N/A	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$667.5	N/A	1	\$794.1	\$871.8

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

all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-0.2
	Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
	Revised program estimates (Estimating)	-1.0	-0.8
	RDT&E Subtotal	<u>-0.9</u>	<u>-0.9</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-293.0
	Adjustment for Current and Prior Inflation. (Estimating)	+79.5	+83.8
	Transfer funding to cover FY96 Program Shortfalls. (Estimating)	+41.2	+42.0
	Adjustment for Navy Work Capital Funds rates and other across the board reductions (Estimating)	-6.9	-7.4
	Revised estimate for inflation adjustment (Estimating)	-33.2	-37.7
	Cost to complete funds to offset Ship Cost Adjustment (SCA) shortfalls in FY96,99 & 00 (Estimating)	+254.2	+285.0
	Revised Outfitting and Post Delivery cost estimates (Estimating)	-14.2	-16.7
	Addition of Outfitting and Post Delivery previously not included (Estimating)	+455.8	+554.4
	Revised shipbuilding estimates (Estimating)	+185.7	+209.2
	Procurement Subtotal	<u>+962.1</u>	<u>+819.6</u>

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LPD 17 Class, December 31, 1999

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	77.8	10684.0	-	10761.8
Previous Changes:				
Economic	-1.2	-523.7	-	-524.9
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+21.8	-377.3	-	-355.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+20.6	-901.0	-	-880.4
Current Changes:				
Economic	-0.2	-293.0	-	-293.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.7	+1112.6	-	+1111.9
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.9	+819.6	-	+818.7
Total Changes	+19.7	-81.4	-	-61.7
Current Estimate	97.5	10602.6	-	10700.1

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	78.7	8939.4	-	9018.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+19.8	-305.5	-	-285.7
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+19.8	-305.5	-	-285.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-0.9	+962.1	-	+961.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.9	+962.1	-	+961.2
Total Changes	+18.9	+656.6	-	+675.5
Current Estimate	97.6	9596.0	-	9693.6

(U) Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across

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LPD 17 Class, December 31, 1999

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	78.7	92.7	97.6
Procurement	8939.4	8925.9	9596.0
Sailaway	(8939.4)		(9596.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1996 Base-Year \$	9018.1	9018.6	9693.6
 Escalation	 1743.7	 1745.2	 1006.5
Development (RDT&E)	(-0.9)	(1.5)	(-0.1)
Procurement	(1744.6)	(1743.7)	(1006.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	10761.8	10763.8	10700.1
 b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>12</u>	<u>12</u>	<u>12</u>
Total	12	12	12

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline	Current Estimate	Percent Change
	<u>(MAY 1997 APB)</u>	<u>(Dec 1999 SAR)</u>	<u></u>
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	9018.6	9693.6	
(2) Quantity	12	12	
(3) Unit Cost	751.550	807.800	+7.48
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	8925.9	9596.0	
(2) Quantity	12	12	
(3) Unit Cost	743.825	799.667	+7.51

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10. (U) Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Mobility	(b)(1)			
(S) Sustained Speed (Kts)	(b)(1)			
(S) Endurance ((NM)(K) @ Kts)	(b)(1)			
Amphibious Warfare Embarkation (NET)				
Troops	750	750 / 650	TBD	720
Vehicles (Sq Ft) (k)	25	25 / 22	TBD	25
Cargo (Cubic Feet) (k)	25	25 / 22	TBD	36
Bulk Fuel (Gals) (k)	325	325 / 250	TBD	325
LCAC	2	2 / 1(+1)	TBD	2
VTOL Land/Launch Spots (CH-46 or CH-53E or MV-22)	4/3/2	4/3/2 / 4/2/2	TBD	4/2/2
VTOL Maint/Storage (CH-46 or CH-53E or MV-22)	3/1/1	3/1/1 / 2/1/1	TBD	2/1/1
Ship To Shore Capability (LCAC)				
Sustained Operations (reload 6 LCACs) (mins)	220	220 / 285	TBD	285
Operational Availability (Ao)	.90	.90 / .80	TBD	.80

b. Current Change Explanations -- None



8c. (U) Threshold Breaches (Cont'd):

adjustment. Awaiting approval from OSD.

9. (U) Schedule:

a. Milestones --

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Milestone I	JAN 1993	JAN 1993	JAN 1993
DT&E (DT-I)			
Start	MAR 1993	MAR 1993	MAR 1993
Complete	FEB 1996	FEB 1996	FEB 1996
OT&E (OT-IA)			
Start	JAN 1995	JAN 1995	JAN 1995
Complete	MAR 1995	MAR 1995	MAR 1995
OT&E (OT-IB)			
Start	FEB 1996	FEB 1996	FEB 1996
Complete	APR 1996	APR 1996	APR 1996
Milestone II	JUN 1996	JUN 1996	JUN 1996
Lead Ship Award	AUG 1996	AUG 1996	DEC 1996
DT&E (DT-IIA)			
Start	SEP 1996	SEP 1996	APR 1997
Complete	AUG 1998	AUG 1998	MAR 2001
DT&E (DT-IIB)			
Start	SEP 1998	SEP 1998	MAR 1999
Complete	JUN 2002	JUN 2002	SEP 2003
OT&E (OT-IC)			
Start	SEP 1998	SEP 1998	MAY 1999
Complete	MAR 1999	MAR 1999	MAY 2000
Lead Ship Delivery	JUN 2002	JUN 2002	SEP 2003
DT&E (DT-IIC)			
Start	JUL 2002	JUL 2002	SEP 2003
Complete	JAN 2004	JAN 2004	MAY 2005
OT&E (IIA)			
Start	JUN 2003	JUN 2003	OCT 2004
Complete	SEP 2003	SEP 2003	JAN 2006
(S) LEAD SHIP IOC	(b)(1)		
OT&E (OT-IIIA)			
Milestone III	AUG 2007	AUG 2007	JUL 2008

b. Current Change Explanations -- None

7. (U) Executive Summary (Cont'd):

given the status of design. In order to provide a realistic schedule for management purposes, on December 30, 1999, the contract delivery date for the LPD 17 was extended 10 months to September 2003 and the delivery date for LPD 18 was extended 3 months to May 2004, without prejudice to the rights of the Government or Avondale Alliance. Receipt of the formal proposal and Government analysis of the cost implications will take place in the March-June 2000 timeframe. Since a 10 month adjustment to the lead ship delivery date results in an Acquisition Program Baseline schedule breach, a Program Deviation Report has been submitted reflecting this adjustment.

Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation, to determine a more accurate measure of shipbuilding economic adjustments.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The LPD 17 Program has deviated from the approved Acquisition Program Baseline (APB) dated May 5, 1997. Schedule milestones have been breached due to a 10 month extension of the lead ship delivery. An APB and a Program Deviation Report (PDR) revising the baseline have been submitted reflecting the schedule

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LPD 17 Class, December 31, 1999

5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated May 5, 1997

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated May 5, 1997.

6. (U) Mission and Description:

(U) The LPD 17 Class Amphibious Transport Dock Ship will be the functional replacement for the LPD 4, LSD 36, LKA 113, and LST 1179 Classes of Amphibious Ships in embarking, transporting and landing elements of a Marine landing force in an assault by helicopters, landing craft, amphibious vehicles, and by a combination of these methods to conduct the primary amphibious warfare mission. The LPD 17 Class is required to fill the projected lift shortfall created by the retirement of the above ships.

The current ship configuration including Rolling Airframe Missiles and NULKA decoys meet the Chief of Naval Operations capstone self defense anti-air warfare requirement. However, the Navy removed the Vertical Launch System (VLS) and Evolved Sea Sparrow missile from the LPD 17 defense suite subsequent to OSD Milestone II approval of the LPD 17 baseline. The Navy has completed its comparative analysis of this decision which indicated that the baseline combat system without VLS/ESSM is satisfactory against near and mid term threats. Agreement within the department on this conclusion was achieved in February 2000.

7. (U) Executive Summary:

(U) The lead ship contract for LPD 17 (with options for up to two follow ships) was awarded to Avondale Industries in December 1996. An option for Life Cycle Planning was awarded to Avondale Industries in October 1998 and the LPD 18 option was awarded in December 1998.

The program is currently in detail design. A very challenging detail design schedule was established to achieve the original contract delivery date (November 2002). In the July 1999 timeframe, it became apparent that the Avondale Alliance design progress was not consistent with this aggressive schedule. Factors contributing to this lack of progress included Integrated Product and Process Development (IPPD) and Integrated Product Data Environment start up efforts greater than anticipated, lack of vendor/Government furnished information, insufficient resources and performance less than expected. Given the rate of design progress, extensions of deliveries for Sealift Ships at Avondale, and the acquisition of Avondale by Litton Systems, a yard wide review of Navy programs at Avondale was requested by ASN(RD&A). In September 1999, as a result of this review, the Avondale Alliance proposed a 10 month adjustment to the delivery of the LPD 17, and an adjustment in delivery of LPD 18 of less than six months. Deliveries of ships in FY01 and beyond would be unaffected. This recommendation was independently confirmed by a Litton Systems analysis. The Navy's evaluation of the proposed dates indicated they were reasonable,

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: LPD 17 Class

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): LPD 17 Class Amphibious Transport Dock Ship
2. (U) DoD Component: Navy
3. (U) Responsible Office and Telephone Number:  
 LPD 17 AMPHIBIOUS TRANSPORT DOCK      CAPT W.H. LUEBKE  
 SHIP PROGRAM OFFICE (PMS317)      Assigned: August 29, 1997  
 NAVAL SEA SYSTEMS COMMAND      DSN 332-6333; COMM (703)602-6333  
 NEW ORLEANS, LA 70094-0000      LUEBKEWH@LPD17.NAVSEA.NAVY.MIL
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
 (U) PE 0603564N (Shared) Project S0408 (Shared)  
 (U) PE 0604311N Project 22283, 22425, S2283  
 (U) PE 0604567N Project S1803 (Shared), S2198 (Shared)  
 PROCUREMENT:  
 (U) APPN 1611 ICN 303600 (Navy)

**AS AMENDED**  
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MAR 29 2000 7

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

No Security Objection  
to Open Publication  
(AS AMENDED)  
00-C-0137  
MAR 28 2000  
Office of the Chief of  
Naval Operations  
Dept. of the Navy

~~Derived from N/A  
Downgrade instruction: INST S5513.3C - 107  
Declassify on: X3, X4~~

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LONGBOW HELLFIRE, December 31, 1999

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

o Surveillance Program.

There is no antecedent system.

Total operations and maintenance cost is \$78.5M from the approved Army Cost Position dated Oct 97.

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Missile	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	0.0
Intermediate Maintenance	N/A	0.0
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	0.1	N/A
Indirect Costs	N/A	N/A
Total	0.1	0.0

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Longbow Hellfire, December 31, 1999

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

Appropriation: 2032 - Missile Procurement, Army

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	2200		201.1	201.3	222.7
2003	1797		224.2	163.1	184.0
2004				22.7	26.1
2005				18.9	22.2
2006				21.7	26.0
Subtotal	12905	103.2	1861.2	1972.5	2107.0

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	12905	103.2	1861.2	2405.6	2523.7

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	1115	1372

(U) Percent Total Program Quantities Delivered: 10.6%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1092

(U) Percent Total Program Expended: 43.3%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
Operating and support costs for Longbow HELLFIRE are costed under the philosophy of a "certified round" concept. The sustainment phase costs are for FY 97 through FY 25. 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, 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 System Project Management

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LONGBOW HELLFIRE, December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY91-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-06)	<u>Total</u>
RDT&E	386.2	-	12.3	18.2	416.7
Procurement	1047.7	292.9	285.4	481.0	2107.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1433.9	292.9	297.7	499.2	2523.7

b. Annual Summary -- LONGBOW HELLFIRE

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1996 Dollars Nonrec</u>	<u>Flyaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1991				66.9	61.2
1992				107.6	100.8
1993				85.7	82.2
1994				108.7	106.2
1995				36.0	35.8
1996					
1997					
1998					
1999					
2000					
2001				11.5	12.3
2002				16.7	18.2
2003					
2004					
Subtotal				433.1	416.7

Appropriation: 2032 - Missile Procurement, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1996 Dollars Nonrec</u>	<u>Flyaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1995		25.1		40.7	41.2
1996	352	45.4	147.4	178.4	182.1
1997	1056	17.9	222.6	241.7	249.2
1998	1100	14.8	205.4	222.6	231.9
1999	2000		324.8	325.1	343.3
2000	2200		273.5	273.8	292.9
2001	2200		262.2	262.5	285.4

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Longbow Hellfire, December 31, 1999

15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

The FY 98 option for 1100 missiles was exercised by Letter Contract 24 Nov 97 and definitized on 1 Jul 98.

(U) <u>Longbow HF Multiyear:</u> Longbow LLC, Orlando, FL DAAH01-99-C-0086, FFP Award: April 30, 1999 Definitized: April 30, 1999	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1244.2	N/A	10397

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$607.3	N/A	4200	\$607.3	\$607.3

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

Current Contract Price and Estimated Price at Completion represents two years of procurement costs on a 5-year multiyear contract.

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Longbow Hellfire, December 31, 1999

14b. (U) Unit Cost and Other History (Cont'd):

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.17	--	--	-0.01	-0.02	+0.03	--	--	--	0.17

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.17	-0.01	-0.01	--	--	+0.01	--	--	-0.01	0.16

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	AUG 1985	AUG 1985	AUG 1985
Milestone II	N/A	DEC 1990	DEC 1990	DEC 1990
Milestone III	N/A	OCT 1995	OCT 1995	OCT 1995
FUE/IOC	N/A	APR 1997	JUL 1998	JUL 1998
Total Cost	N/A	2190.3	2635.6	2523.7
Total Quantity	N/A	10896	13311	12905
Prog Acq Unit Cost	N/A	0.2	0.2	0.2

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

a. Procurement --

(U) Longbow HF LRIP II/FRP:  
 Longbow LLC, Orlando, FL  
 DAAH01-97-C-0082, FFP  
 Award: February 7, 1997  
 Definitized: February 7, 1997

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$446.9	N/A	2156	\$446.9	\$446.9

Explanation of Change:

None.

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

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.2
Revised estimate of in-house test costs. (Estimating)	-0.1	-0.1
RDT&E Subtotal	<u>-0.1</u>	<u>-0.3</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-10.8
Economic adjustment for negative program change. (Economic)	N/A	+0.5
Tactical software update for new target set detection/identification. (Engineering)	+21.7	+26.0
Adjustment for Current and Prior Inflation. (Estimating)	+4.4	+4.6
Revised estimate of in-house production support and test costs. (Estimating)	+2.6	+2.6
Reduced quantity of environmental covers by 2797, from 7305 to 4508. (Support)	-6.9	-7.8
Procurement Subtotal	<u>+21.8</u>	<u>+15.1</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes									PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
0.20	-0.01	--	-0.01	-0.01	+0.03	--	--	--	0.20	

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes									PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
0.20	-0.01	+0.01	--	--	--	--	--	--	0.20	

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Longbow Hellfire, December 31, 1999

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	386.6	2249.0	-	2635.6
Previous Changes:				
Economic	+3.1	-166.9	-	-163.8
Quantity	-	-54.7	-	-54.7
Schedule	+2.5	+4.7	-	+7.2
Engineering	+30.1	-8.6	-	+21.5
Estimating	-5.3	+62.0	-	+56.7
Other	-	-	-	-
Support	-	+6.4	-	+6.4
Subtotal	+30.4	-157.1	-	-126.7
Current Changes:				
Economic	-0.2	-10.3	-	-10.5
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+26.0	-	+26.0
Estimating	-0.1	+7.2	-	+7.1
Other	-	-	-	-
Support	-	-7.8	-	-7.8
Subtotal	-0.3	+15.1	-	+14.8
Total Changes	+30.1	-142.0	-	-111.9
Current Estimate	416.7	2107.0	-	2523.7

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	411.0	1941.0	-	2352.0
Previous Changes:				
Quantity	-	-41.8	-	-41.8
Schedule	-1.1	-	-	-1.1
Engineering	+28.0	-8.0	-	+20.0
Estimating	-4.7	+52.6	-	+47.9
Other	-	-	-	-
Support	-	+6.9	-	+6.9
Subtotal	+22.2	+9.7	-	+31.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	+21.7	-	+21.7
Estimating	-0.1	+7.0	-	+6.9
Other	-	-	-	-
Support	-	-6.9	-	-6.9
Subtotal	-0.1	+21.8	-	+21.7
Total Changes	+22.1	+31.5	-	+53.6
Current Estimate	433.1	1972.5	-	2405.6

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LONGBOW HELLFIRE, December 31, 1999

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

(2) The Milestone II DAB established LRIP quantities of 1118 missiles. A Special Program Review was held in Aug 92 and the LRIP quantities were changed from 1118 missiles to 1414 missiles. The Milestone III ASARC changed the LRIP quantities from 1414 missiles to 1408 missiles. The LRIP quantities were established over the 10% limit to align the missile deliveries with the aircraft fielding schedule.

c. (U) Foreign Military Sales --

A direct commercial sale (co-production) with the United Kingdom was implemented Apr 96 for a quantity of 987 missiles (Quantity is classified UK Restricted) and a cost of \$195M. A foreign military sale to Singapore was signed Mar 99 for a quantity of 10 missiles and a cost of \$2.4M.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (OCT 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	2392.4	2405.6	
(2) Quantity	12905	12905	
(3) Unit Cost	0.185	0.186	+0.54
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	1934.2	1972.5	
(2) Quantity	12905	12905	
(3) Unit Cost	0.150	0.153	+2.00

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LONGBOW HELLFIRE, December 31, 1999

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

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

Independent Function After Launch Probability of Single Shot Kill	Production	Approved	Demon-	Current
	<u>Estimate (SAR)</u>	<u>Program (APB)</u>	<u>strated</u>	<u>Estimate</u>
	Yes	Obj/Threshold	Perf	YES
	Yes	/ Yes	YES	YES
(b)(1)	[REDACTED]			

AS AMENDED

(U) Demonstrated data source is the 42 missile inertially guided, radar aided development test firing program.

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Production	Approved	Current
	<u>Estimate (SAR)</u>	<u>Program (APB)</u>	<u>Estimate</u>
Development (RDT&E)	411.0	458.2	433.1
Procurement	1941.0	1934.2	1972.5
Flyaway	(1932.9)		(1964.4)
Other Wpn Sys Cost	(2.8)		(4.1)
Peculiar Support	(5.3)		(4.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1996 Base-Year \$	2352.0	2392.4	2405.6
Escalation	283.6	213.5	118.1
Development (RDT&E)	(-24.4)	(-9.6)	(-16.4)
Procurement	(308.0)	(223.1)	(134.5)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	2635.6	2605.9	2523.7
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	13311	12905	12905
Total	13311	12905	12905

Note: Excludes 70 RDT&E prototypes from the SAR Baseline and 70 from the Current Estimate that are not considered fully configured.

(U) (1) Unit of measure is one missile.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I In-Process Review	AUG 1985	AUG 1985	AUG 19
Milestone IB ASARC	JUL 1989	JUL 1989	JUL 19
Milestone II DAB	DEC 1990	DEC 1990	DEC 19
FSD Contract Award	DEC 1990	DEC 1990	DEC 19
Component Qual Test			
Start	AUG 1993	AUG 1993	AUG 19
Complete	MAY 1995	MAY 1995	MAY 19
System Qual Test			
Start	JUL 1994	JUL 1994	JUL 19
Complete	MAY 1995	MAY 1995	MAY 19
Milestone III (LRIP - DAB)	OCT 1995	OCT 1995	OCT 19
Low-Rate Initial Production Contract Award	DEC 1995	DEC 1995	DEC 19
First Production Delivery	MAR 1997	MAR 1997	JUL 19
Milestone III (Full Rate - ASARC)	N/A	OCT 1997	OCT 19
Full-Rate Production Contract Award	DEC 1997	DEC 1997	NOV 19
Authorization FY 99 Multiyear Contract	OCT 1998	OCT 1998	OCT 19
First Unit Equipped (FUE)	JUL 1998	JUL 1998	JUL 19

(U) Acronym List:

Army Systems Acquisition Review Council (ASARC)  
 Defense Acquisition Board (DAB)  
 Low Rate Initial Production (LRIP)  
 First Unit Equipped (FUE)

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LONGBOW HELLFIRE, December 31, 1999

7. (U) Executive Summary (Cont'd):

EMD of the Longbow missile was awarded 26 Dec 90. The letter contract was definitized 7 May 91. A Special Program Review (SPR) to assess the Longbow HELLFIRE Program and define funding strategies to support Longbow Apache, fire control radar and missile programs was held in Aug 92. To better align the Longbow HELLFIRE program with the Longbow Apache program, initiation of production was delayed by one year and the procurement program was stretched. The Conventional Systems Committee review for Longbow long lead items and initial production facilitization was held 5 Oct 94. Approval to proceed with long lead of the HELLFIRE missile was withheld until cost reduction efforts were evaluated and approved. The Longbow HELLFIRE Cost Reduction Plan was briefed to the Defense Acquisition Executive on 1 Dec 94. The plan was approved and the contract for long lead procurement was awarded 23 Dec 94 by definitization of option one under the engineering and manufacturing development contract.

On 11 May 95, the final development flight test of the Longbow HELLFIRE Missile was conducted. This flight met a cost effective combination of system qualification and live fire test objectives and successfully concluded the development flight test program. Live fire tests were successfully completed 27 Jul 95.

On 13 Oct 95 the Defense Acquisition Executive granted approval for Longbow HELLFIRE to enter low-rate initial production (LRIP) and delegated authority to the Army to make the full-rate production (FRP) decision. The Longbow HELLFIRE LRIP I option was definitized with available Continuing Resolution Authority funding 14 Dec 95. The remaining portion of this option was exercised 31 Jan 96. The LRIP II contract was awarded to the Longbow Limited Liability Company 7 Feb 97. Savings from Cost Reduction Program hardware initiatives early cut-in for FY 97, were used to procure an additional 51 missiles in FY 97. The first Longbow HELLFIRE tactical missile was delivered 31 Jul 97. On 28 Oct 97 the Army Acquisition Executive granted approval for Longbow HELLFIRE to proceed into full rate production. The FY 98 full rate production contract option was exercised by letter contract 24 Nov 97 and definitized 1 Jul 98. The final milestone for the program, first unit equipped, was accomplished Jul 98. Congressional authorization for the FY 99 - FY 03 multiyear contract was received Oct 98 and the contract was awarded 30 Apr 99 for 10,397 missiles. The missile firings associated with the Longbow Apache System first article tests were successfully completed on 29 Oct 98. Currently the Army has 1,334 missiles in inventory.

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Longbow HELLFIRE, December 31, 1999

5. (U) References:

SAR Baseline (Production Estimate):

(U) DAE Approved Acquisition Program Baseline dated November 27, 1995.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated October 1, 1998.

6. (U) Mission and Description:

(U) HELLFIRE is an air-to-ground, point target, precision strike missile system designed to defeat individual hardpoint targets. The missile configuration has the capability for modular guidance section replacements. A version of the missile utilizing laser guidance, Laser HELLFIRE is a separate program. Longbow HELLFIRE (a version utilizing a radio frequency guidance section) is in production. Longbow HELLFIRE and Laser HELLFIRE are complementary and neither missile replaces another missile system in the air-to-ground role.

Longbow HELLFIRE and Laser HELLFIRE are employed on the AH-64D Longbow Apache helicopter. Longbow HELLFIRE provides the capability to engage targets both day and night in adverse weather and with battlefield obscurants present. Longbow also offers a fire and forget capability against a given target set which complements the semi-active Laser HELLFIRE missile. The Longbow HELLFIRE Missile contains a radio frequency guidance section which provides a lock-on before launch (LOBL) or lock-on after launch (LOAL) capability, depending on target range and movement parameters. Longbow does not change the AH-64 mission or role, but provides for increased aircraft survivability. It is envisioned that Longbow HELLFIRE will also be used on the Comanche as a pre-planned product improvement item.

7. (U) Executive Summary:

(U) 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 classified 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 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 Aug 85, a contract was awarded in Nov 85 to MMC and WEC, as a joint venture (JV), for preliminary design of the tactical Longbow System. This was followed in Aug 86 by the award of a Proof of Principle demonstration contract to the JV. An Initial Design Phase contract was awarded to the JV in Sep 89. Proof of Principle of the Longbow missile was accomplished 11 Apr 90. The Defense Acquisition Board (DAB) granted approval for engineering and manufacturing development (EMD) of the Longbow Missile 5 Dec 90, and a letter contract for

- 2 -

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# A-17 LONGBOW HELLFIRE

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
**PROGRAM: LONGBOW HELLFIRE**

**AS OF DATE: December 31, 1999**

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1. (U) Designation and Nomenclature (Popular Name): LONGBOW HELLFIRE - subsystem of the AH-64 APACHE Weapon System
2. (U) DoD Component: Army
3. (U) Responsible Office and Telephone Number:  

PROJECT MANAGER	MR. RHETT FARRIOR
AIR-TO-GROUND MISSILE SYSTEMS	Assigned: July 14, 1999
ATTN: SFAE-MSL-HD	DSN 746-1117; COMM (256) 876-1117
RSA, AL 35898-5610	rhett.farrior@msl.redstone.army.mil
4. (U) Program Elements/Procurement Line Items:  

RDT&E:	
(U) PE 23802 (Shared)	Project D785
(U) PE 64816 (Shared)	Project DC13
PROCUREMENT:	
(U) APPN 2032 ICN C70300	(Army)

**CLEARED AS AMENDED FOR OPEN PUBLICATION**

**MAR 28 2000 10**

**DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW DEPARTMENT OF DEFENSE**

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Downgrade instructions: ACM Security Classification Guide, August 1998  
Declassify on: ACM~~

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17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 125.1

Percent Total Program Expended: 12.5%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The Operating and Support (O&S) cost estimate is based on analysis performed in preparation for the July 1995 MS II decision. The estimate assumes a 20 year life from year FY00 to FY19. There is no antecedent system.

b. Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per NAS Site	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	1.4	0.0
Unit Level Consumption	0.6	0.0
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	0.3	0.0
Sustaining Support	0.1	0.0
Indirect Costs	0.4	0.0
Total	2.8	0.0

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

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	1		4.9	9.6	12.3
2002	2		17.3	23.2	30.1
2003			11.2	21.7	28.8
2004	5		16.8	21.7	29.3
2005			9.8	11.8	16.2
2006	1		1.0	2.9	4.1
2007				0.6	0.8
Subtotal	9		61.9	94.5	125.4

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998			3.7	12.9	15.8
1999			4.8	12.2	15.1
2000	1		24.0	39.1	49.2
2001	2		34.7	49.8	63.6
2002	6		42.6	52.3	68.0
2003	5		31.0	43.8	58.1
2004	5		24.0	38.1	51.5
2005	5		27.0	37.4	51.6
2006	9		45.7	59.1	83.1
2007	11		25.3	33.8	48.4
2008				8.4	12.3
Subtotal	44		262.8	386.9	516.7

Note: Appropriation 3080 Other Procurement, Air Force, includes spares funding.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	35		151.5	189.8	250.0
Army	9		61.9	97.4	128.4
USAF	44		262.8	482.0	626.1
Grand Total	88		476.2	769.2	1004.5

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001				0.2	0.2
2002				0.2	0.2
2003				0.2	0.2
<b>Subtotal</b>				<b>95.1</b>	<b>109.4</b>

FY00 funds realigned to ATCALs PE 35114F IAW HAC guidance.

Note: In the following procurement appropriations (1810, 2031, 3080), a NAS quantity represents a site receiving a full complement of NAS equipment. Recurring Flyaway Dollars shown without any respective quantity represents locations that will receive less than a full complement of NAS equipment.

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998			0.7	1.8	2.2
1999			4.4	6.2	7.7
2000	2		22.2	27.8	34.9
2001	7		18.9	23.9	30.6
2002	6		29.7	33.7	43.8
2003	4		18.5	23.9	31.7
2004	4		21.2	24.1	32.6
2005	7		11.4	13.9	19.2
2006			17.3	20.5	28.8
2007	5		6.9	9.5	13.6
2008			0.3	0.6	0.9
<b>Subtotal</b>	<b>35</b>		<b>151.5</b>	<b>185.9</b>	<b>246.0</b>

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				0.6	0.7
1998				0.3	0.4
1999			0.5	1.0	1.3
2000			0.4	1.1	1.4

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

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

<u>Appropriation</u>	<u>Prior Years (FY90-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-08)</u>	<u>Total</u>
RDT&E	114.0	1.8	0.2	0.4	116.4
Procurement	43.2	85.5	106.5	652.9	888.1
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	157.2	87.3	106.7	653.3	1004.5

b. Annual Summary -- NAS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1990 Dollars Nonrec</u>	<u>Flyaway FY 1990 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				3.9	4.0
Subtotal				3.9	4.0

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1990 Dollars Nonrec</u>	<u>Flyaway FY 1990 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				2.9	3.0
Subtotal				2.9	3.0

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1990 Dollars Nonrec</u>	<u>Flyaway FY 1990 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				3.9	4.0
1991				9.3	9.9
1992				3.8	4.2
1993				6.0	6.7
1994				12.5	14.2
1995				25.4	29.5
1996				11.2	13.3
1997				9.8	11.8
1998				9.6	11.6
1999				1.5	1.8
2000				1.5	1.8

14c. Unit Cost and Other History (Cont'd):

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	JUL 1992	JUL 1992	N/A	JUL 1992
Milestone II	JAN 1994	JUL 1995	N/A	JUL 1995
Milestone III	MAR 1997	JUN 1998	N/A	MAR 2001
FUE/IOC	OCT 1999	APR 2000	N/A	FEB 2001
Total Cost	122.6	791.1	N/A	1004.5
Total Quantity	N/A	53	N/A	88
Prog Acq Unit Cost	N/A	14.93	N/A	11.41

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

a. RDT&E --		Initial Contract Price		
<u>DASR:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon Company, Marlborough, MA		\$186.0	N/A	0
F19628-96-D0038, FFP				
Award: August 9, 1996				
Definitized: August 9, 1996				
Current Contract Price		Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$186.0	N/A	\$186.0	\$186.0	

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Engineering Change to support the Video Information Distribution System (VIDS). (Engineering)	+19.8	+26.0
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.4
Refinement of estimate due to site specific configuration changes. (Estimating)	+32.6	+44.0
Refined estimate due to site specific configuration changes. (Estimating)	+29.5	+39.9
Refined estimate due to site specific configuration changes. (Estimating)	+20.0	+30.6
Adjustment for Current and Prior Inflation. (Support)	+0.3	+0.3
Change in Initial Spares (Support)	+10.8	+15.1
Change in Other Wpn Systems Cost (Support)	+11.0	+16.9
Procurement Subtotal	<u>+157.0</u>	<u>+217.4</u>

QR = Quantity related changes.

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
14.93	-0.78	-2.86	+1.20	+0.47	-1.89	--	+0.34	-3.52	11.41

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
12.71	-0.70	-1.97	+1.20	+0.47	-1.96	--	+0.34	-2.62	10.09

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

Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	96.6	473.7	3.0	573.3
Previous Changes:				
Quantity	-	+123.7	-	+123.7
Schedule	-	+27.5	-	+27.5
Engineering	-	+6.4	-	+6.4
Estimating	+5.3	-119.1	-3.0	-116.8
Other	-	-	-	-
Support	-	-1.9	-	-1.9
Subtotal	+5.3	+36.6	-3.0	+38.9
Current Changes:				
Quantity	-	+73.1	-	+73.1
Schedule	-	+23.5	-	+23.5
Engineering	-	+25.3	-	+25.3
Estimating	-	+13.0	-	+13.0
Other	-	-	-	-
Support	-	+22.1	-	+22.1
Subtotal	-	+157.0	-	+157.0
Total Changes	+5.3	+193.6	-3.0	+195.9
Current Estimate	101.9	667.3	-	769.2

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.2
Adjustment for Current and Prior Inflation. (Estimating)	0.0	+0.2
RDT&E Subtotal	0.0	0.0
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-5.6
Economic adjustment for negative program change. (Economic)	N/A	+1.9
Total Quantity Variance associated with decrease of 40 units.	+32.7	+79.6
Quantity decrease of -2 units. (Quantity)	+73.1	+99.8
Allocation to Schedule variance resulting from Quantity Change. (QR)(Schedule)	+23.5	+39.4
Allocation to Engineering variance resulting from Quantity Change. (QR)(Engineering)	+5.5	+5.9
Allocation to Estimating variance resulting from Quantity Change. (QR)(Estimating)	-69.4	-100.9
Stretchout of annual procurement buy profile. (Schedule)	0.0	+3.7



12. Unit Cost Summary:

	UCR Baseline (MAY 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1990 BY\$)	783.6	769.2	
(2) Quantity	92	88	
(3) Unit Cost	8.517	8.741	+2.63
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1990 BY\$)	678.2	667.3	
(2) Quantity	92	88	
(3) Unit Cost	7.372	7.583	+2.86

Please note that because of significant variations of the many complex and varied configurations at each NAS site, Program Acquisition Unit Cost (PAUC) and Average Procurement Unit Cost (APUC) information does not provide a useful measure of unit cost. PAUC and AUPC provides only notional data.

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	113.0	673.7	4.4	791.1
Previous Changes:				
Economic	-6.3	-58.0	-	-64.3
Quantity	-	+171.9	-	+171.9
Schedule	-	+62.1	-	+62.1
Engineering	-	+9.3	-	+9.3
Estimating	+9.7	-186.2	-4.4	-180.9
Other	-	-	-	-
Support	-	-2.1	-	-2.1
Subtotal	+3.4	-3.0	-4.4	-4.0
Current Changes:				
Economic	-0.2	-3.7	-	-3.9
Quantity	-	+99.8	-	+99.8
Schedule	-	+43.1	-	+43.1
Engineering	-	+31.9	-	+31.9
Estimating	+0.2	+14.0	-	+14.2
Other	-	-	-	-
Support	-	+32.3	-	+32.3
Subtotal	-	+217.4	-	+217.4
Total Changes	+3.4	+214.4	-4.4	+213.4
Current Estimate	116.4	888.1	-	1004.5

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

a. Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	96.6	105.4	101.9
Procurement	473.7	678.2	667.3
Flyaway	(302.8)		(476.2)
Other Wpn Systems Cost	(144.7)		(149.9)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(26.2)		(41.2)
Construction (MILCON)	3.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1990 Base-Year \$	573.3	783.6	769.2
Escalation	217.8	248.4	235.3
Development (RDT&E)	(16.4)	(21.8)	(14.5)
Procurement	(200.0)	(226.6)	(220.8)
Construction (MILCON)	(1.4)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	791.1	1032.0	1004.5
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>53</u>	<u>92</u>	<u>88</u>
Total	53	92	88

The unit of measure of this program represents National Airspace System (NAS) operational sites.

The LRIP quantity approved at MS II was 8 Digital Airport Surveillance Radars (DASR) and 0 DoD Advanced Automation Systems (DAAS) for the radar and automation portions of NAS. However, the current approved LRIP quantities are 20 DASR and 20 DAAS. The LRIP quantity for both DASR and DAAS represents less than 10% of the total maximum contractual DoD/DoT buy.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

10a. Performance Characteristics (Cont'd):

<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Data	Data / Data		Data
<or= 1 (min);	Requests/ Requests		Requests
Total	<or= 1 / <or= 10		<or= 1 (min);
Manual	Total / Total		Total
and	Manual / Manual		Manual
ic	and / and		and
Report	Automat-/ Automat-		Automat-
tion	ic / ic		ic
<or= 10 (min)	Report / Report		Report
	Genera- / Genera-		tion
	tion / tion		<or= 10 (min)
	<or= 10 / <or= 30 (min)		

ACRONYM: ICD - Interface Control Document

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>	
<b>DOD ATCALs IN THE NAS</b>					
<b>Inter/Intrafacility</b>					
<b>Data Transfer</b>					
Auto Transfer of Position Track Data	IAW ICD	IAW ICD / IAW ICD	TBD	IAW ICD	
Electronic Inter-facility Transfer of Flight Plans	IAW ICD	IAW ICD / IAW ICD	TBD	IAW ICD	
Aircraft Tracked Medium (LCF)	900	900 / 250	TBD	900	
Radar Subclutter Visibility (dB)	55	55 / 42	TBD	43	
Voice Compatibility/ Interoperability	Digital Voice Systems	Digital Voice Systems / Inter-face to existing / FAA / Systems	Met Thresh.	Digital Voice Systems	
<b>MAMS</b>					
Conflict Identification	100% of flicts fied; 85% of flicts fied <or- 10 (sec)	100% of flicts fied; 85% of flicts fied <or- 10 (sec)	98% of flicts fied; 85% of flicts fied <or- 30 (sec)	Met Thresh.	100% of con-flicts identi-fied; 85% of con-flicts identi-fied <or- 10 (sec)
Interface with FAA	Trans-mittal for 85% of messages between Scheduler and FAA <or- 5 (min)	Trans-mittal for 85% of messages between Scheduler and FAA <or- 5 (min) / Trans-mittal for 85% of messages between Scheduler and FAA <or- 10 (min)	Met Obj.	Trans-mittal Time for 85% of messages between scheduler and FAA <or- 5 (min)	
Reporting	Process-ing Time of Util-ization	Process-ing Time/ of Util-ization	Process-ing Time Obj.	Process-ing Time of Util-ization	

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9a. Schedule (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Complete	MAR 1998	AUG 1998	AUG 1998
IOT&E			
Start	MAY 1998	N/A	N/A
Complete	AUG 1998	N/A	N/A
Milestone III Review	NOV 1998	NOV 1998	DEC 1998
Full Rate Production Contract Award	NOV 1998	NOV 1998	MAR 1999
IOC (First Delivery)	AUG 1998	AUG 1998	JAN 1999

ACRONYMS:

ATCALs = Air Traffic Control and Landing Systems  
 DASR = Digital Airport Surveillance Radar  
 DAAS = DoD Advanced Automation System  
 VCSS = Voice Communications Switching System  
 MAMS = Military Airspace Management System

b. Current Change Explanations --

(Ch-1) In March 1999, the program office submitted a program deviation report (PDR) to the AFAE concerning Federal Aviation Administration (FAA) Standard Terminal Automation Replacement System (STARS) program schedule delays caused by software anomalies and requirements issues. DoD worked closely with the FAA to evaluate the schedule migration and minimize impact to the DoD NAS milestone events listed below. As a result of the FAA schedule delays, Change 3 to the NAS APB was approved on May 3, 1999. The following adjustments reflect the required changes.

Milestone Event	From	To
Milestone III	AUG 2000	MAR 2001
IOC	APR 2000	FEB 2001
IOT&E Start	NOV 1999	JUL 2000
IOT&E Complete	MAR 2000	OCT 2000
Full Rate Production Contract Award	AUG 2000	MAR 2001
Automation Production Award Exercise	AUG 2000	MAR 2001

(Ch-2) The Digital Airport Surveillance Radar (DASR) Developmental Test and Evaluation (DT&E) was completed on October 8, 1999. The current estimate of DT&E Complete was changed from June 1999 to October 1999 to reflect the actual completion date of this event.

(Ch-3) The Voice Communications Switching System (VCSS) Program Review occurred on November 10, 1999. The current estimate of VOICE (VCSS) Program Review was changed from September 1999 to November 1999 to reflect the actual date this event occurred.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
DoD ATCALs in the NAS			
Milestone 0	NOV 1990	NOV 1990	NOV 1990
Milestone I	JUL 1992	JUL 1992	JUL 1992
Milestone II	JUL 1995	JUL 1995	JUL 1995
Milestone III	JUN 1998	MAR 2001	MAR 2001(Ch-1)
IOC (First DoD Site Activation)	APR 2000	FEB 2001	FEB 2001(Ch-1)
RADAR (DASR)			
Contract Award	DEC 1995	AUG 1996	AUG 1996
DT&E			
Start	AUG 1996	JUL 1997	JUL 1997
Complete	JAN 1998	JUN 1999	OCT 1999(Ch-2)
LRIP Contract	MAR 1998	N/A	N/A
LRIP First Delivery	JUN 1999	N/A	N/A
IOT&E			
Start	JUN 1997	JUL 2000	JUL 2000(Ch-1)
Complete	MAR 1998	OCT 2000	OCT 2000(Ch-1)
Full Rate Production Contract Award	MAR 1999	MAR 2001	MAR 2001(Ch-1)
AUTOMATION (DAAS)			
Production Award Exercise	JUL 1998	MAR 2001	MAR 2001(Ch-1)
VOICE (VCSS)			
Program Review	MAY 1997	SEP 1999	NOV 1999(Ch-3)
MAMS			
Development Contract	JUL 1995	JUL 1995	NOV 1995
Combined T&E			
Start	OCT 1997	MAR 1998	MAR 1998

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7. Executive Summary (Cont'd):

Enhanced Terminal Voice Switch (ETVS) contract award to Denro, Inc.

1996 included the Federal Aviation Administration (FAA) contract award of the Standard Terminal Automation Replacement System (STARS) to Raytheon Corporation on September 16, 1996. The DASR contract was awarded to Raytheon Corporation on August 9, 1996.

1997 included the AFAE approval of Change 1 to the NAS APB on February 27, 1997. A second key approval occurred on June 30, 1997 with the issuance of an amendment to the DoD National Airspace System (NAS) MS II Decision and Phase II Guidance which authorized NAS a quantity increase from 53 to 65 operational sites.

1998 included the successful completion of the Military Airspace Management System (MAMS) Combined Test & Evaluation, favorable Milestone III Review, and Multi-Service CONOPS approval. The Voice Communications Switching System (VCSS) portion of NAS also experienced success with the completion of DT&E and the PEO approval of the OT&E certification briefing.

1999 included the declaration of the Military Airspace Management System (MAMS) IOC on January 21, 1999 and start of MAMS Full Rate Production on March 31, 1999. Completion of the DoD Advanced Automation System (DAAS) DT&E occurred October 1, 1999, with the completion of the Digital Airport Surveillance Radar (DASR) DT&E following in step on October 8, 1999. The Voice Communication Switching System (VCSS) achieved a successful Full Rate Production Decision on November 15, 1999.

Change 3 to the NAS APB received AFAE approval on May 3, 1999. This APB change was necessitated due to an anticipated slip to several NAS milestone events triggered by delays in the Federal Aviation Administration (FAA) Standard Terminal Automation Replacement System (STARS) program. The FAA delays resulted from software anomalies and requirements issues. DoD worked closely with the FAA to evaluate the schedule migration and minimize impact to the NAS milestone schedule. Required DoD schedule changes are reflected in Section 9 of this report. SAF/AQ approved an amendment to the DoD National Airspace System (NAS) MS II Decision and Phase II Guidance on May 3, 1999. The new ADM authorized NAS a quantity increase from 65 to 92 operational sites.

**5. References:**

**SAR Baseline (Development Estimate):**

AFAE Approved Acquisition Decision Memorandum dated July 24, 1995.

**Approved Program:**

AFAE Approved Acquisition Program Baseline (APB) dated May 3, 1999.

**6. Mission and Description:**

The DoD National Airspace System (NAS) program will modernize the DoD radar approach control facilities in parallel with the Federal Aviation Administration (FAA). The DoD NAS program provides systems and facilities compatible/interoperable with the FAA modernization, prevents DoD flight delays and cancellations, continues DoD's access into Special Use Airspace, provides transparent services to military and civil aircraft, replaces aging DoD Air Traffic Control (ATC) systems, and increases flight safety. DoD will upgrade voice, data, and sensor systems as well as facility configurations and operations concepts to provide continued quantity and quality of ATC services to the aviation community. The NAS program also includes the Military Airspace Management System (MAMS) which will schedule and manage special use airspace. MAMS is an automated Special Use Airspace (SUA) scheduling and utilization reporting tool which will enable DoD to more efficiently manage SUA. DoD military ATC and fighting/flying readiness will be maintained.

**7. Executive Summary:**

DoD will acquire, to the maximum extent practical, systems on contract or systems to be on contract with the FAA to reduce development costs and prevent duplication. If the DoD does not modernize the DoD Air Traffic Control (ATC) system, the resulting reduced interoperability between current DoD and FAA facilities will negatively impact DoD flight operations.

1993 included the demonstration of the Military Airspace Management System (MAMS) prototype software at Edwards AFB, CA; the demonstration of a repackaged Federal Aviation Administration (FAA) Common Console into the DoD configuration; release of the MAMS Request for Proposal (RFP); and formal approval of executive interagency agreements for test, procurement and support of FAA Automation Systems.

1994 included Chief of Staff of the Air Force (CSAF) approval of updated National Airspace System (NAS) and MAMS Operational Requirements Documents (ORDs); DAC approval of MAMS Milestone II review; OSD approval of the NAS Test and Evaluation Master Plan (TEMP); and the FAA release of the Enhanced Terminal Voice Switch (ETVS) RFP. In August 1994, the DoD assumed from the FAA, the lead role for the Digital Airport Surveillance Radar (DASR) acquisition.

1995 included the NAS paper AFSARC Milestone II review; the Military Airspace Management System (MAMS) successful negotiations with SM-ALC to utilize their existing Advanced Technology Support Program (ATSP) contract for completion of the MAMS development effort; and the Federal Aviation Administration (FAA)



AF-18 NAS

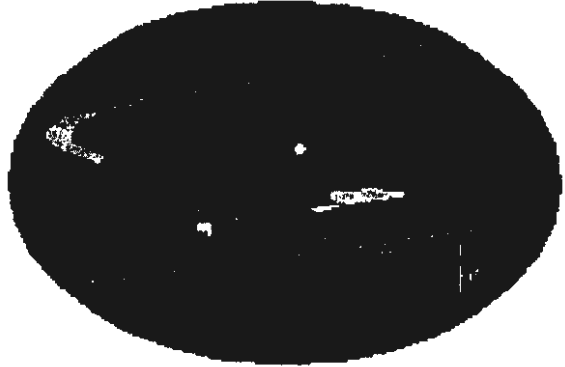
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: NAS

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): National Airspace System (NAS)

2. DoD Component: USAF

Joint Participants:

Army, Navy

3. Responsible Office and Telephone Number:

ESC/GAA  
75 Vandenberg Drive  
Hanscom AFB  
Bedford, MA 01731-2103

GM-15 Thomas Robillard  
Assigned: June 22, 1997  
DSN 478-4947; COMM (781) 377-4947  
Thomas.Robillard@hanscom.af.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0204696N  
PE 0305137F  
PE 0604633A

PROCUREMENT:

APPN 1810 ICN 24696N (Navy)  
APPN 3080 ICN 35137F (Air Force)  
APPN 2031 ICN 64633A (Army)

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

b. (U) Costs -- (FY 1994 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per squadron/year	Avg Annual Cost Per squadron/year
Mission Pay & Allowances	10.6	N/A
Unit Level Consumption	14.7	0.0
Intermediate Maintenance	3.9	0.0
Depot Maintenance	4.5	0.0
Contractor Support	0.0	0.0
Sustaining Support	2.1	0.0
Indirect Costs	11.5	N/A
Total	47.3	0.0

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

b. Annual Summary -- AV-8B Remanufacture

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994	4		121.4	141.0	145.4
1995	4	2.3	96.6	124.3	130.3
1996	8	13.1	171.5	240.5	255.5
1997	12	6.3	245.6	337.0	361.0
1998	12	6.0	231.1	300.3	325.0
1999	11		205.8	324.9	356.0
2000	11		201.2	285.1	316.9
2001	10	10.6	183.9	208.2	235.1
Subtotal	72	38.3	1457.1	1961.3	2125.2

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	72	38.3	1457.1	1961.3	2125.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	32	32

(U) Percent Total Program Quantities Delivered: 44.4%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1091.2

(U) Percent Total Program Expended: 51.3%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
There is no antecedent to the AV-8B.

Flight hours per aircraft per month 22.7  
 Number of aircraft/squadron 16  
 (10 aircraft per squadron with a six aircraft detachment)  
 Consumption rate gal/hr 686.4  
 POL cost, JP-5, per barrel, FY 94 31.4  
 Date of estimate: 25 Aug 1998  
 Source: AIR-4.2 FY98 Operating and Support Cost Update Report

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AV-8B Remanufacture, December 31, 1999

15. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.4	\$0.1
Cumulative Variances To Date (12/31/99)	<u>\$-0.3</u>	<u>\$-2.8</u>
Net Change	\$0.1	\$-2.9

Explanation of Change:

(U) The cumulative cost variance is insignificant at this time. The cumulative unfavorable schedule variance is a result of late delivery and shortage of materials.

The Integrated Baseline Review (IBR) was satisfactorily completed in November 1999. Not having mature program specific metrics, the government estimate at completion is set at the contractor's LRE at this time. It is expected that program metrics will be mature by July 2000. A more accurate assessment of the estimate at completion will be developed at that time.

(U) Contract Comments:

A not to exceed price for this Fixed Price Incentive Fee multiyear contract was established on March 11, 1999 for the FY1999-FY2001 production buy of 32 AV-8B (remanufacture) aircraft. The Target Price and Ceiling Price are for 32 aircraft and do not include Integrated Logistics Support and Publications which were negotiated separately. The target and ceiling price are based on an exchange rate of \$1.63 per British Pound Sterling.

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

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

<u>Appropriation</u>	<u>Prior Years (FY94-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	-	-	-	-	-
Procurement	1573.2	316.9	235.1	-	2125.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1573.2	316.9	235.1	-	2125.2

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15. (U) Contract Information (Cont'd):

This contract is more than 90 percent complete and will no longer be reported.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>FY98 AIRFRAME:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
MCDONNELL DOUGLAS CORP, ST. LOUIS MO N00019-97-C-0046, FFP Award: September 16, 1997 Definitized: January 23, 1998	\$10.5	N/A	

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$188.1	N/A	12	\$188.1	\$188.1

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

Contract N00019-97-C-0046 is a four-year multiyear contract with two distinct parts. The first part reflects the FY98 buy of 12 AV-8B (remanufacture) aircraft definitized 23 January 1998. The FY98 portion is a single year Firm Fixed Price (FFP) contract. The second part reflects a Fixed Price Incentive Fee (FPIF) FY99-FY01 buy of 32 AV-8B (remanufacture) aircraft. The FPIF definitization modification was signed 28 May 1999.

(U) <u>FY99-01 AIRFRAME:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
MCDONNELL DOUGLAS, ST. LOUIS, MO N00019-97-C-0046, FPIF Award: September 16, 1997 Definitized: May 28, 1999	\$489.0	\$505.5	32

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$489.0	\$505.5	32	\$505.5	\$505.5

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AV-8B Remanufacture, December 31, 1999

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
29.57	-2.38	+0.12	+0.55	+0.96	-1.52	--	+2.22	-0.05	29.52

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
29.57	-2.38	+0.12	+0.55	+0.96	-1.52	--	+2.22	-0.05	29.52

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	JAN 1994	MAR 1994
FUE/IOC	N/A	N/A	DEC 1996	SEP 1997
Total Cost	N/A	N/A	2158.4	2125.2
Total Quantity	N/A	N/A	73	72
Prog Acq Unit Cost	N/A	N/A	29.57	29.52

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

a. Procurement --

(U) FY97 AIRFRAME:  
 McDonnell Douglas Corp., St. Louis MO  
 N00019-96-C-0025, FFP  
 Award: September 30, 1996  
 Definitized: September 30, 1996

Initial Contract Price		
Target	Ceiling	Qty
\$10.0	N/A	

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$210.4	N/A	12	\$210.4	\$210.4

Explanation of Change:

(U) The target price and estimated price at completion have not increased.

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AV-8B Remanufacture, December 31, 1999

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

(U) Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	1843.0	-	1843.0
Previous Changes:				
Quantity	-	-16.6	-	-16.6
Schedule	-	+23.0	-	+23.0
Engineering	-	+60.3	-	+60.3
Estimating	-	-99.0	-	-99.0
Other	-	-	-	-
Support	-	+138.6	-	+138.6
Subtotal	-	+106.3	-	+106.3
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+15.6	-	+15.6
Other	-	-	-	-
Support	-	-3.6	-	-3.6
Subtotal	-	+12.0	-	+12.0
Total Changes	-	+118.3	-	+118.3
Current Estimate	-	1961.3	-	1961.3

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-5.0
Economic adjustment for negative program change. (Economic)	N/A	+1.4
Adjustment for Current and Prior Inflation. (Estimating)	+2.4	+2.6
Rephase annual procurement buys for FY99-FY01. (Schedule)	0.0	+1.0
Reprogramming for additional FY96-FY97 funds to cover Foreign Exchange Rate increases for the Engine contract. (Estimating)	+4.0	+4.2
Refinement of estimate for learning curve inefficiencies for FY99-FY01 profile changes. (Estimating)	+9.2	+9.9
Adjustment for Current and Prior Inflation. (Support)	+1.0	+1.3
Adjustment of Initial Spares requirements to reflect actual costs. (Support)	+0.4	+0.5
Refinement of estimate for Peculiar Support. (Support)	-5.0	-8.1
Procurement Subtotal	+12.0	+7.8

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12. (U) Unit Cost Summary:

	UCR Baseline (FEB 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1994 BY\$)	2044.3	1961.3	
(2) Quantity	73	72	
(3) Unit Cost	28.004	27.240	-2.73
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1994 BY\$)	2044.3	1961.3	
(2) Quantity	73	72	
(3) Unit Cost	28.004	27.240	-2.73

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	-	2158.4	-	2158.4
Previous Changes:				
Economic	-	-167.7	-	-167.7
Quantity	-	-20.9	-	-20.9
Schedule	-	+38.8	-	+38.8
Engineering	-	+69.3	-	+69.3
Estimating	-	-126.4	-	-126.4
Other	-	-	-	-
Support	-	+165.9	-	+165.9
Subtotal	-	-41.0	-	-41.0
Current Changes:				
Economic	-	-3.6	-	-3.6
Quantity	-	-	-	-
Schedule	-	+1.0	-	+1.0
Engineering	-	-	-	-
Estimating	-	+16.7	-	+16.7
Other	-	-	-	-
Support	-	-6.3	-	-6.3
Subtotal	-	+7.8	-	+7.8
Total Changes	-	-33.2	-	-33.2
Current Estimate	-	2125.2	-	2125.2

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AV-8B Remanufacture, December 31, 1999

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	0.0	0.0	0.0
Procurement	1843.0	2044.3	1961.3
Airframe	(1163.2)		(1143.8)
Engine	(310.6)		(265.9)
Avionics	(37.2)		(42.5)
Other GFE	(1.1)		(43.2)
Total Flyaway	(1512.1)		(1495.4)
Other Wpn Sys Cost	(0.0)		(0.0)
Peculiar Support	(248.3)		(379.3)
Initial Spares	(82.6)		(86.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1994 Base-Year \$	1843.0	2044.3	1961.3
Escalation	315.4	277.7	163.9
Development (RDT&E)	(0.0)	(0.0)	(0.0)
Procurement	(315.4)	(277.7)	(163.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2158.4	2322.0	2125.2
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>73</u>	<u>73</u>	<u>72</u>
Total	73	73	72

(U) There are no LRIP quantities associated with this program.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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

b. Current Change Explanations -- None

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

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
<b>Dimensions</b>				
Length	47.97	47.97 / 47.97	47.97	47.97
Height	11.65	11.65 / 11.65	11.65	11.65
Span	30.33	30.33 / 30.33	30.33	30.33
Weight Empty (lbs)	14,700	14,700 / 14,730	14,730	14,730
Max VTOGW Wt (lbs)	19,200	19,200 / 19,200	19,200	19,200
<b>(Vertical Take-off Gross Weight)</b>				
Max STOGW Wt (lbs)	29,750	29,750 / 29,750	32,000	32,000
Speed Max. (Mach)	.83	.83 / .83	1.00	1.00
<b>Mission Radius (nm)</b>				
CAS	142	142 / 95	250	250
Interdiction	486	486 / 440	486	486
<b>Reliability (hrs)</b>				
MFHBMCF(HW) - Oper	12.6	12.6 / 12.6	32.6	32.6
<b>Maintainability (hrs)</b>				
MMH/FH(HW) Oper	3.2	3.2 / 3.2	2.7	2.7
MTTR (Critical)	6.7	6.7 / 6.7	4.4	4.4
<b>Oper</b>				
Gun Accuracy (mils)	(b)(1)			
Sea Surf Search (nm)				
Air-to-Air Det Range (5 sq.m. tgt) (nm)				
Nose, VS 1000 (ft)				
Tail, RWS 2000 (ft)	80	12.9 / 12.9	12.9	12.9

b. Current Change Explanations -- None

7. (U) Executive Summary (Cont'd):

Remanufacture assembly line have resumed. The engine contract schedule delays will be recovered in June 2000.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone IV/III Review	JAN 1994	JAN 1994	MAR 1994
Contract Award	FEB 1994	FEB 1994	MAY 1994
First A/C delivery	FEB 1996	FEB 1996	FEB 1996
DT-III			
Start	FEB 1996	FEB 1996	FEB 1996
Complete	AUG 1996	AUG 1996	AUG 1996
OT-IIIIB FOT&E			
Start	FEB 1996	FEB 1996	FEB 1996
Complete	SEP 1996	MAY 1997	MAY 1997
IOC (Completion of FOT&E Report)	DEC 1996	AUG 1997	SEP 1997
FOC (Delivery of the 20th REMAN acft)	MAR 1999	MAR 1999	MAR 1999
Material Support Date 1/	MAR 1999	MAR 1999	APR 1995
Navy Support Date 2/	MAR 1999	OCT 2002	OCT 2002

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AV-8B Remanufacture, December 31, 1999

5. (U) References:

SAR Baseline (Production Estimate):

(U) NAE Approved Acquisition Program Baseline dated June 30, 1994.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated February 26, 2000.

6. (U) Mission and Description:

(U) The AV-8B (Harrier II) is a second generation, Vertical/Short Takeoff 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 AV-8B Remanufacture program converts older AV-8B aircraft to the most recent production configuration. The process requires disassembly of the aircraft; modification of selected subsystems and components; and reassembly of selected original, modified, and new production subsystem and parts. Production processes and tooling are used to fabricate new subsystems, parts and components as well as to assemble the aircraft.

AV-8B Remanufacture is an Acquisition Category IC program managed by the A/V Weapon Systems Program Manager, PMA-257. Because the remanufactured aircraft reflect the present production aircraft configuration, they satisfy existing Operational Requirements (OR) 025-05-85 of September 19, 1984 (Night Attack) and OR 224-05-89 of August 8, 1988 (Radar). Remanufacture provides the Marine Corps with increased quantities of aircraft capable of effective night fighting operations at a reduced cost by reusing major components of the day attack fleet aircraft.

7. (U) Executive Summary:

(U) During the Integrated Baseline Review in November 1999 the contractor provided a top level latest revised estimate (LRE) of \$450.1M indicating going above the calculated Ceiling Cost. The LRE is based on the difference between the cost of the last documented production activity (FY1996-FY1997) for this aircraft and that of the current target cost. The target cost of the program is based on several challenges to manufacturing and taking advantage of multiyear procurement bulk buys. Boeing's LRE of \$450.1M, without the benefit of full expenditure metrics, may be premature. Not having mature program specific metrics, the government estimate at completion is set at the contractor's LRE at this time. It is expected that program metrics will be mature by July 2000. A more accurate assessment of the estimate at completion will be developed at that time.

During the third and fourth quarter of FY1999 the quality issues at Rolls Royce disrupted deliveries of new engines to the Remanufacture production line. The quality issues have been resolved. Deliveries of new engines to the Boeing

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N-3 AV-8B REMAN

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

**PROGRAM: AV-8B Remanufacture**

**AS OF DATE: December 31, 1999**

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1. (U) Designation and Nomenclature (Popular Name): AV-8B/Attack, V/STOL, Close Air Support (Harrier II+ Remanufacture)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

PMA-257, AV-8B Joint Program Office	COL Thomas White, III
IPT Building	Assigned: January 15, 1999
47123 Buse Road	DSN 757-5460; COMM (301) 757-5460
Patuxent River, MD 20670-1547	WHITETBIII@navair.navy.mil

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

PROCUREMENT:

(U) APPN 1506 ICN 0124 (Navy)

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**AS AMENDED**  
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Joint STARS CGS, December 31, 1999

**17. Delivery/Expenditure Information:**

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	18	18
Procurement	85	85

Percent Total Program Quantities Delivered: 74.1%

b. Total Expenditures To Date (In Millions of Dollars): \$ 1007.3

Percent Total Program Expended: 69.9%

**18. Operating and Support Costs:**

a. Assumptions and Ground Rules --

O&S costs were based on LPU & IGSM models being fielded for 5 years. All CGSs are presumed to have a 20 year life. 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 May 1999 Joint STARS (Army) Army Cost Position. There are no antecedent systems.

b. Costs -- (FY 1989 Constant (Base-Year) Dollars in Thousands)

Cost Element	JSTARS CGS Avg Annual Cost CGS	N/A
Mission Pay & Allowances	221.0	0.0
Unit Level Consumption	114.0	0.0
Intermediate Maintenance	11.0	0.0
Depot Maintenance	1.0	0.0
Contractor Support	14.0	0.0
Sustaining Support	33.0	0.0
Indirect Costs	0.0	0.0
Support Costs	6.0	0.0
Other	0.0	0.0
Total	400.0	0.0

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Joint STARS CGS, December 31, 1999

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

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1989 Dollars Nonrec	Flyaway FY 1989 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2005				8.2	11.5
Subtotal	18			614.8	656.6

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY 1989 Dollars Nonrec	Flyaway FY 1989 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987	3	2.1	9.8	14.9	14.7
1988	6		16.9	21.3	21.9
1989				2.2	2.4
1990					
1991					
1992					
1993	5	1.0	22.5	29.3	34.9
1994	7	0.2	33.8	53.1	64.0
1995	8	1.7	39.6	46.6	57.3
1996	16	5.3	52.2	67.8	84.1
1997	16	4.3	52.2	74.3	93.2
1998	20	1.9	75.3	79.3	100.4
1999	12	1.3	59.3	69.0	88.2
2000	14	1.2	65.5	78.1	100.9
2001	12		45.0	55.4	72.6
2002	2		18.1	20.8	27.8
2003				3.2	4.4
2004			6.1	7.8	10.8
2005			2.7	4.5	6.3
Subtotal	121	19.0	499.0	627.6	783.9

Recurring flyaway in FY98/99 includes \$22.5M required to upgrade 16 MGSM units to the CGS configuration. Recurring costs in FY04 and FY05 are P3I costs which will be required to upgrade the CGS.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	139	19.0	499.0	1242.4	1440.5

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Joint STARS CGS, December 31, 1999

15. Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY82-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
RDT&E	556.6	25.7	17.9	56.4	656.6
Procurement	561.1	100.9	72.6	49.3	783.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>1117.7</b>	<b>126.6</b>	<b>90.5</b>	<b>105.7</b>	<b>1440.5</b>

b. Annual Summary -- COMMON GROUND STATION

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1989 Dollars Nonrec</u>	<u>Flyaway FY 1989 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1982				5.1	4.1
1983				43.4	36.5
1984				75.0	65.3
1985				30.8	27.7
1986				43.9	40.6
1987				27.2	25.9
1988				18.9	18.7
1989				22.2	22.9
1990				35.3	37.8
1991				38.8	43.1
1992				59.6	67.8
1993				53.7	62.5
1994				24.8	29.4
1995				31.3	37.8
1996				12.4	15.3
1997				7.6	9.4
1998				5.2	6.5
1999				4.2	5.3
2000				20.0	25.7
2001				13.8	17.9
2002				13.4	17.7
2003				9.5	12.8
2004				10.5	14.4

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Joint STARS CGS, December 31, 1999

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
11.53	-0.06	-1.41	-0.12	+2.41	-2.67	--	+0.68	-1.17	10.36

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.69	-0.04	-0.90	-0.14	+1.61	-3.52	--	+0.78	-2.21	6.48

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	DEC 1988	N/A	DEC 1988
Milestone III	N/A	N/A	N/A	JUN 2000
FUE/IOC	N/A	JUN 1990	N/A	JUN 1990
Total Cost	N/A	1291.6	N/A	1440.5
Total Quantity	N/A	112	N/A	139
Prog Acq Unit Cost	N/A	11.53	N/A	10.36

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

a. Procurement --

CGS LRIP: Motorola, Scottsdale, AZ DAAB07-96-C-S204, FFP Award: December 14, 1995 Definitized: December 14, 1995	Initial Contract Price		
	Target	Ceiling	Qty
	\$70.6	N/A	18

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$386.4	N/A	79	\$386.4	\$386.4

Explanation of Change:

The adjusted target price includes additional end item units and current P3I efforts to upgrade the end item.

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

Summary (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	452.4	680.6	-	1133.0
Previous Changes:				
Quantity	+12.1	+81.9	-	+94.0
Schedule	-	+7.4	-	+7.4
Engineering	+100.9	+144.9	-	+245.8
Estimating	+42.2	-337.2	-	-295.0
Other	-	-	-	-
Support	-	+48.4	-	+48.4
Subtotal	+155.2	-54.6	-	+100.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+7.0	-	-	+7.0
Estimating	+0.2	+1.6	-	+1.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+7.2	+1.6	-	+8.8
Total Changes	+162.4	-53.0	-	+109.4
Current Estimate	614.8	627.6	-	1242.4

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.9
Additional P3I enhancements to the CGS. (Engineering)	+7.0	+9.7
Adjustment for current and prior inflation. (Estimating)	+0.2	+0.2
RDT&E Subtotal	+7.2	+9.0
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-2.1
To account for the delay in production schedule from 1998 thru 2002. (Schedule)	0.0	+0.5
Adjustment for current and prior inflation. (Estimating)	+1.0	+1.2
To account for refining of program estimate for P3I efforts. (Estimating)	+0.6	-1.8
Procurement Subtotal	+1.6	-2.2

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

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (OCT 1995 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1989 BY\$)	1206.6	1242.4	
(2) Quantity	125	139	
(3) Unit Cost	9.653	8.938	-7.41
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1989 BY\$)	651.9	627.6	
(2) Quantity	104	121	
(3) Unit Cost	6.268	5.187	-17.25

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	448.4	843.2	-	1291.6
Previous Changes:				
Economic	-2.0	-3.2	-	-5.2
Quantity	+15.1	+100.2	-	+115.3
Schedule	-	-17.1	-	-17.1
Engineering	+130.5	+194.9	-	+325.4
Estimating	+55.6	-425.8	-	-370.2
Other	-	-	-	-
Support	-	+93.9	-	+93.9
Subtotal	+199.2	-57.1	-	+142.1
Current Changes:				
Economic	-0.9	-2.1	-	-3.0
Quantity	-	-	-	-
Schedule	-	+0.5	-	+0.5
Engineering	+9.7	-	-	+9.7
Estimating	+0.2	-0.6	-	-0.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+9.0	-2.2	-	+6.8
Total Changes	+208.2	-59.3	-	+148.9
Current Estimate	656.6	783.9	-	1440.5

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Joint STARS CGS, December 31, 1999

10a. Performance Characteristics (Cont'd):

description for TACFIRE and ASAS refer to number of preformatted message sets that can be received.

b. Current Change Explanations --

(Ch-1) All performance characteristics for these systems have been designated as N/A due to the fact that these systems have been decommissioned or will not enter production (HGSM). The non-Y2K compliant LGSMs/MGSMs were decommissioned in CY99 and were replaced by the interim three-vehicle configured CGS. A proposed JSTARS APB, which will reflect these changes, has been prepared and is currently being staffed.

(Ch-2) The Operational Availability values were adjusted to reflect data obtained from the Operational Readiness Demonstration Test (ORDT) conducted in February 1999.

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

a. Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	452.4	554.7	614.8
Procurement	680.6	651.9	627.6
Recurring Costs	(563.8)		(499.0)
Nonrecurring Costs	(55.6)		(19.0)
Total Flyaway	(619.4)		(518.0)
Other Weapon Systems	(16.2)		(78.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(45.0)		(31.5)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1989 Base-Year \$	1133.0	1206.6	1242.4
Escalation	158.6	271.0	198.1
Development (RDT&E)	(-4.0)	(27.7)	(41.8)
Procurement	(162.6)	(243.3)	(156.3)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	1291.6	1477.6	1440.5
b. Quantity --			
Development (RDT&E)	15	21	18
Procurement	97	104	121
Total	112	125	139

The procurement quantities noted above include a total of up to 79 LRIP CGSs. It should be noted that the LRIP quantity exceeds the statutory guideline of 10% for LRIP as a percentage of total production, however approval was granted based on the economic advantages and the documented low risk of the program.

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10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate terminal</u>
Hard Copy Data Capability	N/A	Color / Color printout/ of of IMINT, / graphics/ & text /	Color printout of IMINT data	Color of IMINT, graphics & text
Nuclear Survivability	N/A	Hardened / Hardened against / against EMP / EMP CTT data/ CTT data	Hardened against EMP CTT data	Hardened against EMP CTT
Commander's Tactical Terminal (CTT)	N/A	inter- / inter-face	intrfce	data inter-face
Transportability (Light)	N/A	C-130 / C-130 drive / drive on, / on, drive / drive off / off	C-130 drive on, drive	C-130 drive on, drive off
Set up/Tear down (w/3 man crew) (min) (Light)	N/A	10 / 15	10	10
Payload Weight (lbs)				
Light	N/A	4250 / 4400	4250	4250
Heavy	N/A	7100 / 8500	N/A	N/A
Data Dissemination	N/A	Maintain/ and / and ically / ically disseminate / disseminate current / current enemy / enemy situa- / situa- tion / graphics/ graphics	Maintain and ically disseminate current enemy situa- tion graphics	Maintain and automati cally disseminate current enemy situa- tion
National Imagery Data	N/A	Provide / Provide imagery / imagery graphs &/ data text / GSM comm through / links GSM comm/ links	Provide imagery data through GSM comm links	Provide imagery graphs & text through GSM comm links

The bracketed numbers contained in the interoperability characteristic

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Joint STARS CGS, December 31, 1999

10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>	
Mean Time to Repair (MTTR) DS/GS (min)	N/A	60 / 180	60	60	
Interoperability	N/A	Rec & / Rec & transmit/ transmit messages/ messages to TAC- / to TAC- FIRE/ / FIRE/ AFATDS / AFATDS (to / (to facili- / facili- tate / tate target- / target- ing) and/ ing) and ASAS (to/ ASAS (to facili- / facili- tate / tate intelli- / gence / report- report- ing and / battle- battle- field / mgmt) / mgmt)	Rec & / Rec & transmit messages to TAC- to TACFIRE/ AFATDS (to facilitate targetin ASAS (to g) and ASAS (to facilitate intelligence reportin and battlefi eld	Rec & / Rec & transmit messages to FIRE/ AFATDS (to facilitate targetin ASAS (to facilitate intelligence reportin and battlefi eld	Rec & / Rec & messages to TAC- FIRE/ AFATDS (to facilitate targetin ASAS (to facilitate intelligence reportin and battlefi eld
Standard IEW Modules	N/A	Std HW & / Std HW & SW	Std HW & SW	Std HW & SW	
Imagery Storage (hrs)					
Digital Radar	N/A	8 / 8	8	8	
Video	N/A	2 / 2	2	2	
Simultaneous Multi-sensor Operations	N/A	Data / Data from 2 / from 2 or more / or more sensors / sensors	Data / Data from 3 / from 3 or more / or more sensors	Data / Data from 3 / from 3 or more / or more sensors	
Two Independent Workstations	N/A	Display / Display MTI, / MTI, FTI, and/ FTI, and SAR data/ SAR data	Display / Display MTI, FTI and SAR	Display / Display MTI, FTI, and SAR	
Remote Data Display	N/A	Data / Data into / into existing/ existing data / data process / process facility/ facility	Data / Data into / into existing data / data process	Data / Data into / into existing data / data process facility or CGS provided remote	

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Joint STARS CGS, December 31, 1999

10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>	
Secondary Data Dissemination	N/A	configs / Provide / second- / ary data / communi- / cation / via / SATCOM / or wide / area / Coms to / distrib- / ute / JSTARS / and / other / correla- / ted IEW / common / data / beyond / line of / sight /	Provide / second- / ary data / communi- / cation / via / SATCOM / or wide / area / Coms to / distrib- / ute / JSTARS / data / beyond / line of / sight / capabil- / ity /	Provide / second- / ary data / communi- / cation / via / SATCOM / or wide / area / Coms to / distrib- / ute / JSTARS / data / beyond / line of / sight / capabil- / ity	N/A (Ch-1)
BLOCK II (CGS)					
Time Compression/ Integration of Data Display (frames MTI data per second)	N/A	5 / Level / ient to / strate / target / movement / on GSM / monitor	5	5	
Software Assisted Target Tracking/ Prediction (# of target files tracked)	N/A	16 / 16	16	16	
Workstations	N/A	2 / 2	2	2	
Operational Availability (HW&SW)	N/A	.80 / .75	.92	.92	(Ch-2)
NBC Survivability	NBC pro- tected	N/A / N/A	N/A	N/A	
Maintenance (HW&SW) Mean Time to Repair (MTTR) (min)	N/A	30 / 60	30	30	

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Joint STARS CGS, December 31, 1999

10a. Performance Characteristics (Cont'd):

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate	
Two Independent Workstations	N/A	Display / Display MTI, / MTI, FTI, and/ FTI, and SAR data/ SAR data	Display MTI, and SAR data	N/A	(Ch-1)
Remote Data Display	N/A	Data / Data into / into existing/ existing data / data process / process facility/ facility	Data into existing data facility	N/A	(Ch-1)
Nuclear Survivability	N/A	Hardened/ Hardened against / against EMP / EMP	Hardened against	N/A	(Ch-1)
Hard copy data capability	N/A	Color / Color printout/ printout of / of IMINT, / IMINT graphics/ & text /	Color of IMINT data	N/A	(Ch-1)
Transportability	N/A	C-130 / C-130 drive / drive on, / on, drive / drive off / off	C-130 drive on, drive off	N/A	(Ch-1)
Set up/Tear down (w/3 man crew) (min)	N/A	10 / 15	15	N/A	(Ch-1)
Commander's Tactical Terminal (CTT)	N/A	CTT data/ CTT data inter- / inter- face / face	CTT data inter- face	N/A	(Ch-1)
Remote Data Display (m)	N/A	Up to / Up to 1000M / 100M into an / into an existing/ existing data / data process- / process- ing fac- / ing ility / facility	Up to 300M into an existing data process facility	N/A	(Ch-1)
Payload weight (each vehicle) (lbs)	N/A	4250 / 4400	4250	N/A	(Ch-1)
Platforms	N/A	Develop / Develop and / and deploy / deploy in Lt, / in Lt Med, & / config Hvy /	HMMWV mounted, light configur	N/A	(Ch-1)

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10a. Performance Characteristics (Cont'd):

Commander's Tactical Terminal (CTT)	Development	Approved		Demon-	Current	(Ch-1)
	Estimate (SAR)	Program (APB)	Obj/Threshold	strated	Estimate	
CTT data inter- face	N/A	/	N/A	Perf	N/A	
BLOCK I (LIGHT) GSM						
Time Compression/ Integration of Data Display (frames MTI data per second)	N/A	5	/ Level / suffic- / ient to / demon- / strate / target / movement / on GSM / monitor	5	N/A	(Ch-1)
Software Assisted Target Tracking/ Prediction (# of target files tracked)	N/A	16	/ 16	16	N/A	(Ch-1)
Workstations	N/A	2	/ 2	2	N/A	(Ch-1)
Operational Availability (HW&SW)	N/A	.80	/ .75	.88	N/A	(Ch-1)
Maintenance (HW&SW)						
Mean Time to Repair (MTTR) (min)	N/A	30	/ 60	19	N/A	(Ch-1)
Mean Time to Repair (MTTR) DS/GS (min)	N/A	60	/ 180	56	N/A	(Ch-1)
Interoperability	N/A	Rec & trans to TACFIRE (10) and ASAS (10)	/ Rec & trans to TACFIRE (6) and ASAS (2)	Rec & Trans to both TACFIRE (7) and ASAS (2)	N/A	(Ch-1)
Standard IEW Modules	N/A	Std HW & SW	/ Std HW & SW	Std HW & SW	N/A	(Ch-1)
Imagery Storage (hrs)						
Digital Radar	N/A	8	/ 8	8	N/A	(Ch-1)
Video (analog)	N/A	2	/ 2	2	N/A	(Ch-1)
Simultaneous Multisensor Operations	N/A	Data from 2 or more sensors	/ Data from 2 or more sensors	Data from 2 or more sensors	N/A	(Ch-1)

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Joint STARS CGS, December 31, 1999

10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>	
		(10) /				
Standard IEW Modules	Std HW & SF	Std HW & SW	/ Std HW & SW	Std HW & SW	N/A	(Ch-1)
Payload Weight (lbs)	9500	N/A	/ N/A	N/A	N/A	(Ch-1)
Imagery Storage (hrs on line per 2 hrs video)	8	N/A	/ N/A	N/A	N/A	(Ch-1)
Imagery Storage (hrs)						
Mean Time to Repair (MTTR) (min)	N/A	30	/ 60	30	N/A	(Ch-1)
Video (analog)	N/A	2	/ 2	2	N/A	(Ch-1)
Simultaneous Multisensor Operations	Data from 2 or more sensors	Data from 2 or more sensors	/ Data from 2 or more sensors	Data from 2 sensors	N/A	(Ch-1)
Two Independent Workstations	Display MTI, FTI, and SAR data	Display MTI, FTI, and SAR data	/ Display MTI, FTI, and SAR data	Display MTI, FTI & SAR data	N/A	(Ch-1)
Remote Data Display	Data into existing data process facility	Data into existing data process facility	/ Data into existing data process facility	Data into existing data process facility	N/A	(Ch-1)
Nuclear Survivability	Hardened against EMP	Hardened against EMP	/ Hardened against EMP	Hardened against EMP	N/A	(Ch-1)
Hard copy data capability	N/A	Color printout of IMINT graphics & text	/ Color printout of IMINT data	Color printout of IMINT data	N/A	(Ch-1)
BLOCK I (HEAVY) GSM Nuclear Survivability	Hardened against EMP and thermal t ion and blast	N/A	/ N/A	N/A	N/A	(Ch-1)
Digital Radar	N/A	8	/ 8	N/A	N/A	(Ch-1)

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Joint STARS CGS, December 31, 1999

10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>	
		ASAS (10)	/ (2)			
LPU GSM						
Workstations	2	2	/ 2	2	N/A	(Ch-1)
Track Targets	Display time of detection heading, speed & location	Display time of detection heading, speed & location	/ Display / target file heading, speed & location	Display target file description heading speed & location	N/A	(Ch-1)
Predict Target Locations	Time of arrival	Time of arrival	/ Time of arrival	Time of arrival	N/A	(Ch-1)
BLOCK I (MEDIUM) GSM						
Time Compression/ Integration of Data Display (frames MTI data per second)	N/A	5	/ Level / sufficient to demonstrate target movement on GSM monitor	5	N/A	(Ch-1)
Interface JSTARS Radar (bits per second) (k)	N/A	50	/ 50	50	N/A	(Ch-1)
Software Assisted Target Tracking Prediction (# of target files tracked)	N/A	16	/ 16	16	N/A	(Ch-1)
Operational Availability (HW&SW)	N/A	.80	/ .75	.86	N/A	(Ch-1)
Workstations	N/A	2	/ 2	2	N/A	(Ch-1)
Maintenance (HW&SW)	N/A	60	/ 180	60	N/A	(Ch-1)
Mean Time to Repair (MTTR) DS/GS (min)	N/A	60	/ 180	60	N/A	(Ch-1)
Interoperability	N/A	Rec & Trans to TACFIRE (10) and ASAS	/ Rec & Trans to TACFIRE (6) and ASAS (2)	Rec & Trans to TACFIRE (19) and ASAS (2)	N/A	(Ch-1)

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Joint STARS CGS, December 31, 1999

10. Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>	
<b>INTERIM GSM</b>					
Time Compression/ Integration of Data Display (frames MTI data per second)	5	5 / Level / suffic- / ient to / demon- / strate / target / movement / on GSM / monitor	5	N/A	(Ch-1)
Target Auto Track/ Prediction (track on tgt file)	16	N/A / N/A	16	N/A	(Ch-1)
Software Assisted Target Tracking/ Prediction (# of target files traced)	N/A	16 / 16	16	N/A	(Ch-1)
Interface JSTARS Radar & AN/UPD-7 Radar (bits per second) (k)	50	50 / 50	50	N/A	(Ch-1)
Workstations	2	2 / 2	2	N/A	(Ch-1)
<b>Reliability</b>					
Mean Time Between Failure (MTBF) (hrs)	150	150 / 125	155	N/A	(Ch-1)
Mean Time Between Op Maint Failure (MTBOMF) (hrs)	71	70 / 70	77	N/A	(Ch-1)
<b>Maintenance</b>					
Mean Time to Repair (MTTR) (min)	30	30 / 30	13	N/A	(Ch-1)
Mean Time to Repair (MTTR) ODS/GS (min)	60	60 / 60	60	N/A	(Ch-1)
Max Time to Repair Unit (min)	60	60 / 60	30	N/A	(Ch-1)
Max Time to Repair (DS/GS (hrs)	3.5	3.5 / 3.5	3.5	N/A	(Ch-1)
<b>Interoperability</b>					
	Rec & Trans to both (19) and ASAS (11)	Rec & Trans to TACFIRE (10) and	/ Rec & / Trans / to TACFIRE (6) and ASAS	Rec & Trans to TACFIRE (19) and ASAS (2)	N/A (Ch-1)

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Joint STARS CGS, December 31, 1999

9a. Schedule (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
Production Award	MAR 1995	N/A	N/A
First Unit Equipped	MAR 1997	N/A	N/A
Block I (Light) GSM (LGSM)			
EMD Award	N/A	MAY 1992	MAY 1992
FDT&E			
Start	N/A	AUG 1994	SEP 1994
Complete	N/A	OCT 1994	OCT 1994
LRIP Decision	N/A	MAR 1995	MAR 1995
MOTE			
Start	N/A	JUN 1995	NOV 1995
Complete	N/A	FEB 1996	APR 1996
First Low Rate Production Delivery	N/A	NOV 1996	MAR 1997
First Unit Equipped	N/A	JAN 1997	MAY 1997
Organic Support Capability (LGSM)	N/A	JAN 1997	MAY 1997
Block II Common Ground Station (CGS)			
LRIP Award	N/A	NOV 1995	DEC 1995
Milestone III/IV	N/A	MAY 1998	JUN 2000 (Ch-1)
Operational Test			
Start	N/A	NOV 1997	MAR 1998
Complete	N/A	DEC 1997	APR 1998
CDR	N/A	JUN 1993	AUG 1993
First Delivery	N/A	APR 1997	APR 1997
First Unit Equipped	N/A	SEP 1997	SEP 1997
Technical/Operational Assessment I	N/A	MAR 1999	SEP 1999
Organic Support Capability (CGS)	N/A	SEP 1997	SEP 1997

b. Current Change Explanations --

(Ch-1) The CGS Milestone III/IV has changed from Jun 99 to Jun 00 in order to conduct additional testing.

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8c. Threshold Breaches (Cont'd):

9. Schedule:

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
INTERIM GSM			
FSD Award	AUG 1984	AUG 1984	AUG 1984
CDR	FEB 1985	FEB 1985	FEB 1985
Force DT&E	FEB 1990	N/A	N/A
Joint SLPA/GD/OA:			
Start	OCT 1990	SEP 1990	SEP 1990
Complete	N/A	SEP 1991	N/A
First Unit Equipped	OCT 1993	OCT 1993	OCT 1993
LPU GSM			
Limited Prod Contract Award	SEP 1987	SEP 1987	SEP 1987
ARDS Eval (UK)	N/A	NOV 1988	NOV 1988
FDT&E			
Start	JUN 1989	AUG 1989	N/A
First Delivery	N/A	JUL 1989	JUL 1989
ARDS Eval (France)	N/A	AUG 1989	AUG 1989
First US Unit Equipped	JUN 1990	MAY 1990	MAY 1990
Type Classification (LPU)	N/A	JUL 1992	JUL 1992
Block I (Medium) GSM			
FSD Award	AUG 1989	SEP 1989	SEP 1989
CDR	N/A	JUL 1990	NOV 1990
PDR	MAR 1990	N/A	MAR 1990
Development Test			
Start	N/A	APR 1992	APR 1992
Complete	N/A	SEP 1992	SEP 1992
Milestone III	NOV 1992	N/A	N/A
LRIP Decision	N/A	JUL 1993	JUL 1993
LRIP Contract Award	DEC 1992	JUL 1993	SEP 1993
First Production Delivery	N/A	NOV 1995	JUL 1995
Production Qualification Test (PQT)			
Start	N/A	MAY 1995	JUL 1995
Complete	N/A	AUG 1995	OCT 1995
Organic Support Capability (MGSM)	N/A	FEB 1996	DEC 1995
First Unit Equipped	SEP 1994	FEB 1996	FEB 1996
MOTE			
Start	N/A	JUN 1995	NOV 1995
Complete	N/A	FEB 1996	FEB 1996
Block I (Heavy) GSM			
Early Prototype Awd	N/A	JAN 1992	JAN 1992
Prototype Delivery	N/A	FEB 1994	FEB 1994
Operational Assessment	N/A	APR 1994	APR 1994
EMD Award	OCT 1992	N/A	N/A
CDR	APR 1993	N/A	N/A
FDT&E			
Start	JAN 1994	N/A	N/A

7. Executive Summary (Cont'd):

IOT&E commenced on 22 March 1998 at Ft. Huachuca, AZ and concluded on 13 April 1998. Due to testing concerns regarding the system availability and operator training the Milestone III DAB was delayed until the 3RD QTR FY99. A reliability event was conducted in February 1999 with the follow-on ASARC scheduled in April 1999 and the DAB June 1999. On December 11, 1998 the USDA&T approved the Army's request for 12 additional CGSs in LRIP. The contract award for the additional units was made in late December 1998. The Y2K renovations on the CGS are complete and were certified on 23 December 1998. During 1998 the CGS participated in the Winter Training Cycle, ACOM Exercise Purple Dragon and Ulchi Focus Lens 98. An Operational Readiness Demonstration Test (ORDT) was conducted in February 1999 with a resultant system Ao of .92. The CGS participated in the Eastern European Theater during 1999 in support of NATO contingency operations. The CGS was given the approval to field systems in an interim three-vehicle configuration by the ASARC. The CGS Milestone III DAB was held in August 1999 and a decision to conduct additional testing was rendered. The follow-on Milestone III will be held in June 2000. The DAB also yielded an approval to acquire an additional 7 LRIP CGSs. The additional testing will be conducted in the February/March 2000 frame in conjunction with the All Service Combat Identification Evaluation Team (ASCIET) exercise. During 1999 the PM fielded 17 CGSs to complete the decommissioning of the MGSM/LGSM systems.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

A schedule breach in the program occurred due to the need to conduct additional testing prior to the DAB. A program deviation report was submitted to notify Army and OSD leadership.

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Joint STARS CGS, December 31, 1999

7. Executive Summary (Cont'd):

documented operational requirements. Based on this new distribution, quantities increased from 90 to 125. During the FY92 Defense Appropriations review process, the GSM budget request was increased by the Congress in order to accelerate start-up of the Light GSM (LGSM) EMD effort. The LGSM mission equipment is housed in a Standard Integrated Command Post (SICP) type shelter and mounted on a HMMWV. The LGSM EMD program was completed in FY95. An LRIP contract was awarded to Motorola Corporation to produce 8 LGSMs, 12 MGSM LRIP models were also produced by Motorola in FY93-94.

A revised Acquisition Program Baseline (APB) was approved by the Under Secretary of Defense for Acquisition (USD(A)) on 11 August 93. In it the (USD(A)) approved the acceleration of the objective Joint STARS Ground Station, the Block II or Common Ground Station (CGS) based on the LGSM design. The CGS will integrate SIGINT and advanced imagery processing through a series of preplanned product improvement (P3I), which will result in an evolutionary program which began in FY96. The approval of the Acquisition Decision Memorandum (ADM) accelerating the CGS was formally received on 6 November 93. A subsequent 5 Oct 95 ADM authorized the CGS LRIP contract. The CGS LRIP contract was awarded on 14 December 1995 via full and open competition to a team headed by Motorola Corp. This eight year competitive contract (basic year plus seven option year) provides for potential significant unit price reductions based on range quantity pricing. The first two years of the CGS contract were designated as LRIPs in order to allow the delivery and test of the performance based hardware prior to the Milestone III. The first production configuration CGS successfully completed Acceptance Test Procedures in January 1997 and was formally accepted by the government.

Joint STARS participated in a NATO demonstration and experimentation program to evaluate alternative systems to provide airborne reconnaissance capability in support of NATO operations. In 1995, NATO created an Embryonic Project Office (EPO) to pursue additional cooperative efforts. The JSTARS Enhanced Ground Station Module (EGSM) was sent to the SHAPE Technical Center (STC) to be used as part of a US initiative to demonstrate and study interoperability of Joint STARS in the NATO command and control environment. On 2 December 95 the Chairman, Joint Chiefs of Staff (CJCS) tasked Joint STARS to support Operation JOINT ENDEAVOR. A total of twelve GSMs and two aircraft were deployed. The PM staff participated in a series of briefings to NATO member nations throughout 1996, detailing the JSTARS capability. Cost data for the NATO request for information (RFI) was prepared and provided to the Air Force in May 1996. On March 25, 1997 the first CGS option was exercised for a total of 16 systems. The CGS successfully participated in Task Force XXI, Advanced Warfighting Exercise (AWE) at the National Training Center, Fort Irwin, California. The PM supported the Paris Air Show 14-22 June 1997 by providing and demonstrating stand-alone JSTARS workstations to numerous US and European dignitaries. The final MGSM was fielded in July 97 and the first CGS was fielded on 26 August 1997. IOT&E was changed to a mid-March commencement (vice November 97). A NATO Ground Station study plan was awarded to an international industry team headed by Motorola, Scottsdale, AZ, and concluded in October 1998. The NATO plan focused on: a NATO Ground Station Concept of Operations, architectural requirements and recommended design for the Ground Station.

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Joint STARS CGS, December 31, 1999

**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), Fixed Target Indicator (FTI) and Synthetic Aperture Radar (SAR) functions. The radar is carried aboard a modified E-8 Aircraft and broadcasts processed radar data to the Army Common Ground Station (CGS) through an omnidirectional data link. CGSs also receive and process intelligence data from Unmanned Aerial Vehicles (UAV), Commander's Tactical Terminal (CTT) and Air Reconnaissance Low (ARL). 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 targets. The Army 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 missiles. 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. Executive Summary:**

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. The Army Ground Station Module (GSM) Full Scale Engineering Development (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). In Dec 1988, the GSM program was restructured to capture all user requirements, 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 enhanced in a phased effort (IGSM, LPU, Block I, Block II). Block I improvements entailed 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. In Dec 89 an EMD contract was awarded to Motorola Corp. to develop the Block I Medium Ground Station Module (MGSM) to implement these OSD directed Improvements. In Sep 90, Operational Field Demonstration (OPD-1) successfully demonstrated the JSTARS system (Aircraft/GSM) capabilities to NATO and US Forces in Europe. The JCS ordered the deployment of the Joint STARS system, aircraft and Ground Station Modules (GSMs) to Operation Desert Storm in December 90. The order came at the request of CINCCENT (Commander-in Chief Central Command). In March 91, HQDA approved a revised distribution plan which aligned GSM fieldings with

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A) 823)  
PROGRAM: Joint STARS CGS

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Joint STARS Common Ground Station (formerly Ground Station Module)

2. DoD Component: Army

3. Responsible Office and Telephone Number:

SPAE-IEW-JS	COL. James E. Young
FT. Monmouth, NJ 07703-5304	Assigned: August 23, 1996
	DSN 987-5165; COMM 908-427-5165

4. Program Elements/Procurement Line Items:

RDT&E:  
PE 64770A Project D202

PROCUREMENT:  
APPN 2035 ICN BA1080 (Army)  
APPN 2035 ICN BS9724 (Army)

5. References:

SAR Baseline (Development Estimate):  
ADM dated 8 Mar 89, subject "Joint STARS Ground Station Module (GSM) Acquisition Decision Memorandum".

Approved Program:  
Approved Acquisition Program Baseline (APB) dated October 5, 1995.

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DEPARTMENT OF DEFENSE

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

transportation, and organizational level simulator maintenance. The depot maintenance includes the cost of labor, material, and overhead incurred in performing major overhauls or maintenance on an electronic system, its components, and associated support equipment at centralized repair depots, contractor repair facilities, or on site by depot teams. The contractor support includes the cost of contractor labor, materials, and depreciable assets used in providing all or part of the logistics support to a weapon system, subsystem, or related support equipment. Sustaining support includes the cost of replacement support equipment, modification kits, sustaining engineering, software maintenance support and simulator operations. Indirect support includes the costs of personnel support for specialty training, permanent changes of station, and medical care. Indirect cost also includes the costs of relevant host installation services, such as base operating support and real property maintenance.

b. (U) Costs -- (FY 1997 Constant (Base-Year) Dollars in Millions)

Cost Element	Radar System, E-3 Annual Steady-State Radar with RSIP	Annual Steady-State Fleet Predecessor E3 Radar Pre-RSIP
Mission Pay & Allowances	9.9	9.9
Unit Level Consumption	2.2	4.1
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.2	0.0
Contractor Support	0.7	1.0
Sustaining Support	4.2	3.7
Indirect Costs	6.0	6.1
Total	23.2	24.8

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E-3 AWACS RSIP, December 31, 1999

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

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2006				1.3	1.5
Subtotal	32	18.9	295.4	521.3	549.9

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	32	18.9	295.4	986.8	974.3

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	5	5

(U) Percent Total Program Quantities Delivered: 15.6%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 547

(U) Percent Total Program Expended: 56.1%

(U) Expenditures data are as of December 31, 1999, and reflect US funds only. The total program cost include initial spares, which reflect Contract Authority (CA).

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
 The operating and support cost estimate for AWACS RSIP was updated in August 1997. The concept of operation is for a fleet of 32 aircraft, which does not include the TS-3, flying 1000 hours per year each with two-level maintenance. In the updated O&S cost, a comparison was made between the Post-RSIP and the Pre-RSIP configurations. These two estimates were separately prepared to reflect the annual steady-state cost, the phase-out of the predecessor system AN/APY-1/2 radar and the phase-in to the steady-state of the Post-RSIP modification to the AN/APY-1/2 radar. The Pre-RSIP system estimated FY96 as the steady-state year with complete phase out by FY04. The O&S cost of the Pre and Post systems are used to compare the differences in support cost in the steady-state mode. The mission personnel element includes the cost of pay and allowances for officer, enlisted, and civilian personnel required to operate, maintain, and support a discrete electronic system. Unit level consumption includes consumables, condemnations, second destination

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E-3 AWACS RSIP, December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY89-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-06)	<u>Total</u>
RDT&E	424.4	-	-	-	424.4
Procurement	228.3	63.6	79.9	178.1	549.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	652.7	63.6	79.9	178.1	974.3

(U) RSIP Development (RDT&E) is a cooperative program with NATO. The total \$424.2M (TY\$) is the U.S. share of the cooperative development program.

b. Annual Summary -- RSIP MOD

Appropriation: 3600 - Research, Development, Test+ Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1997 Dollars Nonrec</u>	<u>Flyaway FY 1997 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1989				52.8	44.2
1990				73.8	63.7
1991				80.2	71.8
1992				127.1	117.1
1993				16.4	15.4
1994				40.1	38.4
1995				43.8	42.7
1996				31.3	31.1
Subtotal				465.5	424.4

Appropriation: 3010 - Aircraft Procurement, Air Force

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1997 Dollars Nonrec</u>	<u>Flyaway FY 1997 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1996	2	16.6	22.4	51.5	51.9
1997	2	1.6	15.3	46.7	47.5
1998	4	0.5	28.6	64.6	66.2
1999	5	0.2	41.6	60.6	62.7
2000	1		42.8	60.6	63.6
2001	4		45.5	75.0	79.9
2002	8		59.2	80.1	86.7
2003	6		40.0	60.6	66.9
2004				12.0	13.5
2005				8.3	9.5

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14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	DEC 1988	N/A	DEC 1988
Milestone III	N/A	N/A	SEP 1997	SEP 1997
FUE/IOC	N/A	SEP 1996	JUN 2000	AUG 2000
Total Cost	N/A	689.9	891.3	974.3
Total Quantity	N/A	34	32	32
Prog Acq Unit Cost	N/A	20.29	27.85	30.45

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

a. Procurement --  
 (U) AWACS RSIP PRODUCTION:  
 The Boeing Company, Seattle, WA  
 F19628-95-C-0041, FFP  
 Award: February 9, 1996  
 Definitized: N/A

Initial Contract Price		
Target	Ceiling	Qty
\$156.9	N/A	13

Current Contract Price		
Target	Ceiling	Qty
\$156.9	N/A	13

Estimated Price At Completion	
Contractor	Program Manager
N/A	N/A

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

b. (U) Current Change Explanations --	(Dollars in Millions)
	<u>Base-Year</u> <u>Then-Year</u>
Change in Other Weapon Systems (Support)	+41.9        +45.7
Procurement Subtotal	<u>+61.9</u> <u>+63.8</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
20.29	-1.31	+0.70	+4.18	-2.40	+3.79	--	+2.60	+7.56	27.85

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
27.85	-0.65	--	+0.85	--	-0.24	--	+2.64	+2.60	30.45

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.62	-1.18	-0.02	+2.67	--	+1.90	--	+2.60	+5.97	14.59

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
14.59	-0.65	-0.01	+0.85	--	-0.24	--	+2.64	+2.59	17.18

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

(U) Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	465.5	424.6	-	890.1
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	+22.2	-	+22.2
Engineering	-	-	-	-
Estimating	-	-27.3	-	-27.3
Other	-	-	-	-
Support	-	+39.9	-	+39.9
Subtotal	-	+34.8	-	+34.8
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+23.2	-	+23.2
Other	-	-	-	-
Support	-	+38.7	-	+38.7
Subtotal	-	+61.9	-	+61.9
Total Changes	-	+96.7	-	+96.7
Current Estimate	465.5	521.3	-	986.8

(U) See the Executive Summary for a full explanation of changes in the program cost estimate.

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-4.0
Stretchout of annual procurement buy profile. (Schedule)	0.0	+1.2
Adjustment for Current and Prior Inflation. (Estimating)	+1.0	+1.0
Procurement of an APY-2 kit for the Avionics integration Support Facility (AISF). (Estimating)	+12.1	+12.7
Updated RSIP Group B kit cost and System Engineering and Program Management because of production break, schedule change, addition of second AISF and NATO kit buy. (Estimating)	+10.1	+10.6
Adjustment for Current and Prior Inflation. (Support)	+0.6	+0.6
Change in Initial Spares (Support)	-3.8	-4.0

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

d. (U) Nuclear Costs --  
None.

12. (U) Unit Cost Summary:

	UCR Baseline (MAR 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1997 BY\$)	985.4	986.8	
(2) Quantity	32	32	
(3) Unit Cost	30.794	30.838	+0.14
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1997 BY\$)	520.1	521.3	
(2) Quantity	32	32	
(3) Unit Cost	16.253	16.291	+0.23

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	424.4	466.9	-	891.3
Previous Changes:				
Economic	-	-16.9	-	-16.9
Quantity	-	-	-	-
Schedule	-	+25.9	-	+25.9
Engineering	-	-	-	-
Estimating	-	-31.9	-	-31.9
Other	-	-	-	-
Support	-	+42.1	-	+42.1
Subtotal	-	+19.2	-	+19.2
Current Changes:				
Economic	-	-4.0	-	-4.0
Quantity	-	-	-	-
Schedule	-	+1.2	-	+1.2
Engineering	-	-	-	-
Estimating	-	+24.3	-	+24.3
Other	-	-	-	-
Support	-	+42.3	-	+42.3
Subtotal	-	+63.8	-	+63.8
Total Changes	-	+83.0	-	+83.0
Current Estimate	424.4	549.9	-	974.3

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

c. (U) Foreign Military Sales --

NATO/UK: The RSIP Memorandum of Agreement (MOA) between the USAF and the NATO Airborne Early Warning and Control (AEW&C) Program Management Organization (NAPMO), signed on May 7, 1992, sets forth the terms for the RSIP Cooperative Development Program. Two U.S. RSIP EMD contracts were modified with Boeing and Northrop Grumman for the NATO RSIP Phase I effort. During Phase I Northrop Grumman is providing one more RSIP Group B radar set modification kit and instrumentation for the NATO E-3A aircraft. Boeing Phase I effort has provided one RSIP Group A Kit and the NATO Airborne Operational Computer Program (AOCP) software. In Phase II, added in January 1994, Northrop Grumman has developed the logistics support for the RSIP hardware and software components and supported Boeing during the test program; Boeing has installed and integrated the RSIP prototype Group A and B kits into the NATO E-3A test aircraft and conducted the test program. The AWACS SPO, working with NATO, developed a comprehensive strategy to implement a joint U.S. - NATO development test program for RSIP. Under the joint test concept, NATO participates in testing on the U.S. test aircraft and accomplishes the majority of NATO testing on the same aircraft. Joint test was implemented as part of the Phase II portion of the NATO RSIP effort. On March 31, 1993, the United Kingdom (UK) signed a \$5.6M Letter of Offer and Acceptance (LOA) to conduct a pre-production study for incorporating production U.S./NATO RSIP kits into the fleet of seven (7) UK E-3D AWACS aircraft. The study consisted of two parts: Phase IA provided technical information sufficient to identify differences in the UK configuration while Phase IB designed any adaptations necessary and prepared the production Request for Proposals (RFPs) and LOA. The Boeing Company was placed on contract (EST 93-UK-04A) July 13, 1993 with the Northrop Grumman Corporation placed on directed subcontract on September 1, 1993 to support Phase I. Including the \$5.8M Phase IB LOA option, the study lasted for approximately two years. UK requirements include acquisition of production kits for all 7 UK aircraft and 1 ground laboratory.

The U.S., NATO and UK joined together and awarded a contract on February 9, 1996 to purchase 28 aircraft worth of RSIP kits (2 U.S., 18 NATO, and 8 UK) under the production program. The U.S. has contracted for 11 more aircraft worth of kits in three follow-on options in FY97, FY98 and FY99. Option 1 to acquire two kits for the U.S. was awarded on October 31, 1996. Option 2 was awarded October 31, 1997 to acquire four kits. Option 3 was awarded in October 8, 1998 to acquire an additional 5 kits. The initial set of kits for NATO, N-2 and N-1, were delivered on September 30, 1997 and October 31, 1997, respectively and retrofit for N-2 began on December 8, 1997. The last NATO kits were delivered in December 1999, with final aircraft retrofits scheduled to be complete in January 2000. The UK completed retrofit of its third aircraft in December 1999, with its final aircraft scheduled for completion in February 2001.

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10b. ~~(U)~~ Performance Characteristics (Cont'd):

b. Current Change Explanations --  
(U) None

Acronyms: MTBCF - Mean Time Between Critical Failure, ECCM - Electronic Counter-counter Measures, SRC - Surveillance Radar Computer, SRCMP - Surveillance Radar Computer Maintenance Panel.

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	465.5	465.3	465.5
Procurement	424.6	520.1	521.3
Flyaway	(296.2)		(314.3)
Other Weapon Systems	(102.6)		(184.2)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(25.8)		(22.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1997 Base-Year \$	890.1	985.4	986.8
 Escalation	 1.2	 -10.7	 -12.5
Development (RDT&E)	(-41.1)	(-40.9)	(-41.1)
Procurement	(42.3)	(30.2)	(28.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	891.3	974.7	974.3

(U) Initial spares reflect Contract Authority (CA).

b. (U) Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>32</u>	<u>32</u>	<u>32</u>
Total	32	32	32

(U) Development excludes 6 RDT&E units which are not fully configured end items. This number includes the Test System-3 (TS-3), Avionics Integration Lab (AIL), Reliability Verification Testing (RVT), Environmental Qualification (EQ), Performance Qualification Lab (PQL). The NATO kit was added in 1992 when RSIP became a joint cooperative program.

Production LRIP quantities were numbered at four; two in FY96 and two in FY97, which was more than ten percent (10%) of total planned buy. This quantity of two per year was selected for economic reasons; the original buy of 34 production kits plus software maintenance facility, training, and partial spares kits was rounded to four kits.

10a. ~~(S)~~ Performance Characteristics (Cont'd):

(b)(1)

Approved Program                      Scaled  
Threshold                              Threshold                      Demonstrated

(b)(1)

TARGET RCS                      MODE                      DETECTION PHASE  
0.8m<sup>2</sup>                              NEL/OFF                      330nm ~~(SECRET)~~

(b)(1)

(U) 8. US IOT&E was completed in October 1996.

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

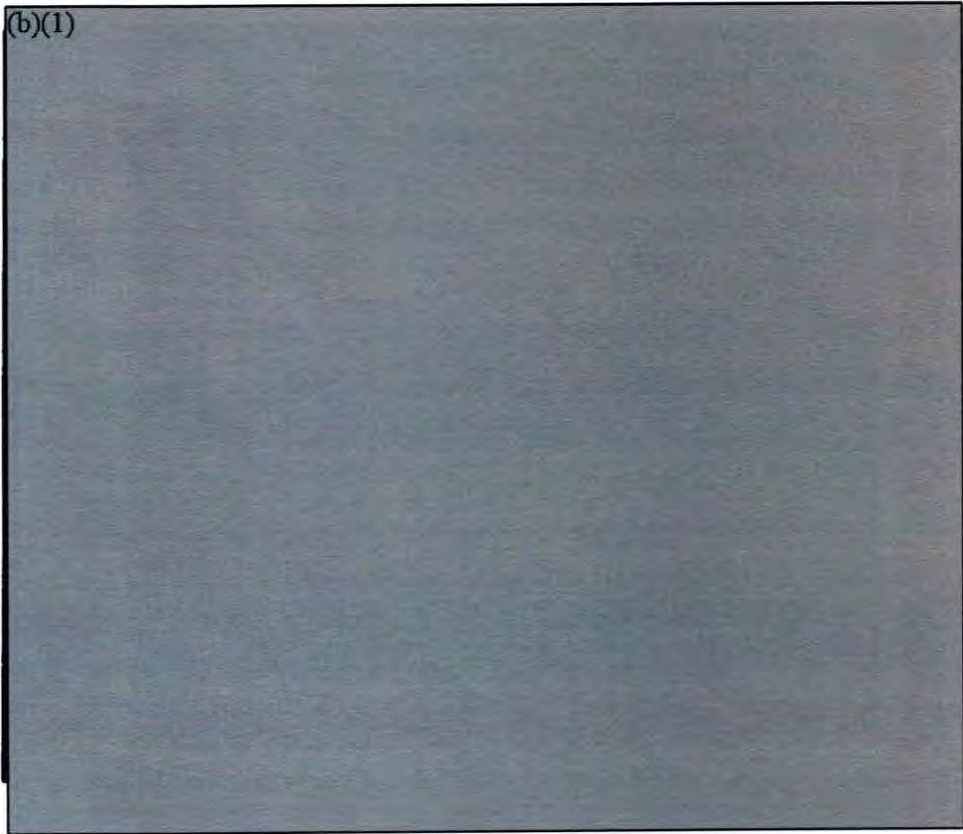
b. Current Change Explanations --

(U) (Ch-1) The Required Assets Available current estimate was changed from June 2000 to August 2000 due to severe corrosion on RSIP aircraft number 4.

10. (U) Performance Characteristics:

a. Performance --

	Production <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Improve System	13.0	13.0 / 10.6	10.9 (1)	10.6
Sensitivity (dB)				
Detection Range				
Towed-Sphere (.1M <sup>2</sup> )				
Low Altitude (nm)				
High Altitude (nm)				
Overland Mission				
MTBCF (hrs)				
Detection Range (360 degrees)				
Fighter-size target				
Low Altitude (nm)				
High Altitude (nm)				
ECCM				
3 millirad strobe azimuth, accuracy strobe on mainbeam noise jammer at 100 nm (dBw/MHz)				
Detect fighter-size target (.8m <sup>2</sup> )(nm) (dBw/MHz)				
Detect 16 degrees off main beam jammer (nm) (dBw/MHz)				
Inband frequency change (msec)				
Maintainability (SRC/SRCMP)				
Mean Repair Time (hrs)				
Fraction of Failures detected (%)				
Reliability (Radar Set)				



~~10~~ Performance Characteristics, Reference Notes

(U) 1. Non Elevation Scan (NEL) mode over Sea.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II AFSARC	DEC 1988	DEC 1988	DEC 1988
Brassboard Flight Tests	APR 1991	APR 1991	MAR 1991
System Design Review	FEB 1990	FEB 1990	FEB 1990
Critical Design Review	SEP 1991	SEP 1991	SEP 1991
Test System-3 (TS-3) I&CO	NOV 1993	NOV 1993	NOV 1993
Flight Test DT&E			
Start	JAN 1994	JAN 1994	NOV 1993
Complete	JAN 1995	JAN 1995	MAR 1995
IOT&E			
Start	AUG 1995	AUG 1995	AUG 1995
Complete	NOV 1996	NOV 1996	OCT 1996
Physical Configuration Audit	DEC 1995	DEC 1995	JUN 1996
Low Rate Initial Production Decision	NOV 1995	NOV 1995	NOV 1995
Trial Installation	MAR 1998	MAR 1998	SEP 1998
Required Assets Available	JUN 2000	JUN 2000	AUG 2000(Ch-1)

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7. (U) Executive Summary (Cont'd):

contract will be awarded for the remaining 18 aircraft kits.

In September-November 1999, the follow-on production effort experienced a number of events which significantly changed the program cost estimates. First, the Program Office revised its cost estimate, based on experience from the NATO production and retrofit program and the retrofit of the first two U.S. aircraft. Costs associated with installation and checkout support, diminishing manufacturing sources (DMS) resolution, hardware anomaly resolution, and software ICS had been significantly underestimated and had to be revised upward. Second, costs for the Avionics Integration Support Facility (AISF) RSIP APY-2 configuration, which had been dropped by the program office due to prior year budget cuts, were added back into the program estimate to meet operational support requirements. Third, the production of two RSIP kits was deferred two years as a result of a \$10M Congressional reduction in RSIP funding in FY00. Fourth, the RSIP contractors submitted a draft proposal which showed the Government estimate had underestimated the impact of the RSIP production break and had overestimated efficiencies achievable by the contractor in the follow-on production effort. Fifth, program office support costs (e.g. computer support, administrative support), which had been funded separately, were reallocated to the various AWACS programs, resulting in a significant growth in total program costs. The APB was updated in March 2000 to reflect these changes.

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7. (U) Executive Summary (Cont'd):

Flight Qualification, Software Formal Qualification Testing (FQT) and In-Plant Formal Qualification were all completed with satisfactory radar detection performance. Concurrent U.S./NATO IOT&E testing began in October 1995. Other key events in 1995 were the signing of the RSIP Operational Requirements Document (ORD) and the U.S. Low Rate Initial Production (LRIP) approval. The initial IOT&E results unexpectedly indicated inconsistent radar tracking and poor long range fighter detection in the dense clutter environment of Europe. Consequently, IOT&E was extended in order to satisfactorily resolve these issues.

In February 1996, a production contract was awarded to Boeing for 13 U.S. kits (basic [2], plus 3 options [11]), 18 NATO kits and 8 UK kits; this included specific contract language to minimize expenditures pending the resolution of the open IOT&E issues. From January-July 1996, software updates were developed and tested, critical Deficiency Report (DR) fixes were implemented and training/tech order handbook deficiencies were resolved. In July 1996, a final IOT&E software version was released, following successful integration, regression and flight testing. U.S. and NATO operational flight tests in August-September 1996 confirmed the validity of the software fixes and provided the basis for NATO's full-rate production decision in November 1996. The award of U.S. production option #1 for 2 additional LRIP units and U.S. IOT&E completion both occurred in October 1996.

The Milestone III full rate production decision was made on September 11, 1997. Key events leading to the Milestone III and NATO retrofit readiness decisions in September 1997 included the development and implementation of new radar software versions to resolve remaining critical software deficiencies, the establishment and execution of a joint U.S./NATO EMD closeout plan and completion of development and test of the SRC R4400 processor to replace the Diminishing Manufacturing Sources R3000. The Option II award for 4 additional RSIP kits was awarded on October 31, 1997. In addition, the RSIP production and retrofit contract was modified to implement a process for mating software updates (managed by the software change working group [SCWG]) similar to the process that was successfully used as part of the IOT&E and post-IOT&E corrective action plans. The SCWG will manage the software updates to clean-up discrepancies remaining from EMD and new problems discovered during the U.S., NATO and UK retrofit programs.

The Option III award for 5 additional RSIP kits was awarded on October 8, 1998. This is the last option on the F19628-95-C-0041 contract. The Acquisition Program Baseline (APB) for RSIP was updated August 1998 to accommodate FY00 POM funding disconnects. The program restructuring caused a delay in the completion of the RSIP production and installation program. The restructuring was not caused by any RSIP activities, but was caused by the overall weapon system funding constraints.

The Program Office is in the process of acquiring the remaining 19 aircraft kits. The Program Office intends to acquire one additional kit from the 0041 contract. This kit was initially procured by NATO, but is now excess due to the loss of one of their aircraft. In addition, a follow-on production

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

a. RDT&E --			Initial Contract Price		
<u>Airframe E&amp;MD:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
MCDONNELL DOUGLAS, St. Louis, MO			\$3879.5	N/A	0
N00019-92-C-0059, CPAF/IF					
Award: July 20, 1992					
Definitized: December 7, 1992					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$3875.6	N/A	0	\$3875.6	\$4009.9	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$4.6	\$-18.8	
Cumulative Variances To Date (12/31/99)			<u>\$-22.2</u>	<u>\$-3.0</u>	
Net Change			\$-27.5	\$15.8	

Explanation of Change:

Since December 1998, overall cost performance has declined due to multiple factors which include; additional effort to redesign Horizontal Stabilator Actuator, Wing Buffet Assessment, Wing Pylon Loads Study, continued support of Transonic Flying Qualities Improvement, and Correction of Deficiencies (CODS) resulting from flight test anomalies. As a result of redesigns, CODS, the release of additional Flight Control Computer and Operation Flight Program software, and flight test schedule delays resulting for Wing Drop, the flight test Program was extended six months without additional budget being allocated. Schedule variance recovery continued to date by \$15.8M to \$-3.0M. This schedule variance recovery is attributable to completion of the Flight Test Program, 65 KVA Generators qualification report, Proximity Switch redesign, and the development test associated with establishing a second source for Electronic Warfare antenna effort.

<u>F414-GE-404 ENGINE:</u>			Initial Contract Price		
General Electric Company, Lynn, MA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00019-92-C-0149, CPAF/IF EMD			\$773.8	N/A	21
Award: July 20, 1992					
Definitized: December 7, 1992					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$756.8	N/A	21	\$820.0	\$820.0	

15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-57.5	\$-1.1
Cumulative Variances To Date (12/31/99)	<u>\$-61.1</u>	<u>\$-1.1</u>
Net Change	\$-3.6	\$0.0

Explanation of Change:

Since December 1998, overall cost performance has declined primarily due to redesign efforts and developmental test and evaluation issues associated with accomplishing Full Production Qualification. Schedule variance continued to improve due to completion of design and test tasks through October 1998, when full EVM reporting was discontinued. Since that time, the contractor has been authorized to report ACWP only. In November 1999, funds were added to extend Flight Test program.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>F414-GE-404 ENGINE:</u> General Electric Co., Lynn,, MA N00019-96-C-0080, CPAF/IF LRIP I Award: April 30, 1996 Definitized: September 29, 1996	\$244.1	N/A	24

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$247.2	N/A	24	\$247.2	\$247.2

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-3.9	\$-11.8
Cumulative Variances To Date (12/31/99)	<u>\$1.3</u>	<u>\$-0.9</u>
Net Change	\$5.2	\$10.9

Explanation of Change:

Cost performance to date is favorable as the result of the sale of over-requisitioned material and excess risk abatement material to LRIP-2. Additionally, mischarges to LRIP-1 were transferred to a GE inventory account. All 24 engines were delivered on schedule. Schedule variance recovery reflects completion of outside vendor tasks, and receipt of all "make part" deliveries. The remaining unfavorable variance reflects delayed tooling and slippage in ILS and Engineering efforts.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
<u>Airframe LRIP I:</u> Boeing, St. Louis, MO N00019-96-C-0065, CPAF/IF Award: April 1, 1996 Definitized: March 10, 1997	\$1753.0	N/A	12

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>

15. Contract Information (Cont'd):

\$1781.2	N/A	12	\$1781.2	\$1781.2
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances			\$74.8	\$-29.2
Cumulative Variances To Date (12/31/99)			<u>\$27.2</u>	<u>\$-26.4</u>
Net Change			\$-47.6	\$2.8

Explanation of Change:

Overall cost performance has remained favorable but declined \$47.6M since December 1998 developing a downward trend. However, the cumulative cost variance underrun remains a healthy \$27.2M and the Cost Performance Index remains green at 1.02. Unfavorable variance trend is primarily attributable to a contract modification which purchased additional non-production engineering hours that could not be funded in the original plan. The contract modification now provides a more proper phasing of non-production engineering hours in alignment with the contract period of performance.

b. Procurement --

<u>AIRFRAME LRIP II/III:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
BOEING, ST. LOUIS, MO			
N00019-97-C-0136, FPIF	\$3703.0	\$4067.3	50
Award: June 24, 1997			
Definitized: April 24, 1998			

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$3663.9	\$4023.1	50	\$3663.9	\$3663.9

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	N/A	N/A
Cumulative Variances To Date (12/31/99)	<u>\$82.4</u>	<u>\$-22.2</u>
Net Change	\$82.4	\$-22.2

Explanation of Change:

Overall cost performance has remained favorable due to improved manufacturing techniques, reduced scrap, less than anticipated material usage and tool order releases to production floor, and lower average unit cost for parts disbursed to assembly. On a cumulative basis, this contract is showing an \$82.4M underrun. A schedule variance of \$-22.2M is unfavorable due to late pull from inventory, temporary staffing shortages on the production line. However, these schedule delays are not expected to impact contractual aircraft deliveries since the contractor is working to an accelerated schedule. In addition, the first two LRIP II aircraft were delivered to the Government over a month early to the contractual delivery date.

15. Contract Information (Cont'd):

<u>ENGINE LRIP II/III:</u>			Initial Contract Price		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
General Electric Company, Lynn, MA					
N00019-97-C-0114, FPIF			\$679.7	N/A	112
Award: June 30, 1997					
Definitized: May 28, 1998					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$697.5	N/A	112	\$697.5	\$697.5	
			<u>Cost Variance</u> <u>Schedule Variance</u>		
Previous Cumulative Variances			N/A	N/A	
Cumulative Variances To Date (12/31/99)			\$3.7	\$3.6	
Net Change			\$3.7	\$3.6	

Explanation of Change:

Cost performance has improved in several "make part" plants as a result of operating efficiencies. Schedule variance improvements reflect the early receipt of materials in Prime Outside Vendor material and in some "make part" plants.

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

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

<u>Appropriation</u>	<u>Prior</u> <u>Years</u> (FY92-99)	<u>Budget</u> <u>Year</u> (FY00)	<u>Budget</u> <u>Year</u> (FY01)	<u>Balance To</u> <u>Complete</u> (FY02-10)	<u>Total</u>
RDT&E	5411.7	141.8	19.2	1.3	5574.0
Procurement	7433.3	2918.0	3061.4	28001.9	41414.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	12845.0	3059.8	3080.6	28003.2	46988.6

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F/A-18E/F, December 31, 1999

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

b. Annual Summary -- F/A-18E/F

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				320.2	349.5
1993				752.1	839.9
1994				1227.3	1396.2
1995				1074.6	1246.0
1996				680.7	802.6
1997				289.4	345.4
1998				194.8	234.4
1999				162.8	197.7
2000				115.3	141.8
2001				15.4	19.2
2002				1.0	1.3
Subtotal				4833.6	5574.0

Pre-development effort of \$8.0M in FY91 is included in the F/A-18 Improvements project line and is not reflected in the RDT&E total.

Pre-development effort of \$39.9M in FY92, previously reported as a part of the F/A-18 C/D SAR, is reflected in the RDT&E total. This \$39.9M (TYS) is not included in the \$4.883B Congressionally mandated funding cap.

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				195.8	233.6
1997	12	217.5	1172.3	1760.6	2118.4
1998	20	175.3	1467.6	1794.2	2181.4
1999	30	208.3	1761.0	2356.4	2899.9
2000	36	162.9	1678.4	2337.0	2918.0
2001	42	208.0	1790.0	2413.6	3061.4
2002	45	255.3	1796.8	2360.0	3045.4
2003	48	285.4	1864.4	2412.3	3172.7
2004	48	291.8	1815.8	2421.8	3248.9
2005	48	267.5	1836.7	2433.1	3329.3
2006	48	279.6	1816.4	2349.1	3278.6
2007	48	279.6	1774.1	2283.4	3250.7
2008	48	279.6	1736.8	2253.4	3272.1
2009	48	279.6	1709.9	2209.3	3272.2
2010	27	148.6	1062.2	1411.2	2132.0
Subtotal	548	3339.0	23282.4	30991.2	41414.6

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	548	3339.0	23282.4	35824.8	46988.6

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	14	14

Percent Total Program Quantities Delivered: 2.6%

b. Total Expenditures To Date (In Millions of Dollars): \$ 8790

Percent Total Program Expended: 18.7%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --  
 Current Program: F/A-18E  
 Flight hours per aircraft per month: 35  
 Number of aircraft per squadron: 12  
 Consumption rate, gallons per hour: 1154.0 POL cost, JP-5 per gallon FY90\$: \$0.56

Antecedent Program: F/A-18C  
 Flight hours per aircraft per month: 31.1  
 Number of aircraft per squadron: 12  
 Consumption rate, gallons per hour: 976.49 POL cost, JP-5, per gallon, FY90\$: \$0.56  
 Date of estimate: September 1998  
 Source: AIR-4.2 Operating & Support Cost Estimate

b. Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per F/A-18E Squadron 12 A/C Squadron	Avg Annual Cost Per F/A-18C Squadron 12 A/C Squadron
Mission Pay & Allowances	7.4	7.1
Unit Level Consumption	15.1	12.5
Intermediate Maintenance	0.3	0.5
Depot Maintenance	3.2	2.2
Contractor Support	0.0	0.0
Sustaining Support	2.8	2.4

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

b. Costs -- (FY 1990 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per F/A-18E Squadron 12 A/C Squadron	Avg Annual Cost Per F/A-18C Squadron 12 A/C Squadron
Indirect Costs	1.0	1.0
Total	29.8	25.7

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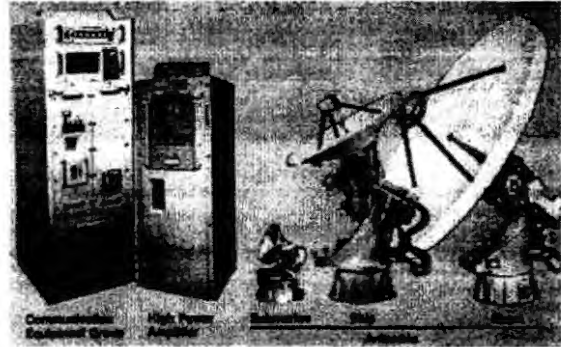
SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

**PROGRAM:** Navy EHF SATCOM Prog

**AS OF DATE:** December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Navy EHF SATCOM Program (NESP) AN/USC-38(V)

2. (U) DoD Component: Navy

3. (U) Responsible Office and Telephone Number:

Space and Naval Warfare Systems	CAPT Gary Graupmann
Command - PMW 176	Assigned: January 9, 1998
4301 Pacific Highway	DSN ; COMM (619) 524-7930
San Diego, CA 92110-3217	grpmnn@spawar.navy.mil

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

RDT&E:  
 (U) PE 0303109N Project X0728

PROCUREMENT:  
 (U) APPN 1810 ICN 33321000 (Navy) (Shared)  
 (U) APPN 1810 ICN 33322000 (Navy) (Shared)  
 (U) APPN 1810 ICN 33902000 (Navy) (Shared)  
 (U) APPN 1611 ICN MULTIPLE (Navy)

MILCON:  
 (U) PE 0303109N

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 00-0-0859  
 MAR 29 2000  
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 Office of the Chief of  
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Derived from:  
 Downgrade instructions: Manual System Classification Guide September 10, 1993  
 Declassification: X3

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5. (U) References:

SAR Baseline (Production Estimate):

(U) NAE Approved Acquisition Program Baseline dated March 24, 1993.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated December 9, 1999.

6. (U) Mission and Description:

(U) The Navy Extremely High Frequency (EHF) Satellite Communications (SATCOM) Program (NESP) AN/USC-38(V) is an anti-jam, low probability of intercept communications terminal designed to accommodate a wide variety of command and control communication applications (i.e., secure voice, teletype, data and fleet broadcast systems). As the Navy's portion of Milstar I (Low Data Rate) and II (Medium Data Rate), NESP terminals are an essential part of the number one command and control communications system within DOD. The terminal operates within the EHF uplink and Super High Frequency (SHF) downlink radio frequency (RF) spectrums. The terminals are interoperable with Army and Air Force terminals and operate with Milstar satellites as well as EHF packages on board Ultra High Frequency (UHF) Follow-On (UFO) Satellites and with the Fleet Satellite (FLTSAT) EHF Packages (FEP) installed on FLTSATs 7 and 8. A Medium Data Rate (MDR) capability has been developed to allow MDR communications with Milstar II satellites while also providing backward compatibility with Milstar I satellites. The EHF terminal will provide vital survivable wartime command and control communications for the National Command Authority, Unified CINCs and operational commanders. NESP has configurations for Submarine, Ship and Shore platforms with significant commonality between platform types. This system does not replace another system.

7. (U) Executive Summary:

(U) The Navy EHF terminal was developed to support the requirements of the Mission Elements Needs Statement (MENS), ASN (RE&S) letter of July 23, 1981, Navy Decision Coordinating Paper (NDCP) of January 21, 1982, updated April 25, 1989 and the Milstar ORD of September 1992. NESP's operational performance will meet the threat defined in the Milstar System Threat Assessment Report (STAR) updated March 1997. After a full and open competition, three companies began system definition and concept demonstration in 1979. Two companies were selected for Full Scale Development (FSD) in 1982; one company was awarded a Firm Fixed Price contract in 1986 for FSD completion and initial production. Low Rate Initial Production (LRIP) beginning in FY90 was approved at a Milestone IIIA decision in May 1989. Operational Evaluation (OPEVAL) Phase I and OPEVAL II were successfully completed in September 1990 and August 1992, respectively. Full Rate Production beginning in FY93 was approved at a Milestone III decision in April 1993.

(U) The first Milstar satellite was launched on February 7, 1994. A production NESP terminal successfully communicated with an Air Force terminal over the on-orbit Milstar I Satellite on February 15, 1994 as part of Milstar

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7. (U) Executive Summary (Cont'd):

System Test (MST)-8000. NESP Initial Operational Capability (IOC) was achieved in April 1994.

(U) Operational test event OT-IIIB, Signal Susceptibility and Vulnerability Assessment, which tested the anti-jam (AJ) and low probability of intercept (LPI) performance of the NESP terminal, was successfully completed in November 1996. During this test, EHF shore, sub and ship terminals met their respective AJ and LPI requirements. Completion of this test represented a major accomplishment in the Navy EHF SATCOM Program.

(U) The Navy EHF SATCOM Program Acquisition Strategy updated in December 1996 provided for the development and deployment of a Medium data Rate (MDR) upgrade to satisfy interoperability and compatibility with Milstar II satellites. In addition, the strategy included a plan to competitively procure a Low data Rate (LDR)/Medium Data Rate (MDR) follow-on NESP terminal based on performance specifications, to allow the Navy to capitalize on the most current technology to satisfy remaining fleet requirements. The resultant "Follow-On Terminal" (FOT) procurement was based on full and open competition, and integrates the LDR and MDR capability into a streamlined terminal configuration.

(U) The MDR upgrade contract was awarded on January 20, 1998. The contract supplies an MDR capability via a spare drawer in the initial LDR terminal.

(U) The Follow-On Terminal Contract was awarded on March 20, 1998. This contract will provide LDR/MDR capability to satisfy remaining Fleet requirements.

(U) MST-6000 was successfully completed in August 1998. This test verified Navy unique MDR data communications as well as interoperability between the Navy EHF terminal and Army SMART-T terminals over the ground based Milstar II MDR payload.

(U) The Navy EHF Program Office Supported the Advanced EHF (AEHF) satellite program Operational Requirements Document development process. The ORD was validated by the Joint Requirements Oversight Council (JROC) on March 22, 1999.

(U) The EHF Program has completed the first two installations of the AN/USC-38(V) MDR upgrade. The installations were completed at Commander-in-Chief, US Pacific Fleet (CINCPACFLT) and on the USS CORONADO. The increased capability from LDR to MDR consisted of the installation of larger antennas and the MDR applique.

(U) A revised Acquisition Program Baseline (APB) was approved by Assistant Secretary of the Navy on December 9, 1999 that reflects an MDR Operational Test (OT) date of November 2000. MDR Operational Test is dependent upon the successful launch of the Air Force Milstar II Flight 4 satellite. The Milstar Flight 3 satellite launch failure caused the delay of the MDR Operational Test.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
System Definition/Concept Demo (CEB) (3 Contractors)	OCT 1979	OCT 1979	OCT 1979
FSD Approval (Milestone II) (2 Contractors)	JAN 1982	JAN 1982	JAN 1982
PDR Complete	NOV 1982	NOV 1982	NOV 1982
CDR Complete	JUN 1984	JUN 1984	JUN 1984
Downselect (1 Contractor)	MAR 1986	MAR 1986	MAR 1986
Factory Acceptance Test	JAN 1988	JAN 1988	JAN 1988
Operational Assessment (OTIIA)	MAR 1988	MAR 1988	MAR 1988
Program Review (Low Rate Initial Prod)	MAY 1989	MAY 1989	MAY 1989
Operational Evaluation (OTIIB)	JUN 1990	JUN 1990	JUN 1990
Low Rate Initial Production First Delivery	JUL 1992	AUG 1992	AUG 1992
Additional Operational Testing (OTIIC)	JUL 1992	JUL 1992	JUL 1992
Milestone III (Full Rate Production)	DEC 1992	DEC 1992	APR 1993
First Unit Equipped Start	JAN 1993	JAN 1993	JAN 1993
Service Depot Support Date	FEB 1994	FEB 1994	FEB 1994
Organic Support Capability Date	FEB 1994	FEB 1994	FEB 1994
Initial Operational Capability (Navy)	JAN 1994	JAN 1994	APR 1994
FOT&E	MAR 1994	MAR 1994	AUG 1994
Follow-On Procurement RFP Release	JAN 1997	JAN 1997	JUL 1997
MDR Applique Award	OCT 1997	OCT 1997	JAN 1998
MDR Operational Test	OCT 1998	NOV 2000	NOV 2000
Milestone IV	FEB 1999	N/A	N/A

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

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

a. Performance --

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Survivability	(b)(1)			
1) Transient Overpressure (psi)	(b)(1)			
1) Neutron Fluence (neutrons/cm^2)	(b)(1)			
1) Gamma Dose Rate (rads) (si)/(sec)	(b)(1)			
1) Total Gamma Dose (rads) (si)	(b)(1)			
1) Gamma Dose Initial (rads) (si)	(b)(1)			
Thermal Fluences	(b)(1)			
1) 1 MT yield (cal/cm^2)	(b)(1)			
EMP (peak at antenna)	(b)(1)			
1) Eo Field (volts/meter)	(b)(1)			
1) Ho Field (amps/meter)	(b)(1)			
Resistance to Jamming	(b)(1)			
Shore (EIRP) (dBW)	(b)(1)			
Shore (G/T) (dBi)	(b)(1)			
Ship (EIRP) (dBW)	(b)(1)			
Ship (G/T) (dBi)	(b)(1)			
Sub (EIRP) (Wet Radome) (dBW)	(b)(1)			
Sub (G/T) (Wet Radome) (dBi)	(b)(1)			
Low Probability of Intercept (CEVR) (75bps/minimum power)	(b)(1)			
Ship (nmi)	(b)(1)			
Sub (nmi)	(b)(1)			
Submarine	(b)(1)			
Surface	(b)(1)			
Shore	(b)(1)			
Reliability (All Terminals) (hrs)	(b)(1)			
Maintainability (MTTR) (hrs)	(b)(1)			
Minimum Essential Communications	(b)(1)			



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

	Production Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
(U) Ship (4 Ft. Ant.) (kBPS)	(b)(1)			
(U) Ship (3 Ft. Ant.) (kBPS)				
(U) Sub (9.5 in. Ant.) (kBPS)				

(U) The results of the OT-IIIB are documented in COMOPTEVFOR report Ser. 611/5049 of December 19, 1996. OT-IIIB test results verified that the performance of the NESP terminal meets or exceeds APB Thresholds.

(b)(1)	(b)(1)			
(b)(1)				
(b)(1)				
(b)(1)				
(b)(1)				

(U) Entries shown for Performance Characteristics under "Demonstrated Performance" have been tested at values equal to or better than the Approved Program Objective/Threshold.

(U) Acronyms:

- bps - bits per second
- cal - calories
- cm - centimeters
- CEVR - Circular Equivalent Vulnerability Radius
- dBi - logarithmic ratio of directional power relative to a spherical (isotropic) radio frequency radiator
- dBW - logarithmic ratio relative to one watt
- EIRP - effective isotropic radiated power
- G/T - antenna receive gain/temperature of receive system (figure of merit)
- nmi - nautical miles
- sec - seconds
- rads(si)/sec - radiation dose (square inches)/second
- sv - secure voice
- TTY - Teletype
- hrs - hours
- FLTBCST - Fleet Broadcast

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

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	457.4	457.4	494.4
Procurement	1395.2	1395.2	1325.1
Terminals	(991.7)		(995.7)
Other Weapon Sys	(127.9)		(135.4)
Peculiar Support	(40.7)		(34.7)
Initial Spares	(234.9)		(159.3)
Construction (MILCON)	24.0	24.0	7.7
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1990 Base-Year \$	1876.6	1876.6	1827.2
Escalation	497.1	497.1	261.5
Development (RDT&E)	(6.0)	(6.0)	(14.7)
Procurement	(486.3)	(486.3)	(245.9)
Construction (MILCON)	(4.8)	(4.8)	(0.9)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2373.7	2373.7	2088.7
b. (U) Quantity --			
Development (RDT&E)	7	7	7
Procurement	<u>386</u>	<u>386</u>	<u>512</u>
Total	393	393	519

(U) Note: RDT&E units are fully configured.

A total of 116 EHF terminals were procured under LRIP, exceeding 10% of total production. Three one-year LRIPs were approved between FY90-92 by the Navy Acquisition Executive as the Navy terminal program was ahead of Milstar Satellite schedules as well as Army and Air Force terminal program schedules.

The current estimate for total units (Procurement) has increased from 352 in the December 1998 SAR to 512 in this SAR. The 512 represents 183 LDR only Terminals, 13 LDR only Single Channel Anti-Jam Man Portables (SCAMPS), 71 LDR Terminals with MDR AppliquUpgrades, and 245 LDR/MDR Follow-On Terminals (FOTs). This increase in end-item procurements reflects a change in the strategy for providing an MDR capability to meet Fleet requirements. The actual total number of terminals required to be fielded by FY 2005 to meet Fleet requirements is 342, a decrease of 10 from last year.

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

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

d. (U) Nuclear Costs --  
None.

12. (U) Unit Cost Summary:

	UCR Baseline (MAR 1993 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1990 BY\$)	1876.6	1827.2	
(2) Quantity	393	519	
(3) Unit Cost	4.775	3.521	-26.26
b. (U) Avg. Proc. Unit Cost (APOC)			
(1) Cost (FY 1990 BY\$)	1395.2	1325.1	
(2) Quantity	386	512	
(3) Unit Cost	3.615	2.588	-28.41

(U) The revised Acquisition Program Baseline of December 9, 1999 updated schedule information only; no cost information was updated.

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13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	463.4	1881.5	28.8	2373.7
Previous Changes:				
Economic	-7.7	-188.5	-0.6	-196.8
Quantity	-	-120.9	-	-120.9
Schedule	+23.9	+46.8	-	+70.7
Engineering	+35.5	+33.7	-	+69.2
Estimating	-4.2	+59.0	+0.8	+55.6
Other	-	-	-	-
Support	-	-146.2	-20.4	-166.6
Subtotal	+47.5	-316.1	-20.2	-288.8
Current Changes:				
Economic	-1.1	-7.1	-	-8.2
Quantity	-	+262.8	-	+262.8
Schedule	-	-11.4	-	-11.4
Engineering	-	-	-	-
Estimating	-0.7	-261.2	-	-261.9
Other	-	-	-	-
Support	-	+22.5	-	+22.5
Subtotal	-1.8	+5.6	-	+3.8
Total Changes	+45.7	-310.5	-20.2	-285.0
Current Estimate	509.1	1571.0	8.6	2088.7

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	457.4	1395.2	24.0	1876.6
Previous Changes:				
Quantity	-	-77.8	-	-77.8
Schedule	+12.1	+29.1	-	+41.2
Engineering	+24.3	+23.8	-	+48.1
Estimating	+0.6	+35.8	+0.5	+36.9
Other	-	-	-	-
Support	-	-91.1	-16.8	-107.9
Subtotal	+37.0	-80.2	-16.3	-59.5
Current Changes:				
Quantity	-	+203.5	-	+203.5
Schedule	-	-9.0	-	-9.0
Engineering	-	-	-	-
Estimating	-	-201.4	-	-201.4
Other	-	-	-	-
Support	-	+17.0	-	+17.0
Subtotal	-	+10.1	-	+10.1
Total Changes	+37.0	-70.1	-16.3	-49.4
Current Estimate	494.4	1325.1	7.7	1827.2

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised inflation indices. (Economic)	N/A	-1.1
	Revised estimate for terminal upgrades in the outyears. (Estimating)	0.0	-0.8
	Adjustment for current and prior inflation. (Estimating)	0.0	+0.1
	RDT&E Subtotal	0.0	-1.8
(2)	<u>Procurement</u>		
	Revised inflation indices. (Economic)	N/A	-7.1
	Quantity increase of 160 terminals and 120 NECCs due to revised strategy for fielding Medium Data Rate (MDR) capability. (QR) (Quantity)	+363.2	+469.0
	Quantity decrease of 159 Medium Data Rate (MDR) appliques due to revised strategy for fielding MDR capability. (QR) (Quantity)	-159.7	-206.2
	Revised procurement schedule for terminals and other equipment. (QR) (Schedule)	-9.0	-11.4
	Revised estimates for Follow-On NESP terminal procurement based on definitized contract data. (QR) (Estimating)	-51.6	-67.3
	Revised estimates for Follow-On NESP terminal installation costs based on detailed installation analysis. (QR) (Estimating)	-149.8	-195.5
	Adjustment for current and prior year inflation. (Estimating)	0.0	+1.6
	Revised estimates for initial spares costs based on better estimates for the Follow-On NESP terminal partially offset by changes in quantity. (QR) (Support)	+17.0	+22.5
	Procurement Subtotal	+10.1	+5.6

QR = Quantity related changes.

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Navy EHF SATCOM Prog, December 31, 1999

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.04	-0.39	-1.19	+0.11	+0.13	-0.40	--	-0.28	-2.02	4.02

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.87	-0.38	-0.93	+0.07	+0.07	-0.39	--	-0.24	-1.80	3.07

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	OCT 1979	OCT 1979
Milestone II	N/A	N/A	JAN 1982	JAN 1982
Milestone III	N/A	N/A	DEC 1992	APR 1993
FUE/IOC	N/A	N/A	JAN 1994	APR 1994
Total Cost	N/A	N/A	2373.7	2088.7
Total Quantity	N/A	N/A	393	519
Prog Acq Unit Cost	N/A	N/A	6.04	4.02

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

a. Procurement --

(U) EHF Terminals:

RAYTHEON COMPANY, MARLBOROUGH, MA  
N00039-82-C-0146, FFP  
Award: February 14, 1990  
Definitized: February 14, 1990

Initial Contract Price	Initial Contract Price	
	Target	Ceiling
Qty	\$83.7	N/A

Current Contract Price		
Target	Ceiling	Qty
\$414.0	N/A	269

Estimated Price At Completion	
Contractor	Program Manager
\$414.0	\$414.0

Explanation of Change:

None.

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Navy EHF SATCOM Prog, December 31, 1999

15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>EHF Follow-On Terminals:</u> Raytheon Company, Marlborough, MA N00039-98-C-0047, FFP Award: March 20, 1998 Definitized: January 20, 2000	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$9.5	N/A	1

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$9.5	N/A	1	\$155.0	\$155.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY82-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-06)	<u>Total</u>
RDT&E	410.7	8.4	9.3	80.7	509.1
Procurement	1024.5	151.5	154.9	240.1	1571.0
MILCON	8.6	-	-	-	8.6
O&M	-	-	-	-	-
Total	1443.8	159.9	164.2	320.8	2088.7

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Navy EHF SATCOM Prog, December 31, 1999

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

b. Annual Summary -- NAVY EHF SATCOM PROGRAM

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1982				22.3	17.2
1983				30.2	24.4
1984				29.7	24.8
1985				38.0	32.8
1986				23.9	21.2
1987				37.4	34.2
1988				42.8	40.4
1989				27.9	27.4
1990				19.8	20.3
1991				16.2	17.2
1992				30.3	33.1
1993				23.2	25.9
1994				12.7	14.5
1995				17.1	19.8
1996				11.4	13.4
1997				11.4	13.6
1998				12.3	14.8
1999				12.9	15.7
2000				6.8	8.4
2001				7.5	9.3
2002				8.4	10.6
2003				8.3	10.7
2004				9.1	11.9
2005				6.0	8.1
2006				28.8	39.4
Subtotal	7			494.4	509.1

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1990	3		6.6	4.0	4.3
1991	1		2.0	1.2	1.3
1992	1		2.2	2.0	2.3
1993	9		19.6	12.0	13.9
1994	7		26.7	11.6	13.7
1995				6.7	8.0
1996	3		7.4	15.1	18.2
1997				4.9	6.0
1998	15		26.8	19.8	24.3

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Navy EHF SATCOM Prog, December 31, 1999

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				4.6	5.7
2000	13		16.8	16.8	21.3
2001	10		13.2	16.4	21.2
2002	6		8.4	12.0	15.7
2003	6		8.5	8.5	11.4
2004	5		8.4	9.1	12.4
2005	2		3.4	5.3	7.4
2006				1.4	2.0
2007					
Subtotal	81		150.0	151.4	189.1

(U) "Flyaway" costs include installation amounts in the year in which the equipment is procured. "Total Base Year" and "Total Then Year" costs reflect installation in the year in which funds are budgeted.

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1989		4.3	4.5	8.8	9.1
1990	21	17.4	44.7	119.2	127.5
1991	37	2.8	71.5	98.2	106.9
1992	53	1.8	118.9	137.2	154.0
1993	54	1.0	110.5	111.0	126.0
1994	58	0.4	138.6	93.3	107.4
1995			1.1	48.2	56.5
1996	7		14.6	46.2	54.8
1997		7.8	5.0	61.7	74.0
1998	1	7.2	16.2	39.7	48.0
1999	13	1.8	38.3	51.2	62.6
2000	74	1.0	86.5	105.1	130.2
2001	54		64.0	106.3	133.7
2002	49		63.8	82.3	105.2
2003	10		7.7	38.3	49.9
2004			5.3	17.5	23.2
2005			7.8	9.5	12.9
Subtotal	431	45.5	799.0	1173.7	1381.9

(U) "Flyaway" costs include installation in the year in which equipment is procured. "Total Base Year" and "Program" costs reflect installation in the year in which funds are budgeted. Also, "Flyaway Rec" numbers include production of upgrades such as MDR upgrades for retrofit into NESP

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

terminals in the year in which the funds are budgeted.

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Sailaway FY 1990 Dollars Nonrec	Sailaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				7.7	8.6
Subtotal				7.7	8.6

	Qty	Sailaway Dollars Nonrec	Sailaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	519	45.5	949.0	1827.2	2088.7

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	7	7
Procurement	254	254

(U) Percent Total Program Quantities Delivered: 50.3%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1280.3

(U) Percent Total Program Expended: 61.3%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

(U) Operating and support costs are the sum of all costs resulting from the operation, maintenance, and support of the terminals after acceptance into the Navy inventory. The operating costs are the sum of the cost of operating personnel and facilities, in addition to energy and software maintenance. The prime equipment inventory objective by FY 2005 will consist of 197 Ship, 72 Submarine, 60 Shore, and 13 Training.

(U) Support costs include the following: (1) corrective maintenance labor and material at Organizational/Intermediate (O/I) and depot levels, (2) packaging and shipping costs incurred as a result of shipping failed and repaired items between organizational and depot level maintenance facilities, (3) preventive maintenance labor and material costs, (4) Support and Test equipment maintenance and material costs, (5) O/I and depot level maintenance shop spare costs, (6) O/I and depot level inventory storage costs, (7) documentation maintenance costs, (8) replenishment spare costs, (9) supply system management costs and, (10) the cost of training operators and O/I and depot level

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

maintenance personnel.

(U) Source of data: Program Life Cycle Cost Estimate (PLCCE) prepared for MS III approval decision granted April 1993.

(U) O&S costs for the NESP Follow-On Terminals (FOT) are being formalized, but are expected to be lower than the original NESP terminal estimates from MS III.

(U) There is no Antecedent System for this program.

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg. Annual Cost Per Terminal	N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	18.0	0.0
Intermediate Maintenance	39.0	0.0
Depot Maintenance	41.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	98.0	0.0

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DoD-7 THAAD

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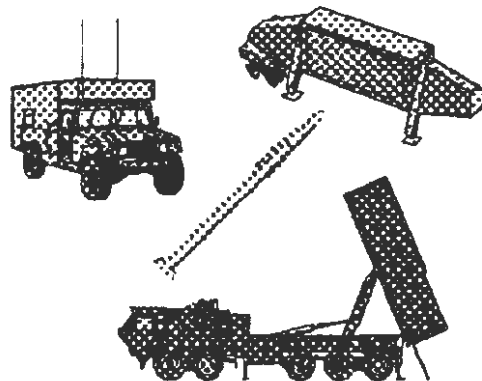
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)  
PROGRAM: THAAD System

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

AS OF DATE: 1999

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1. (U) Designation and Nomenclature (Popular Name): Theater High Altitude Area Defense (THAAD) System

2. (U) DoD Component: BMDO

Joint Participants:

The Department of the Army is the Executing Agency

3. (U) Responsible Office and Telephone Number:

THAAD Project Office	COL Patrick J. O'Reilly
P.O. Box 1500	Assigned: July 15, 1999
Huntsville, AL 35807-3801	DSN 645-2169; COMM (256) 955-2169
	oreillyp@thaad.army.mil

(U) Program Executive Officer	BG John M. Urias, USA
Air and Missile Defense	Assigned: September 10, 1999
PO Box 1500	DSN 897-3401; Comm (256) 313-3401
Huntsville, Al 35807-3801	uriasjm@md.redstone.army.mil

Ballistic Missile Defense	LtGen Ronald T. Kadish, USAF
Organization, The Pentagon	Assigned: June 14, 1999
Washington, DC 20301-7100	DSN 223-3025 COMM (703) 693-3025

~~Classified by: USAASDC THAAD Program Security Classification Guide 210003  
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4. (U) Program Elements/Procurement Line Items:

RDT&E:

(U) PE 0602218C  
(U) PE 0603216C (Shared) Project A2104, A2210, A3304  
(U) PE 0603861C Project A2260, M2260  
(U) PE 0603862C Project A2154  
(U) PE 0603872C  
(U) PE 0604218C (Shared) Project S2260  
(U) PE 0604861C Project M2260

(U) PE 0604218C, Upper Tier Missile is no longer used and the funds have been disbursed between THAAD and the Navy Theater Wide programs.

5. (U) References:

SAR Baseline (Planning Estimate):

(U) ADM, dated January 28, 1992, subject: ADM for Upper Tier Theater Missile Defense System (UTTMDS) Program

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated March 10, 1998.

6. (U) Mission and Description:

(U) The mission of the Theater High Altitude Area Defense (THAAD) System is to defend against Theater Ballistic Missiles (TBMs) at long ranges and high altitudes. THAAD's long range capability will protect U.S. and allied Armed Forces, broadly dispersed assets and population centers against TBM attacks. THAAD's capability to intercept at high altitudes allows multiple intercept opportunities and will significantly mitigate the effects of weapons of mass destruction. The THAAD System consists of missiles, launchers, radars, battle management/command, control, communications, and intelligence (BM/C3I) units, and support equipment. The THAAD radar utilizes state-of-the-art radar technology to accomplish its required functions of threat attack early warning, threat type classification, interceptor fire control, external sensor cueing, launch and impact point estimation, and kill assessment after intercept. THAAD will be fully interoperable with Army PATRIOT, Navy Area Wide, and other missile defense systems to provide near leak proof defense as part of an integrated air and missile defense system. Two THAAD battalions of four batteries each will be developed. The THAAD System does not replace another system.

7. (U) Executive Summary:

(U) The Theater High Altitude Area Defense (THAAD) System (formerly Upper Tier Theater Missile Defense System) requirement was initiated as a Concept Definition Program in 1990. The THAAD System was approved at Milestone Decision Review I in January 1992 for the Demonstration/Validation (Dem/Val) Acquisition Phase I.

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7. (U) Executive Summary (Cont'd):

The Ground Based Radar (GBR) Program evolved from the Ballistic Missile Defense Organization (BMDO) Terminal Imaging Radar (TIR) Project which supported the BMDO in their sensor programs. The TIR program changed into the GBR-X in January 1988 and was again restructured to support near term goals of the Missile Defense Act of 1991 to include Theater Missile Defense (TMD) and Strategic Defense System protection against limited attacks.

The THAAD and TMD-GBR Project Offices merged on June 30, 1995, forming the THAAD System Project Office.

A \$2.1B reduction in funding over the Future Years Defense Plan in the FY 1997 President's Budget resulted in a major restructure of the program. This restructure redefined the Objective System design and delayed the First Unit Equipped (FUE) from FY 2002 to FY 2006.

The lack of an intercept on Flight Test 07 resulted in another restructure of the program. Based on the recommendations of Independent Review Teams, the number of Program Definition & Risk Reduction (PDRR) flights increased from eleven to thirteen.

In total, THAAD conducted eleven PDRR flight tests. Flight Tests 01-03 were non-intercept missions. Beginning with Flight Test 03, THAAD began the process of integrating the segments into the flights, so that by Flight Test 07, the integrated system had been tested.

After the failure of Flight Test 08, the funding and program were restructured, with the RDT&E period of performance extended and FUE delayed from FY 2006 to FY 2007.

THAAD achieved 1st intercept with Flight Test 10 on June 10, 1999 and a second intercept with Flight Test 11 on August 02, 1999. The Under Secretary of Defense (Acquisition and Technology) directed the end of the PDRR flight test program on August 26, 1999 as a result of completing PDRR test objectives with the two intercepts, and directed the program to prepare for an EMD decision. THAAD is currently undergoing extensive rebaselining activities in preparation for a Milestone II Defense Acquisition Board review in May 2000 with an FUE 2007 program that fits within the President's Budget.

Consistent with this approach, the THAAD program has adopted a program restructure based on an evolutionary acquisition approach in lieu of the standard acquisition approach. An initial capability Configuration 1 (C1), will be fielded with an FUE of FY2007. This capability will meet the key performance parameters (KFPs) in the Operational Requirements Document (ORD) and will defeat all expected Upper Tier threats in this timeframe. Fully ORD compliant capabilities are deferred until a Configuration 2 (C2) FUE of FY2012.

This is an RDT&E-only SAR in accordance with Title 10, United States Code, Section 2432, "Selected Acquisition Reports".

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

**Schedule:** A revised APB reflecting current program restructures has not yet been developed and approved. Therefore, this SAR reports the same schedule parameter breaches reflected in the last SAR. Milestones breached are Low Rate Initial Production Review, Milestone III, and Full Rate Production Contract Award. The schedule breach was caused by fiscal constraints and additional flight failure analysis.

**RDT&E Cost:** The Current Estimate reflects the budget requirements for the Project Manager's First Unit Equipped 2007 program as briefed to the OSD Overarching Integrated Product Team (OIPT) on December 20, 1999. The APB RDT&E cost threshold has been breached as shown. A new APB was developed and staffed through the Integrated Product Team (IPT) process and submitted in accordance with the Under Secretary of Defense (Acquisition and Technology) memorandum of February 25, 1999 as noted in the last SAR. However, the program has continued to evolve as direction changed, and the APB will be revised and staffed for approval with the Milestone II Defense Acquisition Board documents per the latest program guidance.

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9. (U) Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Army Concept Definition Studies Complete	MAY 1992	MAY 1992	MAY 1992
Milestone I Review	JAN 1992	JAN 1992	JAN 1992
THAAD Dem/Val Contract Award	JUN 1992	JUN 1992	SEP 1992
GBR Dem/Val Contract Award	JUN 1992	SEP 1992	SEP 1992
Integrated System Test Start	JUL 1995	OCT 1995	SEP 1995
System Delivery Complete (Less Missiles and Radars)	JUL 1996	N/A	N/A
Delivery of Optional 40 UOES Missiles Complete	TBD	N/A	N/A
Milestone II DAB Review	JUL 1996	JUL 1999	MAY 2000 (Ch-1)
THAAD EMD Contract Award	AUG 1996	JUL 1999	MAY 2000
GBR EMD Contract Award	AUG 1996	N/A	N/A
LRIP Review	FEB 1999	JAN 2004	FEB 2007 (Ch-1)
Milestone III DAB Review	JUL 2001	JAN 2007	SEP 2008 (Ch-1)
Full Rate Production Contract Award	N/A	FEB 2007	DEC 2008 (Ch-1)
FUE	JUL 2001	SEP 2006	MAY 2007 (Ch-1)
IOC	TBD	TBD	TBD

(U) Project Manager's current estimate reflects a preliminary restructured program of a Configuration 1 First Unit Equipped (FUE) 2007 program resulting from current OSD funding and guidance.

FUE C1 - one modified firing battery  
FUE C2 - one complete firing battery  
IOC - will be identified at MSIII

b. Current Change Explanations --

(U) (Ch-1) Due to a change in acquisition strategy and fiscal constraints, Milestone II DAB Review changed from APR 2000 to MAY 2000; LRIP Review changed from APR 2005 to FEB 2007; Milestone III changed from OCT 2008 to SEP 2008; Full Rate Production Contract Award changed from JAN 2009 to DEC 2008; and FUE changed from a single FUE of AUG 2007 to a split C1 FUE (meets all KPPs) of MAY 2007 and a C2 FUE (fully ORD compliant) of APR 2012.

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10. (U) Performance Characteristics:

a. Performance --

AS AMENDED      Planning      Approved      Demon-      Current  
Estimate (SAR)      Program (APB)      strated      Estimate  
Obj/Threshold      Perf

(b)(1)



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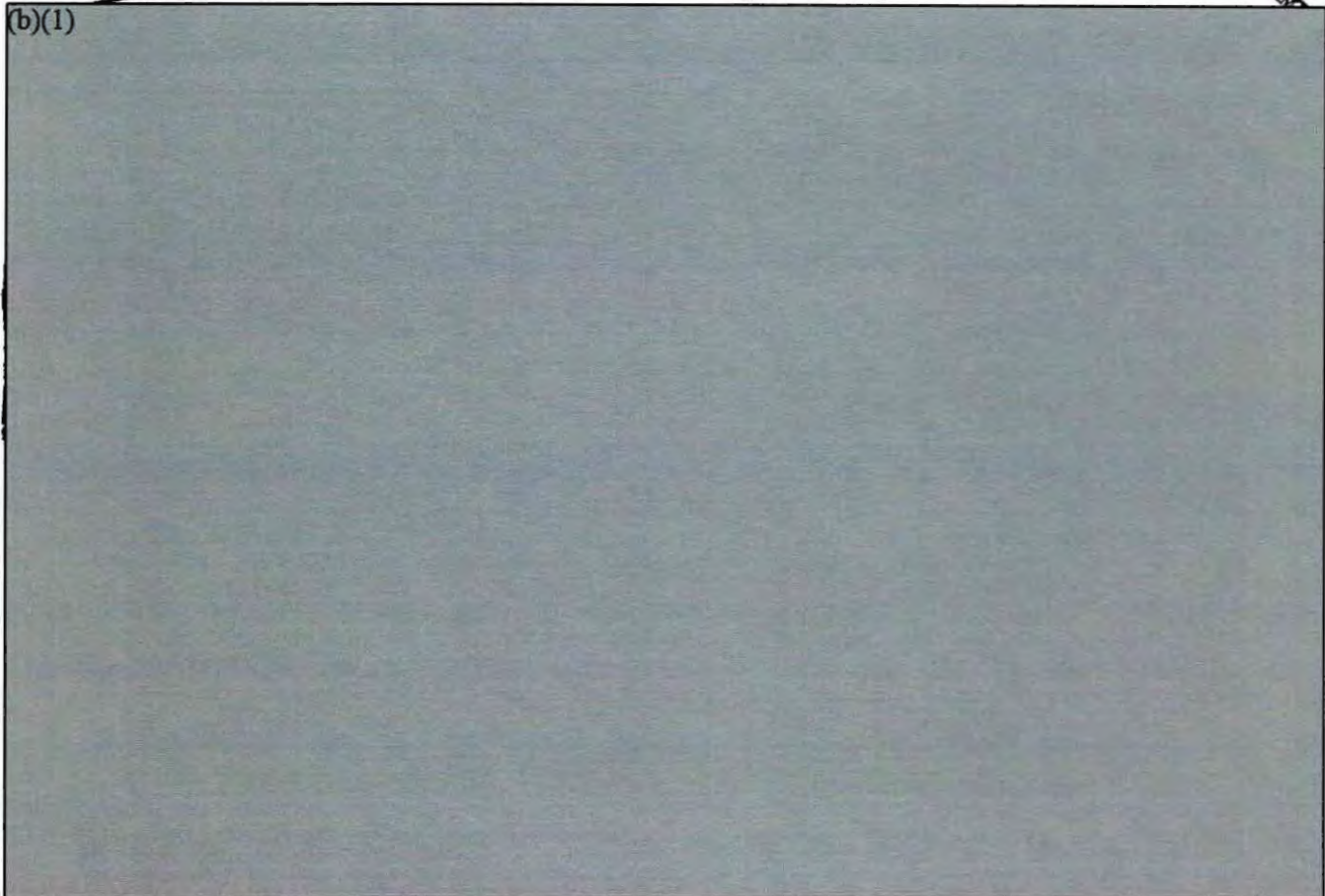
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10a. (U) Performance Characteristics (Cont'd):

Planning	Approved Program (APB)	Demon- strated	Current
----------	---------------------------	-------------------	---------

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(b)(1)



(U) \* These performance characteristics are not among the six KPPs validated by the JROC on January 15, 1998 and thus were not included in the revised APB approved on March 10, 1998. Although they are still ORD requirements for the system, they are no longer required for program tracking purposes.

\*\* These performance characteristics were renamed and are provided in the JROC validated six KPPs of the new ORD.

\*\*\* These six KPPs were validated by the JROC on January 15, 1998 and included in the revised APB approved on March 10, 1998. These KPPs supersede Approved Performance Characteristics from previous APBs. Additionally, to clarify use of terms, the following are current terminology changes: 1) "Defended Area - Battery (Equivalent Area)" to "Defended Radius" 2) "Degree of Protection (Leakage)" to "Protection Effectiveness".

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

b. Current Change Explanations --  
 (U) (Ch-1) "Critical Information Exchange Requirements (IERs)" added to Interoperability as stated in the current ORD that is scheduled for JROC validation in May 2000.

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	3165.2	5499.6	7032.1
Procurement	0.0	N/A	0.0
Total Flyaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	N/A	0.0
Total FY 1988 Base-Year \$	<u>3165.2</u>	<u>5499.6</u>	<u>7032.1</u>
 Escalation	 1158.5	 1851.2	 2558.5
Development (RDT&E)	(1158.5)	(1851.2)	(2558.5)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(N/A)	(0.0)
Total Then Year \$	<u>4323.7</u>	<u>7350.8</u>	<u>9590.6</u>
 b. (U) Quantity --			
Development (RDT&E)	0	40	0
Procurement	0	N/A	0
Total	<u>0</u>	<u>40</u>	<u>0</u>

(U) RDT&E development quantity. There are no longer any plans to provide for a contingency or any quantities other than for test purposes.

c. (U) Foreign Military Sales --  
 The potential exists for Foreign Military Sales of the THAAD System, where European, Mideast, or Asian countries would use THAAD as an upper tier capability essentially providing defense of entire countries. There has been considerable interest from various countries. These interests will be developed at the appropriate time.

d. Nuclear Costs -- None.



12. (U) Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	4323.7	-	-	4323.7
Previous Changes:				
Economic	-515.8	-	-	-515.8
Quantity	-235.6	-	-	-235.6
Schedule	+2189.8	-	-	+2189.8
Engineering	+1381.2	-	-	+1381.2
Estimating	+1549.5	-	-	+1549.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+4369.1	-	-	+4369.1
Current Changes:				
Economic	-42.9	-	-	-42.9
Quantity	-	-	-	-
Schedule	+211.8	-	-	+211.8
Engineering	+76.5	-	-	+76.5
Estimating	+652.4	-	-	+652.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+897.8	-	-	+897.8
Total Changes	+5266.9	-	-	+5266.9
Current Estimate	9590.6	-	-	9590.6

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

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

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	3165.2	-	-	3165.2
Previous Changes:				
Quantity	-168.4	-	-	-168.4
Schedule	+1391.3	-	-	+1391.3
Engineering	+953.3	-	-	+953.3
Estimating	+1093.5	-	-	+1093.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+3269.7	-	-	+3269.7
Current Changes:				
Quantity	-	-	-	-
Schedule	+133.2	-	-	+133.2
Engineering	+23.0	-	-	+23.0
Estimating	+441.0	-	-	+441.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+597.2	-	-	+597.2
Total Changes	+3866.9	-	-	+3866.9
Current Estimate	7032.1	-	-	7032.1

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) RDT&E	Base-Year	Then-Year
Revised escalation indices. (Economic)	N/A	-42.9
Extended EMD period of performance (contractor & government) 22 months as part of risk-reduction program restructure. (Schedule)	+133.2	+211.8
Added engineering effort to incorporate cost reduction initiatives into missile design. (Engineering)	+249.3	+408.0
Eliminated use and support of User Operational Evaluation System ground equipment in THAAD test program. (Engineering)	-226.3	-331.5
Adjustment for Current and Prior Inflation. (Estimating)	+3.3	+4.4
Revised estimating methodology to reflect an increase in fee structure to sufficiently cover the EMD contract, plus an adjustment in the development engineering to correct a previous reconciliation agreement with BMDO leading to the Joint Cost Position. (Estimating)	+293.3	+417.8

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THAAD System, December 31, 1999

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

b. (U) Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Added 15 flight tests to incorporate OSD lessons-learned and evolutionary development approach. (Estimating)	+144.4	+230.2
RDT&E Subtotal	<u>+597.2</u>	<u>+897.8</u>

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR	SAR	SAR	Current Estimate
	Planning Estimate (PE)	Development Estimate (DE)	Production Estimate (PdE)	
Milestone I	JAN 1992	N/A	N/A	JAN 1992
Milestone II	JUL 1996	N/A	N/A	MAY 2000
Milestone III	JUL 2001	N/A	N/A	SEP 2008
FUE/IOC	JUL 2001	N/A	N/A	MAY 2007
Total Cost	4323.7	N/A	N/A	9590.6
Total Quantity	N/A	N/A	N/A	0
Prog Acq Unit Cost	N/A	N/A	N/A	0

(U) Note: FUE for Configuration 1 (meets all KPPs) is MAY 2007 and FUE for Configuration 2 (fully ORD compliant) is APR 2012.

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

a. RDT&E --				Initial Contract Price		
(U) THAAD PDRR:				<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Lockheed Martin Msl&Space, Sunnyvale CA				\$688.9	N/A	0
DASG60-92-C-0101, CPFF						
Award: September 4, 1992						
Definitized: September 4, 1992						
Current Contract Price			Estimated Price At Completion			
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>		
\$1739.4	N/A	0	\$2367.8	\$2367.8		
			<u>Cost Variance</u>	<u>Schedule Variance</u>		
Previous Cumulative Variances			\$-53.4	\$-2.0		
Cumulative Variances To Date (12/26/99)			\$-62.9	\$-2.7		
Net Change			\$-9.5	\$-0.7		

Explanation of Change:

(U) The change in Current Contract Price since the previous report is primarily due to the extension of the Integrated Risk Mitigation Restructure effort.

The Project Manager's estimate at completion reflects Lockheed's current estimate as the flight test program was terminated and uncertainties in the program have prevented support for any different estimate.

Cost Variance: Test flight 09 failure investigation was the largest contributor for the net change in cost variance. Another significant contributor to the variance was the extension of the period of performance on the contract.

Schedule Variance: Based on two successful intercept tests, the flight test program was terminated in August and the program was replanned to reflect the stop work. The schedule variance net change was caused by various minor problems in the Integrated Risk Mitigation Restructure program. Those included software training in BMC3I, program priorities which caused simulation and discrimination tasks at Raytheon to fall behind schedule, and understaffing in Missile and Radar segments.

(U) Contract Comments:

The initial contract price has increased from \$688.9M to the current price of \$1,739.4M due to contract changes that added scope or reduced risk to the program. The major changes include: in-flight survivability of \$69M in FY94; EMD risk mitigation of \$307M in FY97/FY98; the restructure of EMD risk mitigation in FY99 and redesignation as the Integrated Risk Mitigation of \$117M; and the extension of the Integrated Risk Mitigation Restructure of \$398M in FY00.

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THAAD System, December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY92-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-10)	<u>Total</u>
RDT&E	3737.9	603.0	549.9	4699.8	9590.6
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>3737.9</b>	<b>603.0</b>	<b>549.9</b>	<b>4699.8</b>	<b>9590.6</b>

b. Annual Summary -- THAAD System

Appropriation: 0400 - RDT&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1988 Dollars Nonrec</u>	<u>Flyaway FY 1988 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1992				101.0	119.6
1993				325.0	393.6
1994				567.7	701.1
1995				515.7	649.3
1996				395.8	506.5
1997				424.4	549.6
1998				296.7	387.3
1999				326.9	430.9
2000				451.7	603.0
2001				405.7	549.9
2002				497.7	685.2
2003				563.6	789.7
2004				528.4	755.1
2005				405.4	591.0
2006				367.1	545.8
2007				306.1	464.2
2008				255.0	394.4
2009				175.5	277.0
2010				122.7	197.4
<b>Subtotal</b>				<b>7032.1</b>	<b>9590.6</b>

(U) **Funding Explanation:** The Upper Tier Program element has been distributed across the THAAD and Navy Theater Wide programs.

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THAAD System, December 31, 1999

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total				7032.1	9590.6

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 3443.5

(U) Percent Total Program Expended: 35.9%

18. (U) Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

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N-14 MIDS-LVT

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)  
PROGRAM: MIDS-LVT

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Multifunctional Information Distribution System - Low Volume Terminal (MIDS-LVT)

2. (U) DoD Component: Navy

Joint Participants:  
Army/Air Force

3. (U) Responsible Office and Telephone Number:

PEO for Tactical Aircraft Programs	CAPT Thomas B. Russell
MIDS Program (PMW 101)	Assigned: May 28, 1998
4201 Pacific Highway	DSN 524-7776; COMM 619-524-7776
San Diego, CA 92110-3215	russellt@spawar.navy.mil

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

RDT&E:

- (U) PE 0205604N (Shared) LINK-16 Project X2126
- (U) PE 0207134F (Shared) F-15E Project
- (U) PE 0207133F (Shared) F-16 Project
- (U) PE 0603713A (Shared) Project, D370
- (U) PE 0604771D (Shared) MIDS Project P773
- (U) PE 0207130F (Shared) F-15C/D Project

PROCUREMENT:

- (U) APPN 3080 ICN 0207130F (Air Force) (Shared)
- (U) APPN 3010 ICN 0207133F (Air Force) (Shared)
- (U) APPN 3080 ICN 0207134F (Air Force) (Shared)

No Security Objection  
to Open Publication  
**AS AMENDED**  
00-C-0134  
MAR 28 2000  
*W. Russell*  
Office of the Chief of  
Naval Operations  
Dept. of the Navy

Derived from MIDS Security Classification Guide, dated 15 JUN 94  
Downgrade instructions: OADR  
Declassify on: OADR

(THIS PAGE IS UNCLASSIFIED)

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FOR OPEN PUBLICATION

MAR 29 2000 7

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

DFOR 002-C-0831

4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) APPN 0300 ICN 0208865C (DCA/DNA) (Shared)  
(U) APPN 1506 ICN 3105250000 (Navy) (Shared)  
(U) APPN 1611 ICN 3321220000 (Navy) (Shared)  
(U) APPN 1611 ICN 3330360000 (Navy) (Shared)  
(U) APPN 1810 ICN 3426140000 (Navy) (Shared)  
(U) APPN 0300 ICN 0208861C (DCA/DNA) (Shared)

5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline dated March 8, 1994.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated November 1, 1999.

6. (U) Mission and Description:

(U) The Multifunctional Information Distribution System - Low Volume Terminal (MIDS-LVT) does not replace an existing DOD system in that it provides Link 16 capability to platforms that were unable to employ Joint Tactical Information Distribution System (JTIDS) due to space and weight constraints. The MIDS-LVT Program is a multinational (U.S., France, Germany, Italy, Spain) cooperative development program with joint service participation (Navy, Army, Air Force). The program was established to design, develop and deliver low volume, lightweight tactical information system terminals for U.S. and Allied fighter aircraft, bombers, helicopters, ships, and ground sites. MIDS-LVT will provide interoperability with North Atlantic Treaty Organization (NATO) users while significantly increasing force effectiveness and minimizing hostile actions and friend-on-friend engagements. The terminal is designed to be smaller, lighter, highly reliable, interoperable with JTIDS Class 2 terminal, compatible with all the participants' designated platforms, affordable, and re-configurable to individual user needs and budgets. Three principal configurations of the terminal are being developed using open, modular architecture. MIDS-LVT(1) includes voice, Tactical Air Navigation (TACAN) and variable power transmission with maximum power of 200 watts and will provide Link-16 capability to F/A-18 aircraft previously unable to use JTIDS due to space and weight limitations. MIDS-LVT(2) is an Army variant of MIDS tailored to be a functional replacement for the JTIDS Class 2M terminal. MIDS-LVT(3), also referred to as MIDS Fighter Data Link (FDL), is a reduced function terminal for the Air Force F-15 (no voice, no TACAN, and a minimum power of 40 watts). The MIDS-LVT(3) variant is being procured through a separate contract with Data Link Solutions (DLS). Currently, over 2,000 terminals (total for all three variants) are planned for procurement through FY10.



MIDS-LVT, December 31, 1999

7. (U) Executive Summary:

(U) The Under Secretary of Defense (Acquisition, Technology and Logistics) (USD (AT&L)) approved the revised Acquisition Strategy Report (ASR) November 2, 1999. Approval included direction to reduce production schedule risk of terminal delivery beginning September 2001 by awarding two sole source letter contracts for long-lead material and nonrecurring engineering needed to produce the terminals that are to be authorized at the Low Rate Initial Production (LRIP) Defense Acquisition Board (DAB) in April 2000. The procurement of the FY00 LRIP terminals will be equitably split between the two U.S.-led production teams and future year requirements will be competed. The ASR also authorizes award of a sole source contract to a European consortium for European MIDS LRIP terminal requirements. This award is contingent on final approval of Program Memorandum of Understanding (PMOU) Supplement 3, which governs the Production Phase of the MIDS International Program and is expected by April 2000. PMOU Supplement 3 was agreed to in principle by the participating nations (U.S., France, Italy, Germany, and Spain) on November 10, 1999. As a result of a transatlantic teaming initiative sponsored by USD (AT&L) and pending final ratification of PMOU Supplement 3, all parties have agreed to open competition for combined production requirements after completion of the U.S. and European qualification efforts.

In support of the above strategy, the U.S. Request For Proposal (RFP) was issued on November 15, 1999 for the nonrecurring engineering and long lead material necessary to meet initial terminal requirements. A class Justification & Approval (J&A) was executed by Assistant Secretary of Navy (Research, Development, and Acquisition) (ASN (RD&A)) on December 7, 1999. On January 20, 2000, the Contract Directorate for the Space and Naval Warfare (SPAWAR) Systems Command awarded letter contracts to Data Link Solutions (DLS), the prime contractor for the MIDS Fighter Data Link (FDL) variant, and ViaSat, a participant in the Production Readiness Program during the Engineering and Manufacturing Development (EMD) Phase. Both U.S. contractors have been qualified on the Certified MIDS Manufacturer's Register (CMMR). The LRIP DAB is planned for April 2000 at which time the balance of the first year procurement will be authorized.

PMOU Supplement 2 identifies the U.S. as the host nation, governs program management, and delineates EMD cost share allocation, of which the U.S. share is 41% of program common cost. The EMD participants are committed to cooperative development as documented in the PMOU for Development, Supplement 2. The International Steering Committee (SC), composed of members from the five participating nations, met in Madrid, Spain in October 1999 to evaluate progress on the EMD contract scheduled to end December 31, 1999 and to plan the way ahead for production. The International SC authorized a six-month extension through June 30, 2000 to complete hardware and software deliveries and to provide continued EMD terminal support. All U.S. terminals are projected to be complete by the end of the extension period, whereas approximately five terminals designated for European participants are not expected to be complete by June 2000.

In addition to the U.S. and European production contracts, the MIDS participants have agreed in principle to implement a Systems Engineering and

7. (U) Executive Summary (Cont'd):

Integration (SE&I) concept that will provide continued EMD hardware and software support after dissolution of MIDSCO. The International SC has directed that the common core software continue to be supported by the U.S. development subcontractor, BAE Systems North America (formerly GEC-Marconi-Hazeltine), and the common tailored software be supported by Thomson-CSF, the French development subcontractor. An Associated Contract Agreement will be required between the two to achieve this directed cooperative arrangement.

The Air Force development program for the MIDS-LVT(3) variant, FDL, successfully completed Initial Operational Test and Evaluation (IOT&E) for the F-15C/D platform in August 1999. Director, Operational Test and Evaluation (DOT&E) issued a favorable Beyond LRIP (BLRIP) Report in October 1999 and the Program Executive Office for Tactical Aircraft Programs (PEO(T)) authorized the procurement of 200 Full Rate Production (FRP) FDL terminals that were awarded to DLS on October 20, 1999. A second production lot of 200 terminals is planned for award in June 2000, pending successful completion of IOT&E on the F-15E. The successful completion of IOT&E on the F-15C/D demonstrates a strong measure of success for the MIDS Open Systems Architecture and build to specification methodology.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Note: On January 31, 2000, PEO(T) endorsed a Program Deviation Report (PDR) that had been initiated by the Program Manager after Change 2 to the Development Baseline was approved on November 1, 1999. This PDR identifies an unrecoverable schedule deviation to the Initial Operational Capability (IOC) threshold established for the MIDS-LVT(3). The associated platform

8c. (U) Threshold Breaches (Cont'd):

installation and logistics support criteria will not meet the IOC threshold established for the F-15. The PDR does not involve performance or cost breaches.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone II (DAB)	DEC 1993	DEC 1993	DEC 1993
Development Contract Award			
LVT Contract Award	DEC 1993	MAR 1994	MAR 1994
LVT(2) Modification	N/A	AUG 1995	AUG 1995
LVT(3) Qual Contract Award	N/A	SEP 1996	SEP 1996
F/A-18 Integration Contract Award (NAVAIR)	MAR 1994	N/A	N/A
Critical Design Review (MIDS Terminal)	DEC 1995	N/A	N/A
Critical Design Review			
LVT	N/A	NOV 1995	NOV 1995
LVT(2)	N/A	FEB 1997	FEB 1997
First EMD Terminal Delivery			
LVT	N/A	DEC 1997	FEB 1998
LVT(2)	N/A	MAY 1998	OCT 1998
LVT(3)	N/A	FEB 1998	MAY 1998
First EMD Flight	JUN 1998	N/A	N/A
Initial Carrier Suitability TECHEVAL	N/A	NOV 1998	FEB 1999
Start	JUN 2000	N/A	N/A
Complete	JUN 2000	N/A	N/A
OPEVAL			
Start	DEC 2000	N/A	N/A
Complete	DEC 2000	N/A	N/A
IOT&E Complete			
LVT	N/A	DEC 2000	MAR 2001 (Ch-1)
LVT(2)	N/A	FEB 2002	FEB 2002
LVT(3)	N/A	JUL 1999	AUG 1999
Low-Rate Initial Production First Delivery	OCT 2000	N/A	N/A
Program Review DAB for LRIP	JUN 2001	FEB 2000	APR 2000 (Ch-2)
LRIP Production Contract Award	N/A	MAR 2000	APR 2000 (Ch-2)
Milestone III (Navy)			
LVT	N/A	MAR 2001	JUN 2001 (Ch-1)
LVT (2)	N/A	MAY 2002	MAY 2002
LVT (3)	N/A	DEC 1999	OCT 1999 (Ch-3)
Full Rate Production Contract Award	JUN 2001	N/A	N/A
Initial Operational Capability			
LVT	N/A	DEC 2000	JUN 2001 (Ch-1)
LVT(2)	N/A	JUN 2002	JUN 2002
LVT(3)	N/A	APR 2000	JAN 2001 (Ch-3)
Organic Support Capability Date	JUN 2003	N/A	N/A

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

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Service Depot Support Date	JAN 2004	MAR 2005	MAR 2005

b. Current Change Explanations --

(U) (Ch-1) The later than planned completion of Developmental Test for MIDS On Ship will delay Initial Operational Test and Evaluation (IOT&E) completion and two subsequent LVT milestones. These changes are within the thresholds established by approved Change 2 to the Development Baseline approved November 1, 1999.

<u>Milestone</u>	<u>From</u>	<u>To</u>
IOT&E Complete		
LVT	Dec 00	Mar 01
Milestone III (Navy)		
LVT	Mar 01	Jun 01
Initial Operational Capability		
LVT	Mar 01	Jun 01

(Ch-2) The LRIP DAB Program Review and subsequent award of the full FY00 LRIP procurement have been delayed until completion of additional F/A-18 flight testing in March 2000. This testing is not required to meet established exit criteria for early operational assessment (successfully completed August 1996) but the data will be used to further verify the operational performance of the MIDS-LVT.

<u>Milestone</u>	<u>From</u>	<u>To</u>
Program Review DAB for LRIP	Feb 00	Apr 00
LRIP Production Contract Award	Mar 00	Apr 00

(Ch-3) The Beyond LRIP (BLRIP) report for the F-15C/D was delivered to Congress earlier than expected which improved the schedule for the Milestone III decision and the award of the first MIDS-LVT(3), FDL production lot. The Air Force projects a delay in meeting the Initial Operational Capability (IOC) objective because of the slower than planned MIDS installation rate for the F-15 platform. This projected delay breaches the approved IOC threshold for LVT(3) and a Program Deviation Report has been initiated by the PM and endorsed by PEO(T).

<u>Milestone</u>	<u>From</u>	<u>To</u>
Milestone III (Navy)		
LVT(3)	Dec 99	Oct 99
Initial Operational Capability		
LVT(3)	Jun 00	Jan 01

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold		Demon- strated Perf	Current Estimate
Link 16 Waveform	N/A	STANAG 4175	/ STANAG 4175	STANAG 4175	STANAG 4175
Message Standard	N/A	STANAG 5516	/ STANAG 5516	STANAG 5516	STANAG 5516
Maximum Power Transmission (w)					
LVT	N/A	200	/ 200	200	200
LVT(2)	N/A	200	/ 200	200	200
LVT(3)	N/A	50	/ 40	40 - 80	50
Coded Data Rate (Kbps)					
Standard Packing	28.8	28.8	/ 28.8	28.8	28.8
Packed 2 DP	57.6	57.6	/ 57.6	57.6	57.6
Packed 4 DP	115.2	115.2	/ 115.2	115.2	115.2
Relay Range (nm)	1200	1200	/ 500	TBD	1200
Communication Range (NM)	300	300	/ 300	300	300
Voice Channels	2	2	/ 1	2	2
Coded Message Error Probability (%)	1	1	/ 2	1	1
Jam Resistance (db) Ao	(b)(1)	(b)(1)	/ (b)(1)	TBD	(b)(1)
MTBF (hr) (lab)					
LVT	1000	1000	/ 1000	1662	1000
LVT(2)	N/A	1000	/ 1000	TBD	1000
LVT(3)	N/A	1500	/ 1000	1048	1500
MFHBMCF (hr) (field)	300	N/A	/ N/A	N/A	N/A
MTTR (0-level) (min)	30	30	/ 30	TBD	30
Volume (dm3)	16.4	16.4	/ 16.4	16.4	16.4
Weight (kg)					
LVT	29.5	29.5	/ 29.5	26.8	29.5
LVT(2)	N/A	40.0	/ 40.0	40.0	40
LVT(3)	N/A	23.6	/ 29.5	23.6	23.6

(U) Acronyms:

- Ao - Operational Availability
- db - decibels
- dm3 - Cubic Decimeters
- DP - Double Pulse
- hr - Hour
- Kbps - Kilobytes per second
- kg - Kilograms
- MFHBMCF - Mean Flight Hours Between Mission Critical Failures
- min - Minute
- MTBF - Mean Time Between Failures
- MTTR - Mean Time to Repair
- nm - Nautical miles

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

w - Watts

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	481.1	593.5	606.5
Procurement	443.8	615.9	651.1
Prime Mission Eqmt (PME)	(313.7)		(550.4)
Production Support	(10.5)		(23.1)
Total Flyaway	(324.2)		(573.5)
Other Wpn Sys	(55.7)		(28.6)
Peculiar Support	(6.6)		(1.2)
Initial Spares	(57.3)		(47.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1992 Base-Year \$	<u>924.9</u>	<u>1209.4</u>	<u>1257.6</u>
 Escalation	 194.6	 225.9	 223.6
Development (RDT&E)	(51.9)	(69.2)	(64.5)
Procurement	(142.7)	(156.7)	(159.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	<u>1119.5</u>	<u>1435.3</u>	<u>1481.2</u>
 b. (U) Quantity --			
Development (RDT&E)	42	63	62
Procurement	<u>630</u>	<u>2358</u>	<u>2499</u>
Total	672	2421	2561

(U) Note: Procurement quantities include MIDS terminals for Navy ships and F/A-18s, Air Force F-15s and F-16s, and other Air Force and Army platforms. Procurement costs reflect the costs for which the MIDS Program Office and PEO(T) have direct responsibility for execution, which include terminal development, production and support, and the costs for integration and test of MIDS in U.S. Navy platforms. Costs of platform installation and platform kits, and Air Force and Army platform integration and testing of MIDS, are to be included in the respective budgets and baseline agreements of the various platforms that are implementing MIDS.

The total planned LRIP quantity is currently estimated to be 361 terminals, 19% of the total planned procurement as compared to the 452 LRIP terminals (LVT(1) and LVT(2)) identified in the Acquisition Strategy Report approved by USD (AT&L) November 2, 1999. The current estimated LRIP quantity of 361 terminals (LVT(1) and LVT(2)) is justified to support developmental and operational test and training schedules and to establish a production capacity and provide an orderly increase in the production rates of the two U.S. contractors.

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

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

International Cooperative Programs -- The following data represents RDT&E funding received from the MIDS International Program Office (IPO) European participants in accordance with the Program Memorandum of Understanding and accompanying Supplements.

Years	1994-96	1997	1998	1999	Total
France	77.0	26.7	12.0	15.8	131.5
Italy	37.6	20.9	31.9	11.8	102.2
Germany	18.0	5.8	6.6	6.2	36.6
Spain	11.7	8.2	10.2	3.2	33.3
NETMA	10.6	4.1	7.6	3.2	25.5
<b>Total</b>	<b>154.9</b>	<b>65.7</b>	<b>68.3</b>	<b>40.2</b>	<b>329.1</b>

NETMA - NATO EF2000 and Tornado Management Agency

The estimated European production quantities are 1157 MIDS-LVTs including spares at a cost of \$436M (then year). The European production strategy provides for a sole source contract to be awarded to a European Manufacturer in FY00 by an U.S. contracting agency (SPAWAR) and managed through the MIDS IPO.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (Nov 99 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1992 BY\$)	1209.4	1257.6	
(2) Quantity	2421	2561	
(3) Unit Cost	0.500	0.491	-1.80
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1992 BY\$)	615.9	651.1	
(2) Quantity	2358	2499	
(3) Unit Cost	0.261	0.261	0.00

(U) The APUC current estimate has been revised in consideration of actual contractor cost proposals for recurring and nonrecurring production costs. The PAUC may be subject to a slight increase when actual costs of the EMD contract extension are incurred.

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	533.0	586.5	-	1119.5
Previous Changes:				
Economic	-16.6	-46.8	-	-63.4
Quantity	-1.3	+412.0	-	+410.7
Schedule	-	+12.7	-	+12.7
Engineering	-	-41.5	-	-41.5
Estimating	+150.6	-169.5	-	-18.9
Other	-	-	-	-
Support	-	-67.0	-	-67.0
Subtotal	+132.7	+99.9	-	+232.6
Current Changes:				
Economic	-0.7	-5.4	-	-6.1
Quantity	-	+11.7	-	+11.7
Schedule	-	+2.8	-	+2.8
Engineering	-	+4.9	-	+4.9
Estimating	+6.0	+96.0	-	+102.0
Other	-	-	-	-
Support	-	+13.8	-	+13.8
Subtotal	+5.3	+123.8	-	+129.1
Total Changes	+138.0	+223.7	-	+361.7
Current Estimate	671.0	810.2	-	1481.2

(U) Summary (FY 1992 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	481.1	443.8	-	924.9
Previous Changes:				
Quantity	-0.9	+316.6	-	+315.7
Schedule	-	-	-	-
Engineering	+0.4	-29.7	-	-29.3
Estimating	+120.6	-128.2	-	-7.6
Other	-	-	-	-
Support	-	-52.0	-	-52.0
Subtotal	+120.1	+106.7	-	+226.8
Current Changes:				
Quantity	-	+10.9	-	+10.9
Schedule	-	-	-	-
Engineering	-	+4.1	-	+4.1
Estimating	+5.3	+75.6	-	+80.9
Other	-	-	-	-
Support	-	+10.0	-	+10.0
Subtotal	+5.3	+100.6	-	+105.9
Total Changes	+125.4	+207.3	-	+332.7
Current Estimate	606.5	651.1	-	1257.6



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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-0.9
	Economic adjustment for negative program change. (Economic)	N/A	+0.2
	Adjustment for Current and Prior Inflation. (Estimating)	+0.4	+0.4
	Increased developmental cost to perform F/A-18 installation and integration (Navy). (Estimating)	+5.4	+6.6
	Estimated cost increase for terminal development (USAF). (Estimating)	+0.4	+0.6
	Reduction in developmental cost for MIDS-LVT(2) testing (Army). (Estimating)	-0.4	-0.4
	Revised estimate to reflect Congressional reductions (DA). (Estimating)	-0.5	-1.2
	RDT&E Subtotal	<u>+5.3</u>	<u>+5.3</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-6.9
	Economic adjustment for negative program change. (Economic)	N/A	+1.5
	Total Quantity Variance associated with decrease of 31 units (Navy).	-3.9	-5.7
	Quantity decrease of 31 MIDS-LVT: from 1,233 to 1,202 (Navy). (Quantity)	-14.4	-19.1
	Allocation to Schedule variance resulting from Quantity Change (Navy). (QR)(Schedule)	0.0	+1.1
	Allocation to Engineering variance resulting from Quantity Change (Navy). (QR)(Engineering)	+2.1	+3.0
	Allocation to Estimating variance resulting from Quantity Change (Navy). (QR)(Estimating)	+8.4	+9.3
	Stretchout of annual procurement buy profile (Navy Ships and USAF F-16). (Schedule)	0.0	+3.3
	Acceleration of annual procurement buy profile (Navy F/A-18 and USAF F-15). (Schedule)	0.0	-1.6
	Adjustment for Current and Prior Inflation. (Estimating)	+0.9	+0.9
	Service cost sharing agreement to fund nonrecurring engineering costs previously allocated to the USAF and Army (Navy). (Estimating)	+14.8	+17.5
	Cost increase for the procurement of 1,202 MIDS-LVT (Navy). (Estimating)	+30.8	+40.7
	Contract streamlining initiatives for MIDS-LVT(3) production (USAF). (AR)(Estimating)	-3.6	-3.8

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

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Production nonrecurring engineering to support procurement of MIDS-LVT(3) (USAF). (Estimating)	+4.7	+6.0
Cost increase for the procurement of 654 MIDS-LVT (USAF). (Estimating)	+22.2	+28.6
Quantity increase of 14 MIDS-LVT and 154 MIDS-LVT(3) for the USAF: from 640 to 654 MIDS-LVT and from 415 to 569 MIDS-LVT(3) (USAF). (Quantity)	+25.3	+30.8
Cost increase for the procurement of 87 MIDS-LVT(2) for the Army (DA). (Engineering)	+2.0	+1.9
Quantity decrease of 12 MIDS-LVT(2) for the Army: from 99 to 87 (DA). (Estimating)	-2.6	-3.2
Change in Initial Spares stemming from the revised F/A-18 logistics sparing plan (Navy). (Support)	-4.5	-4.9
Change in Initial Spares as a result of increased procurement quantities and cost (Navy, USAF, DA). (Support)	+7.5	+9.7
Change in Peculiar Support for cost/quantity reductions to test program sets (Navy). (Support)	-1.3	-1.6
Change in Other Weapon Systems resulting from service cost sharing agreement to fund annualized production support costs previously allocated to the USAF and Army (Navy). (Support)	+5.4	+7.1
Change in Other Weapon Systems as a result of increased procurement quantities and cost (Navy, USAF, DA). (Support)	+2.3	+2.8
Change in Other Weapons Systems for increased production software support (USAF). (Support)	+0.6	+0.7
Procurement Subtotal	+100.6	+123.8

AR = Acquisition Reform related changes.

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.67	-0.03	-1.07	+0.01	-0.01	+0.03	--	-0.02	-1.09	0.58

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.93	-0.02	-0.54	+0.01	-0.01	-0.03	--	-0.02	-0.61	0.32

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	DEC 1993	N/A	DEC 1993
Milestone III	N/A	N/A	N/A	JUN 2001
FUE/IOC	N/A	N/A	N/A	JUN 2001
Total Cost	N/A	1119.5	N/A	1481.2
Total Quantity	N/A	672	N/A	2561
Prog Acq Unit Cost	N/A	1.67	N/A	0.58

(U) NOTE: The baseline includes three separate MS III and IOC events, one for each MIDS variant. The primary emphasis of the SAR is on the Joint Service, International Program for the MIDS-LVT variant.

<u>Milestone III</u>	<u>Date</u>
LVT	Jun 01
LVT(2)	May 02
LVT(3)	Oct 99 (Actual)
<u>IOC</u>	
LVT	Jun 01
LVT(2)	Jun 02
LVT(3)	Jan 01

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

a. RDT&E --			Initial Contract Price		
(U) MIDS-LVT EMD:			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
MIDSCO, Inc., Wayne, NJ					
N00039-94-C-0008, CPIF/AF			\$342.4	N/A	60
Award: March 18, 1994					
Definitized: March 31, 1994					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$391.1	N/A	126	\$482.3	\$513.9	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date (12/31/99)			\$-59.9	\$-12.3	
Net Change			\$-66.2	\$-10.9	
			\$-6.3	\$1.4	

Explanation of Change:

(U) The contractor estimated price at completion reported above does not yet include the six-month contract extension through June 2000, whereas the Program Manager's estimated price at completion does. Continued unfavorable cost growth is attributed to contractor performance. The decreased unfavorable schedule variance stems from reductions in unfinished work. This variance is expected to further improve as the contract nears completion.

(U) Contract Comments:

The contract value reflects the international effort, including U.S., France, Italy, Germany, and Spain. The U.S. share of program common cost is 41%. The target for the initial contract price has been corrected from \$360.1M reported in previous SARs to \$342.4M to reflect the initial definitized price. The EMD contract is 94 percent complete based upon the budget at completion and will not be subject to future reporting. The International SC approved a six-month extension to the EMD contract in October 1999. This extension is required to complete unfinished EMD work scope, provide continued pre-operational EMD hardware and software terminal support, and retain a streamlined program management organization. The extension was negotiated in December 1999.

(U) F/A-18 INTEGRATION:			Initial Contract Price		
Boeing, St. Louis, MO			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00019-91-G-0091, CPFF					
Award: July 1, 1994			\$22.5	N/A	0
Definitized: March 1, 1996					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$26.8	N/A	0	\$26.8	\$26.8	

15. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.2	\$-0.6
Cumulative Variances To Date (12/31/99)	<u>\$-0.6</u>	<u>\$-0.2</u>
Net Change	\$-0.4	\$0.4

Explanation of Change:

(U) The unfavorable cost variance has increased by \$0.4M since the June 1999 SAR because of the higher than expected cost for testing the redesigned Amplifier Control Intercom and performing the Radar Warning Receiver compatibility test. The unfavorable schedule variance has decreased by \$0.4M because contract work scope is nearing completion.

(U) Contract Comments:

The F/A-18 integration contract (CPFF) was awarded to McDonnell Douglas Aerospace, now Boeing, to perform F/A-18 hardware development and integration of the MIDS-LVT A-Kit in July 1994. The contract was definitized in March 1996 at \$22.5M. A subsequent modification for the development of an Interface Blanking Unit increased the target cost to \$26.3 million. The contractor re-baselined the program in July 1998 and increased the contract cost from \$26.3M to \$26.8M. The contract baseline reflects the Navy's current plan for ground and flight testing which began in 1998. The integration contract is over 90% complete and will not be subject to future reporting.

b. Procurement --

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>Data Link Solutions:</u> Data Link Solutions, Wayne, NJ N00039-96-C-0038, FFP Award: September 30, 1996 Definitized: September 30, 1996	\$3.1	N/A	6

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$80.0	N/A	262	\$80.0	\$80.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

The Fighter Data Link (FDL) contract was competitively awarded to Data Link Solutions, a joint venture of BAE Systems (formerly GEC-Marconi-Hazeltine (GMH)) and Rockwell-Collins, on September 30, 1996 and is fully funded by the Air Force. The initial contract was to qualify and produce a reduced function Link-16 terminal for the F-15C/D aircraft that would use the

15. (U) Contract Information (Cont'd):

previously developed JTIDS interface software. The target for the initial contract price has been corrected from \$125.0M reported in previous SARs to \$3.1M to reflect only the initial contract target price prior to exercise of options. The initial contract quantity has been corrected from 506 to 6, which identifies only the qualification terminals that were initially procured under the base contract. The FDL contract supports Air Combat Command's urgent need date for reduced function F-15 Link-16 terminals. The competitively awarded contract contains not-to-exceed priced options for the initial qualification program, pilot and rate production lots (up to 500 terminals), warranty through April 2002, and Contractor Logistics Support (CLS) for 5 years after the warranty expires.

The definitized price of each production lot, associated warranty, and CLS option are negotiated prior to award. Production lot option quantities are 50, 200, 200, and 50. A contract modification was exercised to award the first lot of 50 Pilot Production Terminals September 14, 1998. Pilot production terminal deliveries will begin in March 2000. The production award of 200 terminals was authorized by PEO(T) on October 20, 1999 immediately after the BLRIP report was delivered to Congress on October 19, 1999. The Air National Guard participated in this lot to acquire 51 terminals for the F-15A/Bs. The RFP for Lot #2 procurement of an additional 200 terminals was issued on October 15, 1999. The award of this lot is planned for June 2000.

(U) <u>MIDS NRE &amp; LLM:</u>	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Data Link Solutions, Cedar Rapids IA N00039-00-D-2100, FFP Award: January 20, 2000 Definitized: N/A	\$16.1	N/A	27

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$16.1	N/A	27	\$16.1	\$16.1

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

A MIDS-LVT letter contract for Production Nonrecurring Engineering (NRE) and Long Lead Material (LLM) was awarded on a sole source basis to Data Link Solutions (DLS), a limited liability company on January 20, 2000. The initial contract effort is to perform the NRE and procure LLM needed to support MIDS-LVT(1) deliveries commencing in September 2001. The contract supports urgent need dates for the U.S. Navy's F/A-18 and the U.S. Air

15. (U) Contract Information (Cont'd):

Force's F-16 platforms. The contract also contains not-to-exceed priced options for full MIDS-LVT(1) qualification; full build of additional MIDS-LVT(1) terminals, and various functional modifications to the terminal.

(U) <u>MIDS NRE &amp; LLM:</u> ViaSat, Carlsbad, CA N00039-00-D-2101, FFP Award: January 20, 2000 Definitized: N/A	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$23.4	N/A	27

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$23.4	N/A	27	\$23.4	\$23.4

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

A MIDS-LVT letter contract for Production Nonrecurring Engineering (NRE) and Long Lead Material (LLM) was awarded on a sole source basis to ViaSat, Inc., a small business, on January 20, 2000. The initial contract effort is to perform the NRE and procure LLM needed to support MIDS-LVT(1) deliveries commencing in September 2001. The contract supports the urgent need dates for the U.S. Navy's F/A-18 and the U.S. Air Force's F-16 platforms. The contract also contains not-to-exceed priced options for full MIDS-LVT(1) qualification; full build of additional MIDS-LVT(1) terminals and various functional modifications to the terminal.

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MIDS-LVT, December 31, 1999

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY90-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-10)	<u>Total</u>
RDT&E	515.1	67.2	32.7	56.0	671.0
Procurement	97.2	105.1	56.5	551.4	810.2
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>612.3</b>	<b>172.3</b>	<b>89.2</b>	<b>607.4</b>	<b>1481.2</b>

b. Annual Summary -- MIDS-LVT

Appropriation: 0400 - RDT&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1992 Dollars Nonrec</u>	<u>Flyaway FY 1992 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				9.4	9.0
1991				5.1	5.0
1992				16.2	16.5
1993				22.9	23.9
1994				22.0	23.3
1995				45.9	49.6
1996				38.8	42.7
1997				33.2	36.9
1998				40.3	45.2
1999				24.1	27.3
2000				21.3	24.4
2001				10.5	12.2
2002				6.3	7.5
2003				5.7	6.8
<b>Subtotal</b>	<b>26</b>			<b>301.7</b>	<b>330.3</b>

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1992 Dollars Nonrec</u>	<u>Flyaway FY 1992 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1990				3.0	2.9
1991				4.8	4.7
1992				9.8	10.0
1993				11.9	12.4
1994				21.7	23.0
1995				17.0	18.4
1996				28.2	31.0

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				25.3	28.2
1998				35.5	39.8
1999				40.1	45.4
2000				34.1	39.1
2001				17.6	20.5
2002				17.2	20.3
2003				17.5	21.0
Subtotal	13			283.7	316.7

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				0.4	0.5
1998				2.1	2.4
1999				5.2	5.9
Subtotal	3			7.7	8.8

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997				3.6	4.0
1998				6.3	7.1
1999					
2000				3.2	3.7
2001					
2002				0.3	0.4
2003					
2004					
Subtotal	20			13.4	15.2

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	30	0.3	10.6	13.7	15.7
2000					

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

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001					
2002					
2003					
2004					
2005	6		0.7	1.8	2.3
2006	36		6.1	7.4	9.6
2007	6		1.2	2.4	3.1
2008	6		1.2	2.5	3.3
2009	3		0.7	1.9	2.6
2010					
Subtotal	87	0.3	20.5	29.7	36.6

(U) Note: The Defense Agencies appropriation provides for the procurement of the Army unique MIDS-LVT(2) variant. This appropriation summary replaces information previously reported for appropriation 2035, Other Procurement Army.

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	12	2.4	4.5	7.0	8.0
2000	41	22.2	22.6	52.9	61.6
2001	65	0.7	20.5	23.3	27.6
2002	80	0.2	19.6	21.9	26.4
2003	112	1.7	20.8	25.2	30.9
2004	120	0.2	23.1	26.4	33.0
2005	108	0.2	20.4	23.4	29.8
2006	130	0.1	27.0	30.2	39.3
2007	130	0.1	27.1	29.4	39.1
2008	117	0.1	25.8	28.1	38.1
2009	67	0.1	17.4	21.2	29.3
2010	31		10.7	15.4	21.7
Subtotal	1013	28.0	239.5	304.4	384.8

(U) NOTE: This USN appropriation identifies the MIDS-LVT(1) that are planned for the F/A-18C/D/E/F.

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MIDS-LVT, December 31, 1999

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

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	7		2.8	3.2	4.0
2002	6		1.6	2.0	2.5
2003	7		1.6	1.9	2.5
2004	6		1.3	1.6	2.1
2005	6		1.3	1.6	2.1
2006	8		1.5	1.9	2.6
2007	5		1.0	1.2	1.7
2008	5		1.1	1.3	1.9
2009	6		1.5	1.7	2.5
2010	5		1.4	1.8	2.6
Subtotal	61		15.1	18.2	24.5

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2003	5		1.1	1.2	1.5
2004	27		5.7	6.9	8.6
2005	25		5.2	6.2	7.8
2006	23		4.5	5.6	7.2
2007	20		4.0	4.9	6.4
2008	15		3.2	4.0	5.3
Subtotal	115		23.7	28.8	36.8

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	25	3.3	8.1	12.0	14.2
2002	94	2.7	17.1	22.2	26.8
2003	156	1.7	28.0	33.3	40.9
2004	116	0.2	21.5	24.5	30.7
2005	93	0.1	16.6	19.1	24.4
2006	93	0.1	16.9	19.4	25.3
2007	77	0.1	14.1	16.6	22.1
Subtotal	654	8.2	122.3	147.1	184.4

(U) NOTE: This USAF appropriation identifies the MIDS-LVT(1) that are planned for the F-16 and the Airborne Laser.

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

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1992 Dollars Nonrec	Flyaway FY 1992 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996	6	2.8		2.8	3.1
1997					
1998	46	10.7	15.3	26.8	30.5
1999	189		33.0	34.7	39.9
2000	208		34.5	37.3	43.5
2001	47		8.2	9.0	10.7
2002					
2003					
2004	73		11.4	12.3	15.4
Subtotal	569	13.5	102.4	122.9	143.1

(U) NOTE: This USAF appropriation identifies the MIDS FDL terminals for the F-15C/D/E that are being procured on a separate contract. The FY96 funding (\$2.8M) identified above report the Air Force funds contributed to the qualification and build of six FDL terminals. Additional funds in excess of \$8M were contributed by the contractor, Data Link Solutions, for completion of the full qualification program requirements.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	113	0.3	20.5	331.4	366.9
Navy	1202	28.0	278.3	635.1	762.8
Army	3			7.7	8.8
USAF	1243	21.7	224.7	283.4	342.7
Grand Total	2561	50.0	523.5	1257.6	1481.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	62	31
Procurement	6	6

(U) Percent Total Program Quantities Delivered: 1.4%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 498.4

(U) Percent Total Program Expended: 33.6%

(U) Note: Delivery information pertains to U.S. quantities only. RDT&E deliveries to date are from MIDSCO, Inc. for the MIDS-LVT and MIDS-LVT(2)

17. (U) Delivery/Expenditure Information (Cont'd):

and from Data Link Solutions (DLS) for the MIDS-LVT(3). Procurement deliveries to date are from DLS for the MIDS-LVT (3).

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The O&S Cost portion of the Program Manager Life Cycle Cost Estimate, dated December 1998, depicted a 31-year support period of 2438 MIDS-LVT terminals installed on numerous U.S. platforms associated with each Service's Link 16 requirement. This period included a phase-in, steady state, and phase-down profile with a terminal operational life estimated to be 20 years. The annual operating hours per aircraft for peace time deployment are estimated to be 400. The annual operating hours per ship for peace time deployment are estimated to be 3977. The annual operating hours per Army Ground Air Defense station are estimated to be 2212. For Navy aircraft and Army platforms it is a three level structure (i.e., Organizational, Intermediate/Direct Support, and Depot). For Navy ships and Air force aircraft platforms it is a two level structure (i.e., Organizational and Depot). Navy aircraft support costs assume the use of the Consolidated Automated Support System (CASS) at the Intermediate level of maintenance. The terminal reliability and maintainability characteristics used are consistent with the requirements contained in the Operational Requirements Document. Other pertinent cost estimates include use of values experienced by analogous systems including JTIDS and the AN/ARC-182 radio. The program office will analyze alternative life cycle support strategies concurrent with preparation for production, with the objective of reducing per unit Operating and Support costs.

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

Cost Element	Avg Annual Cost Per MIDS - LVT	Avg Annual Cost Per N/A
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	0.1	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.4	0.0
Contractor Support	5.1	0.0
Sustaining Support	1.5	0.0
Indirect Costs	0.0	0.0
Other ILS	0.0	0.0
Total	7.1	0.0

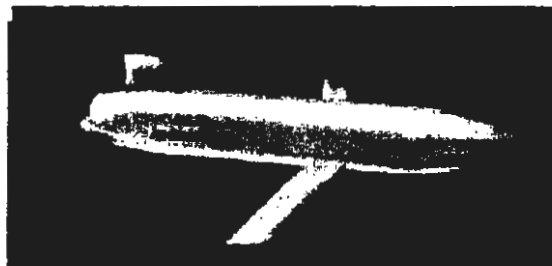
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: JASSM

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Joint Air-to-Surface Standoff Missile (JASSM)

2. (U) DoD Component: USAF

Joint Participants:  
USAF, USN

3. (U) Responsible Office and Telephone Number:

AAC/YV	SES Terry R. Little
JASSM System Program Office	Assigned: January 2, 1996
102 West D Ave, Suite 300	DSN 872-4785 x3046
Eglin AFB, FL 32542-6807	COMM 850-882-4785 x3046
	little@eglin.af.mil

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

RDT&E:  
 (U) PE 0207325F  
 (U) PE 0604312N  
 PROCUREMENT:  
 (U) APPN 3020 ICN 0207325F (Air Force)

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

~~Classified by JASSM Security Classification Guide, Rev 2, Nov 03, 1998  
Downgrade instructions: 12959 Section 1.5.(e)  
Declassify on: Not Subject to Automatic Downgrade~~

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JASSM, December 31, 1999

5. (U) References:

SAR Baseline (Development Estimate):

(U) Approved Acquisition Program Baseline (Development) dated November 09, 1998.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated November 9, 1998.

6. (U) Mission and Description:

(U) The Joint Air-to-Surface Standoff Missile (JASSM) is a next generation air-to-surface missile that will enable Air Force and Navy bombers and fighters to destroy the enemy's war-sustaining capabilities from outside the ranges of enemy air defenses. The autonomous precision strike weapon will attack both fixed and relocatable targets ranging from non-hardened above ground to moderately hardened buried point targets. The system will offer reliable performance in world-wide operational environments. The system will also offer low operational support costs. The JASSM does not replace any existing weapon system.

7. (U) Executive Summary:

(U) The JASSM program office is restructuring the master schedule due to delays in development. USD(AT&L) approved the restructure on 1 November 1999. We will extend EMD by approximately ten months. Consequently, the LRIP I contract award will move from January 2001 to November 2001. There are no APB breaches. Several factors drove the restructure. First, the Teledyne engine development/modification process progressed at a pace slower than planned due to bearing, digital fuel control and compressor design issues. Second, several key subcontractors, two of them small businesses, were delivering items late due to the configuration changes made by Lockheed Martin Skunkworks. Third, two unplanned development test flights are required because of a new air data probe design driven by weight, cost and nose mold line and pitot port location changes.

This restructure shifted the entire production program out one fiscal year and freed up \$144.5 M in the Future Year Defense Plan (FYDP). Of this, \$52.6 M was moved to EMD and the remainder returned to the Department of Defense. The Air Force also supplied Acquisition Stability Reserve (ASR) funds to support the Air Force C4I infrastructure evolution and the addition of 21 Production Prove-Out Test Units (PPOTUs) needed for aircraft integration and anti-tamper testing. Lockheed committed to limiting the escalation of the Firm Fixed Price Production option prices for Lots 1 to 5 to 4.99 percent.

The majority of the FY00 test program is not affected by the restructure. Mission planning builds, SEEK EAGLE flight certification, Instrumented Measurement Vehicle (IMV) tests, ground tests and environmental qualification all maintain schedule. Four Development Test/Operational Test (DT/OT) tests move to FY01. Additional design efforts in the airframe, engine and fuze are

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7. (U) Executive Summary (Cont'd):

planned to stabilize the production configuration before DT/OT. The majority of the restructure costs represent additional man loading necessary to meet the requirements of the restructure schedule.

Teledyne has been delivering engines and has a viable plan for the improved delivery schedule they have promised Lockheed. They are no longer the long pole in our development schedule. During the month of November, the JASSM Program Director completed a series of trips to all of the key JASSM suppliers. He briefed them on the need for JASSM by the warfighter and their importance to JASSM's success.

We conducted the flight test of our last prototype vehicle, Flight Test Vehicle (FTV) 3, on 23 November. We achieved all test objectives during the 22 minute, 180 mile flight. The next scheduled flight test is a contractor test in September 2000. The first DT/OT test is planned for February 2001. Lockheed's other recent test accomplishments include the successful December 1 Sled Test. The test involved a live warhead with an instrumented fuze. The warhead sliced through four feet of concrete (5,000 psi) at 856 feet per second. Lockheed demonstrated the lethality of the warhead with the December 14 Arena Test.

Lockheed Martin completed 644 successful passes during 118 sorties with the Captive Carry Flying Test Bed (FTB), with data archived. This testing provided integrated phase testing of the PDRR Inertial Measurement Unit (IMU), seeker and missile control unit under flight conditions against representative targets. Using EMD hardware, Lockheed is currently conducting Missile Avionics Simulator (MAS) testing. The MAS consists of a helicopter (UH-1N) mounted production configuration JASSM Seeker, Missile control Unit, JASSM Anti-Jam GPS Receiver (JAGR) and antenna and IMU components. So far, 117 passes during 19 sorties have been completed, verifying the JASSM enroute navigation and the terminal performance functions of the seeker, automatic target correlator, gimbal servo control and associated software algorithms against representative targets under terminal dive geometries.

Lockheed's mission planning IPT successfully completed Joint Expeditionary Forces eXperiment (JEFX) 99 Spiral 3 when they demonstrated the Precision Targeting Module (PTM) and the Weapon Planning Module (WPM) capability as integrated within the JEFX 99 C4I infrastructure. Lockheed provided follow-on training to the Rear Echelon Production Facility (REPF), PTM training for intelligence personnel and WPM and PTM training at the Expeditionary Operations Center (EOC) with AFOTEC observing. We have been able to leverage from JEFX C4I environment to include experimenting with building, retrieving, modifying, storing and disseminating seeker models at the JASSM production facility and accessing imagery products in the field. We have also been able wring out the CONOPs early by having operator hands-on and experimenting with JASSM tasking during the ATO cycle. Users were able to mission plan rapidly and feedback was very positive.



8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone 0	SEP 1995	SEP 1995	SEP 1995
Milestone I	JUN 1996	JUN 1996	JUN 1996
PDRR Contract Award	JUN 1996	JUN 1996	JUN 1996
Milestone II	NOV 1998	NOV 1998	NOV 1998
EMD Contract Award	NOV 1998	NOV 1998	NOV 1998
LRIP Decision/Contract Award	JAN 2001	JAN 2001	NOV 2001
Lot II Contract Award	JAN 2002	JAN 2002	NOV 2002
Milestone III	JUL 2002	JUL 2002	FEB 2003
RAA/B-52	SEP 2002	SEP 2002	JUL 2003
RAA/F-16	DEC 2003	DEC 2003	DEC 2003

(U) Acronyms

PDRR - Program Definition and Risk Reduction

RAA - Required Assets Available

RAA for the B-52 is 42 missiles

RAA for the F-16 is 25 missiles

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

b. Current Change Explanations --

(U) The Approved Program represents the Milestone II approved APB.

Notes: Approved APB thresholds for LRIP Decision/Contract Award, Milestone III, RAA/B-52 and RAA/F-16 are one year, not six months. All Current Estimates are within approved thresholds.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
(S) Missile Operational Range (NM)	(b)(1)			
(S) Missile Mission Effectiveness				
Carrier Operability				

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	771.1	771.1	832.5
Procurement	960.0	960.0	974.7
Flyaway	(914.3)		(919.7)
Other Wpn System Costs	(45.7)		(55.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	18.4	18.4	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1995 Base-Year \$	1749.5	1749.5	1807.2
Escalation	323.8	323.8	294.2
Development (RDT&E)	(67.5)	(67.5)	(59.5)
Procurement	(249.6)	(249.6)	(234.7)
Construction (MILCON)	(6.7)	(6.7)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	2073.3	2073.3	2101.4

(U) Note: Procurement funding does not include Seek Eagle funding of \$19.3M (\$6.4M in FY01, \$3.4M in FY02, \$3.7M in FY04 and \$2.9M in FY05). Exit criteria for LRIP were approved at Milestone II.

b. (U) Quantity --

Development (RDT&E)	69	69	82
Procurement	<u>2400</u>	<u>2400</u>	<u>2400</u>
Total	2469	2469	2482

(U) Note: Total Program Quantity includes 82 fully configured RDT&E units for EMD (10 Contractor Development Test and Evaluation (CDT&E) units, 9 Initial Operational Test and Evaluation (IOT&E) units and 63 Pre-Production Operational Test Units (PPOTUs). Post November 1998 APB, Congressional action deleted 8 PPOTUs and 21 were added during the November 1999 restructure. LRIP quantities for the JASSM program have not yet been approved.

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

d. (U) Nuclear Costs --  
None.

12. (U) Unit Cost Summary:

	UCR Baseline (NOV 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	1749.5	1807.2	
(2) Quantity	2469	2482	
(3) Unit Cost	0.709	0.728	+2.68
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	960.0	974.7	
(2) Quantity	2400	2400	
(3) Unit Cost	0.400	0.406	+1.50

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	838.6	1209.6	25.1	2073.3
Previous Changes:				
Economic	-35.1	-10.3	-	-45.4
Quantity	+3.6	-	-	+3.6
Schedule	+26.8	+20.8	-	+47.6
Engineering	-56.3	-	-	-56.3
Estimating	+50.2	-43.8	-25.1	-18.7
Other	-	-	-	-
Support	-	+2.0	-	+2.0
Subtotal	-10.8	-31.3	-25.1	-67.2
Current Changes:				
Economic	+2.3	-14.4	-	-12.1
Quantity	+12.6	-	-	+12.6
Schedule	+70.1	+35.1	-	+105.2
Engineering	-	-	-	-
Estimating	-20.8	-	-	-20.8
Other	-	-	-	-
Support	-	+10.4	-	+10.4
Subtotal	+64.2	+31.1	-	+95.3
Total Changes	+53.4	-0.2	-25.1	+28.1
Current Estimate	892.0	1209.4	-	2101.4

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

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	771.1	960.0	18.4	1749.5
Previous Changes:				
Quantity	+3.4	-	-	+3.4
Schedule	+24.0	+14.8	-	+38.8
Engineering	-47.4	-	-	-47.4
Estimating	+20.8	-19.1	-18.4	-16.7
Other	-	-	-	-
Support	-	+1.4	-	+1.4
Subtotal	+0.8	-2.9	-18.4	-20.5
Current Changes:				
Quantity	+11.3	-	-	+11.3
Schedule	+63.6	+9.7	-	+73.3
Engineering	-	-	-	-
Estimating	-14.3	-	-	-14.3
Other	-	-	-	-
Support	-	+7.9	-	+7.9
Subtotal	+60.6	+17.6	-	+78.2
Total Changes	+61.4	+14.7	-18.4	+57.7
Current Estimate	832.5	974.7	-	1807.2

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-2.6
Economic adjustment for negative program change. (Economic)	N/A	+4.9
21 additional PPOTUS for aircraft integration and anti-jam testing (QR)(Quantity)	+11.3	+12.6
Restructure (Schedule)	+63.6	+70.1
Redefined Navy Program (Estimating)	-5.7	-11.0
Adjustment for Current and Prior Inflation. (Estimating)	+1.2	+1.4
Congressional/OSD/AF reductions (Estimating)	-9.8	-11.2
RDT&E Subtotal	+60.6	+64.2
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-14.4
Shift of annual procurement buy profile from FY2001 -FY2009 to FY2002-FY2010. (Schedule)	+9.7	+35.1
Addition of FY2010 (Support)	+7.9	+10.4
Procurement Subtotal	+17.6	+31.1

QR = Quantity related changes.

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

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.84	-0.02	+0.01	+0.06	-0.02	-0.02	--	--	+0.01	0.85

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.50	-0.01	--	+0.02	--	-0.02	--	+0.01	--	0.50

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	JUN 1996	JUN 1996	N/A	JUN 1996
Milestone II	JUN 1998	NOV 1998	N/A	NOV 1998
Milestone III	APR 2001	JUL 2002	N/A	FEB 2003
FUE/IOC	JUN 2001	SEP 2002	N/A	JUL 2003
Total Cost	811.3	2073.3	N/A	2101.4
Total Quantity	44	2469	N/A	2482
Prog Acq Unit Cost	18.44	0.84	N/A	0.85

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

a. RDT&E -- Initial Contract Price  
 (U) JASSM EMD: Target Ceiling Qty  
 Lockheed Martin, Orlando, FL \$172.5 N/A 0  
 F08626-96-C-0002, CPAF  
 Award: November 13, 1998  
 Definitized: November 13, 1998

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$260.4	N/A	0	\$260.4	\$324.6

15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-3.6	\$-5.7
Cumulative Variances To Date (11/28/99)	<u>\$-7.9</u>	<u>\$-9.3</u>
Net Change	\$-4.3	\$-3.6

Explanation of Change:

(U) The unfavorable schedule variance is due to late deliveries of flight test hardware from suppliers driven by factors described in the Executive Summary. The unfavorable cost variance is due to Lockheed not meeting planned personnel attrition rates. The manpower loading and associated cost will increase to meet the requirements of the restructure.

(U) Contract Comments:

The difference of \$87.9 million between the Initial Contract Price and the Current Contract Price is due to the extension of EMD by six months based on the Milestone II decision and the addition of Selective Availability Anti-Spoofing Module (SAASM) task, Joint Expeditionary Forces eXperiment (JEFX) task, the Congressionally mandated alternate engine study and additional B-2 wind tunnel work.

The Contractor's EAC does not include the additional scope of the restructure while the Program Manager's EAC does.

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

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

<u>Appropriation</u>	<u>Prior Years (FY96-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-10)</u>	<u>Total</u>
RDT&E	480.2	166.4	122.3	123.1	892.0
Procurement	-	-	-	1209.4	1209.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	480.2	166.4	122.3	1332.5	2101.4

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

b. Annual Summary -- JASSM

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				5.0	5.2
1999				1.7	1.8
2000				1.9	2.0
2001				1.9	2.0
2002				1.8	2.0
Subtotal				12.3	13.0

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				26.7	27.6
1997				153.5	160.7
1998				155.4	163.8
1999				114.0	121.1
2000				152.8	164.4
2001				110.0	120.3
2002				62.0	68.8
2003				33.0	37.2
2004				7.9	9.1
2005				5.1	6.0
Subtotal	82			820.4	879.0

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002	87		34.3	38.0	42.9
2003	92		38.3	43.9	50.5
2004	242		80.6	86.7	101.8
2005	347		115.2	121.4	145.4
2006	360		115.3	121.8	148.8
2007	360		151.9	158.5	197.5
2008	360		150.6	157.4	200.1
2009	360		150.8	157.7	204.4
2010	192		82.7	89.3	118.0
Subtotal	2400		919.7	974.7	1209.4



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

(U) Note: Procurement funding does not include Seek Eagle funding of \$10.1M (\$0.7M in FY01, \$2.9M in FY02, \$3.6M in FY04 and \$2.9M in FY05)

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy				12.3	13.0
USAF	2482		919.7	1795.1	2088.4
Grand Total	2482		919.7	1807.4	2101.4

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 647

(U) Percent Total Program Expended: 30.8%

(U) Expenditures reflect Program Office information as of 31 December 1999.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

The JASSM O&S estimate includes only Air Force requirements. The Navy requirements are not yet defined. A 15 year bumper-to-bumper warranty is assumed with a 20 year shelf life and the subsequent demilitarization of the weapon. As part of the warranty, the contractor will perform all warranty surveillance and the resulting repairs with the exception of acts of God and natural disasters. Included in the warranty are depot-level repairs and repair-induced transportation within CONUS, all systemic defect induced retrofits and software maintenance. Transportation costs assume 70 percent of the weapons will be deployed in CONUS and 30 percent OCONUS. The JASSM program will not stand up a Government depot; however, the estimate does include costs for minor technical support, repair of government induced failures and program office support. This estimate was prepared November 04, 1999 for the Air Combat Command (ACC) budget process.

There is no antecedent system for JASSM.

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JASSM, December 31, 1999

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

b. (U) Costs -- (FY FY95 Constant (Base-Year) Dollars in Thousands)

Cost Element	Average Annual Cost Per JASSM	N/A
Mission Pay & Allowances	0.0	N/A
Unit Level Consumption	0.0	N/A
Intermediate Maintenance	0.0	N/A
Depot Maintenance	0.4	N/A
Contractor Support	0.0	N/A
Sustaining Support	1.3	N/A
Indirect Costs	0.1	N/A
Total	1.8	N/A

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# A-10 CRUSADER

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&M))

PROGRAM: CRUSADER

DATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE  
AS OF DATE: December 31, 1999

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### 1. Designation and Nomenclature (Popular Name):

2. DoD Component: Army

### 3. Responsible Office and Telephone Number:

Project Manager Crusader	COL Charles Cartwright
Attention: SPAE-GCSS-CR	Assigned: July 16, 1998
Picatinny Arsen, NJ 07806-5000	DSN 880-4588; COMM 973/724-4588
	cartwright@pica.army.mil

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

#### RDT&E:

PE 6.36.45.A	Project D409, DB88
PE 6.38.54.A	Project D505, DC68
PE 6.48.54.A	Project D2KT, D503

### 5. References:

#### SAR Baseline (Planning Estimate):

DAE Approved Acquisition Program Baseline dated January 4, 1995.

#### Approved Program:

DAE Approved Acquisition Program Baseline (APB) dated October 23, 1997.

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00-C-0823

**6. Mission and Description:**

Crusader will be the indirect fire support system providing direct and general support fires to the maneuver forces on the battlefield. Crusader consists of a self-propelled howitzer (SPH), and a resupply vehicle (RSV). Crusader responds to the battlefield deficiencies identified in the Close Combat Battlefield Functional Mission Area and the Fire Support Battlefield Functional Mission Area and fulfills the need for an indirect fire weapon system that has increased range and can survive through autonomous operations.

Crusader's SPH will provide close, tactical, and operational fires during offensive and defensive operations; have a 155mm primary armament with significantly increased capabilities over the current M109-series fleet; provide increased rate-of-fire, hold more ammunition, be more responsive and survivable on the battlefield, with reduced manpower requirements; provide increased lethality; be deployable worldwide; and, provide for forward maintenance and employ future maintenance concepts.

The companion vehicle to the SPH will be Crusader's RSV. The RSV will sustain the SPH with ammunition and fuel as it provides close, tactical, and operational fires; be a self-propelled armored vehicle with significantly increased capabilities over the current system, the M992A1 FAASV; be a combination of wheeled and tracked vehicles; automate resupply functions; provide increased payload capability, and increased survivability with reduced manpower requirements; enable the SPH to achieve increased lethality levels and achieve independent mission execution; be deployable worldwide; and, provide forward maintenance support and employ future maintenance concepts.

**7. Executive Summary:**

Early in fiscal year 1995, the Principal Deputy Under Secretary of Defense (Acquisition & Technology) signed the Acquisition Decision Memorandum which approved Crusader to proceed into Program Definition and Risk Reduction (PDRR) phase. The ADM directed the Army plan for a Milestone II DAB or equivalent review, incorporating as many acquisition reform measures as practical.

The Government entered into an Unfinalized Contract Action to initiate the PDRR efforts of requirements analysis and concepting early in Fiscal Year 1995. The effort was subsequently finalized for the design, fabrication, testing and delivery of two prototype Crusader systems (two self-propelled howitzers and two resupply vehicles). The contract engages the expertise of United Defense Armament Systems Division (Minneapolis, Minnesota) as prime contractor, and United Defense Ground Systems Division (San Jose, California), General Dynamics Land Systems (Muskegon, Michigan and Sterling Heights, Michigan), General Dynamics Defense Systems (Pittsfield, Massachusetts), General Dynamics Armament Systems (Burlington, Vermont), Raytheon (Fort Wayne, Indiana and El Segundo, California), Honeywell (Clearwater, Florida and Albuquerque, New Mexico), Alliant (Hopkins, Minnesota), and Electronic Data Systems (Herndon, Virginia) as major subcontractors. The Army Tank-automotive and Armaments Command (TACOM) provides the armament development effort to United Defense, the prime development contractor, through a Memorandum of Agreement between the two parties. The contract is based upon streamlined acquisition initiatives, and

7. Executive Summary (Cont'd):

integrated product development with "Team Crusader" consisting of each of the contractor team players, the Tank-automotive and Armaments Command, the Army's Project Management Office (Picatinny Arsenal, New Jersey), and the Training and Doctrine Command System Manager (Ft. Sill, Oklahoma).

In March 1996, the Army changed the armament system for Crusader from a liquid propellant-based system to a solid propellant-based system. The solid propellant system selected by United Defense was the congressionally directed Crusader backup armament system developed by the Army Tank-automotive and Armaments Command (Picatinny Arsenal, New Jersey) and Benet Weapons Laboratory (Watervliet, New York). This change was made with due consideration given to the potential benefits of liquid propellant and the technical performance, schedule, and cost risks associated with the development and weaponization of that technology. The PDRR contract was refocused addressing necessary requirements, maturation, and development efforts for a solid propellant-based Crusader.

The Crusader development approach is undergoing a major restructuring that began in 1999 to align itself with the Army's vision for more deployable forces. The FY 2001 President's Budget supports the restructuring efforts. The purpose of the revised Crusader is to increase deployability while retaining all key performance parameters. The revised system will reduce weight and volume allowing deployment of two Crusader vehicles on a C5B transport plane (without waiver), employ a change in resupply philosophy utilizing a "50/50 mix" of tracked and wheeled resupply vehicles, leverage successful development to date, and continue in the Preliminary Design and Risk Reduction phase. Major subsystems will largely remain unchanged, but will be repackaged. The PM's Current Estimate supports the restructured program.

The restructuring development efforts will also be implementing a new engine design that will be common with the M1 Abrams Tank. The common engine approach, in addition to reducing system weight, is intended to improve performance, reduce logistic burdens, and reduce operation and support costs.

Development efforts in 1999 were focused on the fabrication and delivery of the PDRR prototypes. The first of two resupply vehicle prototype was delivered in July 1999. The fabrication and integration of the first of the two self-propelled howitzers were essentially completed in 1999, with delivery to Yuma Proving Grounds for testing scheduled for February 2000. Significant fabrication efforts were completed on the second resupply vehicle and second self-propelled howitzer prototypes. These two PDRR prototypes will be the integration platforms for the major subsystems of the redesigned Crusader.

Crusader's foremost development challenge continues to be software development and integration with hardware. The principal drivers for software risk are software requirements definition, software requirement volatility, software integration and the availability of qualified staff. Team Crusader has concentrated management efforts to mitigate the software development challenges. The prime development contractor, United Defense, has enlisted the expertise of Honeywell for software development and integration.

7. Executive Summary (Cont'd):

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

As a result of software development challenges, a congressional decrement of \$75 million to FY 2000 President's Budget for Crusader, and restructuring Crusader's development in accordance with the Army's vision for more deployable forces, the PM's Current Estimate for RDTE costs and program milestones has exceeded the APB thresholds. The PM's Current Estimate exceeds the approved RDTE cost threshold by \$1,051.8K (FY95 baseyear dollars), and milestone II is now scheduled 2 years later than the respective APB threshold. The revised APB parameters are being developed via integrated product development with key representative of DA and OSD staffs for approval.

9. Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program (APB)	Current Estimate	
ORD Approval	JUN 1993	N/A	JUN 1993	
Milestone I ASARC	OCT 1994	N/A	OCT 1994	
Milestone I DAB Review	NOV 1994	N/A	NOV 1994	
Development Phase I & II Contract Award	JUN 1995	DEC 1994	DEC 1994	
First Prototype Delivered	OCT 1999	N/A	N/A	
Early User Test				
Start	OCT 1999	NOV 2000	TBD	(Ch-1)
Complete	JAN 2000	JAN 2001	TBD	(Ch-1)
Milestone II	APR 2000	OCT 2000	APR 2003	(Ch-1)
EMD Continuation Decision	N/A	MAR 2001	N/A	(Ch-1)
Phase III Contract Award	APR 2000	MAR 2001	MAY 2003	(Ch-1)
Critical Design Review (CDR)	JUN 2000	N/A	N/A	
First Pre-Production Delivery	APR 2002	N/A	N/A	
Pre-Production Qualification Test				
Start	APR 2002	JAN 2002	OCT 2004	(Ch-1)
Complete	JUL 2003	N/A	JUL 2006	(Ch-1)
LRIP IPR	AUG 2003	N/A	FEB 2006	(Ch-1)
LRIP Contract Award	OCT 2003	N/A	MAR 2006	(Ch-1)
LRIP First Delivery	OCT 2004	N/A	N/A	
IOT&E				
Start	JAN 2005	MAR 2005	NOV 2007	(Ch-1)
Complete	APR 2005	JUL 2005	JAN 2008	(Ch-1)
First Unit Equipped (FUE)	JUL 2005	SEP 2005	APR 2008	(Ch-1)
Organic Support Capability	SEP 2005	N/A	N/A	
Milestone III DAB Review	OCT 2005	NOV 2005	OCT 2008	(Ch-1)
Full Rate Production Contract Award	OCT 2005	NOV 2005	NOV 2008	(Ch-1)
Service Depot Support Date	DEC 2006	N/A	N/A	
First Full Rate Production Delivery	FEB 2007	N/A	N/A	

b. Current Change Explanations --

(Ch-1) As a result of the software challenges, the congressional decrement to the FY 2000 President's Budget for Crusader, and restructuring Crusader in accordance with the Army's Vision, the following milestones have changed from the 1998 SAR:

Milestone	1998 SAR	1999 SAR
	Current Estimate	Current Estimate
Early User Test		
Start	Nov 00	N/A
Complete	Apr 01	N/A
Milestone II	Feb 01	Apr 03
EMD Continuation Decision	Aug 01	N/A
Phase III Contract Award	Feb 01	May 03
Pre-Production Qualification Test		
Start	Jan 02	Oct 04
Complete	Jul 03	Jul 06
LRIP IPR	Aug 03	Feb 06

9b. Schedule (Cont'd):

LRIP Contract Award	Oct 03	Mar 06
IOT&E		
Start	Mar 05	Nov 07
Complete	Jul 05	Jan 08
First Unit Equipped	Sep 05	Apr 08
Milestone III DAB Review	Nov 05	Oct 08
Full Rate Production Contract Award	Nov 05	Nov 08

10. Performance Characteristics:

a. Performance --

	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
AFAS					
Maximum rate of fire (rds/min)	12 for 3-5 mins	N/A	/ N/A	TBD	10.1-11 rds for 3-5 mins
Maximum range assisted (km)	50	N/A	/ N/A	TBD	40
Cross Country Mobility (with rolling resistance of 90 kg per metric ton) (km/hr)	48	N/A	/ N/A	TBD	47
Highway Mobility (on level hard surface) (km/hr)	78	N/A	/ N/A	TBD	67
Mean Time Between System Abort (MTBSA) (hrs)	68	N/A	/ N/A	TBD	68
FARV					
Rearm AFAS	60 complete rds in less than 12 mins	N/A	/ N/A	TBD	60 complete rds in 12 mins
Cross Country Mobility (with rolling resistance of 90 kg per metric ton) (km/hr)	48	N/A	/ N/A	TBD	47
Highway Mobility (on hard surface road) (km/hr)	78	N/A	/ N/A	TBD	67
Mean Time Between System Abort (MTBSA)	116	N/A	/ N/A	TBD	116



10a. Performance Characteristics (Cont'd):

Performance characteristics did not change for the 1999 SAR.

Note, the acronym AFAS is obsolete that is now defined as SPH for the Self-propelled Howitzer. The acronym FARV is also obsolete that is now defined as RSV for the Resupply Vehicle.

b. Current Change Explanations -- None

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

a. Cost --	<u>Planning Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	2357.0	2471.0	3844.1
Procurement	0.0	N/A	0.0
Total Sailaway			(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		
Initial Spares	(0.0)		
Construction (MILCON)	0.0	N/A	0.0
Acquisition O&M	0.0	N/A	0.0
Total FY 1995 Base-Year \$	<u>2357.0</u>	<u>2471.0</u>	<u>3844.1</u>
Escalation	423.0	449.3	458.2
Development (RDT&E)	(423.0)	(449.3)	(458.2)
Procurement	(0.0)	(N/A)	(0.0)
Construction (MILCON)	(0.0)	(N/A)	(0.0)
Acquisition O&M	(0.0)	(N/A)	(0.0)
Total Then Year \$	<u>2780.0</u>	<u>2920.3</u>	<u>4302.3</u>
b. Quantity --			
Development (RDT&E)	0	9	9
Procurement	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Total	<u>N/A</u>	<u>9</u>	<u>9</u>

Nine units in Low Rate Initial Production are funded with the RDTE appropriation per OSD fiscal direction for Initial Operational Test and Evaluation and Production Qualification Tests..

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

13. Cost Variance Analysis:

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

	RD&E	PROC	MILCON	TOTAL
Planning Estimate	2780.0	-	-	2780.0
Previous Changes:				
Economic	-237.4	-	-	-237.4
Quantity	+140.0	-	-	+140.0
Schedule	+183.1	-	-	+183.1
Engineering	-	-	-	-
Estimating	+39.3	-	-	+39.3
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+125.0	-	-	+125.0
Current Changes:				
Economic	-14.8	-	-	-14.8
Quantity	-	-	-	-
Schedule	+492.5	-	-	+492.5
Engineering	+936.2	-	-	+936.2
Estimating	-16.6	-	-	-16.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1397.3	-	-	+1397.3
Total Changes	+1522.3	-	-	+1522.3
Current Estimate	4302.3	-	-	4302.3

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

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	2357.0	-	-	2357.0
Previous Changes:				
Quantity	+118.6	-	-	+118.6
Schedule	+156.2	-	-	+156.2
Engineering	-	-	-	-
Estimating	+27.0	-	-	+27.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+301.8	-	-	+301.8
Current Changes:				
Quantity	-	-	-	-
Schedule	+426.2	-	-	+426.2
Engineering	+780.6	-	-	+780.6
Estimating	-21.5	-	-	-21.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+1185.3	-	-	+1185.3
Total Changes	+1487.1	-	-	+1487.1
Current Estimate	3844.1	-	-	3844.1

The PM's Current Estimate supports the restructured program in accordance with the Army's vision for more deployable forces.

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-15.6
Economic adjustment for negative program change. (Economic)	N/A	+0.8
Stretched development due to software delays and FY00 Appropriation Act (Schedule)	+426.2	+492.5
Increase due to Army's Vision for more deployable forces. (Engineering)	+780.6	+936.2
Adjustment for Current and Prior Inflation. (Estimating)	+3.1	+3.3
Distributed congressional reductions (Estimating)	-24.6	-19.9
RDT&E Subtotal	<u>+1185.3</u>	<u>+1397.3</u>

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

b. Procurement Unit Cost (PUC) History

Not required for Pre-Milestone II programs in accordance with Section 2433, Title 10, USC.

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	NOV 1994	N/A	N/A	NOV 1994
Milestone II	APR 2000	N/A	N/A	APR 2003
Milestone III	OCT 2005	N/A	N/A	OCT 2008
FUE/IOC	JUL 2005	N/A	N/A	NOV 2008
Total Cost	2780	N/A	N/A	4302.3
Total Quantity	0	N/A	N/A	N/A
Prog Acq Unit Cost	0	N/A	N/A	N/A

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

a. RDT&E --

Crusader Ph I/II Develop:  
 United Defense, Minneapolis, MN  
 DAAE30-95-C-0009, CPIF/AF  
 Award: December 29, 1994  
 Definitized: January 29, 1997

Initial Contract Price		
Target	Ceiling	Qty
\$61.4	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$1129.2	N/A	0	\$1494.0	\$

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$-41.8	\$-43.1
Cumulative Variances To Date (12/31/99)	\$-8.6	\$0.0
Net Change	\$33.2	\$43.1

Explanation of Change:

As discussed in the Executive Summary, Crusader is currently being restructured in accordance with the Army Vision for a more deployable Crusader system.

The PDRR contract is being revised accordingly. As a result, the remaining development efforts through MSII are being rebaselined. Therefore, work scheduled and work performed were set equal to actual cost as of the end of

15. Contract Information (Cont'd):

December 1999, with the exception of the variances applicable to the early contractual efforts in Requirements Analysis and Component Maturation (RACM). The RACM variances will remain in tact. The contract fee structure is being revised accordingly to accommodate the elimination of the schedule and cost variances.

The PM Estimates are to be determined pending contractual finalization of the restructured efforts.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-10)	<u>Total</u>
RDT&E	1083.5	262.2	355.5	2601.1	4302.3
Procurement	-	-	-	-	-
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>1083.5</b>	<b>262.2</b>	<b>355.5</b>	<b>2601.1</b>	<b>4302.3</b>

b. Annual Summary -- Crusader

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1995 Dollars Nonrec</u>	<u>Flyaway FY 1995 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				3.8	3.8
1995				64.0	65.0
1996				175.6	181.5
1997				221.5	231.5
1998				285.9	301.2
1999				282.5	300.5
2000				243.4	262.2
2001				325.1	355.5
2002				437.7	486.1
2003				419.0	473.6
2004				393.7	453.8
2005				361.7	425.3
2006				416.6	499.7
2007				163.6	200.1
2008				42.1	52.5
2009				7.5	9.5
2010				0.4	0.5
<b>Subtotal</b>	<b>9</b>			<b>3844.1</b>	<b>4302.3</b>

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

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	9			3844.1	4302.3

17. Delivery/Expenditure Information:

a. Deliveries To Date - None.

Percent Total Program Quantities Delivered: N/A

b. Total Expenditures To Date (In Millions of Dollars): \$ 1179

Percent Total Program Expended: 27.4%

18. Operating and Support Costs:

Not applicable for Pre-Milestone II programs.

AF-13 JPATS

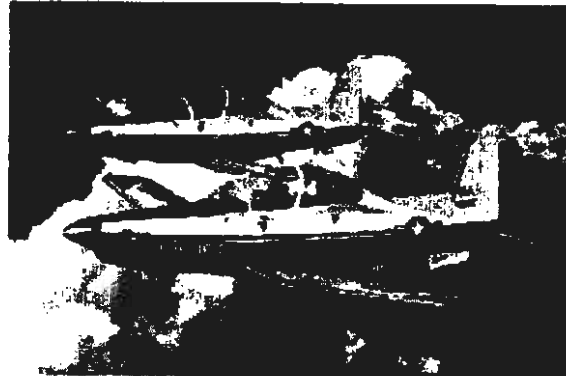
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)B23)  
PROGRAM: JPATS

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Joint Primary Aircraft Training System/JPATS
2. DoD Component: USAF  
  
Joint Participants:  
USAF/USN
3. Responsible Office and Telephone Number:  
ASC/YT COL C.R. Davis  
Building 11A Room 201I Assigned: July 23, 1999  
1970 Monahan Way DSN 674-4291; COMM (937) 904-4291  
WPAFB, OH 45433-7211 charles.davis2@wpafb.af.mil
4. Program Elements/Procurement Line Items:  
RDT&E:  
PE 0603208N (Shared) Project H1150  
PE 0604233F (Shared) Project 654102  
PE 64233F (Shared) Project 644102  
PROCUREMENT:  
APPN 3010 ICN 0804740F (Air Force)  
APPN 1506 ICN 0804745N (Navy)  
MILCON:  
PE 0804741F  
PE 0805796N  
O&M:  
PE 0804741F (Shared)

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DEPARTMENT OF DEFENSE

**5. References:**

**SAR Baseline (Development Estimate):**

Program Management Directive 1104(15)  
/PE64233F/PE84740F/84741F Dated April 24, 1996  
Operational Requirements Document dated August 15, 1993, Change 2 dated June 6, 1994  
DAE Approved Acquisition Program Baseline dated August 4, 1995

**Approved Program:**

CAE Approved Acquisition Program Baseline (APB) dated February 14, 2000.

**6. Mission and Description:**

The Joint Primary Aircraft Training System (JPATS) is a joint USAF/USN program to replace the USAF's T-37B aircraft and the USN's T-34C aircraft and their associated Ground Based Training Systems (GBTS). The aircraft (T-6A Texan II) and GBTS will be used to train entry-level students in the fundamentals of flying so they can transition into advanced training tracks leading to qualification as military pilots, navigators, and Naval Flight Officers.

The program represents a systems approach to aviator training requiring the purchase of air vehicles, aircrew training devices, associated ground based training devices, an integrated training management system, instructional courseware, and contractor logistics support. The USAF will train at 6 bases and the USN at 3 bases. Each operational training location will be equipped with a full complement of operational flight trainers, instrument flight trainers, unit training devices and egress training devices. Courseware is being developed for the T-6A and converted from existing courseware for other platforms where appropriate. The Training Integrated Management System (TIMS) will provide a training and scheduling capability which will tie the efforts and activities of all Air Education and Training Command (AETC) and Chief of Naval Air Training (CNATRA) operating locations together.

The USAF will have contractor logistics support for most of the off-aircraft equipment maintenance. The on-equipment maintenance will be performed by third party contractor or organically supported. The USN will employ total contractor logistics support (CLS) for the entire aircraft. The GBTS will be a total contractor logistics support effort for both services.

**7. Executive Summary:**

**Program History**

Feb 89: DoD Trainer Masterplan approved.

Dec 90: Mission Need Statement validated by the Joint Requirements Oversight Council, Joint Services Operational Requirements Document published.



JPATS, December 31, 1999

**7. Executive Summary (Cont'd):**

Jan 93: DAB conducted Milestone 0/I Review. Milestone 0 was approved with the Air Force designated lead service.

Jan 94: Updated Operational Requirements Document (ORD) II released.

May 94: Source Selection began with the RFP release to industry. Flight evaluation phase began Jul 94 and was completed Sep 94.

Jun 95: Source Selection Authority briefed and the winner, Raytheon Aircraft Company (RAC), announced. Protests (2) were filed following the announcement and the contract award was delayed.

Aug 95: JPATS Milestone II DAB conducted and the ADM was signed. JPATS was redesignated an Acquisition Category 1C program.

Nov 95/Feb 96: GAO released its decision on the protests; all allegations were denied, and the contract was awarded. The first production lot option (Lot II for 3 aircraft) was exercised on 14 Feb 96.

May 96: ORD II Rev 1 increased aircraft procurement quantities from 711 to 740 with no service specific quantity breakout.

Sep 96: Lot III production option (6 aircraft) awarded.

Apr 97: Lot IV production option (15 aircraft) awarded.

Dec 97: Bombardier of Canada reached an agreement with RAC to purchase 24 T-6A aircraft for NATO Flight Training Canada (NFTC).

Feb 98: Lot V option (22 aircraft) awarded.

May 98: Rollout of aircraft T-1 (PT-4) completed; first flight of T-1 was completed on 15 Jul 98.

FY99 Appropriations Act cut \$10M of \$36.2M from AF procurement funds for the Ground Based Training System (GBTS). This level of funding did not allow the execution of FY99 contract options as planned to install Training Information Management System (TIMS) at all 7 AETC pilot training bases.

Oct 98: RAC selected by Hellenic Air Force (HAF) to produce 45 aircraft and associated GBTS elements.

**Program Activity Since Last Report**

On 28 Jan 99, while flying chase for T-1, an apparent engine malfunction forced aircraft P-2 to make an emergency landing. All aircraft were grounded as RAC, the SPO, and Pratt & Whitney conducted an investigation into the cause. The government and contractor team concluded that the cause was contamination resulting from the propeller manufacturing process. Corrective actions were implemented and all restrictions resulting from the incident have been removed.

7. Executive Summary (Cont'd):

During static article testing in Feb 99, part of the rear fuselage failed at 133% of the design load (contract requirement is 150%). Structural modifications to correct the failure were installed and successfully tested on the static test article.

On 26 Feb 99 the SPO forwarded official notification that we expected to breach our APB Milestone for DD-250 of T-1 (threshold May 99). Three technical issues affected our ability to proceed with FAA Certification and DD-250 of T-1. The problems involve the Environmental Control System (ECS), the engine's automatic airstart system, and the aircraft's empennage structure. New baseline approved in May 99 substituting the milestone Start MOT&E for DD-250 of T-1.

Air Force Research Laboratory (AFRL) analysis of the egress system data showed higher than expected neck loads on the crew caused by the high deceleration of the seat when the drogue chute is deployed. Martin Baker conducted both a flight and ground test of the Head Box Deployment Unit with a reduced charge. Analysis of the data confirms the system meets requirements.

The Air Force turned over facilities at Randolph AFB to support the Contractor Operated Management of Base Supply (COMBS) portion of the Contractor Logistics Support contract. The contractor began populating the facility with spares and equipment in anticipation of beginning T-6A activities at Randolph AFB during the summer of 1999.

The program office exercised the Lot VI production option for 22 aircraft on 14 May 99. This option brings the total number of aircraft ordered to 68 (all USAF).

Aircraft P-4 was delivered to Randolph AFB on 30 Jun 99 to begin the 7 month Combined Verification and Validation (CV&V) of the maintenance manuals.

The program office, Raytheon, and the users successfully completed the Critical Design Review (CDR) for all six types of Aircrew Training Devices (ATDs) in Apr 99 and the Operational Support Segment (OSS) in Jul 99.

The FAA granted Raytheon both the Type and Production Certificates for the Beech Model 3000 (civilian designation of the T-6A Texan II) on 30 July 1999. The simultaneous award of both certificates was a monumental achievement for acquisition reform initiatives as the Production certificate is generally awarded a year after the Type certificate is granted. Specifically, reform initiatives required the use of production tooling for building every aircraft.

The program office submitted a Program Deviation Report on 10 November 1999 stating that the Acquisition Program Baseline would be breached for the start of Multi-Service Operational Test and Evaluation (MOT&E) and the Milestone III thresholds. The schedule delays are the result of engine manufacturing variability that increases the chance of engine damage during high load maneuvers. The root causes have been identified and verification testing is

7. Executive Summary (Cont'd):

on-going. New schedule milestones were approved on 14 Feb 00.

NOTE: This SAR reflects program impacts resulting from Operational Requirements Document (ORD II) Revision 1 (Rev 1) except for the following; ORD II (Rev 1) calls for the purchase of 740 air vehicles without specifying service quantities. This report documents the last official position (USAF - 372, USN - 339 aircraft). The draft ORD III, which has been submitted for service approval, corrects this deficiency by identifying a total procurement of 782 airframes (454 USAF, 328 USN). Upon ORD approval the PM's estimate and program documentation will be updated to match ORD III.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone 0/I	JAN 1993	N/A	JAN 1993
Milestone II	AUG 1995	N/A	AUG 1995
Low Rate Initial Production Option (LRIP) Exercise Award	FEB 1995	N/A	N/A
Aircraft Critical Design Review (CDR)	JUN 1996	JUN 1996	NOV 1996
Start MOT&E	N/A	APR 2000	APR 2000 (Ch-1)
Milestone III	SEP 1999	NOV 2000	NOV 2000 (Ch-1)
Initial Operational Capability (AF)	FEB 2001	AUG 2001	AUG 2001
Initial Operational Capability (Navy)	JUL 2003	JUL 2003	JUL 2003

9b. Schedule (Cont'd):

b. Current Change Explanations --

Ch-1: Milestone III (from Feb 00 to Nov 00) and Start MOT&E (new APB Milestone) have been delayed pending resolution of the engine manufacturing variability problem discussed in the executive summary. APB Breach notification letter was submitted in Nov 99, and new milestone dates were approved on 14 Feb 00.

10. Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
Syllabus Maneuvers Mission Profiles (Contact, Familiarization, Precision Aero- batics, Instrument, and Navigation - High and Low)	Accomp- lish all five mission profiles	Accomp- / Accomp- lish all/ lish all five / five mission / mission profiles/ profiles	Accomp- lish all five mission profiles	Accomp- lish all five mission profiles
Sustained Speed at 1000 ft MSL, hot day (KTAS)	270	270 / 250 (270 / Dash)	250(270 Dash)	250 (270 Dash)
Operational G Envelope (Gs)	+7 to -3 sym- metric	+7 to -3/ +6 to -3 sym- / sym- metric / metric; / +4 to 0 / metric	+7 to -3.5 sym- metric; +2.5 to 0 asym- metric	+7 to (Ch-1) -3.5 sym- metric; +4 to 0 asym- metric
Pressurization (PSI Differential)	5.0	5.0 / 3.5	3.5	3.5
Bird Strike Capabil- ity (4 lb bird, no catastrophic damage) (KTAS)	Max Low Airspeed	Max Low / 270 Airspeed/	270	270
Ejection Seat with Survival Kit (Altitude/Airspeed in Knots)	0/0	0/0 / 0/60	0/0	0/0
Able To Perform an Engine Out Landing	Unpre- pared surface	Unpre- / Runway pared / surface /	Runway	Runway
Anthropometric Accommodation (Sitting Height in inches)	31.0 to 40.0	31.0 to / 32.8 to 40.0 / 40.0	31.0 to 40	31.0 to 40

10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Cockpit Configuration	able to be operationally flown from either cockpit	Inter- / Yes change- / able / tor / Student /	Inter- change- able Instruc- tor/ Student	Yes
Cockpit Seating Configuration	0 Degree Over-the-Nose visibility from the Rear Cockpit at Design Eye Height	0 / Stepped DEGREES / Tandem OVER-THE/ NOSE / VISIBILI/ TY FROM / THE REAR/ COCKPIT / AT / DESIGN / EYE / HEIGHT /	Stepped Tandem	Stepped Tandem
Exterior Noise	FAR Part 36, Most Restrictive licable Standard	FAR Part/ 36, Most/ Restrictive / licable / Standard/	FAR Part 36, Most Restrictive App- licable Standard	FAR Part 36, Most Restrictive App- licable Standard
Takeoffs/Touch & Go/Land (Wx, Weight, Configuration) at Main Operating Bases (Runway Length - FT)	4000	4000 / 5000	5000	5000
IFR Certified Instrumentation	All Digital except Backups	All / IFR Digital / ified except / (Select- able / EHSI)	IFR Cert- ified (Select- able EADI/ EHSI)	IFR Cert- ified (Select- able EADI/ EHSI)
Visual System For IFT/OFT	Yes	YES / Provide / a visual / field of / view / commensu / rate / with the	Yes	Yes

10a. Performance Characteristics (Cont'd):

<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
	/ JPPT		
	/ syllabus		
	/ training		
	/ requirem		
	/ ents		

b. Current Change Explanations --

Ch-1: Operational G envelope (symmetric) demonstrated values expanded (from +6 to -3G, to +7 to -3.5 G) during flight test activities this year. Program has demonstrated objective value for symmetric loads.

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

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	314.7	263.4	257.5
Procurement	2501.0	2802.1	3058.4
Navy	(825.5)		(1192.7)
Air Force	(974.6)		(1235.9)
Total Flyaway	(1800.1)		(2428.6)
Navy GBTS	(163.8)		(126.0)
Air Force GBTS	(178.2)		(184.6)
Navy Mission Support	(11.5)		(29.0)
Air Force Mission Suppo	(35.3)		(46.4)
Air Force Other Support	(35.5)		(42.9)
Navy Other Support	(7.7)		(30.1)
Total Other Wpn Sys	(432.0)		(459.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(268.9)		(170.8)
Construction (MILCON)	63.2	37.1	35.9
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1995 Base-Year \$	2878.9	3102.6	3351.8
Escalation	1171.7	894.4	622.8
Development (RDT&E)	(48.6)	(19.8)	(13.4)
Procurement	(1102.4)	(865.9)	(603.7)
Construction (MILCON)	(20.7)	(8.7)	(5.7)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	4050.6	3997.0	3974.6

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

b. Quantity --

Development (RDT&E)	1	1	1
Procurement	<u>711</u>	<u>711</u>	<u>711</u>
Total	712	712	712

JPATS' RDT&E aircraft is fully configured.

The Low Rate Initial Production Rate (LRIP) quantities authorized by the Milestone II ADM (9 Aug 95) are up to a maximum of 108 aircraft (through Lot 7) LRIP establishes an initial production base and permits an orderly increase in the production to lead to full-rate production upon successful completion of operational testing. The program office will execute subsequent production contracts for the remaining aircraft with a maximum anticipated production rate of seven per month.

The new procurement quantities identified in the ORD II Rev 1 are not reflected in the current SAR.

c. Foreign Military Sales --

The Bombardier of Canada and Hellenic Air Force procurements are a direct sale from RAC.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (DEC 1997 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	3102.6	3351.8	
(2) Quantity	712	712	
(3) Unit Cost	4.358	4.708	+8.03
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	2802.1	3058.4	
(2) Quantity	711	711	
(3) Unit Cost	3.941	4.302	+9.16

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	363.3	3603.4	83.9	4050.6
Previous Changes:				
Economic	-6.6	-538.8	-4.0	-549.4
Quantity	-	-	-	-
Schedule	-	-44.9	-2.9	-47.8
Engineering	-	-	-	-
Estimating	-78.8	+787.7	-35.4	+673.5
Other	-	-	-	-
Support	-	-221.6	-	-221.6
Subtotal	-85.4	-17.6	-42.3	-145.3
Current Changes:				
Economic	-	-51.8	-	-51.8
Quantity	-	-	-	-
Schedule	-	-3.4	-	-3.4
Engineering	-	-	-	-
Estimating	-7.0	+41.0	-	+34.0
Other	-	-	-	-
Support	-	+90.5	-	+90.5
Subtotal	-7.0	+76.3	-	+69.3
Total Changes	-92.4	+58.7	-42.3	-76.0
Current Estimate	270.9	3662.1	41.6	3974.6

Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	314.7	2501.0	63.2	2878.9
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-2.7	-2.7
Engineering	-	-	-	-
Estimating	-50.9	+600.6	-25.1	+524.6
Other	-	-	-	-
Support	-	-150.3	-	-150.3
Subtotal	-50.9	+450.3	-27.8	+371.6
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-6.3	+27.9	-	+21.6
Other	-	-	-	-
Support	-	+79.2	-	+79.2
Subtotal	-6.3	+107.1	+0.5	+101.3
Total Changes	-57.2	+557.4	-27.3	+472.9
Current Estimate	257.5	3058.4	35.9	3351.8



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

b. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
	Air Force revised program requirements (Estimating)	-6.6	-7.3
	RDT&E Subtotal	-6.3	-7.0
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-52.9
	Economic adjustment for negative program change. (Economic)	N/A	+1.1
	Navy acceleration of annual procurement buy profile. (Schedule)	0.0	-2.4
	Air Force acceleration of annual procurement buy profile. (Schedule)	0.0	-1.0
	Navy adjustment for Current and Prior Inflation. (Estimating)	-0.6	-0.7
	Navy revised program requirements (Estimating) (Estimating)	+7.8	+17.0
	Air Force adjustment for Current and Prior Inflation. (Estimating)	+1.1	+1.2
	Air Force estimating (Estimating)	+19.6	+23.5
	Navy adjustment for Current and Prior Inflation. (Support)	+1.2	+1.2
	Change in Initial Spares (Support)	+9.3	+9.8
	Change in Navy GBTS (Support)	+6.9	+5.9
	Change in Air Force GBTS (Support)	+57.6	+66.5
	Change in Navy Mission Support (Support)	+10.8	+15.0
	Change in Air Force Mission Support (Support)	-9.2	-10.5
	Change in Air Force Other Support (Support)	-11.3	-11.7
	Change in Navy Other Support (Support)	+3.0	+3.0
	Air Force adjustment for Current and Prior Inflation. (Support)	+0.7	+0.7
	AF change in Initial Spares (Support)	+10.2	+10.6
	Procurement Subtotal	+107.1	+76.3
(3)	<u>MILCON</u>		
	(Economic)	N/A	0.0
	(Economic)	N/A	0.0
	MILCON Subtotal	+0.5	0.0

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5.69	-0.84	-0.01	-0.07	--	+0.99	--	-0.18	-0.11	5.58

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5.07	-0.83	-0.01	-0.07	--	+1.17	--	-0.18	+0.08	5.15

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	JAN 1993	JAN 1993	N/A	JAN 1993
Milestone II	JUN 1994	AUG 1995	N/A	AUG 1995
Milestone III	JUN 1998	SEP 1999	N/A	NOV 2000
FUE/IOC	MAR 2000	FEB 2001	N/A	AUG 2001
Total Cost	277.3	4050.6	N/A	3974.6
Total Quantity	2	712	N/A	712
Prog Acq Unit Cost	138.65	5.69	N/A	5.58

Air Force IOC is Aug FY01; Navy IOC is Jul FY03.

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

a. RDT&E --

JPATS:  
Raytheon Aircraft Company, Wichita KS  
F33657-94-C-0006, FPIF  
Award: February 5, 1996  
Definitized: February 5, 1996

Target	Initial Contract Price	
	Ceiling	Qty
\$84.8	\$101.0	1

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$166.3	N/A	1	\$182.4	\$184.7

15a. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-14.8	\$-7.1
Cumulative Variances To Date	<u>\$-23.1</u>	<u>\$-1.6</u>
Net Change	\$-8.3	\$5.5

Explanation of Change:

Variance data is taken from the December 1999 Cost Performance Report and was reflected in the January 2000 DAES report.

Variance Analysis:

The Manufacturing Development (MD) contract is now 75% complete (the air vehicle portion is over 95% complete). The elimination of the ceiling price is due to the inclusion of two cost plus line items within the GBTS subcontract.

The negative cost variance increase was primarily driven by differences in the general and administrative rate (driven by lower foreign sales than planned), rework, absorption of sustaining labor costs driven by delays in other lots, material cost increases in the factory, and unplanned tests. The program manager is concerned about the material cost variances and their impact on future lots.

The contractor's estimate at completion results in a variance at completion of -\$24.5M. The program manager's estimate for best case (\$184.7M) is based on a detailed CPI forecast at the cost account level. This also includes some adjustments for known factors and risks. The current estimate (\$184.7M) represents the government liability for contract funding. The program office has obligated all funding on the contract at the limit of its liability.

b. Procurement --		Initial Contract Price		
<u>JPATS PROD LOT 2:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon Aircraft Company, Wichita KS				
F33657-94-C-0006, FPIF		\$43.9	\$49.0	3
Award: February 14, 1996				
Definitized: February 14, 1996				
Current Contract Price		Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$40.8	\$45.2	\$45.4	\$45.2	
	Qty			
	3			

15b. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-11.4	\$-0.9
Cumulative Variances To Date	<u>\$-15.0</u>	<u>\$-0.9</u>
Net Change	\$-3.6	\$0.0

Explanation of Change:

Variance data is taken from the December 1999 Cost Performance Report and was reflected in the January 2000 DAES report.

Variance Analysis:

Lot 2 is 94% complete at this time.

Indirect costs, such as overhead and the general and administrative rate, make up over 40% of the cost variance. Other significant variances are driven by factory fabrication of parts, multiple set-ups, higher use of machined parts, use of overtime to recover schedule, and higher quality assurance costs. The program manager's best estimate is based on a detailed CPI forecast at the cost account level, with adjustments for risk. (It should be noted that the contractor still has \$5.5M in management reserve; a significant amount that should be excluded from top level EAC calculations.) The program office has obligated all funding to the ceiling value. However, the program office projects that the final costs may increase beyond the government liability by \$2.1M; this will be absorbed by RAC.

<u>JPATS PROD LOT 3:</u>			<u>Initial Contract Price</u>		
			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon Aircraft Company, Wichita KS			\$31.2	\$34.3	6
F33657-94-C-0006, FPIF					
Award: September 23, 1996					
Definitized: September 23, 1996					
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$30.8	\$34.0	6	\$32.5	\$34.0	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$-7.2	\$-4.2	
Cumulative Variances To Date			<u>\$-16.0</u>	<u>\$-1.5</u>	
Net Change			\$-8.8	\$2.7	

Explanation of Change:

Variance data is taken from the December 1999 Cost Performance Report and was reflected in the January 2000 DAES report.

Variance Analysis:

Lot 3 is now 92% complete.

15. Contract Information (Cont'd):

Indirect costs, such as overhead and the general and administrative rate, make up over 40% of the cost variance and can be attributed to lack of volume. Other significant variances are driven by fabrication of parts, multiple set-ups, higher use of machined parts, use of overtime to recover schedule, and higher quality assurance costs. The program manager's best estimate is based on an average of a CPI forecast at the cost account level. (It should be noted that the contractor still has \$8.6M in management reserve; a very significant amount that should be excluded from top level EAC calculations. This equates to about 54% of work remaining.) The contractor's EAC of \$32.5M is viewed as optimistic. Lots 2, 4, and 5 are projected to go to ceiling and the PM has sufficient funding to cover these costs. The program office has obligated all funding to the ceiling value. However, the program office projects that the final costs may increase beyond the government liability by \$3.1M; this cost will be absorbed by RAC.

<u>JPATS PROD LOT 4:</u>			<u>Initial Contract Price</u>		
Raytheon Aircraft Company, Wichita KS			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F33657-94-C-0006, FPIF			\$62.9	\$69.3	15
Award: April 18, 1997					
Definitized: April 18, 1997					
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$63.0	\$69.6	15	\$68.3	\$69.6	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$-3.1	\$-10.1	
Cumulative Variances To Date			<u>\$-13.9</u>	<u>\$-16.8</u>	
Net Change			\$-10.8	\$-6.7	

Explanation of Change:

Variance data is taken from the December 1999 Cost Performance Report and was reflected in the January 2000 DAES report.

Variance Analysis:

Lot IV is now 51% complete. The schedule variance of is due to a delay in deliveries of engines, airframes, and airframe assemblies. The cost variance is due to higher costs for factory fabrication of parts, multiple set-ups, and higher use of machined parts, as well as the lack of volume impact to general and administrative costs. The PM's best estimate is a CPI forecast at the cost account level with adjustments for known risk. The program office has obligated all funding to the ceiling value. However, the program office projects that the final costs may increase beyond the government liability by \$10.8M; this cost will be absorbed by RAC

15. Contract Information (Cont'd):

<u>JPATS PROD LOT 5:</u>			Initial Contract Price		
Raytheon Aircraft Company, Wichita KS			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F33657-94-C-0006, FPIF			\$60.0	\$66.2	22
Award: February 20, 1998					
Definitized: February 20, 1998					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$63.1	\$69.9	22	\$73.1	\$69.9	
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Cumulative Variances To Date			\$-0.2	\$-1.9	
Net Change			<u>\$0.8</u>	<u>\$-9.1</u>	
			\$1.0	\$-7.2	

Explanation of Change:

Variance data is taken from the December 1999 Cost Performance Report and was reflected in the January 2000 DAES report.

Variance Analysis:

The contract is 25% complete. The program manager's current estimate is capped at ceiling (\$69.9M). The program office has obligated all funding to the ceiling value. However, the program office projects that the final costs may increase beyond the government liability by \$8.5M; this will be absorbed by RAC.

<u>JPATS Lot VI:</u>			Initial Contract Price		
Raytheon Aircraft Company, Wichita KS			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
F33657-94-C-0006, FPIF			\$67.4	\$74.8	22
Award: May 14, 1999					
Definitized: May 14, 1999					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$67.4	\$74.8	22	\$	\$	

15. Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$	\$
Cumulative Variances To Date	\$	\$
Net Change	\$	\$

Explanation of Change:

Lot VI was exercised on 14 May 99, no CPR data is available at this time.

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

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

<u>Appropriation</u>	<u>Prior Years (FY92-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-14)</u>	<u>Total</u>
RDT&E	207.6	33.6	21.7	8.0	270.9
Procurement	338.1	166.9	188.2	2968.9	3662.1
MILCON	3.9	9.4	5.2	23.1	41.6
O&M	-	-	-	-	-
Total	549.6	209.9	215.1	3000.0	3974.6

b. Annual Summary -- JPATS

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1994				3.6	3.6
1995				3.6	3.7
1996				1.1	1.1
1997				1.6	1.7
1998				0.3	0.3
1999				0.6	0.6
2000				0.3	0.3
Subtotal				11.1	11.3

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JPATS, December 31, 1999

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

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				0.9	0.9
1993				1.9	1.9
1994				2.6	2.6
1995				34.9	35.4
1996				26.1	27.0
1997				39.3	41.1
1998				46.8	49.3
1999				36.1	38.4
2000				30.9	33.3
2001				19.9	21.7
2002				1.7	1.9
2003				1.8	2.0
2004				1.7	2.0
2005				1.8	2.1
2006					
2007					
2008					
2009					
2010					
2011					
Subtotal	1			246.4	259.6

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	12		28.9	50.8	55.5
2001	21		50.2	67.1	74.4
2002	24		79.4	92.5	104.3
2003	24		79.1	100.1	115.2
2004	24		78.3	97.3	114.1
2005	24		79.1	87.4	104.5
2006	24		83.2	101.5	123.9
2007	24		86.9	102.2	127.2
2008	24		89.5	115.7	146.8
2009	24		91.2	117.4	152.0
2010	24		92.4	110.0	145.3
2011	24		92.7	105.1	141.6
2012	24		93.1	102.0	140.2
2013	24		94.9	103.9	145.7
2014	18		73.8	81.0	115.9
Subtotal	339		1192.7	1434.0	1806.6

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JPATS, December 31, 1999

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

Navy Procurement Flyaway Costs also include Award Fee.

Appropriation: 3010 - Aircraft Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	3		76.0	77.5	80.4
1996	6		13.7	14.2	14.9
1997	15		36.2	57.8	61.3
1998	22		65.7	68.8	73.3
1999	22		60.0	100.5	108.2
2000	29		68.8	102.0	111.4
2001	27		67.6	102.6	113.8
2002	48		164.1	191.8	216.4
2003	55		187.4	261.7	301.0
2004	50		170.0	212.2	249.0
2005	50		170.3	216.0	258.4
2006	45		156.1	208.9	254.8
2007				5.2	6.4
2008				4.9	6.2
Subtotal	372		1235.9	1624.1	1855.5

Flyaway exceeds total program costs in FY96 due to OSD direction to roll funds to procure Aircraft. OSD directed the use of \$40.5M of FY95 excess funds to procure 6 A/C in FY96. OSD further directed the use of \$15.3M of FY96 funds to procure 3 A/C of the next lot (15 A/C) in FY97.

Appropriation: 1205 - Military Construction, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				1.3	1.4
2000				5.7	6.2
2001				4.7	5.2
2002				0.5	0.6
2007				8.1	10.0
2008				0.6	0.7
2011				0.7	0.9
Subtotal				21.6	25.0

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

Appropriation: 3300 - Military Construction, Air Force

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998				2.3	2.5
2000				2.9	3.2
2003				2.8	3.2
2005				3.0	3.6
2006				3.3	4.1
Subtotal				14.3	16.6

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	339		1192.7	1466.7	1842.9
USAF	373		1235.9	1884.8	2131.7
Grand Total	712		2428.6	3351.5	3974.6

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 160.7

Percent Total Program Expended: 4.0%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The operations and support costs are based on the purchase of 711 aircraft, Aircrew Training Devices (ATDs), Training Integration Management System (TIMS), development and conversion courseware, and CLS which will be provided by Raytheon Aerospace.

Section 18b consists of five elements. Mission Personnel includes the cost of military and civilian system-related personnel involved in the operation of this system. Unit-Level Consumption includes the cost of fuel resources and unit level consumables. Sustaining Support includes the costs of replacement support equipment, modification kits, sustaining engineering, software maintenance, and simulator operations for the aircraft system. Indirect

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

Support includes the costs of personnel support for specialty training, permanent changes of station and medical care. Finally, Program Management includes the cost of managing the system by the Air Force Flight Training System Program Office.

Section 18c consists of costs for contract labor, materials, and overhead incurred in providing the logistics support required by an aircraft system, subsystem or associated support equipment. Aircraft CLS covers depot maintenance for both the Air Force and the Navy, and covers organizational and intermediate maintenance activities for the Navy. GBTS CLS support is provided separately.

Typically, CLS is estimated in Base Year (BY) and not converted to Then Year due to the length of the O&S support relative to the number of years for which inflation indices are available. Due to the lack of inflation indices through 2038, the dollar amounts in this section are in BY95.

This reflects the information briefed by the OSD Cost Analysis Improvement Group at the DAB reflecting the JPATS Most Probable Life Cycle Cost documenting the Source Selection dated 25 Jul 95.

\* The antecedent systems are the T-37B for the Air Force and T-34C for the Navy.

At the JPATS Milestone I decision, the requirement for a Cost/Operational Effectiveness Analysis (COEA) was waived due to the streamlining initiatives for pilot programs. Thus, the direct comparison to the antecedent systems was not prepared.

**b. Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)**

Cost Element	Avg Annual Cost Per JPATS PROGRAM	Avg Annual Cost Per *
Mission Pay & Allowances	85.0	0.0
Unit Level Consumption	15.7	0.0
Intermediate Maintenance	4.9	0.0
Depot Maintenance	35.1	0.0
Contractor Support	5.9	0.0
Sustaining Support	N/A	0.0
Indirect Costs	N/A	N/A
Total	146.6	0.0

# N-20 STRATEGIC SEALIFT

\*\*\* UNCLASSIFIED \*\*\*

SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: SEALIFT

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): STRATEGIC SEALIFT
2. DoD Component: Navy
3. Responsible Office and Telephone Number:  
 PMS 325 SUPPORT SHIPS, BOATS & CRAFT CAPT DOYLE R. KITCHIN  
 NAVAL SEA SYSTEMS COMMAND Assigned: October 1, 1999  
 2531 JEFFERSON DAVIS HWY DSN 332-3507; COMM 703-602-3507  
 ARLINGTON, VA 22242-5160 kitchindr@navsea.navy.mil
4. Program Elements/Procurement Line Items:  
 RDT&E:  
 PE 0604567N  
 PROCUREMENT:  
 APPN 4557 ICN 240208036N (DCA/DNA)

National Defense Sealift Fund account executed by the Naval Sea Systems Command under procedures directed by the National Defense Sealift Fund Charter dated October 15, 1994. This SAR addresses the Sealift Ship Acquisition Program financed by the NDSF.

No Security Objection  
to Open Publication  
(AS AMENDED)  
02-C-0141  
MAR 28 2000  
Office of the Chief of  
Naval Operations  
Dept. of the Navy

**CLEARED**  
FOR OPEN PUBLICATION

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MAR 29 2000 7

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE  
DFOIR 02-C-0810

SEALIFT, December 31, 1999

**5. References:**

SAR Baseline (Development Estimate):

Approved Acquisition Program Baseline dated July 20, 1993.

Approved Program:

NAE Approved Acquisition Program Baseline (APB) dated December 9, 1999.

**6. Mission and Description:**

To carry Army equipment for afloat prepositioning and to transport ARMY/USMC or other services surge equipment to include wheeled/tracked vehicles, helicopters and cargo from CONUS to deployment areas. The Strategic Sealift Program will provide the U.S. Navy with nineteen Large, Medium-Speed, Self-Sustaining, Roll-on/Roll-off (LMSR) ships.

**7. Executive Summary:**

The JCS Mobility Requirement Study (MRS) defined overall Strategic Sealift requirements. The Acting ASN(RDA) accepted the Navy Program Decision Memorandum (NPDM) of August 17, 1992 as the Milestone I Decision Meeting in his memorandum signed on June 9, 1993. The FY93 Defense Authorization Act established the National Defense Sealift Fund (NDSF). The Program was designated ACAT IC by USD(A) on March 5, 1993. Milestone II approval was granted for Conversions on July 30, 1993 and New Construction on August 30, 1993. The Acquisition Program Baseline (APB) was approved on July 20, 1993. MacGregor-NAVIRE (USA) was awarded a FFP/AF contract on March 29, 1993 for procurement of one ship set of Class Standard Equipment (CSE) with options for up to nineteen additional ship sets. On July 30, 1993 Newport News Shipbuilding (NNS) and National Steel and Shipbuilding Company (NASSCO) were awarded FPI contracts for detail design and conversion of a total of five foreign built ships (two at NNS and three at NASSCO). On September 2, 1993 Avondale Industries, Inc. (AII) and on September 15, 1993 NASSCO were awarded FPI contracts for detail design and construction of one ship each with options for five more ships each for a total of twelve new construction ships under contract.

The calendar years 1994, 1995, 1996, 1997 and 1998 options were exercised for a total of five additional ships each at AII and NASSCO. A limited competition between AII and NASSCO was conducted for the two remaining hulls (ships 18 and 19) which resulted in the award of a seventh ship on May 23, 1997 to NASSCO. The FY99 option for the seventh ship to the AII contract was exercised on December 18, 1998.

A quarterly SAR was submitted in June 1999 to announce that the program would deviate from the revised approved Acquisition Program Baseline (APB) dated April 10, 1998. The Operational Test and Evaluation (OT&E) scheduled for April 1999 (threshold October 1999) and Milestone III (Total Program) scheduled for August 1999 (threshold February 2000) were the areas to deviate. A proposed APB was submitted to ASN(RDA) for approval. The APB was approved December 9,

SEALIFT, December 31, 1999

7. Executive Summary (Cont'd):

1999, changing the OT&E to June 2000 (threshold December 2000) and Milestone III to October 2000 (threshold April 2001).

The Program has deviated from the total procurement cost threshold due to the FY00 appropriation of \$316.3M for a fifteenth new construction ship. This new construction ship replaces the USNS SODERMAN which has been transferred to the Marine Corps Maritime Prepositioning Force (Enhanced). A revised APB and Program Deviation Report (PDR) have been prepared and are being staffed for approval.

Overall, five conversion ships and six new construction ships have been delivered. Three more ships are scheduled to deliver between March and October 2000. One ship has been launched and the remaining four ships have started construction. The Program Office conducted a limited competition between AII and NASSCO for a fifteenth new construction ship. NASSCO was awarded a contract on February 25, 2000 for the fifteenth new construction ship.

**Significant events since the June 30, 1999 SAR.**

The AII contract was modified to a Firm Fixed Price contract in July 1999. AII was purchased by Litton Industries in July 1999 and is still in the process of instituting management improvements.

The TAKR 301 (USNS FISHER) was delivered August 4, 1999.

The APB revision was approved December 9, 1999.

The TAKR 314 (USNS CHARLTON) was launched December 11, 1999 from NASSCO.

TAKR 304 (USNS PILILAAU) was christened January 8, 2000 and launched January 28, 1999 from AII.

TAKR 313 (USNS RED CLOUD) was delivered January 18, 2000.

FY00 Appropriation for \$316.3M for a fifteenth new construction ship.

Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. The single 50/50 Labor/Material escalation index employed across all shipbuilding programs, which has been effective in prior years, has proven unduly sensitive to escalation associated with iron and steel and insufficiently sensitive to escalation associated with electronics equipment. Inordinate reduction to the price of iron and steel in 1999, as reported in the Bureau of Labor and Statistics "Iron and Steel" Producer Price Index, has resulted in overstated economic savings in Navy shipbuilding programs. The Navy is investigating a revised methodology for calculating escalation to determine a more accurate measure of shipbuilding economic adjustments.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

The Program has deviated from the total procurement cost threshold due to FY00 appropriation of \$316.3M for a fifteenth new construction ship. This new construction ship replaces the USNS SODERMAN which is transferring to the Marine Corps Maritime Prepositioning Force (Enhanced). The APB and PDR have been revised and are being staffed for approval.

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
NPDM	AUG 1992	AUG 1992	AUG 1992
Milestone I	SEP 1992	SEP 1992	SEP 1992
CSP/S-24 Conversion Engineering Design Award	OCT 1992	OCT 1992	OCT 1992
CSP/S-24 New Construction Engineering Design Award	NOV 1992	NOV 1992	NOV 1992
Class Standard Equipment Contract Award	MAR 1993	MAR 1993	MAR 1993
Milestone II Conversion	JUN 1993	JUN 1993	JUN 1993
CSP/S-24 Conversion Contract Award	JUL 1993	JUL 1993	JUL 1993
Milestone II New Construction	AUG 1993	AUG 1993	AUG 1993
CSP/S-24 New Construction Contract Award	SEP 1993	SEP 1993	SEP 1993
Conversion Acceptance Trials	NOV 1994	FEB 1996	APR 1996
OT&E For Conversion	MAY 1995	JUN 1996	SEP 1996
Organic Support Capability (First Conversion Ship)	NOV 1995	JUN 1996	SEP 1996
New Construction Acceptance Trials	AUG 1997	APR 1998	MAY 1998
IOC (New Construction First Ship Delivery)	OCT 1997	MAY 1998	JUN 1998

9a. Schedule (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
OT&E For New Construction	APR 1998	JUN 2000	JUN 2000
Milestone III (Total Program)	AUG 1998	OCT 2000	OCT 2000
Organic Support Capability (First New Construction Ship)	AUG 1998	AUG 1998	AUG 1998
FOC (New Construction Ships)	JUL 2000	JUL 2000	JUL 2000
Service Depot Support (Total Program)	SEP 2000	SEP 2000	SEP 2000

b. Current Change Explanations -- None

10. Performance Characteristics:

a. Performance --

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
<b>RO/RO CAPACITY</b>				
Total Cargo:				
(After broken stow)				
(M sqft)				
PREPO	2	2 / 2	TBD	2
SURGE	2	3 / 3	TBD	3
Cargo capacity per				
ship (K sqft)				
Usable before				
broken stow)				
New Construction				
SURGE	400	400 / 380	393	390
PREPO	350	350 / 300	356	335
Conversion				
SURGE	400	400 / 300	300	320
PREPO	350	350 / 225	275	270
Lift/Cargo Handling				
Capability				
Crane Sets	2	2 / 2	2	2
Stern Ramp	Slewing	Slewing / Slewing	Slewing	Slewing
Side Port	2	2 / 2	2	2
Cargo Onload/Offload				
Times (hrs-not to				
exceed)				
Combined	N/A	96 / 96	96	96
Load/Offload at				
Pier				
Load at Pier	48	N/A / N/A	N/A	N/A
Offload at Pier	48	N/A / N/A	N/A	N/A
Sustained Speed	>24	>24 / 24	24	24
(knots)				
Range (nm)	17500	17500 / 12000	12000	12000
Ship Size Limitation	<PANAMAX	<PANAMAX/ PANAMAX	PANAMAX	PANAMAX



10b. Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

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

a. Cost --	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	39.3	38.1	39.2
Procurement	5654.5	4781.8	5342.3
New Construction Prepo	(2882.7)		(2303.8)
New Construction Surge	(1133.4)		(1506.1)
Conversion	(1638.4)		(1532.4)
Total Sailaway	(5654.5)		(5342.3)
Total Other Wpn Sys			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1992 Base-Year \$	5693.8	4819.9	5381.5
 Escalation	 894.6	 905.2	 773.1
Development (RDT&E)	(0.6)	(1.8)	(0.7)
Procurement	(894.0)	(903.4)	(772.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	6588.4	5725.1	6154.6

The total twenty ship LMSR program control of \$6,154.6M (TY\$) is from the National Defense Sealift Fund. The FY00 Appropriation for NDSF is \$316.3M and when added to prior appropriation reflects a total of \$6,154.6M(TY\$). One of the conversion ships, the USNS SODERMAN, has transferred to the Marine Corps Maritime Prepositioning Force (Enhanced). The FY00 procurement is the replacement for the USNS SODERMAN. Total inventory of LMSR remains at nineteen ships.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>20</u>	<u>19</u>	<u>20</u>
Total	20	19	20

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (DEC 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1992 BY\$)	4819.9	5381.5	
(2) Quantity	19	20	
(3) Unit Cost	253.679	269.075	+6.07
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1992 BY\$)	4781.8	5342.3	
(2) Quantity	19	20	
(3) Unit Cost	251.674	267.115	+6.14

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	39.9	6548.5	-	6588.4
Previous Changes:				
Economic	+0.1	+112.6	-	+112.7
Quantity	-	-351.5	-	-351.5
Schedule	-	+260.4	-	+260.4
Engineering	-	-	-	-
Estimating	-0.1	-774.5	-	-774.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+0.0	-753.0	-	-753.0
Current Changes:				
Economic	-	-49.7	-	-49.7
Quantity	-	+375.6	-	+375.6
Schedule	-	+39.4	-	+39.4
Engineering	-	-	-	-
Estimating	-	-46.1	-	-46.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+319.2	-	+319.2
Total Changes	+0.0	-433.8	-	-433.8
Current Estimate	39.9	6114.7	-	6154.6

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

Summary (FY 1992 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	39.3	5654.5	-	5693.8
Previous Changes:				
Quantity	-	-238.6	-	-238.6
Schedule	-	+137.2	-	+137.2
Engineering	-	-	-	-
Estimating	-0.1	-516.1	-	-516.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-0.1	-617.5	-	-617.6
Current Changes:				
Quantity	-	+308.9	-	+308.9
Schedule	-	+23.6	-	+23.6
Engineering	-	-	-	-
Estimating	-	-27.2	-	-27.2
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	+305.3	-	+305.3
Total Changes	-0.1	-312.2	-	-312.3
Current Estimate	39.2	5342.3	-	5381.5

Economic adjustments reported for 1999 do not reflect actual shipbuilding experience. Please refer to the last paragraph in the Executive Summary for a complete explanation.

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) Procurement

Revised escalation indices. (Economic)	N/A	-49.7
Total Quantity Variance associated with increase of 1 units.	+243.8	+296.4
Quantity increase of one unit. (QR) (Quantity)	+308.9	+375.6
Allocation to Schedule variance resulting from Quantity Change. (QR) (Schedule)	+23.6	+39.4
Allocation to Estimating variance resulting from Quantity Change. (QR) (Estimating)	-88.7	-118.6
Adjustment for Current and Prior Inflation. (Estimating)	+42.7	+49.7
Revised estimate due to additional new construction ship. (QR) (Estimating)	+18.8	+22.8
Procurement Subtotal	+305.3	+319.2

QR = Quantity related changes.

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
329.42	--	--	--	--	--	--	--	--	329.42

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
329.42	+3.15	+1.21	+14.99	--	-41.04	--	--	-21.69	307.73

b. Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Dev Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
327.43	--	--	--	--	--	--	--	--	327.43

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
327.42	+3.14	+1.22	+14.99	--	-41.03	--	--	-21.68	305.74

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	MAY 1993	SEP 1992	N/A	SEP 1992
Milestone II	JUN 1993	JUL 1993	N/A	AUG 1993
Milestone III	AUG 1998	AUG 1998	N/A	OCT 2000
FUE/IOC	OCT 1997	OCT 1997	N/A	JUN 1998
Total Cost	6588.4	6588.4	N/A	6154.6
Total Quantity	20	19	N/A	20
Prog Acq Unit Cost	329.42	346.76	N/A	307.73

SEALIFT, December 31, 1999

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

a. Procurement --			Initial Contract Price		
<u>Class Standard Equip.:</u>			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
MacGregor-NAVIRE (USA), Vienna, VA			\$13.2	N/A	1
N00024-93-C-2220, FFP/AF					
Award: March 29, 1993					
Definitized: March 29, 1993					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$220.4	N/A	19	\$210.6	\$220.4	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$5.9	\$-0.2	
Cumulative Variances To Date (10/31/99)			<u>\$7.2</u>	<u>\$0.0</u>	
Net Change			\$1.3	\$0.2	

Explanation of Change:

Nothing significant.

Contract Comments:

The nineteenth ship set has been delivered to storage. This is the final report on this contract.

<u>NEW CONSTRUCTION:</u>			Initial Contract Price		
AVONDALE IND., INC., NEW ORLEANS LA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00024-93-C-2205, FFP			\$262.0	\$303.0	1
Award: September 2, 1993					
Definitized: September 2, 1993					
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1792.0	\$1792.0	7	\$1792.0	\$1792.0	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$11.4	\$-52.4	
Cumulative Variances To Date (10/31/99)			<u>\$-23.4</u>	<u>\$-7.4</u>	
Net Change			\$-34.8	\$45.0	

Explanation of Change:

The net cost variance of -\$34.8M is due to negative performance in Labor, Material and Overhead costs at AII. The contract was modified to a FFP in July 1999 to cap government financial liability and to allow schedule relief. A few days after the contract modification, AII announced it had been purchased by LITTON Industries. AII agrees production inefficiencies exist and is in the process of reducing the use of contractors, optimizing

SEALIFT, December 31, 1999

15. Contract Information (Cont'd):

utilization of the steel factory and other efficiencies to improve on the production costs to the contract. The government is monitoring the profitability of the contract.

The net schedule variance of \$45M is due to the above production inefficiencies and schedule relief. The government and AII are working together to eliminate continuing inefficiencies.

Contract Comments:

The Program Manager's EAC reflects the Total Contract Price including profit. The Program Manager's challenge will be to achieve delivery of the third Avondale new construction ship by the projected delivery date and subsequent ships at six month intervals thereafter. The Government is teaming with the contractor to ensure that the ship delivery schedule will occur at the most economical cost to the Government.

<u>NEW CONSTRUCTION:</u>			<u>Initial Contract Price</u>		
NASSCO, SAN DIEGO, CA			<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
N00024-93-C-2203, FPI 50/50 share			\$267.1	\$315.8	1
Award: September 15, 1993					
Definitized: February 1, 1994					
<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$1580.7	\$1843.1	7	\$1393.3	\$1426.4	
			<u>Cost Variance Schedule Variance</u>		
Previous Cumulative Variances			\$-14.6	\$-24.9	
Cumulative Variances To Date (10/31/99)			<u>\$-25.1</u>	<u>\$-13.9</u>	
Net Change			\$-10.5	\$11.0	

Explanation of Change:

The net cost variance of \$-10.5M is due to the increased overhead rates. The increased overhead has been partially offset by savings in labor.

The net schedule variance of \$11M for the seven ships shows that even though the NASSCO internal schedule has been stretched out, the ships are delivering ahead of contract schedule.

Contract Comments:

The Program Manager has noted the substantial overhead increases on the later ships due to current business base projections and has presented NASSCO a challenge to investigate methods to reduce overhead rates.

All four remaining ships are expected to deliver early at or below target price. Early delivery will result in NASSCO earning a performance bonus. The negative cost and schedule variances have been caused by the increased overhead rates.

15. Contract Information (Cont'd):

NASSCO has been awarded a commercial contract for two commercial Roll-on/Roll-off ships as well as the Navy contracts to convert the USNS SODERMAN to the Marine Corps Maritime Prepositioning Force (Enhanced) MPF(E) and a fifteenth new construction ship. This will help spread the overhead rates.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY92-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	39.9	-	-	-	39.9
Procurement	5798.4	316.3	-	-	6114.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	5838.3	316.3	-	-	6154.6

b. Annual Summary -- Sealift

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Sailaway FY 1992 Dollars Nonrec</u>	<u>Sailaway FY 1992 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1992				39.2	39.9
<b>Subtotal</b>				39.2	39.9

Appropriation: 1611 - Shipbuilding and Conversion, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Sailaway FY 1992 Dollars Nonrec</u>	<u>Sailaway FY 1992 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1993	7		2215.4	2215.4	2463.5
1994	2		254.2	254.2	288.7
1995	2		479.0	479.0	549.1
1996	2		516.1	516.1	596.0
1997	3		745.6	745.6	868.4
1998	2		577.9	577.9	681.3
1999	1		293.9	293.9	351.4
2000	1		260.2	260.2	316.3
<b>Subtotal</b>	20		5342.3	5342.3	6114.7

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

The President's Budget allocation for FY00 was \$304M. Since the submission of the President's Budget and submission of the SAR, the allocation has been changed to \$316.3M.

The appropriation name in Section 16c. should reflect "4557 National Defense Sealift Fund (NDSF)" vice "1611 Shipbuilding and Conversion, Navy".

	Qty	Sailaway Dollars Nonrec	Sailaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	20		5342.3	5381.5	6154.6

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	11	11

Percent Total Program Quantities Delivered: 55.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 4621.5

Percent Total Program Expended: 75.1%

18. Operating and Support Costs:

a. Assumptions and Ground Rules --

CSP-24. The CSP-24 is prepositioned with military cargo. In Prepositioning Mode, the ship will be deployed with cargo in the holds in a forward area. The cargo hold environmental control system will be used to maintain the cargo holds within the required temperature and humidity range. The ship will be maintained in Full Operating Status (FOS). The ship will participate in occasional fleet exercises. Port facilities may or may not have services such as shore power and steam. For calculating fuel consumption, the ship will not be on shore services and the summer environmental condition is assumed year round. The CSP-24 will operate 33 percent of the time underway and 67 percent of the time in port. While underway, 67 percent of the time the ship will operate at 15 knots and 33 percent of the time will operate at 24 knots.

CSS-24. The CSS-24 is maintained in Reduced Operating Status (ROS). In ROS, the CSS-24 will be maintained without cargo and can be activated within four days (ROS-4). Full crews will be kept on alert and a skeleton crew



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

(approximately 9) will be aboard at all times. For calculating fuel consumption, the ship will be on shore services and the summer environmental condition is assumed 50 percent of the in port and underway periods and assumed to be in the winter environmental condition 50 percent of the in port and underway periods. The CSS-24 will operate 15 percent of the time underway and 85 percent of the time will be in port. While underway, 60 percent of the time will be at 15 knots and 40 percent of the time will be at 24 knots.

During a mobilization (such as, war, crisis, deployment, or redeployment), the CSP-24 and CSS-24 will operate as point-to-point ships. They will transit at maximum attainable speed from port of embarkation to port of debarkation.

The operating and support costs in section 18.b. were developed by the NAVSEA Cost and Estimating Office (SEA017) in June 1992.

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

Cost Element	Avg Annual Cost Per CSP-24 Ship	Avg Annual Cost Per CSS-24 Ship
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	6.1	1.6
Intermediate Maintenance	4.0	1.6
Depot Maintenance	1.5	1.3
Contractor Support	0.2	0.1
Sustaining Support	0.1	0.1
Indirect Costs	0.9	1.3
Total	12.8	6.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: SMART-T

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T)

2. DoD Component: Army

Joint Participants:

U.S. Air Force, U.S. Marine Corps, Joint Communications  
Support Element, Other DoD

3. Responsible Office and Telephone Number:

Project Manager MILSATCOM	Mr. Henry I. Jehan, Jr.
PEO C3 Systems	Assigned: March 5, 1999
ATTN: SFAE-C3S-MSA	DSN 992-7244; COMM (732) 532-7244
Fort Monmouth, NJ 07703-5508	henry.jehan@c3smail.monmouth.army.mil

4. Program Elements/Procurement Line Items:

RDT&E:

PE 0303142\* (Shared) D455/D384/D2PT

PROCUREMENT:

- APPN 3080 ICN 21131F (Air Force) (Shared) \*\*
- APPN 3080 ICN 21131F\*\* (Air Force) (Shared)
- APPN 2035 ICN 28612A (Army) (Shared) \*\*
- APPN 2035 ICN 28612A\*\* (Army) (Shared)
- APPN 3080 ICN 33601F (Air Force)
- APPN 3080 ICN 33601F \*\*\* (Air Force)
- APPN 1109 ICN 402700 (Navy) (Shared) USMC Terminal Buy
- APPN 2035 ICN BC4002\*\*\*\* (Army)
- APPN 2035 ICN BS9720 (Army)

\*SMART-T FY92 and FY93 R&D funds were part of Project D455, which

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SMART-T, December 31, 1999

**4. Program Elements/Procurement Line Items (Cont'd):**

reflected funding for the four Army Milstar programs. Starting in FY94, SMART-T is funded under Project D384. Operational test was funded under Project D2PT.

\*\*The Joint Communications Support Element (JCSE) requirements are funded with Army and Air Force funds managed by JCSE.

\*\*\*Air Force ICN 33601F (Shared) funds all Air Force Milstar terminal requirements.

\*\*\*\* The Other DoD terminals are funded under Army ICN BC4002.

**5. References:**

SAR Baseline (Production Estimate):

AAE Approved Acquisition Program Baseline (APB) dated February 19, 1999.

Approved Program:

Approved Acquisition Program Baseline (APB) dated September 26, 1999.

**6. Mission and Description:**

This program increases the tactical utility of the Milstar System. The SMART-T provides range extension capability to the Army's Mobile Subscriber Equipment (MSE). Specifically, it provides a satellite interface to permit uninterrupted voice/data communication as advancing forces move beyond the line-of-sight capability of MSE. This program supports Echelons Corps and Below (ECB) and special contingency operations. This equipment communicates at both low and medium data rates. It provides the security, mobility, and anti-jam capability required to defeat the threat and satisfy the critical need stated above. The SMART-T has inherent Low Probability of Interception and Low Probability of Detection (LPI/LPD) capability to avoid being targeted for destruction, jamming or eavesdropping. The prime mover is a High Mobility Multi-Purpose Wheeled Vehicle (HMMWV) which carries all electronics, power generation and a self-erectable antenna. The SMART-T program does not replace another; however, it operationally displaces the AN/TSC-85s and 93s (Ground Mobile Forces (GMF) Super High Frequency (SHF) terminals) at Echelon Corps and Below (ECB). The GMF displaced terminals move to support Echelons Above Corps (EAC).

**7. Executive Summary:**

On January 25, 1999, the Army Acquisition Executive (AAE) signed the SMART-T Milestone III Acquisition Decision Memorandum (ADM). The ADM authorized the SMART-T program to proceed into Full Rate Production (FRP), and approved the Type Classification "Standard". Specifically, the ADM authorized the award of the first FRP option, with subsequent FRP option awards based on the successful completion of Follow On Test and Evaluation (FOTE). Post-Milestone III

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7. Executive Summary (Cont'd):

Milestone Decision Authority was also delegated to Program Executive Officer, Command, Control and Communications Systems following successful completion of FOTE. The first FRP option was exercised on January 29, 1999. The total joint service and special user requirement for SMART-T is 318 terminals.

On April 30, 1999 the Milstar Flight-3 satellite was unsuccessfully launched and subsequently declared a complete mission failure. This was to be the first available medium data rate (MDR) satellite. The availability of an MDR satellite is critical for the SMART-T to perform its MDR mission. As a result of the launch failure, PM MILSATCOM convened a SMART-T Army Systems Acquisition Review Council (ASARC) Integrated Product Team (IPT) Meeting on July 27, 1999. The purpose of the IPT was to discuss impacts of the launch failure on the SMART-T acquisition strategy, review options and formulate a recommendation on a new acquisition strategy. The ADM requires successful completion of FOTE exit criteria prior to the FY00 option award, but the operational satellite needed to conduct the Follow-On Test and Evaluation (FOTE) is unavailable. In light of this, the PM presented various alternatives to permit the FY00 option award. It was the ASARC IPT's recommendation that the course of action would be to award the FY00 option after achieving the 800 hours Mean Time Between Failure (MTBF) at the 80% lower confidence level, which is the entrance criteria for FOTE. Once the 800 hour MTBF has been achieved, PM MILSATCOM will reconvene the IPT to revise the ADM and subsequently recommend to the AAE to award the FY00 option, and to conduct the FOTE prior to the FY01 option award.

Due to the MDR satellite launch failure mentioned above, the SMART-T program was unable to conduct its MDR Follow-on Test and Evaluation (FOTE) as originally scheduled. This satellite failure has also impacted the planned terminal Initial Operational Capability (IOC). Both the MDR FOTE and IOC dates are Acquisition Program Baseline (APB) schedule parameters that would be breached. A revised APB reflecting the current estimate for these events was developed and approved by the Army Acquisition Executive (AAE) on September 26, 1999.

It should also be noted that Congress reduced the SMART-T Other Procurement, Army (OPA) appropriation by \$30M in FY00. The decrease was due to program schedule slips related to the loss of the Milstar Flight-3 satellite referenced above, as well as IOTE issues highlighted by OPTEC and the Director, Operational Test and Evaluation (DOTE) in their respective reports.

In response to the reduction of \$30M to the SMART-T FY00 OPA funding, the PM developed several future acquisition strategy options. The recent development of the Tactical High Speed Data Network (THSDN) modifications to MSE that reduced the anticipated benefits of DAMA to satellite throughput efficiency was also taken into consideration. The agreed upon option terminates the SMART-T Demand Assigned Multiple Access (DAMA) modification production efforts to free up funds to support the procurement of the required number of SMART-T terminals on contract for the Army in FY00. This strategy maintains the integrity of the existing production contract, and avoids the cost and schedule impacts associated with renegotiating the remaining production contract efforts in a

7. Executive Summary (Cont'd):

sole-source environment. The procured SMART-Ts would continue to satisfy ORD threshold requirements. The plan still awaits final approval from Higher Headquarters and that of the associated congressional committees.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
MDR Study	FEB 1991	FEB 1991	FEB 1991
Market Survey	SEP 1991	SEP 1991	SEP 1991
LDR Technology Demonstrated (SCOTT Terminal Acceptance)	DEC 1991	DEC 1991	DEC 1991
Milestone II ASARC Review	MAY 1992	MAY 1992	MAY 1992
Development Contract Award	NOV 1992	NOV 1992	NOV 1992
Preliminary Design Review	MAY 1993	MAY 1993	MAY 1993
Critical Design Review	MAR 1994	MAR 1994	MAR 1994
DT&E			
Start	SEP 1994	SEP 1994	SEP 1994
Complete	DEC 1995	DEC 1995	DEC 1995
EDM Deliveries	FEB 1996	FEB 1996	FEB 1996
LRIP Decision	JAN 1996	JAN 1996	JAN 1996
Low Rate Production Contract Award	FEB 1996	FEB 1996	FEB 1996
FAT			
Start	SEP 1997	SEP 1997	SEP 1997

9a. Schedule (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Complete	JUN 1998	JUN 1998	JUN 1998
LRIP First Delivery	MAR 1998	MAR 1998	APR 1998
LDR IOT&E			
Start	JUN 1998	JUN 1998	MAY 1998
Complete	JUN 1998	JUN 1998	JUN 1998
Milestone III ASARC Review	NOV 1998	NOV 1998	NOV 1998
Full Scale Production Award	NOV 1998	NOV 1998	JAN 1999
MDR FOT&E			
Start	SEP 1999	OCT 2000	JAN 2001 (Ch-1)
Complete	NOV 1999	DEC 2000	MAR 2001 (Ch-1)
Terminal IOC	DEC 1999	JAN 2001	APR 2001 (Ch-1)
DAMA ECP Award	JAN 1999	JAN 1999	JUL 1999
AEHF Development Initiated	JAN 2002	JAN 2002	FEB 2000 (Ch-2)
AEHF Production of Retrofit Kits	JAN 2005	JAN 2005	JAN 2005

ACRONYMS:

- AEHF - Advanced Extremely High Frequency
- ASARC - Army Systems Acquisition Review Council
- LDR - Low Data Rate
- MDR - Medium Data Rate
- SCOTT - Single Channel Objective Tactical Terminal
- DAMA - Demand Assigned Multiple Access
- DT&E - Development Test and Evaluation
- EDM - Engineering Development Model
- LRIP - Low Rate Initial Production
- FAT - First Article Test
- IOT&E - Initial Operational Test and Evaluation
- FOT&E - Follow-On Test and Evaluation
- IOC - Initial Operational Capability

Note: Terminal IOC is the date when initial training and provisioning will be completed.

Note: Failure to meet the "Medium Data Rate (MDR) dependent satellite" milestone shall be the basis for an administrative change to the APB (see MDR FOT&E Start and Complete and Terminal IOC).

b. Current Change Explanations --

(Ch-1) - MDR FOT&E (Start): The change from October 2000 to January 2001 is due to the slip in the scheduled launch date of the Milstar Flight-4 satellite from May 2000 to August 2000. This will be the first available MDR satellite. A functional MDR satellite is required to perform the SMART-T FOTE. The SMART-T FOTE is scheduled to begin upon completion of the test and check-out of the satellite.

MDR FOT&E (Complete): The change from December 2000 to March 2001 is due to the delay in the MDR start date precipitated by the slip in the

9b. Schedule (Cont'd):

Milstar Flight-4 satellite launch.

Terminal IOC: The change from January 2001 to April 2001 is also related to the slip in the launch date of the Milstar Flight-4 satellite. Terminal IOC cannot be achieved without a functional MDR satellite on orbit.

(Ch-2) - AEHF Development Initiated: The change in the start of AEHF development efforts for the SMART-T terminal from January 2002 to February 2000 was done to mitigate some of the inherent risk associated with the development of specific AEHF components.

10. Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Set-up Benign Environment (min)	30	30 / 30	27	30
Set-up MOPP 4 Gear (min)	45	45 / 45	32	45
Tear-down Benign Environment (min)	30	30 / 30	15	30
Tear-down MOPP 4 Gear (min)	45	45 / 45	18	45
MTBF (hrs) (80%LCL)/ (Point estimate)	800	800 / 400	489	800
Aggregate Data Rate (kbps)	1544	1544 / 1024	1024	1544
Interface Capability	With MSE	With MSE / With MSE	With MSE	With MSE
Configuration (Full System)	HMMWV	HMMWV / HMMWV	HMMWV	HMMWV
System Weight NTE (lbs) (Integrated on HMMWV)	3177	3177 / 3177	2486	3177
TRANSEC with Over the Air Rekey Capability	Required	Required/ Required	Demo'd	Required
Bit Error Rate (BER)	10 <sup>-5</sup>	10 <sup>-5</sup> / 10 <sup>-3</sup>	10 <sup>-5</sup>	10 <sup>-5</sup>
Airlift				
Transportability				
System Only (By)	UH-60	UH-60 / UH-60	UH-60	UH-60
System and HMMWV (By)	CH-47	CH-47 / CH-47	CH-47	CH-47
Power Sources				
Prime (VDC)	28	28 / 28	28	28

10a. Performance Characteristics (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Alternate AC Power (VAC) @ 50-60 Hz	110-220	110-220 / 110-220		110-220	110-220
Back-up (Vehicular) (Volts)	20-30	20-30 / 20-30		20-30	20-30
DAMA					
Reduce satellite resources req'd to support MSE by a factor of	3	3 / 2		TBD	2 (Ch-1)
AEHF					
Aggregate Data Rate (Mbps)	8	8 / 8		TBD	8
Configuration	Full System on HMMWV (1097)	Full System / Full System on HMMWV / (1097)		TBD	Full System on HMMWV (1097)
Bit Error Rate (BER)	10 <sup>-7</sup>	10 <sup>-7</sup> / 10 <sup>-5</sup>		TBD	10 <sup>-7</sup>
Interface Capability	WIN based MSE	WIN based / based MSE		TBD	WIN Based MSE

ACRONYMS:

- AEHF - Advanced Extremely High Frequency
- DAMA - Demand Assigned Multiple Access
- HMMWV - High Mobility Multi-Purpose Wheeled Vehicle
- kbps - Kilobits per second
- LCL - Lower Confidence Level
- min - Minutes
- mbps - Megabits per second
- MOPP - Mission Oriented Protective Posture
- MSE - Mobile Subscriber Equipment
- MTBF - Mean Time Between Failure
- NTE - Not To Exceed
- TRANSEC - Transmission Security

MTBF: A phased approach was approved to achieve the objective MTBF by FOT&E (ie, 400 hours [point estimate] MTBF by the end of LRIP, and 800 hours MTBF [80% LCL] by FOT&E).

AIRLIFT TRANSPORTABILITY: Airlift Transportability will be tested using the UH-60/CH-47 during First Article Test (FAT).



10b. Performance Characteristics (Cont'd):

b. Current Change Explanations --

(Ch-1) - DAMA: The anticipated reduction in satellite resources required to support MSE has been adjusted from a factor of 3 to a factor of 2. This change was precipitated by the development of the Tactical High Speed Data Network (THSDN) modifications to MSE that reduced the anticipated benefits of DAMA to satellite throughput efficiency.

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

a. Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	315.2	315.2	308.3
Procurement	451.3	451.3	416.7
Recurring Rollaway	(265.5)		(226.6)
Other Rollaway	(126.3)		(117.1)
Total Rollaway	(391.8)		(343.7)
Support Cost	(17.9)		(18.4)
Other System Cost	(18.5)		(28.9)
Total Other Wpn Sys	(36.4)		(47.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(23.1)		(25.7)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1999 Base-Year \$	766.5	766.5	725.0
 Escalation	 13.9	 13.9	 9.7
Development (RDT&E)	(-7.9)	(-7.9)	(-6.2)
Procurement	(21.8)	(21.8)	(15.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	780.4	780.4	734.7
 b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>313</u>	<u>313</u>	<u>318</u>
Total	313	313	318

The unit of measure for SMART-T is terminals.

Note: The RDT&E quantities exclude 12 Engineering Manufacturing Development (EMD) terminals produced under the SMART-T Development contracts that are not fully configured and will not be fielded.

Note: The LRIP quantities approved at Milestone II are 20 (1st year) and 32 (2nd year). The LRIP quantity exceeds 10% of the total planned buy to optimize the utilization of the Milstar MDR payload immediately upon launch.

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

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. Unit Cost Summary:

	UCR Baseline (Sep 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1999 BY\$)	766.5	725.0	
(2) Quantity	313	318	
(3) Unit Cost	2.449	2.280	-6.90
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1999 BY\$)	451.3	416.7	
(2) Quantity	313	318	
(3) Unit Cost	1.442	1.310	-9.15

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	307.3	473.1	-	780.4
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-1.6	-	-1.6
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-4.4	-17.1	-	-21.5
Other	-	-	-	-
Support	-	+4.8	-	+4.8
Subtotal	-4.4	-13.9	-	-18.3
Current Changes:				
Economic	-0.7	-2.0	-	-2.7
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-31.9	-	-31.9
Estimating	-0.1	-1.8	-	-1.9
Other	-	-	-	-
Support	-	+9.1	-	+9.1
Subtotal	-0.8	-26.6	-	-27.4
Total Changes	-5.2	-40.5	-	-45.7
Current Estimate	302.1	432.6	-	734.7

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

Summary (FY 1999 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	315.2	451.3	-	766.5
Previous Changes:				
Quantity	-	-1.5	-	-1.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-6.8	-14.4	-	-21.2
Other	-	-	-	-
Support	-	+4.8	-	+4.8
Subtotal	-6.8	-11.1	-	-17.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-30.7	-	-30.7
Estimating	-0.1	-1.5	-	-1.6
Other	-	-	-	-
Support	-	+8.7	-	+8.7
Subtotal	-0.1	-23.5	-	-23.6
Total Changes	-6.9	-34.6	-	-41.5
Current Estimate	308.3	416.7	-	725.0

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.7
Adjustment for Current and Prior Inflation. (Estimating)	+0.2	+0.2
Refinement of SMART-T development efforts (Estimating)	-0.3	-0.3
RDT&E Subtotal	<u>-0.1</u>	<u>-0.8</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-2.2
Economic adjustment for negative program change. (Economic)	N/A	+0.2
Engineering changes and terminal modifications not initiated based on the results of SMART-T operational testing and related MDR satellite launch issues (Engineering)	-30.7	-31.9
Adjustment for Current and Prior Inflation. (Estimating)	+0.6	+0.6
Refinement of SMART-T procurement efforts (Estimating)	-2.1	-2.4
Change in Initial Spares (Support)	+2.8	+2.9

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

b. Current Change Explanations --

(Dollars in Millions)

	<u>Base-Year</u>	<u>Then-Year</u>
Change in Other System Cost for Milstar Voice Conferencing (Support)	+6.4	+7.1
Change in Other System Cost related to training (Support)	-0.5	-0.9
Procurement Subtotal	<u>-23.5</u>	<u>-26.6</u>

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes									PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
2.49	-0.01	-0.04	--	-0.10	-0.07	--	+0.04	-0.18		2.31

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes									PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total		
1.51	-0.01	-0.02	--	-0.10	-0.06	--	+0.04	-0.15		1.36

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAY 1992	MAY 1992	MAY 1992
Milestone III	N/A	SEP 1998	NOV 1998	NOV 1998
FUE/IOC	N/A	DEC 1999	DEC 1999	APR 2001
Total Cost	N/A	1027.2	780.4	734.7
Total Quantity	N/A	364	313	318
Prog Acq Unit Cost	N/A	2.82	2.49	2.31

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

a. Procurement -- <u>SMART-T LRIP/FRP:</u> Raytheon Company, Marlborough, MA DAAB07-96-C-A757, FFP Award: February 7, 1996 Definitized: N/A	<table border="0"> <tr> <td></td> <td colspan="2" style="text-align: center;">Initial Contract Price</td> </tr> <tr> <td></td> <td style="text-align: center;"><u>Target</u></td> <td style="text-align: center;"><u>Ceiling</u></td> </tr> <tr> <td></td> <td style="text-align: center;">\$212.8</td> <td style="text-align: center;">\$0.0</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">Qty</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">387</td> </tr> </table>		Initial Contract Price			<u>Target</u>	<u>Ceiling</u>		\$212.8	\$0.0			Qty			387
	Initial Contract Price															
	<u>Target</u>	<u>Ceiling</u>														
	\$212.8	\$0.0														
		Qty														
		387														

Current Contract Price		Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>
\$322.0	\$0.0	\$322.0	\$322.0
Qty			
387			

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

In FY 1996, each of the participating services revalidated its operational requirement for SMART-T. As a result of this revalidation, the United States Marine Corps (USMC) reduced its SMART-T requirement from 48 to 25, and the US Air Force, DoD Special Users, and Navy deleted requirements for which funding was deferred beyond the Future Year Defense Plan (FYDP). The FY 2000 President's Budget added funding to the SMART-T Army procurement appropriation to procure 7 additional terminals in FY2001 for the special user. Prior to the award of the FY99 Full Rate Production (FRP) option, Other DoD quantities were reduced by 2 terminals in FY99. No corresponding penalty was assessed by the contractor. The total joint service and special user requirement for SMART-T is now 318 terminals.

Current Contract Price and Estimated Price at Completion changed from \$212.8 to \$322.0 to reflect several significant contract modifications to the SMART-T terminal.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY92-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-17)	<u>Total</u>
RDT&E	227.8	13.8	17.3	43.2	302.1
Procurement	200.4	53.3	68.0	110.9	432.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	428.2	67.1	85.3	154.1	734.7

b. Annual Summary -- SMART-T

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Rollaway FY 1999 Dollars Nonrec</u>	<u>Rollaway FY 1999 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1992				22.1	20.0
1993				47.7	44.3
1994				60.0	56.7
1995				31.2	30.1
1996				20.9	20.5
1997				16.0	15.9
1998				16.9	16.9
1999				23.2	23.4
2000				13.5	13.8
2001				16.7	17.3
2002				14.2	15.0
2003				13.3	14.3
2004				6.5	7.1
2005				6.1	6.8
Subtotal				308.3	302.1

Appropriation: 0300 - Procurement, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Rollaway FY 1999 Dollars Nonrec</u>	<u>Rollaway FY 1999 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
2000	2		1.1	1.3	1.3
2001	2		1.1	1.3	1.4
2002				0.1	0.1
2003				0.1	0.1
Subtotal	4		2.2	2.8	2.9

The 0300 Appropriation funds the JCSE requirements (6).

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SMART-T, December 31, 1999

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

Appropriation: 1109 - Procurement, Marine Corps

Fiscal Year	Qty	Rollaway FY 1999 Dollars Nonrec	Rollaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999	24		13.8	14.7	15.0
2000	1		0.6	0.6	0.6
2001				0.5	0.5
2002				0.2	0.2
2003				0.3	0.3
Subtotal	25		14.4	16.3	16.6

The 1109 appropriation funds the U.S. Marine Corps (USMC) requirements.

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Rollaway FY 1999 Dollars Nonrec	Rollaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996	20	22.9	26.5	52.0	51.4
1997	23	18.6	11.3	34.7	34.7
1998		15.2		21.6	21.8
1999	45	25.9	25.8	56.8	57.8
2000	77		29.8	30.9	31.8
2001	51	8.6	82.9	51.5	53.8
2002		6.9		20.9	22.2
2003		5.0		13.6	14.7
2004		2.9		31.0	34.2
2005		2.8		18.9	21.3
2006		2.2		3.1	3.6
2007		2.2		3.2	3.7
2008				0.4	0.5
2009				0.5	0.6
2010				0.5	0.6
2011				0.5	0.6
2012				0.5	0.6
2013				0.5	0.6
2014				0.4	0.5
2015				0.4	0.5
2016				0.2	0.3
2017				0.1	0.1
Subtotal	216	113.2	176.3	342.2	355.9

The 2035 appropriation funds the Army requirements (209) and the Other DoD requirements (7).

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

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Rollaway FY 1999 Dollars Nonrec	Rollaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1997	9		4.7	5.1	5.1
1998				0.3	0.3
1999	20	1.1	9.0	14.0	14.3
2000	26	1.5	11.6	19.0	19.6
2001	18	1.0	8.2	11.8	12.3
2002		0.2		2.0	2.1
2003		0.2		2.4	2.6
2004		0.1		0.8	0.9
Subtotal	73	4.1	33.5	55.4	57.2

The 3080 appropriation funds the requirements for the U.S. Air Force (73).

Service	Qty	Rollaway Dollars Nonrec	Rollaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Army	216	113.2	176.3	650.5	658.0
OSD	4		2.2	2.8	2.9
Navy	25		14.4	16.3	16.6
USAF	73	4.1	33.5	55.4	57.2
Grand Total	318	117.3	226.4	725.0	734.7

17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	46	22

Percent Total Program Quantities Delivered: 6.9%

b. Total Expenditures To Date (In Millions of Dollars): \$ 345.7

Percent Total Program Expended: 47.1%



18. Operating and Support Costs:

a. Assumptions and Ground Rules --

The following assumptions and ground rules used to develop the operating and support costs for the SMART-T program are based on the November 1998 SMART-T Program Office Estimate (POE) prepared in association with the Milestone III Decision Review.

A three-level maintenance structure is the framework for SMART-T maintenance planning, Unit Level, Direct Support (DS) and Depot Level Maintenance. The SMART-T program assumes contractor support over the life of the program (15 years). The contractor accomplishes all depot level repairs under a five-year failure free warranty. It is assumed that the warranty will be renewed over the remaining life of the terminal. Each complete terminal will be overhauled twice during its lifetime just prior to the subsequent warranty renewals. The conditions under which the SMART-T maintenance costs are calculated include using the annual operating hours per terminal of 1797 hours as extracted from the Operational Mode Summary (OMS) and Mission Profile (MP) section of the MAST ORD dated 10 MAR 1992. The assumptions are based on a peacetime scenario.

There is no antecedent system.

b. Costs -- (FY 1999 Constant (Base-Year) Dollars in Thousands)

Cost Element	Average Annual SMART-T	Avg Annual Cost Per Terminal (Antecedent)
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	25.2	0.0
Intermediate Maintenance	7.4	0.0
Depot Maintenance	23.4	0.0
Contractor Support	11.6	0.0
Sustaining Support	1.1	0.0
Indirect Costs	15.5	N/A
Total	84.2	0.0

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: M1A2 ABRAMS UPGRADE

MAR 29 2000 9

DIRECTORATE FOR FREEDOM OF INFORMATION AND SECURITY REVIEW 1999  
AS OF DATE: DEPARTMENT OF DEFENSE

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1. (U) Designation and Nomenclature (Popular Name): Tank, Combat, Full Tracked, M1A2 (M1A2 Abrams Tank)

2. (U) DoD Component: Army

3. (U) Responsible Office and Telephone Number:  
U.S. Army Tank-Automotive Command COL JAMES R MORAN  
ATTN: SFAE-GCSS-W-AB Assigned: July 1, 1998  
Warren, MI 48397-5000 DSN 786-6885; COMM (810) 574-6885  
moranj@tacom.army.mil

4. (U) Program Elements/Procurement Line Items:  
RDT&E:  
(U) PE 23735 (Shared) For M1A2 Development Project D330  
(U) PE 23758 (Shared) Horiz Btlfld Digit'n Project D374  
(U) PE 63639 (Shared) Armament Project Project DC315

PROCUREMENT:  
(U) APPN 2033 ICN G82917 (Army)  
(U) APPN 2033 ICN GA0151 (Army)  
(U) APPN 2033 ICN GA0730 (Army)  
(U) APPN 2033 ICN GA0750 (Army)  
(U) APPN 2033 ICN GA0755 (Army)  
(U) APPN 2033 ICN GB1302 (Army)  
(U) APPN 2033 ICN GC0161 (Army)  
(U) APPN 2033 ICN GE0161 (Army)  
O&M:

~~Classified by: Derived from Security Classification Guide for Abrams Tank  
Downgrade instructions: regrade to UNCLASSIFIED when separated from classified pages  
Declassify on Exemption 3 Date of Review 24 July 97~~

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M1A2 ABRAMS UPGRADE, December 31, 1999

4a. (U) Program Elements/Procurement Line Items (Cont'd):

(U) PE 118207 (Shared) M1 Overhaul

5. (U) References:

SAR Baseline (Production Estimate):

(U) AAE Approved Acquisition Program Baseline dated January 15, 1995.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated January 15, 1995.

6. (U) Mission and Description:

(U) The mission of the M1A2 Abrams tank is to close with and destroy enemy forces on the integrated battlefield using firepower, maneuver, and shock effect. The M1A2 has completed low rate production and production continues on the M1A2 Upgrade Program. Selected M1 tanks are being overhauled and replaced with M1A2 tanks in order to make them more survivable, fightable, and lethal. Improvements include the combat proven M1A1 features [the 120mm main gun; Nuclear, Biological, and Chemical (NBC) protection; and heavy armor] and the new enhancements linked by the digital distributed data and power architecture of the M1A2. The Inter-vehicular Information System (IVIS) and Position Navigation (POS/NAV) equipment provide improved battlefield command, control, and communications over the M1A1. The new Commander's Independent Thermal Viewer (CITV) also speeds up the target acquisition process so that the gunner may engage more targets in a shorter time interval. The M1A2 Abrams tank replaces the M1A1 tank in the CONUS Contingency Force.

7. (U) Executive Summary:

(U) The M1A2 Abrams tank program is the successor to the M1 and M1A1 tank acquisition programs. Ten M1A2 prototypes were delivered to Army test sites in 1991. An Early User Test & Evaluation (EUT&E), using five of these prototypes, was conducted from June through December 1991. The other prototypes were used to assess ballistic and nuclear vulnerability, system reliability, and logistic supportability. The first of five M1A2 pilot production vehicles was delivered in March 1992. Based on the results of a special Army System Acquisition Review Council (ASARC) held on March 21, 1992, the Army Acquisition Executive (AAE) decided to proceed with low rate initial production (LRIP) of 62 M1A2 tanks. The Congress then directed the Defense Department to proceed with a program to upgrade the M1 tank to the M1A2 configuration. In FY99, a System Enhancement Package (SEP) Engineering Change Proposal (ECP) was incorporated into the M1A2 configuration. The SEP ECP includes the FBCB2 digitization requirements, a Second Generation FLIR, an upgrade to the computer core, color flat panel displays, and an environmental conditioning unit to mitigate power consumption and electronics heat.

An Acquisition Decision Memorandum (ADM), signed on December 18, 1992 by the Deputy to the USD(A), approved the Army's first Acquisition Program Baseline for the Abrams Upgrade Program. M1A2 Live Fire Testing, New Equipment

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7. (U) Executive Summary (Cont'd):

Training, the Initial Operational Test and Evaluation (IOT&E), and the Production Qualification Test (PQT) were completed during 1993 and 1994. The last of the 62 low rate initial production M1A2 tanks was delivered in March 1994. The M1A2 Milestone III ASARC was held on April 8, 1994. The resultant Acquisition Decision Memorandum (ADM), approving the M1A2 for full scale production and deployment, was signed by the Army Acquisition Executive (AAE) on April 20, 1994.

The first production M1A2 upgraded from the M1 configuration was delivered in October 1994. The First Unit Equipped (FUE) milestone was reached on October 21 1995. The new Acquisition Program Baseline reflecting the Milestone III ASARC decision was approved by the AAE on January 15 1995. The Defense Acquisition Executive (DAE) recertified the Abrams Upgrade Program on May 7, 1995.

The M1A2 Test and Evaluation Master Plan (TEMP) which includes the survivability analysis for the M1A2 Tank 2000 was signed in June 1999. Abrams recapitalization made a significant leap forward when the President's Budget FY00 funded a new engine program for all tank variants and an embedded diagnostics system for the M1A1. The first M1A2 with SEP was rolled out in a ceremony held at Lima Army Tank Plant on September 1, 1999.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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M1A2 ABRAMS UPGRADE, December 31, 1999

9. (U) Schedule:

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Block II ASARC Approval	FEB 1985	FEB 1985	FEB 1985
Award Block II Preliminary System Development Contract	JUL 1985	JUL 1985	JUL 1985
Award ICWS/SE #3 Preliminary Engineering Development Contract	SEP 1986	SEP 1986	SEP 1986
Award CO2 LRF Preliminary Engineering Development Contract	SEP 1986	SEP 1986	SEP 1986
Award Block II Advanced System Development Contract	DEC 1987	DEC 1987	DEC 1987
M1A2 Milestone II Decision Review	DEC 1988	DEC 1988	DEC 1988
Award Block II FSD Contract	DEC 1988	DEC 1988	DEC 1988
DAB Program Review	AUG 1989	AUG 1989	AUG 1989
Special M1A2 ASARC	MAR 1990	MAR 1990	MAR 1990
First Prototype Delivery (FSED)	JAN 1991	JAN 1991	JAN 1991
Technical Test			
Start	JAN 1991	JAN 1991	JAN 1991
Complete	MAR 1992	MAR 1992	MAR 1992
User Test			
Start	JUN 1991	JUN 1991	JUN 1991
Complete	DEC 1991	DEC 1991	DEC 1991
LRIP Decision (62 Tanks)	MAR 1992	MAR 1992	MAR 1992
Mod FY91 M1A1 Production Contract (Incorporating Block II Changes)	MAY 1992	MAY 1992	MAY 1992
First M1A2 Production Delivery	NOV 1992	NOV 1992	NOV 1992
Live Fire Test			
Start	JAN 1993	JAN 1993	JAN 1993
Complete	JUL 1993	JUL 1993	OCT 1993
Production Qualification Test			
Start	FEB 1993	FEB 1993	FEB 1993
Complete	AUG 1994	AUG 1994	DEC 1994
IOC (Training Base)	FEB 1993	FEB 1993	FEB 1993
Initial Operational Test and Evaluation			
Start	SEP 1993	SEP 1993	SEP 1993
Complete	DEC 1993	DEC 1993	DEC 1993
First Upgrade Pilot Delivery	MAR 1994	MAR 1994	MAR 1994
M1A2 MS III Decision	APR 1994	APR 1994	APR 1994
First Unit Equipped (CONUS)	JUN 1995	JUN 1995	OCT 1995
Depot Support Established	SEP 1997	SEP 1997	SEP 1997

b. Current Change Explanations -- None

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10. (U) Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Maximum Width (inches)	144	144 / 144	144	144
Maximum Height (inches) (grnd to center of turret roof)	96	96 / 96	96	96
Maximum Combat Weight (tons)	68.5	68.5 / 69.5	68.5	68.7
Minimum Range (miles)				
Paved Roads				
With NBC	257	257 / 243	254	243
Without NBC	270	270 / 256	270	256
Maximum Speed (mph)				
Paved Roads (0% slope)	41.5	41.5 / 41.5	42.5	41.5
Cross Country	30	30 / 30	30	30
Acceleration (0-20 mph) (sec)				
Paved Roads (0% slope)				
With NBC	7.5	7.5 / 9.0	7.0	7.5
Without NBC	7.2	7.2 / 9.0	6.9	7.2
Combat Mission	360	360 / 320	449	360
Reliability (MMBF)				
System Maintainability (Maintenance Ratio)	1.04	1.04 / 1.40	0.95	1.25
Track Life (miles)	2000	2000 / 1000	1509	1509
Air Transportability	C5A, C17	C5A, C17 / C5A, C17	C5A	C5A, C17
Fightability-Improved	40	40 / 25	25	25
Commander's Weapon Station Visibility over M1A1 (%)				
Location Determination (% of distance traveled)	+/-2	+/-2 / +/-3	+/-0.6	+/- 3
Heading error (after 1 hr) (deg-RMS)	+/-1	+/-1 / +/-3	+/-0.88	+/- 3
Testability (BIT) (%)				
On-Board System	95	95 / 95	99	95
Level Detection Capability				
LRU Fault Isolation	95	95 / 90	96	90
Maximum False Alarm Rate	5	5 / 10	9.6	10
115mm APFSDS (Hull/Turret Side Crew Areas, Bustle/Hull Ammo Comp)	(b)(1)			

AS AMENDED

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

	Production Estimate (SAR)	Approved Program (APB) Obi/Threshold	Demonstrated Perf	Current Estimate
Targets Acquired/Unit Time Over M1A1 (%)	(b)(1)			
Average 1st Round Hit Probabilities (Round/Condition/Ranges)	(b)(1)			
Heat/S-S/1500-3000m	(b)(1)			
Heat/S-M/1500-2500m	(b)(1)			
Heat/M-S/1500-2500m	(b)(1)			
Heat/M-M/1500-2500m	(b)(1)			
KE/S-S/1500-3000m	(b)(1)			
KE/S-M/1500-2500m	(b)(1)			
KE/M-S/1500-2500m	(b)(1)			
KE/M-M/1500-2500m	(b)(1)			
Armor Protection vs Threat (deg)	(b)(1)			
Heat Rounds:	(b)(1)			
127mm ATGM (Hull & Turrent Side Crew Areas Bustle and Hull Ammo Compartment)	(b)(1)			
81mm HHIW (Hull Ammo Compartment)	(b)(1)			
81mm HHIW (Turret Bustle Compartment)	(b)(1)			
150mm ATGM (Turret & Hull Front)	(b)(1)			
Kinetic Energy Rounds:	(b)(1)			
125mm APFSDS @ 800-1200mm (Turret Front)	(b)(1)			
115mm APFSDS (Hull Front)	(b)(1)			

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AS DEFENDED

The demonstrated values changed as follows: Average 1st Round Hit Probability for Heat rounds moving tank/moving target (M-M) for distance 1500-2500m from TBD to (b)(1) and Average 1st Round Hit Probability for Kinetic Energy rounds moving tank/moving target (M-M) for distance 1500-2500m from TBD to (b)(1) both due to complete data analysis and final test report.

AS AMENDED

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M1A2 ABRAMS UPGRADE, December 31, 1999

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

Also, the demonstrated values changed as follows: Paved roads with NBC from 290 to 254 miles; paved roads without NBC from 305 to 270 miles. These were adjusted due to loss of fuel tank because of space claim for Under Armor Auxiliary Power Unit (UAAPU). The UAAPU was eliminated due funding shortfalls and is expected to be added to the SEP as a product improvement.

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	755.4	755.4	899.9
Procurement	6028.6	6028.6	8202.3
Rollaway	(4968.9)		(7031.9)
Other Wpn System	(791.1)		(769.9)
Peculiar Support	(108.5)		(158.7)
Initial Spares	(160.1)		(241.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>207.9</u>	<u>207.9</u>	<u>85.4</u>
Total FY 95 Base-Year \$	6991.9	6991.9	9187.6
 Escalation	 970.0	 970.0	 788.7
Development (RDT&E)	(-84.8)	(-84.8)	(-65.5)
Procurement	(1020.8)	(1020.8)	(852.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(34.0)</u>	<u>(34.0)</u>	<u>(1.6)</u>
Total Then Year \$	7961.9	7961.9	9976.3
 b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>1060</u>	<u>1060</u>	<u>1155</u>
Total	1060	1060	1155

Note: Excludes 10 RDT&E prototypes from the SAR Baseline and 0 from the Current Estimate that are not considered fully configured.

(U) Excluded are an additional 15 production pilots and 4 upgrade pilots that are not considered fully configured end items. The total procurement quantity of 1155 M1A2 tanks includes 62 Low Rate Initial Production (LRIP) new production M1A2 tanks, which were all delivered in FY93, and 1093 M1A2 tanks upgraded from M1 tanks.

c. (U) Foreign Military Sales --

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M1A2 ABRAMS UPGRADE, December 31, 1999

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

COUNTRY	QUANTITY/MODEL	CASE VALUE
Saudi Arabia	315/M1A2 Abrams Tanks	\$3.0 Billion
Kuwait	218/M1A2 Abrams Tanks	\$1.9 Billion

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (MAR 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 95 BY\$)	8974.9	9187.6	
(2) Quantity	1155	1155	
(3) Unit Cost	7.770	7.955	+2.38
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 95 BY\$)	7981.8	8202.3	
(2) Quantity	1155	1155	
(3) Unit Cost	6.911	7.102	+2.76

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M1A2 ABRAMS UPGRADE, December 31, 1999

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	670.6	7049.4	-	241.9	7961.9
Previous Changes:					
Economic	+5.2	-426.4	-	-1.4	-422.6
Quantity	-	+578.7	-	-	+578.7
Schedule	-	-181.8	-	-10.5	-192.3
Engineering	+20.9	-	-	-	+20.9
Estimating	+136.0	+47.6	-	-143.0	+40.6
Other	-	-	-	-	-
Support	-	+105.4	-	-	+105.4
Subtotal	+162.1	+123.5	-	-154.9	+130.7
Current Changes:					
Economic	-0.4	-42.6	-	-	-43.0
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	+4.1	+136.3	-	-	+140.4
Estimating	-2.0	+1781.6	-	-	+1779.6
Other	-	-	-	-	-
Support	-	+6.7	-	-	+6.7
Subtotal	+1.7	+1882.0	-	-	+1883.7
Total Changes	+163.8	+2005.5	-	-154.9	+2014.4
Current Estimate	834.4	9054.9	-	87.0	9976.3

(U) Summary (FY 95 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Production Estimate	755.4	6028.6	-	207.9	6991.9
Previous Changes:					
Quantity	-	+488.8	-	-	+488.8
Schedule	-	-	-	-	-
Engineering	+19.1	-	-	-	+19.1
Estimating	+124.0	+4.4	-	-122.6	+5.8
Other	-	-	-	-	-
Support	-	+105.0	-	-	+105.0
Subtotal	+143.1	+598.2	-	-122.6	+618.7
Current Changes:					
Quantity	-	-	-	-	-
Schedule	-	-	-	-	-
Engineering	+3.8	+118.1	-	-	+121.9
Estimating	-2.4	+1452.8	-	+0.1	+1450.5
Other	-	-	-	-	-
Support	-	+4.6	-	-	+4.6
Subtotal	+1.4	+1575.5	-	+0.1	+1577.0
Total Changes	+144.5	+2173.7	-	-122.5	+2195.7
Current Estimate	899.9	8202.3	-	85.4	9187.6

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M1A2 ABRAMS UPGRADE, December 31, 1999

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

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
b. (U) Current Change Explanations --			
(1) <u>RDT&amp;E</u>			
Revised escalation indices. (Economic)	N/A	-0.4	
Change of direction from Embedded Battle Command (EBC) to Integrated Combat Command & Control (IC3) (Engineering)	+3.8	+4.1	
Refining of the estimate for the Survivability Analysis for the M1A2 Tank 2000. (Estimating)	-2.4	-2.0	
RDT&E Subtotal	+1.4	+1.7	
(2) <u>Procurement</u>			
Revised escalation indices. (Economic)	N/A	-42.6	
Increased digitization efforts to include change from EBC to IC3 (Engineering)	+118.1	+136.3	
Adjustment for Current and Prior Inflation. (Estimating)	+7.7	+8.3	
Addition of cost to retrofit 627 M1A2s to SEP configuration, previously included in the Abrams Mod Line which is not a SAR reportable item. (Estimating)	+1612.8	+1982.4	
Reduction of facilities being closed (ie DOE Armor facility) (Estimating)	-201.8	-247.1	
Refinement of Upgrade Estimates (Estimating)	+34.1	+38.0	
Adjustment for Current and Prior Inflation. (Support)	+0.6	+2.1	
Change in Initial Spares (Support)	+0.8	+1.1	
Change in Peculiar Support (Support)	+0.2	+0.2	
Change in Other Wpn System (Support)	+3.0	+3.3	
Procurement Subtotal	+1575.5	+1882.0	
(3) <u>O&amp;M</u>			
Adjustment for Current and Prior Inflation. (Estimating)	+0.1	0.0	
O&M Subtotal	+0.1	0.0	

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M1A2 ABRAMS UPGRADE, December 31, 1999

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.51	-0.40	-0.12	-0.17	+0.14	+1.58	--	+0.10	+1.13	8.64

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.65	-0.41	-0.04	-0.16	+0.12	+1.58	--	+0.10	+1.19	7.84

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	DEC 1988	DEC 1988
Milestone III	N/A	N/A	APR 1994	APR 1994
FUE/IOC	N/A	N/A	JUN 1995	OCT 1995
Total Cost	N/A	N/A	7961.9	9976.3
Total Quantity	N/A	N/A	1060	1155
Prog Acq Unit Cost	N/A	N/A	7.51	8.64

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

a. RDT&E --

(U) M1A2 SEP Dev/FLIR Integ:

General Dynamics Corp., Warren, MI  
DAAE07-94-C-0727, CPFF  
Award: August 18, 1995  
Definitized: August 18, 1995

	Initial Contract Price		Qty
	Target	Ceiling	
	N/A	\$115.2	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
N/A	\$144.2	0	\$144.2	\$144.2

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M1A2 ABRAMS UPGRADE, December 31, 1999

15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-12.8	\$-11.7
Cumulative Variances To Date (09/30/97)	<u>\$-12.8</u>	<u>\$-11.7</u>
Net Change	\$0.0	\$0.0

Explanation of Change:

(U) This contract was completed in June 1999 and will no longer be reported in the SAR.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
b. Procurement -- (U) <u>ABRAMS Upgrade:</u> General Dynamics Corp., Warren, MI DAAE07-95-C-0292, FFP Award: March 10, 1995 Definitized: September 25, 1996	\$1324.0	\$0.0	600

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$1392.0	\$0.0	580	\$1412.0	\$1412.0

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

This contract was converted from the Long Lead Materiel (LLM) funding contract to a 5 year Multiyear production contract starting in FY96.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>Transmission Upgrade:</u> Allison Transmission Div, Indianapolis IN DAAE07-97-CT537, FFP Award: September 29, 1997 Definitized: September 29, 1997	\$23.5	\$0.0	120

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$72.6	\$0.0	240	\$72.6	\$72.6

Explanation of Change:

None.

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M1A2 ABRAMS UPGRADE, December 31, 1999

15. (U) Contract Information (Cont'd):

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>Allied Signal Engines:</u> Allied Signal, Phoenix, AZ DAAE07-98-C-0033, FFP Award: July 30, 1998 Definitized: May 7, 1999	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$2.0	\$2.0	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$34.7	\$34.7	238	\$34.7	\$34.7

Explanation of Change:

(U) This contract started as a Long Lead Material contract with options for additional quantities.

Cost and Schedule variance reporting is not required on this FFP contract.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY85-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-10)	<u>Total</u>
RDT&E	781.1	14.8	13.8	24.7	834.4
Procurement	3856.2	650.9	574.2	3973.6	9054.9
MILCON	-	-	-	-	-
O&M	87.0	-	-	-	87.0
Total	4724.3	665.7	588.0	3998.3	9976.3

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M1A2 ABRAMS UPGRADE, December 31, 1999

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

b. Annual Summary -- ABRAMS Upgrade

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Rollaway FY 1995 Dollars Nonrec	Rollaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985				47.9	36.2
1986				29.2	22.7
1987				30.6	24.5
1988				89.3	74.4
1989				142.9	123.9
1990				84.2	75.8
1991				126.3	117.9
1992				76.2	72.8
1993				8.0	7.8
1994				32.9	32.8
1995				16.6	16.9
1996				49.8	51.5
1997				66.3	69.3
1998				35.1	37.0
1999				16.5	17.6
2000				13.7	14.8
2001				12.6	13.8
2002				6.8	7.6
2003				12.1	13.7
2004				2.9	3.4
Subtotal				899.9	834.4

Appropriation: 2033 - Proc of Weapons & Tracked Combat Veh

Fiscal Year	Qty	Rollaway FY 1995 Dollars Nonrec	Rollaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1986		6.3		6.3	5.1
1987		0.7		0.7	0.6
1988					
1989					
1990		107.3		196.1	182.3
1991	62	91.8	258.0	496.3	475.3
1992				239.0	233.7
1993				163.2	162.8
1994	172	34.5	587.3	131.1	133.1
1995	34		101.6	289.5	298.9
1996	100		352.6	545.7	570.8
1997	120		410.5	458.7	483.8
1998	120		450.4	561.1	597.8
1999	120		554.3	664.3	712.0

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M1A2 ABRAMS UPGRADE, December 31, 1999

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

Appropriation: 2033 - Proc of Weapons & Tracked Combat Veh

Fiscal Year	Qty	Rollaway FY 1995 Dollars Nonrec	Rollaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	120		535.3	598.4	650.9
2001	80		451.6	520.9	574.2
2002	80		546.3	601.3	673.9
2003	80		423.3	522.0	596.3
2004	43		404.2	429.7	500.7
2005	24	40.5	272.3	260.9	310.1
2006		105.3	321.5	450.6	546.2
2007			322.1	345.4	427.1
2008			327.7	350.5	442.0
2009			326.5	348.8	448.7
2010				21.8	28.6
Subtotal	1155	386.4	6645.5	8202.3	9054.9

(U) Within FY01-FY09, recurring rollaway dollars includes SEP Retrofit Program, which has no additional quantities associated with it. Total SEP quantities is 1155. Nonrecurring dollars in FY05-FY06 are to close all upgrade facilities not required for other programs.

Appropriation: 2020 - Operation & Maintenance, Army

Fiscal Year	Qty	Rollaway FY 1995 Dollars Nonrec	Rollaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				2.2	2.1
1994				17.3	17.2
1995				21.9	22.1
1996				20.1	20.7
1997				23.9	24.9
Subtotal				85.4	87.0

	Qty	Rollaway Dollars Nonrec	Rollaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1155	386.4	6645.5	9187.6	9976.3

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M1A2 ABRAMS UPGRADE, December 31, 1999

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	656	649

(U) Percent Total Program Quantities Delivered: 56.2%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 4052.5

(U) Percent Total Program Expended: 40.6%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
Active units for M1A1(Forscom + Europe) drive an average of 650 miles per year. Reserve units and training tanks drive an average of 261 miles per year. An average for an operatin vehicle is 550 miles per year. Source Operating & Support Management Information System (OSMIS) 1998 for M1A1. Assume the same annual usage for M1A2. More of the M1A1 tanks are in Reserve Units, therefore MPA and training costs are lower than M1A2 tanks. Depot maintenance for M1A1 includes Abrams Intergrated Management (AIM) tank overhauls of 135 per year averaged over the M1A1 fleet.

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per M1A2 in an Active Army Battalion	Avg Annual Cost Per M1A1 in an Active Army Battalion
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	159.8	63.4
Intermediate Maintenance	41.7	28.5
Depot Maintenance	9.5	31.5
Contractor Support	9.3	0.0
Sustaining Support	2.8	3.2
Indirect Costs	148.8	101.7
Maintenance Personnel-PA	0.7	0.5
Indirect Support Personn	148.8	105.7
Training (OPA, MPA, OMA)	145.5	108.9
War Reserve Ammo	9.3	9.3
Modification Kits	10.4	7.7
Crew Costs	123.6	82.5
Total	810.2	542.9

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# DoD-2 NAVY AREA TBMD

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)  
PROGRAM: Navy Area TBMD

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Navy Area Theater Ballistic Missile Defense (TBMD)

2. (U) DoD Component: BMDO

Joint Participants:  
U.S. Navy

3. (U) Responsible Office and Telephone Number:

PEO, Theater Surface Combatants PMS 451 2531 Jefferson Davis Highway Arlington, VA 22242-5170	Mr. Jerry LaCamera Assigned: January 5, 1999 DSN NA; COMM 703-892-7940 lacamera jerryl@hq.navy.mil
--------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------

(U) Ballistic Missile Defense Organization, 7100 Defense Pentagon Washington, DC 20301-7100	LtGen Ronald T. Kadish, USAF Assigned: June 14, 1999 DSN 223-3025 COMM (703) 693-3025
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4. (U) Program Elements/Procurement Line Items:

RDT&E:

- (U) PE 0603867C
- (U) PE 0604867C

PROCUREMENT:

- (U) APPN 0300 ICN 0208867C (DCA/DNA)
- (U) APPN 1507 ICN 2234 (Navy) (Shared)

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Navy Area TBMD, December 31, 1999

**5. (U) References:**

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline (APB) dated February 22, 1997.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated October 13, 1999.

**6. (U) Mission and Description:**

(U) The Navy Area Theater Ballistic Missile Defense (TBMD) project builds on the national investment in AEGIS ships, weapon systems, and Navy STANDARD Missile II (SM-2) Block IV missiles. Two classes of ships continue to be deployed with the AEGIS combat system: the CG-47 Ticonderoga-class cruisers and the DDG-51 Burke-class destroyers. Navy Area TBMD will take advantage of the attributes of naval forces including overseas presence, mobility, flexibility, and sustainability in order to provide protection to debarkation ports, coastal airfields, amphibious objective areas, Allied forces ashore, and other high value sites. Navy ships will provide an option for initial TBMD capability for U.S. and other expeditionary forces in an opposed environment. This program does not replace another system.

**7. (U) Executive Summary:**

(U) The role of the U.S. Navy in U.S. Ballistic Missile Defense programs was initially addressed in 1991. A Mission Needs Statement (MNS) for Theater Missile Defense was validated by the Joint Requirements Oversight Council (JROC) in November 1991, and supplemented by a Chief of Naval Operations approved MNS for a sea-based TBMD in February 1993. Operational Requirements Documents (ORDs) for both AEGIS TBMD and STANDARD Missile II (SM-2) Block IVA were approved in December 1992, subsequently revised on April 6, 1998 by the JROC.

The Area program continues making significant progress toward delivering the first Naval TBMD capability to the Fleet. Several key technical risks have been reduced early in the program through a series of highly successful Risk Reduction Activities. Key elements of the engagement sequence were proven, including multiple AEGIS TBM tracking experiments, warhead lethality testing, and a successful intercept of a TBM target. Having resolved these key technical questions, the program entered Engineering, Manufacturing and Development (EMD) following a January 1997 MSII decision. In September 1998, the program delivered its first two TBMD-capable ships, termed LINEBACKER, by equipping two AEGIS cruisers, the USS PORT ROYAL and the USS LAKE ERIE, with initial developmental TBMD computer programs. Since delivery, these LINEBACKER ships have tracked TBM targets, transmitted and received target data, and conducted simulated engagements in several TBM tracking events. Following successful Critical Design Reviews (CDRs) for both the Aegis Weapon System (AWS) and the STANDARD Missile Block IVA, the program is in the middle of the EMD phase and preparing for flight-testing.

Since the last submission of the Selected Acquisition Report, the Navy Area

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Navy Area TBMD, December 31, 1999

7. (U) Executive Summary (Cont'd):

TBMD Program received approval for the new Acquisition Program Baseline (APB) from the Under Secretary of Defense (Acquisition & Technology) (USD (A&T)) on October 12, 1999. The new APB incorporated the updated Program Life Cycle Cost Estimate (PLCCE) that included schedule adjustments due to the Navy's AWS Computer development replan; lessons learned from reviews of Ballistic Missile Defense Organization (BMDO) hit-to-kill Major Defense Acquisition Programs (MDAPs) and the self initiated Welch Panel Study; known Development Testing/Operational Test (DT/OT) funding shortfalls in FY02/03 left unresolved during the FY00 President's Budget (PB00); fact-of-life cost increases; and risk associated with consolidations within Raytheon. The rebaselined program provides for higher confidence in the schedule, lowers technical risk, provides for additional land-based testing and allows for more robust preparation prior to operational testing with no change to the key performance parameters. The rebaselined program continues to provide for a total procurement of 1,500 SM-2 Block IVA missiles. The total number of planned Area TBMD-capable ships remains at 79, though only 72 are fully funded and contained in the new baseline. The Navy and BMDO will address the requirement for the additional seven ships in the years beyond the Future Years Defense Plan (FYDP) after FY05.

Target preparations continued with the completion of the White Sands Missile Range (WSMR) Flight Test Program HERA target Preliminary Design Review (PDR) on January 27 and a CDR on October 27. A successful Short Range Air Launch Target (SRALT) risk-reduction flight test occurred at the Pacific Missile Range Facility (PMRF), Kauai, HI on March 30. The LINEBACKER ships continued to provide risk reduction to the program by participating in several events including the above SRALT, a Joint Task Force Exercise (JTFEX) (TMT-3 SLUGGER) TBMD launch event held at PMRF on June 30, and participation in TBMD Critical Measurements Program event 3A (TCMP-3A) at Kwajalein on September 6. Live Fire Test and Evaluation (LFT&E) successes included Phase I SM-2 Block IVA Direct Hit Sled tests, Phase II SM-2 Block IVA Warhead Arena tests, and FRAGMAT Material Tests 1A (FMT-1A) and 1B (FMT-1B). Successful completion of the AEGIS Baseline 7 Phase I CDR on November 18 solidified the weapon system design and allowed software developers to begin coding. The Hot Battery Test for the Controlled Test Vehicle (CTV) configuration was completed on December 15. This marked the beginning of round level testing for the CTV flight test assets and demonstrated CTV round level electrical stability, continuity, and functionality. By late fall 1999, the Navy Area Ad-Hoc Cost Team completed its independent cost review of the Raytheon and AEGIS contracts with favorable results.

Coding and testing of the AWS Baseline 6 Phase III computer program, commencement of SM-2 Block IVA flight testing, and completion of the Long Lead Material (LLM) exit criteria are the near term program priorities. An extensive ground test and integration process continues to effectively identify and resolve potential test issues, ensuring successful WSMR flight-testing. Plans to complete all of the LLM exit criteria are on track with three of seven exit criteria achieved and closed out. Two others are complete and awaiting formal closure.

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8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
	FEB 1997	FEB 1997	FEB 1997
Milestone II Review			
WSMR Flight Testing (DTIIC)			
Start	FEB 1999	DEC 1999	MAY 2000 (Ch-1)
Complete	FEB 2000	JUN 2001	SEP 2001 (Ch-1)
TECHEVAL (DTIID)			
Start	NOV 2000	MAY 2002	MAY 2002
Complete	DEC 2000	JUN 2002	JUN 2002
OPEVAL (OTII)			
Start	MAR 2001	NOV 2002	NOV 2002
Complete	MAR 2001	DEC 2002	DEC 2002
First Unit Equipped	JUN 2001	DEC 2002	DEC 2002
Milestone III Review	AUG 2001	APR 2003	APR 2003

b. Current Change Explanations --

(U) (CH-1) White Sands Missile Range (WSMR) flight testing dates were changed from DEC 1999 to MAY 2000 (start) and from JUN 2001 to SEP 2001 (complete). Due to ground testing anomalies and ongoing fault diagnosis, delivery of Controlled Test Vehicle (CTV) flight test hardware has been delayed. CTV-1 will be flown when ready.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
--	-------------------------------	--------------------------------------------	---------------------------	---------------------

(b)(1)



11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	1845.0	2286.2	2286.0
Procurement	3216.0	3509.1	3493.9
Recurring Flyaway	(3044.7)		(2991.4)
Nonrecurring Flyaway	(71.8)		(136.1)
Total Flyaway	(3116.5)		(3127.5)
	(0.0)		(254.0)
Other Weapon System Cos	(0.0)		(0.0)
Total Other Wpn Sys	(0.0)		(254.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(99.5)		(112.4)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1994 Base-Year \$	5061.0	5795.3	5779.9
Escalation	1169.0	1075.6	1031.3
Development (RDT&E)	(205.0)	(205.0)	(196.7)
Procurement	(964.0)	(870.6)	(834.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	6230.0	6870.9	6811.2

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

b. (U) Quantity --	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	N/A	N/A	0
Procurement	<u>1500</u>	<u>1500</u>	<u>1500</u>
Total	<u>1500</u>	<u>1500</u>	<u>1500</u>

(U) Research, Development, Test and Evaluation (RDT&E) consists of 52 test units that are non-fully configured for the baseline and current estimate.

A Low Rate Initial Production (LRIP) quantity of 185 (12.3%), as approved at the Milestone II Review, exceeds 10 percent of the total production quantity. The LRIP is required to establish an initial production base for the common missile and permit an orderly increase in the production rate for the common missile sufficient to lead to full-rate production upon successful completion of testing.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (Oct 99 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1994 BY\$)	5795.3	5779.9	
(2) Quantity	1500	1500	
(3) Unit Cost	3.864	3.853	-0.28
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1994 BY\$)	3509.1	3493.9	
(2) Quantity	1500	1500	
(3) Unit Cost	2.339	2.329	-0.43

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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	2050.0	4180.0	-	6230.0
Previous Changes:				
Economic	-55.0	-282.0	-	-337.0
Quantity	-	-	-	-
Schedule	-	+174.0	-	+174.0
Engineering	-59.0	-	-	-59.0
Estimating	+263.1	+424.7	-	+687.8
Other	-	-	-	-
Support	-	+13.8	-	+13.8
Subtotal	+149.1	+330.5	-	+479.6
Current Changes:				
Economic	-6.4	-79.9	-	-86.3
Quantity	-	-	-	-
Schedule	-	+36.3	-	+36.3
Engineering	+35.2	-	-	+35.2
Estimating	+254.8	-458.0	-	-203.2
Other	-	-	-	-
Support	-	+319.6	-	+319.6
Subtotal	+283.6	-182.0	-	+101.6
Total Changes	+432.7	+148.5	-	+581.2
Current Estimate	2482.7	4328.5	-	6811.2

(U) Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	1845.0	3216.0	-	5061.0
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-53.1	-	-	-53.1
Estimating	+236.5	+350.9	-	+587.4
Other	-	-	-	-
Support	-	+5.7	-	+5.7
Subtotal	+183.4	+356.6	-	+540.0
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+29.9	-	-	+29.9
Estimating	+227.7	-339.9	-	-112.2
Other	-	-	-	-
Support	-	+261.2	-	+261.2
Subtotal	+257.6	-78.7	-	+178.9
Total Changes	+441.0	+277.9	-	+718.9
Current Estimate	2286.0	3493.9	-	5779.9

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices (Economic)	N/A	-6.4
	Adjustment for Current and Prior Inflation (Estimating)	+2.1	+2.3
	STANDARD Missile cost estimate adjustment for contract increases (Estimating)	+116.7	+130.1
	AEGIS Weapon System (AWS) cost estimate adjustment for contract increases (Estimating)	+38.9	+45.2
	Revision of estimate Test and Evaluation requirements (Engineering)	+29.9	+35.2
	Refinement of estimate for BMC4I, Vertical Launching System, and Systems Architecture (Estimating)	+70.0	+77.2
	RDT&E Subtotal	<u>+257.6</u>	<u>+283.6</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-79.9
	Adjustment for Current and Prior Inflation. (Estimating)	+1.4	+1.7
	Rephase of buy schedule from FY00-FY09 to reflect completion in FY10. (Schedule)	0.0	+36.3
	Refinement of estimate for fixed contract cost associated with deletion of FY11 and FY12 requirement. (Estimating)	-224.8	-346.5
	Refinement of missile estimate based on common components. (Estimating)	+103.8	+154.4
	Addition of production support and program management requirements. (Support)	+33.7	+43.5
	Adjustment for current and prior inflation. (Support)	+0.1	+0.1
	Refinement of estimate for initial spares requirement. (Support)	+7.1	+8.4
	Re-categorization for production support costs reported previously in error. (Support)	+220.3	+267.6
	(Estimating)	-220.3	-267.6
	Procurement Subtotal	<u>-78.7</u>	<u>-182.0</u>

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.15	-0.28	+0.01	+0.14	-0.02	+0.32	--	+0.22	+0.39	4.54

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.79	-0.24	--	+0.14	--	-0.02	--	+0.22	+0.10	2.89

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate(PE)	SAR Development Estimate(DE)	SAR Production Estimate(PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	FEB 1997	N/A	FEB 1997
Milestone III	N/A	AUG 2001	N/A	APR 2003
FUE/IOC	N/A	JUN 2001	N/A	DEC 2002
Total Cost	N/A	6230	N/A	6811.2
Total Quantity	N/A	1500	N/A	1500
Prog Acq Unit Cost	N/A	4.15	N/A	4.54

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

a. RDT&E --

(U) LINEBACKER - UOES TI 107:  
 LOCKHEED MARTIN GES, MOORESTOWN NJ  
 N00024-95-C-5159, CPAF  
 Award: March 15, 1995  
 Definitized: March 1, 1996

Target	Initial Contract Price	
	Ceiling	Qty
\$47.6	N/A	0

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$47.2	\$47.2	0	\$46.3	\$47.2

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15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-0.6	\$-0.3
Cumulative Variances To Date (12/26/99)	\$0.3	\$0.0
Net Change	\$0.9	\$0.3

Explanation of Change:

(U) The Cost Variance (CV) on this effort is a favorable \$0.3M. There were no significant CV drivers on this effort during this reporting period. This program is Level of Effort (LOE). There will be no Schedule Variance (SV).

Test & Evaluation support continues.

(U) SM-2 BLOCK IVA EMD: Raytheon Systems Corp., Tucson, AZ N00024-97-C-5357, CPAF Award: September 29, 1997 Definitized: September 29, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$407.7	N/A	52

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$545.1	N/A	52	\$545.1	\$545.1

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-30.3	\$-27.3
Cumulative Variances To Date (12/24/99)	\$-12.5	\$-21.4
Net Change	\$17.8	\$5.9

Explanation of Change:

(U) The favorable Net Change is a result of the contract being rebaselined.

The Cost Variance (CV) on this effort is an unfavorable -\$12.5M. The Schedule Variance (SV) on this effort is an unfavorable -\$21.4M. Both variances are largely due to the hardware and integration issues associated with Controlled Test Vehicle 1 (CTV-1) delay. An August 2000 Ready For Issue (RFI) date was established at the initiation of the contract rebaseline activities and was not revised.

The Block IVA Engineering, Manufacturing and Development (EMD) contract modification to reflect the rebaseline is nearing completion. Period of performance will be extended to support completion of Development Testing/Operational Test (DT/OT). Cost at completion is expected to be finalized with no expected impact to Acquisition Program Baseline (APB) parameters.

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15. (U) Contract Information (Cont'd):

(U) <u>B/L 6 Phase III TI 115:</u> Lockheed Martin GES, Moorestown NJ N00024-95-C-5159, CPAF Award: October 1, 1997 Definitized: October 1, 1997			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$128.4	N/A	0		
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$191.6	\$191.6	0	\$191.6	\$191.6	
			<u>Cost Variance</u>	<u>Schedule Variance</u>	
Previous Cumulative Variances			\$-1.2	\$-7.1	
Cumulative Variances To Date (12/26/99)			\$-2.0	\$-5.2	
Net Change			\$-0.8	\$1.9	

Explanation of Change:

(U) The Cost Variance (CV) on this effort is an unfavorable -\$2.0M. The CV in December can be attributed to some technical issues, which have caused delays with Combat System Design and AEGIS Display System (ADS) design.

The Schedule Variance (SV) on this effort is an unfavorable -\$5.2M. ADS design is showing some slippage due to delays in the completion of Engineering, Testing and Evaluation (ET&E) documentation and delays in delivery of ADS computer program functionality (as result of build plan changes).

To mitigate schedule variance challenges with AEGIS computer program development, efforts have been taken to minimize cost and schedule risk. The build plan has been adjusted to shift functionality to later loads to balance efforts and resource availability. Also, an ADS design simplification effort is underway to reduce growth in Source Level of Code (SLOC) estimates.

(U) <u>AEGIS LSTP Dev TI 130:</u> LOCKHEED MARTIN GES, MOORESTOWN NJ N00024-95-C-5197, CPAF Award: June 1, 1999 Definitized: June 1, 1999			Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
	\$14.0	\$14.0	0		
Current Contract Price			Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>	

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15. (U) Contract Information (Cont'd):

\$14.0                      \$14.0                      0                      \$13.3                      \$14.0

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (12/26/99)	<u>\$1.0</u>	<u>\$-0.6</u>
Net Change	\$1.0	\$-0.6

Explanation of Change:

(U) The Cost Variance (CV) on this effort is a favorable \$1.0M. The overall favorable CV is actually the result of delays with completion of specific efforts due to manpower resource availability.

The Schedule Variance (SV) on this effort is an unfavorable -\$0.6M. The unfavorable SV will continue to exist for the next few months. The contractor is currently working on a plan to rectify this situation by reallocating manpower to complete the remaining tasks, which will most likely result in spending more budget than originally planned. At the present time there is a \$972K cost under-run and \$925K in the contractor's Management Reserve available to handle this re-mediation plan. The situation continues to be closely monitored.

(U) B/L 7 Phase I TI 120:  
LOCKHEED MARTIN GES, MOORESTOWN NJ  
N00024-98-C-5197, CPAF  
Award: June 1, 1998  
Definitized: June 1, 1998

	<u>Initial Contract Price</u>		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$243.5	\$243.5	0

<u>Current Contract Price</u>			<u>Estimated Price At Completion</u>	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$243.5	\$243.5	0	\$238.8	\$243.5

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.0	\$0.0
Cumulative Variances To Date (12/26/99)	<u>\$1.8</u>	<u>\$-1.3</u>
Net Change	\$1.8	\$-1.3

Explanation of Change:

(U) The Baseline (B/L) 7 Phase I Critical Design Review (CDR) was conducted from November 16-18 1999 and the computer program coding efforts have commenced.

The Cost Variance (CV) on this effort is a favorable \$1.8M.

The Schedule Variance (SV) on this effort is an unfavorable -\$1.3M. This unfavorable schedule variance is mainly attributed to delays in the Radar

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15. (U) Contract Information (Cont'd):

System Design, Command & Control and Computer Software Development (CSC) areas. Some of the effort has started slower than planned due to manpower shortages. Presently there are no anticipated impacts due to these shortages.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY93-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-11)	<u>Total</u>
RD&E	1441.0	307.3	274.2	460.2	2482.7
Procurement	126.5	112.8	70.9	4018.3	4328.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1567.5	420.1	345.1	4478.5	6811.2

b. Annual Summary -- Navy Area TBMD System

Appropriation: 0400 - RD&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1994 Dollars Nonrec</u>	<u>Flyaway FY 1994 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1993				35.3	35.1
1994				148.0	150.1
1995				135.3	139.9
1996				267.9	281.6
1997				282.4	300.4
1998				272.4	292.1
1999				223.3	241.8
2000				280.2	307.3
2001				246.3	274.2
2002				202.1	228.6
2003				74.6	85.9
2004				28.4	33.3
2005				24.5	29.4
2006				17.4	21.3
2007				12.0	14.9
2008				10.7	13.6
2009				9.5	12.3
2010				8.4	11.1

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

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2011				7.3	9.8
Subtotal				2286.0	2482.7

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995		8.5	5.3	13.8	14.5
1996		7.0	6.8	15.4	16.3
1997		8.5		8.5	9.1
1998		5.6	8.2	13.8	14.9
1999		12.6	23.4	39.1	42.7
2000		9.2	7.1	16.4	18.1
2001					
2002			6.1	6.1	7.0
2003			48.9	48.9	56.9
2004	32		119.0	127.3	150.9
2005	43		135.7	145.9	176.5
2006	87		219.9	237.1	292.5
2007	100		221.0	239.0	300.8
2008	102		240.9	254.7	326.9
2009	103		189.2	201.1	263.3
2010	21		62.4	62.4	83.3
2011			7.9	8.5	11.6
Subtotal	488	51.4	1301.8	1438.0	1785.3

(U) Recurring Flyaway dollars reflect AEGIS upgrades for FY95, FY96, FY98 through FY11 and missile procurements starting in FY00.

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999		26.6		26.6	29.0
2000	11	40.7	36.8	85.6	94.7
2001	11	8.7	32.8	63.1	70.9
2002	28	8.7	71.5	98.5	112.4
2003	58		130.2	159.4	185.3
2004	88		164.3	197.1	233.7
2005	115		198.2	234.8	284.0

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

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1994 Dollars Nonrec	Flyaway FY 1994 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2006	122		196.9	225.3	277.9
2007	127		196.3	221.2	278.4
2008	128		192.1	215.2	276.2
2009	138		201.5	224.6	294.1
2010	186		269.0	304.5	406.6
2011					
Subtotal	1012	84.7	1689.6	2055.9	2543.2

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD	488	51.4	1301.8	3724.0	4268.0
Navy	1012	84.7	1689.6	2055.9	2543.2
Grand Total	1500	136.1	2991.4	5779.9	6811.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1487.8

(U) Percent Total Program Expended: 21.8%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
 The Operations and Support Cost Estimates below assume a 30 year program life, procurement of 1500 SM-2 Block IVA missiles, and computer program and adjunct processor updates to 72 AEGIS Cruisers and Destroyers creates no requirement for additional ship-board or ground-based personnel and has no impact on the operating tempo of the ships. Unit Level Consumption includes the cost to conduct four training mission years after the eight year warranty period expires as well as the cost to dispose of missiles at the end of their life (assumed to be 24 years). Sustaining Support includes the cost of AEGIS Weapon System software maintenance and a missile mid-life refurbishment of the rocket motors and batteries. Indirect costs include technical support provided by Navy facilities during the support phase. There is no antecedent



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Navy Area TBMD, December 31, 1999

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

system, therefore column two for cost is left blank. This estimate was prepared October 1999.

b. (U) Costs -- (FY 1994 Constant (Base-Year) Dollars in Thousands)

Cost Element	NAVY AREA TBMD TOTAL COST	NO ANTECEDENT SYSTEM
Mission Pay & Allowances	0.0	N/A
Unit Level Consumption	86.4	N/A
Intermediate Maintenance	304.3	N/A
Depot Maintenance	267.2	N/A
Contractor Support	0.0	N/A
Sustaining Support	726.4	N/A
Indirect Costs	97.9	N/A
Total	1482.2	N/A

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: AIM-9X

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): AIM-9X/Short Range Air-to-Air Missile

2. (U) DoD Component: Navy

Joint Participants:  
Air Force

3. (U) Responsible Office and Telephone Number:

Program Executive Officer (PMA259)	CAPT David Venlet
Moffett Bldg, Suite 451	Assigned: April 1, 1999
47123 Buse Road	DSN 757-7311; COMM (301)757-7311
Patuxent River, MD 20670-1547	VENLETDJ@NAVAIR.NAVY.MIL

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

RDT&E:

(U)	PE 0207161F (Shared)	Project 4132
(U)	PE 0207161N	Project 0457
(U)	PE 0603715D	Project W04

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DEPARTMENT OF DEFENSE

No Security Objection  
to Open Publication  
~~(AS AMENDED)~~  
00-2-9143  
MAR 28 2000  
Office of the Chief of Naval Operations  
Dept. of the Navy

Derived from:  
Downgrade instructions: Sider... Security Classification of 10/15/96  
Declassify...

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AIM-9X, December 31, 1999

5. (U) References:

SAR Baseline (Development Estimate):

(U) USD(A&T) AIM-9X Acquisition Decision Memorandum dated December 16, 1994.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated March 21, 2000.

6. (U) Mission and Description:

(U) The AIM-9 Sidewinder is an air-to-air Short Range Missile (SRM) that uses passive Infra-Red (IR) energy for acquisition and tracking of enemy aircraft. The AIM-9 complements the Advanced Medium Range Air-to-Air Missile (AMRAAM). Air superiority in the SRM arena is essential to the warfighter and requires first-shot, first-kill opportunity against an enemy employing IR countermeasures. The AIM-9X continues the long-term evolution of the currently fielded AIM-9 series SRM, and qualifies the AIM-9X program as a research category operational systems development. Improvements in missile seeker performance and kinematic capability allow retrofit of components to current missiles to the maximum extent possible. Retrofitting of components extends the operational effectiveness of existing inventories at an affordable cost while continuing evolution of the AIM-9 series.

7. (U) Executive Summary:

(U) Demonstration/Validation contracts were awarded December 20, 1994, to Raytheon Company and Hughes Aircraft Company and completed June 30, 1996. After evaluation of both companies Engineering and Manufacturing Development (EDM) and Low rate Initial Production (LRIP) proposals along with an assessment of the United Kingdom's Advanced Short Range Air-to-Air Missile, Hughes Aircraft Company was selected to complete development and produce the AIM-9X. The Acquisition Decision Memorandum (ADM) dated December 3, 1996 approved the AIM-9X for entry into EMD. The EMD contract with Hughes Aircraft Company (now Raytheon Missile Systems) was awarded December 13, 1996.

Critical Design Review was completed on February 25, 1998. Development Test (DT)-IIA with a DEM/VAL captive test unit was completed in April 1998. An OSD program protection policy resulted in an AIM-9X anti-tamper requirement. DT-IIB/C testing with EMD captive test units began in 1998. Control Actuator System (CAS) hardware technical issues delayed Separation Control Test Vehicle (SCTV) launches from July 1998 until March 1999. This delayed first Engineering Design Model guided launch from February 1999 until June 1999.

As a result of the initial launch delays the Program Office staffed an Acquisition program Baseline (APB) revision that maintained a May 2000 (FY 00) LRIP Defense Acquisition Board (DAB) and LRIP I contract award. IOT&E Completion and Milestone III SAE Review dates moved from August 2001 to November 2002 and from March 2002 to March 2003, respectively. This revised program maintained an August 2002 Initial Operating Capability (IOC). These changes were reported in the AIM-9X June 1999 quarterly Selected Acquisition

7. (U) Executive Summary (Cont'd):

Report and the APB revision was approved in September 1999.

In October 1999 the FY 00 Appropriations Act zeroed FY 00 procurement funding. The decision not to appropriate FY 00 procurement funds delayed LRIP I contract award by six months from May 2000 to November 2000, resulting in a September 2003 IOC. Though the contract award was slipped by six months, the FY 01 procurement funding available is less than the FY 00 funding which slows the ability of the services to support IOC by an additional six months. An APB revision was approved in March 2000 reflecting the revised IOC date of September 2003. The LRIP DAB is now planned for August 2000.

The EMD contract with Raytheon is rebaselined to reflect the APB revision and the effects of the loss of FY 00 procurement funding.

Since the first SCTV launch in March 1999, significant flight testing has been conducted. As of February 9, 2000 nine SCTV launches and three EDM guided launches have been completed. Five SCTV and two EDM launches were completed from F-15 aircraft. Three SCTV launches and one EDM launch were completed from the F-18. Pre and post-flight modeling and simulation data closely matches actual flight data. CAS performance is meeting requirements. All baseline aircraft environmental characterization flight testing is complete. Environmental characterization flights are complete on the F/A-18E/F, AIM-9X's first objective aircraft and are within missile design limits.

Raytheon completed transfer of the tracker development from Lewisville, TX to Tucson, AZ in February 1999. The missile shows improved captive carriage performance against countermeasures. Maturation will continue to improve probability of kill in countermeasures and clutter background scenarios.

When combined with Joint Helmet Mounted Cueing System (JHCMS) and other cueing sources, AIM-9X supports "High Off Boresight" (HOBs) capability. Recent HOBs testing with the missile, JHMCS, F-15 and F/A-18C show good results. Adjustments to missile software are optimizing HOBs performance in both F-15 and F/A-18.

In September 1999, PEO(T) authorized entry into Operational Assessment (OA) IIA - combined DT/OT. This approval resulted from a detailed USN/USAF Operational test Readiness Review involving OPTEVFOR, AFOTEC, and DOT&E personnel. Five EDM missiles have been delivered to the OT testers and captive carry testing has begun. Five guided launches are planned in April and May 2000. The OA results will be presented at the LRIP DAB in August 2000.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone IV/I	DEC 1994	DEC 1994	DEC 1994
DEM/VAL Contract Award	DEC 1994	DEC 1994	DEC 1994
Early Operational Assessment Start	FEB 1995	FEB 1995	MAR 1995
Complete	FEB 1996	FEB 1996	MAY 1996
Milestone II	OCT 1996	OCT 1996	DEC 1996
EMD Contract Award	JAN 1997	JAN 1997	DEC 1996
Critical Design Review	JUL 1998	JUL 1998	MAR 1998
IOT&E Complete	AUG 2001	NOV 2002	NOV 2002
LRIP DAB Decision	APR 2000	APR 2000	AUG 2000 (Ch-1)
Milestone III SAE Review	MAR 2002	MAR 2003	MAY 2003 (Ch-1)
Initial Operational Capability	AUG 2002	SEP 2003	SEP 2003

b. Current Change Explanations --

(U) (Ch-1) The Program Manager's Estimate is revised for LRIP DAB and Milestone III SAE Review from May 2000 to August 2000 and March 2003 to May 2003, respectively, based on LRIP I funding occurring in FY 2001 instead of FY 2000.

10. (U) Performance Characteristics:

a. Performance --

	Development	Approved		Demon-	Current
	Estimate (SAR)	Program (APB)		strated	Estimate
	Yes	Yes	/ Yes	Perf	Yes
Day/Night Capability	(b)(1)				
Infrared counter counter measures (IRCCM)	(b)(1)				
<b>Aircraft Interface</b>					
Missile Weight (lbs)	<.or.= 192	<.or.= 192	/ <.or.= 210	<.or.= 186	<.or.= 192
Missile Size					
Length (in.)	<.or.= 115	<.or.= 115	/ <.or.= 123	119.2	119.2 (Ch-1)
Box Size (in.)	<.or.= 12.5 x 12.5	<.or.= 12.5 x 12.5	/ <.or.= 12.5 x 12.5	<12.15 x 12.15	<.or.= 12.5 x 12.5
Diameter (in.)	5	5	/ <.or.= 7	5	5
Digital Interface	Employ from current fighter aircraft without digital inter-face	Employ from current fighter aircraft without digital inter-face	/ Employ from future/ current fighter aircraft/ with digital inter-face	Employed from F/A-18 C/D and F-15C with digital inter-face	Employ current fighter aircraft with digital inter-face
<b>Off Boresight Capability</b>					
Cueing/Verification	Inter-face to all current and planned aircraft systems which provide accurate Line of Site to target	Inter-face to all current and planned aircraft systems which provide accurate Line of Site to target	/ Inter-face with current/ planned aircraft/ systems and planned Helmet Mounted Cueing System	JHMCS and Radar on both F-15C and F/A-18C/D	Inter-face to all current and planned aircraft systems which provide accurate Line of Site to target

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

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
(S) Acquisition (deg.)	(b)(1)			
(S) Track (deg.)	(b)(1)			
(S) Launch (deg.)	(b)(1)			
(S) Probability of Kill	(b)(1)			
(S) Captive Carry Reliability (hr.)	(b)(1)			
(S) Incoming Missile Reliability Detect Non- Operational Missile (BIT) All Components	(b)(1)			
Detect Non- Operational Missile (BIT-able Components) False Alarm Rate	>.or.= 0.95	>.or.= / >.or.= 0.95 / 0.90	TBD	>.or.= 0.95
BIT Time (sec)	<.or.= .01	<.or.= / <.or.= .01 / 0.01	TBD	<.or.= .01
	<.or.=20	<.or.=20/ <.or.=20	TBD	<.or.=20

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

b. Current Change Explanations --

(U) (Ch-1) The current estimate of missile length changed from 115" to 119.2". The change is the result of actual measurement of AIM-9X hardware.

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	531.4	531.4	541.5
Procurement	1932.6	1932.6	1792.4
Flyaway	(1677.2)		(1731.1)
Other Weapons Systems	(138.2)		(0.0)
Peculiar Support	(78.1)		(51.8)
Initial Spares	(39.1)		(9.5)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1997 Base-Year \$	2464.0	2464.0	2333.9
 Escalation	 768.9	 768.9	 487.6
Development (RDT&E)	(22.1)	(22.1)	(11.0)
Procurement	(746.8)	(746.8)	(476.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	3232.9	3232.9	2821.5

(U) Funding for Seek Eagle is not included here and is in a separate program element and managed at Eglin.

b. (U) Quantity --

Development (RDT&E)	49	49	49
Procurement	<u>10000</u>	<u>10000</u>	<u>10097</u>
Total	10049	10049	10146

(U) Note: The LRIP quantities approved at Milestone II were 150 (1st year), 250 (2nd year) and 600 (3rd year). The recent zeroing of FY 2000 required the services to revise these quantities to 119 (1st year), 339 (2nd year) and 552 (3rd year). This does not represent more than 10% of the planned program buy.

c. ~~(S)~~ Foreign Military Sales --

There has been considerable international interest in the AIM-9X. Briefs have been given to Australia, Norway, Belgium, Denmark, the Netherlands, Sweden, Canada, and Switzerland. In February 1998, Australia selected the Advanced Short Range Air-to-Air Missile (ASRAAM) as their ~~primary~~ ~~preferred~~ ~~choice~~ ~~for~~ ~~their~~ ~~future~~ ~~short-range~~ ~~air-to-air~~ ~~missile~~ ~~requirements~~. ~~(U)~~ ~~ASRAAM~~ ~~and~~ ~~AIM-9X~~ ~~are~~ ~~being~~ ~~evaluated~~ ~~by~~ ~~the~~ ~~United~~ ~~States~~ ~~and~~ ~~its~~ ~~allies~~ ~~for~~ ~~their~~ ~~future~~ ~~short-range~~ ~~air-to-air~~ ~~missile~~ ~~requirements~~. ~~(U)~~ ~~ASRAAM~~ ~~and~~ ~~AIM-9X~~ ~~are~~ ~~being~~ ~~evaluated~~ ~~by~~ ~~the~~ ~~United~~ ~~States~~ ~~and~~ ~~its~~ ~~allies~~ ~~for~~ ~~their~~ ~~future~~ ~~short-range~~ ~~air-to-air~~ ~~missile~~ ~~requirements~~.



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

air-to-air missile requirements. The LO/CLO EXCOM recently approved (b)(1) (U) for release of a full capability AIM-9X. Requests for Exception to National Disclosure Policy (ENDP) and Yockey waiver are in progress. ENDP and Yockey waiver have been approved for Denmark which has requested P&A data. Switzerland has also requested an updated AIM-9X program brief on which to base a short-range missile acquisition competition.

d. (U) Nuclear Costs --  
None.

12. (U) Unit Cost Summary:

	UCR Baseline (DEC 1996 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1997 BY\$)	2464.0	2333.9	
(2) Quantity	10049	10146	
(3) Unit Cost	0.245	0.230	-6.12
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1997 BY\$)	1932.6	1792.4	
(2) Quantity	10000	10097	
(3) Unit Cost	0.193	0.178	-7.77

13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	553.5	2679.4	-	3232.9
Previous Changes:				
Economic	-16.8	-231.4	-	-248.2
Quantity	-	+16.8	-	+16.8
Schedule	+8.9	-	-	+8.9
Engineering	+19.1	+150.9	-	+170.0
Estimating	-17.5	+210.5	-	+193.0
Other	-	-	-	-
Support	-	-280.3	-	-280.3
Subtotal	-6.3	-133.5	-	-139.8
Current Changes:				
Economic	-1.0	+3.4	-	+2.4
Quantity	-	+3.5	-	+3.5
Schedule	+16.5	+43.1	-	+59.6
Engineering	-	+0.4	-	+0.4
Estimating	-10.2	-328.0	-	-338.2
Other	-	-	-	-
Support	-	+0.7	-	+0.7
Subtotal	+5.3	-276.9	-	-271.6
Total Changes	-1.0	-410.4	-	-411.4
Current Estimate	552.5	2269.0	-	2821.5

(U) Summary (FY 1997 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	531.4	1932.6	-	2464.0
Previous Changes:				
Quantity	-	+11.3	-	+11.3
Schedule	+8.5	-	-	+8.5
Engineering	+18.4	+116.0	-	+134.4
Estimating	-22.7	+133.2	-	+110.5
Other	-	-	-	-
Support	-	-194.7	-	-194.7
Subtotal	+4.2	+65.8	-	+70.0
Current Changes:				
Quantity	-	+2.4	-	+2.4
Schedule	+12.8	-	-	+12.8
Engineering	-	+0.3	-	+0.3
Estimating	-6.9	-209.3	-	-216.2
Other	-	-	-	-
Support	-	+0.6	-	+0.6
Subtotal	+5.9	-206.0	-	-200.1
Total Changes	+10.1	-140.2	-	-130.1
Current Estimate	541.5	1792.4	-	2333.9

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-1.0
	Adjustment for Current and Prior Inflation. (Estimating)	+0.6	+0.6
	FY 1999 execution adjustments. (Estimating)	-7.5	-10.8
	Program restructure due to technical issues with Control Actuator System. (Schedule)	+12.8	+16.5
	RDT&E Subtotal	<u>+5.9</u>	<u>+5.3</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-37.7
	Economic adjustment for negative program change. (Economic)	N/A	+41.1
	Quantity increase of 17 missiles from 10080 TO 10097. (Quantity)	+2.4	+3.5
	Allocation to Engineering variance resulting from Quantity Change. (QR)(Engineering)	+0.3	+0.4
	Allocation to Estimating variance resulting from Quantity Change. (QR)(Estimating)	+0.4	+0.6
	Stretchout of annual procurement buy profile. (Schedule)	0.0	+43.1
	Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
	Production profile adjustment to achieve a more economic rate in outyears, decrease in ECO, and a adjustment to hardware cost requirements. (Estimating)	-210.0	-328.9
	Adjustment to Bit Reprogrammers to reflect the current beddown schedule and an adjustment to decrease initial spares. (Support)	+0.6	+0.7
	Procurement Subtotal	<u>-206.0</u>	<u>-276.9</u>

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.32	-0.02	-0.01	+0.01	+0.02	-0.01	--	-0.03	-0.04	0.28

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.27	-0.02	--	--	+0.01	-0.01	--	-0.03	-0.05	0.22

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	DEC 1994	DEC 1994	N/A	DEC 1994
Milestone II	OCT 1996	OCT 1996	N/A	DEC 1996
Milestone III	SEP 2002	MAR 2002	N/A	MAY 2003
FUE/IOC	SEP 2003	AUG 2002	N/A	SEP 2003
Total Cost	695	3232.9	N/A	2821.5
Total Quantity	0	10049	N/A	10146
Prog Acq Unit Cost	0	0.32	N/A	0.28

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

a. RDT&E --

(U) AIM-9X:  
Hughes Aircraft Co., Tuscon, AZ  
N00019-97-C-0027, CPIF/AF  
Award: December 13, 1996  
Definitized: December 13, 1996

	Initial Contract Price		
	Target	Ceiling	Qty
	\$169.2	\$0.0	49

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$247.3	\$0.0	49	\$295.2	\$295.2

15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-6.0	\$-10.5
Cumulative Variances To Date (01/28/00)	<u>\$0.7</u>	<u>\$-1.1</u>
Net Change	\$6.7	\$9.4

Explanation of Change:

(U) Change in variances is due to rebaselining.

The initial and current contract price does not include the contractor's investment of \$48M. The estimated price at completion includes the contractor's investment. The contract rebaseline was definitized November 1999. This was required to reflect the 9 September 1999 APB revision and the FY 2000 WPN elimination. The rebaseline resulted from initial launches being delayed due to problems with the Control Actuation System (CAS) which have been resolved. EMD was extended 12 months, IOT&E complete was delayed 15 months, and MS III was delayed 12 months. FY 2000 Appropriations Act elimination of procurement funding delayed IOC completion by 12 months and impacted EMD cost by creating a production gap between PRM and LRIP missiles.

The increase between initial target and current contract target price is caused by \$21.4M of scope growth (e.g.; anti-tamper implementation, OT-IIA support), \$13.0M of distributed award fee and \$43.6M from the rebaseline due to the September 1999 APB revision and loss of FY 2000 procurement funds.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY95-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-18)	<u>Total</u>
RDT&E	380.4	80.3	43.4	48.4	552.5
Procurement	-	-	54.6	2214.4	2269.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	380.4	80.3	98.0	2262.8	2821.5

(U) Funding for P3I included in the RDT&E appropriation.

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

b. Annual Summary -- AIM9X

Appropriation: 0400 - RDT&E, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995				47.6	46.4
Subtotal				47.6	46.4

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				28.3	28.1
1997				45.1	45.3
1998				54.3	55.0
1999				55.9	57.1
2000				38.5	39.8
2001				20.7	21.7
2002				13.0	13.9
2003				1.8	1.9
2004				0.6	0.7
2005				1.2	1.3
Subtotal	26			259.4	264.8

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				18.9	18.8
1997				29.1	29.2
1998				50.6	51.2
1999				48.3	49.3
2000				39.2	40.5
2001				20.7	21.7
2002				3.3	3.5
2003				4.4	4.8
2004				14.9	16.5
2005				5.1	5.8
Subtotal	23			234.5	241.3

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

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	63	3.7	18.9	26.5	28.3
2002	157	4.1	31.7	40.4	43.9
2003	283	0.4	50.3	55.9	62.0
2004	298	0.4	54.6	55.8	63.1
2005	291	1.4	52.3	55.8	64.4
2006	300	0.6	54.5	56.1	66.0
2007	300	1.1	53.2	56.1	67.3
2008	300	1.1	47.1	49.8	61.0
2009	349	1.2	53.4	56.1	70.1
2010	337	1.1	51.7	54.4	69.3
2011	320	1.1	50.6	53.2	69.1
2012	275	1.1	44.2	47.0	62.3
2013	275	1.1	43.9	46.8	63.2
2014	271	1.1	43.0	45.8	63.1
2015	285	1.1	44.7	47.6	66.9
2016	296	1.1	45.8	48.7	69.8
2017	300	1.1	46.1	48.9	71.5
2018	300	1.1	45.8	47.0	70.1
Subtotal	5000	23.9	831.8	891.9	1131.4

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001	56	3.3	16.5	24.6	26.3
2002	182	4.4	36.5	43.8	47.7
2003	269	0.4	51.5	60.5	67.1
2004	383	0.4	71.3	74.9	84.7
2005	296	1.1	53.9	57.0	65.8
2006	304	0.6	55.3	57.6	67.8
2007	300	1.1	53.7	55.3	66.4
2008	300	1.1	47.7	49.1	60.1
2009	325	1.1	50.2	51.3	64.0
2010	350	1.1	53.2	54.3	69.2
2011	327	1.1	49.5	50.7	65.9
2012	275	1.1	42.8	44.1	58.4
2013	275	1.1	43.9	45.1	61.0
2014	280	1.1	44.4	45.6	62.9
2015	281	1.1	44.1	45.4	63.8
2016	294	1.1	45.6	46.8	67.1
2017	300	1.1	46.1	47.3	69.2
2018	300	1.1	45.8	47.1	70.2

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

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1997 Dollars Nonrec	Flyaway FY 1997 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal	5097	23.4	852.0	900.5	1137.6

(U) Funding for Seek Eagle is not included here and is in a separate program element and managed at Eglin.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
OSD				47.6	46.4
Navy	5026	23.9	831.8	1151.3	1396.2
USAF	5120	23.4	852.0	1135.0	1378.9
Grand Total	10146	47.3	1683.8	2333.9	2821.5

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	15	8
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.1%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 404.4

(U) Percent Total Program Expended: 14.3%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
 The AIM-9X is a long-term evolution to the AIM-9 family, a fielded system. The estimate for the Operating and Support costs are as of December 1997. Mission pay and allowance costs are the direct costs for the primary mission personnel and the costs to operate this joint service air-to-air missile (excluding base operating support). The estimate assumes 12 carriers deployed per year at 300 missiles per carrier (beginning in the third year of operations). Unit level consumption primarily relates to the annual training firings and transportation receipt, segregation, storage and issue (RSSI). The system is procured with an all-up-round (AUR) warranty of 2000 hours or 120 months, whichever come first, on all contractor furnished equipment (CFE). Depot AUR maintenance is limited to component repair of failed Government furnished equipment (GFE) and 2nd destination transportation. The AOTD,



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

rocket motor, and warhead are to be provided as GFE. The cost estimate considers a fifteen (15) year service life and spans a thirty-three (33) year time period. Contractor support is required to repair out of warranty and voided warranty AURs. This cost includes the required AUR repairs, software support, and technical publication revisions. The sustaining support consists of replenishment spares, support equipment replacement, systems engineering and program management, and missile demilitarization. Intermediate maintenance and indirect costs are as noted.

Note: This is based on the Total Ownership Cost (TOC) Plan dated Dec 98.

b. (U) Costs -- (FY 1997 Constant (Base-Year) Dollars in Millions)

Cost Element	AIM-9X NAVY	AIM-9X AIR FORCE
Mission Pay & Allowances	0.6	1.2
Unit Level Consumption	0.4	1.3
Intermediate Maintenance	N/A	N/A
Depot Maintenance	1.1	0.4
Contractor Support	0.3	0.0
Sustaining Support	5.6	9.6
Indirect Costs	N/A	N/A
Total	8.0	12.5

M-4 CEC

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: CEC

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Cooperative Engagement Capability (CEC); AN/USG-2/3

2. (U) DoD Component: Navy

Joint Participants:

U.S. Air Force (AWACS); U.S. Army (PATRIOT); JLENS Program (Studies/Demonstrations)

3. (U) Responsible Office and Telephone Number:

Program Executive Officer	CAPT Daniel E. Busch
Theater Surface Combatants (PEO TSC)	Assigned: September 22, 1997
2531 Jefferson Davis Highway	DSN 332-7415 x200
Arlington, VA 22242-5170	COMM (703) 602-7415 x200
	BuschDE@NAVSEA.NAVY.MIL

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

RDT&E:

(U) PE 0603658N Project K2039, K2616, U2039, U2394  
 (U) PE 0603755N (Shared) Project U2039

PROCUREMENT:

(U) APPN 1611 ICN 2300000000 (Navy) (Shared)  
 (U) APPN 1810 ICN 2606000000 (Navy)  
 (U) APPN 1506 ICN 3300000000 (Navy) (Shared)

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DD-C-0139  
 MAR 28 2000  
 Office of the Chief of  
 Naval Operations  
 Dept. of the Navy  
 DD-C-0851

CEC, December 31, 1999

5. (U) References:

SAR Baseline (Development Estimate):

(U) NAE approved Acquisition Program Baseline (APB) dated 31 May 1995.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated March 18, 1999.

6. (U) Mission and Description:

(U) Cooperative Engagement Capability (CEC) significantly improves Battle Force air and missile defense capabilities by coordinating measurement data from battle force air search sensors, on CEC-equipped units, into a single, real-time, composite track picture. CEC distributes sensor data from each ship and aircraft, or cooperating unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking (relative spatial positioning) between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a high quality track picture which is the same for all CUs. CEC data is presented as a superset of the best air and missile defense sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system. CEC will significantly improve our Battle Force defense in depth, including both local and area defense capabilities against current and future air and missile threats. Moreover, CEC will provide critical connectivity and integration of over-the-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

CEC consists of the the Data Distribution System (DDS), and the Cooperative Engagement Processor (CEP), which is integrated with a host combat system. The DDS encodes and distributes sensor and engagement data and is a high capacity, jam resistant, directive system providing precision gridlocking and high throughput of data. The CEP is a high capacity distributed processor which is able to convert sensor data from each CU to output data which can be utilized for real-time target tracking by all cooperating units. In shipboard implementation, the data is passed to the ships' combat system and the ship can then cue its onboard sensors for fire control and target prosecution, or use the fire control quality data from other units through CEC to engage targets without tracking by own ship sensors.

7. (U) Executive Summary:

(U) (1) The Assistant Secretary of the Navy for Research, Development and Acquisition, ASN(RDA), approved a revised Acquisition Program Baseline (APB) on March 18, 1999. A detailed review of program costs was conducted and final approval by ASN(RDA) eliminated deviations in schedule and cost objectives established by the previous (July 1997) APB.

(a) Operational Evaluation (OPEVAL) was replanned to April 2001. Test requirements, facilities, and engineering support requirements have been

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7. (U) Executive Summary (Cont'd):

redefined. An agreed-to plan is in place to demonstrate incremental progress in AEGIS, CEC, non-AEGIS and Command and Control Processor (C2P) program interoperability leading to OPEVAL. The plan includes a series of progressive test objectives and exit criteria with a final demonstration of capabilities in late 2000, followed by OPEVAL in April 2001.

(b) The revised APB included projected procurement cost savings of \$112.5 million resulting from development of the Low Cost Planar Array (LCPA).

(2) Status of Development Test and Evaluation (DT&E):

(a) CEC AN/USG-3 (airborne) system for E-2C Aircraft

- Engineering tests were conducted February-April 1999 to test the integration of CEC (AN/USG-3) equipment and aircraft systems. Several integration issues and aircraft-specific problems were encountered and corrected. Improvement in data reliability and computer program interoperability were observed, and test objectives were accomplished.

- Development tests (DT-IIC) were also conducted 12-16 July 1999 to measure and evaluate the performance of CEC airborne equipment and to prepare for the combined E-2C development and operational tests scheduled for September 1999. The tests were successfully completed with the test plan objectives.

- Operational Assessment (OA) of the integrated E-2C/CEC system was conducted in October 1999 in the Virginia Capes and Jacksonville Operational Areas by COMOPTEVFOR evaluators. As of the date this Selected Acquisition Report (SAR) was prepared, the COMOPTEVFOR report was not available.

(b) CEC AN/USG-2 (shipboard) system

- Integration into the Distributed Engineering Plant (DEP) was completed. Testing of CEC computer programs satisfied DEP criteria for installation aboard the USS DWIGHT D. EISENHOWER Battle Group and the USS WASP for DEP testing prior to operational deployment of the ships.

- Development testing (DT-IID) was conducted July 1999 in the Virginia Capes (VACAPES) operational area. The purpose of the testing was to demonstrate improved CEC/ship weapon system interoperability over testing conducted in 1997. COMOPTEVFOR informally evaluated the tests as a success in the progressive development of CEC; and indicated the tests were a positive measure that CEC is on track to a successful TECHEVAL and OPEVAL in 2001.

(3) On 3 November 1999, the Under Secretary of Defense for Acquisition, Technology and Logistics, USD(AT&L), redesignated the CEC program from Acquisition Category 1C (ACAT-1C) to (ACAT-1D).

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APR)	Current Estimate
Development Contract Modification	MAY 1995	MAY 1995	MAY 1995
Preliminary Design Review Complete	FEB 1996	FEB 1996	JUL 1996
Critical Design Review Complete	AUG 1996	AUG 1996	DEC 1996
Baseline System Initial Operational Capability	SEP 1996	SEP 1996	SEP 1996
IOT&E (DT-IIB/OT-IIA1)			
Start	MAY 1997	MAY 1997	MAY 1997
Complete	JUL 1997	AUG 1997	AUG 1997
LRIP Decision	DEC 1997	DEC 1997	FEB 1998
Low Rate Production Contract Award	JAN 1998	APR 1998	APR 1998
Service Final DT&E			
Start	MAR 1998	JUL 2000	JAN 2001 (Ch-1)
Complete	APR 1998	NOV 2000	MAY 2001 (Ch-1)
IOT&E - OPEVAL (OT-IIA2)			
Start	MAY 1998	SEP 2000	MAR 2001 (Ch-1)
Complete	MAY 1998	NOV 2000	MAY 2001 (Ch-1)
Milestone III	OCT 1998	JUL 2001	NOV 2001 (Ch-1)
Organic Support Date	JUL 2000	OCT 2001	OCT 2001
Service Depot Support Date	JUL 2000	OCT 2000	OCT 2000
FOT&E-1 (DTIIIA/OT-IIIA)E-2C			
Start	N/A	APR 2001	OCT 2001 (Ch-2)
Complete	N/A	AUG 2001	FEB 2002 (Ch-2)
FOT&E-2 (DTIIIB/OT-IIIB)E-2C			
Start	N/A	MAR 2003	MAR 2003
Complete	N/A	JUL 2003	JUL 2003

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

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Full Rate Production Contract Award	NOV 1998	JUL 2001	DEC 2001 (Ch-1)
Full Operational Capability	JUL 2000	DEC 2003	DEC 2003
AIR IOC	N/A	DEC 2003	DEC 2003
Milestone II	MAY 1995	MAY 1995	MAY 1995

b. Current Change Explanations --

(U) (Ch-1): As a result of computer program interoperability problems identified during FY 1997 Initial Operational Testing and Evaluation (IOT&E) of CEC AN/USG-2 (shipboard) equipment, the CEC test program was re-planned to allow computer program developers adequate time to identify and resolve the interoperability issues. Extensive Development Testing/Operational Testing (DT/OT) was added to the schedule to demonstrate incremental progress in resolution of the issues. The DT/OT testing is structured as a series of more strenuous test objectives and exit criteria, and will lead to a final demonstration of AN/USG-2 (shipboard) capabilities in late 2000, and Operational Testing (OT) will follow in April/May 2001.

(Ch-2): The following sequence of events have delayed FOT&E-1 testing of AN/USG-3 (airborne) equipment for E-2C aircraft as indicated below.

(1) Congressional appropriation of additional FY 1999 Other Procurement, Navy (OP,N) funds of \$21.9 million to "procure additional CEC systems", and Navy decision to utilize the additional appropriation to procure AN/USG-3 (airborne) systems.

(2) A late FY 1999 Navy Comptroller decision that AN/USG-3 (airborne) equipment must be procured with Aircraft Procurement, Navy (AP,N) funds, vice OP,N. A request to reprogram the \$21.9 million from the OP,N appropriation to the AP,N appropriation missed the "window of opportunity" to be included with an omnibus reprogramming request to the Defense Appropriation Committees.

(3) Congressional Professional Staff members were made aware of the appropriation funding issue, and in resolution of the issue, Congress appropriated an additional \$21.9 million of FY 2000 AP,N funds to procure AN/USG-3 (airborne) intended for E-2C aircraft.

(4) The required manufacturing lead time for AN/USG-3 equipment of sixteen (16) months, and the inability to utilize FY 1999 appropriated funds to procure the equipment, caused a delay in the FOT&E-1 test schedule.

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

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
Track Base Size	(b)(1)			
Track Measurement	(b)(1)			
Update Rate (1/sec)	(b)(1)			
Local	(b)(1)			
Remote	(b)(1)			
Operational Availability	(b)(1)			
Data Rate (without any Compression Technology Implemented) (Mbps)	(b)(1)			
Anti-jam Resistance (kW/MHz)	(b)(1)			

b. Current Change Explanations -- None

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

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. (U) Cost --			
Development (RDT&E)	1030.4	1544.4	1620.8
Procurement	1150.3	1644.6	1808.5
Rollaway	(677.3)		(1715.8)
Other Weapon Systems Cost	(473.0)		(92.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	41.2	0.0	0.0
Total FY 1995 Base-Year \$	2221.9	3189.0	3429.3
Escalation	351.2	405.6	419.9
Development (RDT&E)	(57.8)	(80.2)	(82.9)
Procurement	(280.3)	(325.4)	(337.0)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(13.1)	(0.0)	(0.0)
Total Then Year \$	2573.1	3594.6	3849.2
b. (U) Quantity --			
Development (RDT&E)	9	11	11
Procurement	174	220	221
Total	183	231	232

(U) a. Seven (7) Limited Rate Initial Production (LRIP) units were approved for procurement in FY 1998 (LRIP-1), and eleven (11) units were approved for procurement in FY 1999 (LRIP-2). Approval to procure an additional nine (9) units will be required in FY 2000 (LRIP-3).

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

b. Planned procurement of LRIP units will exceed 10% of the units planned to be procured under the Engineering and Manufacturing (E&MD) and production programs. The procurement of LRIP units in excess of 10% is necessary to (1) meet ship installation schedules, (2) outfit Land Based Test Sites (LBTS) in preparation for operational testing, and (3) maintain the Minimum Sustaining Rate (MSR) for production of AN/USG-2 systems pending completion of operational testing and entry into Full Rate Production (FRP).

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (MAR 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1995 BY\$)	3189.0	3403.4	
(2) Quantity	231	232	
(3) Unit Cost	13.805	14.670	+6.27
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1995 BY\$)	1644.6	1782.6	
(2) Quantity	220	221	
(3) Unit Cost	7.475	8.066	+7.91



13. (U) Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	1088.2	1430.6	-	54.3	2573.1
Previous Changes:					
Economic	-30.4	-102.8	-	-5.2	-138.4
Quantity	+8.0	+227.5	-	-	+235.5
Schedule	+85.9	+40.8	-	-	+126.7
Engineering	+72.8	-112.5	-	-	-39.7
Estimating	+400.1	+896.1	-	-49.1	+1247.1
Other	-	-	-	-	-
Support	-	-409.7	-	-	-409.7
Subtotal	+536.4	+539.4	-	-54.3	+1021.5
Current Changes:					
Economic	-2.5	-9.1	-	-	-11.6
Quantity	-	+13.6	-	-	+13.6
Schedule	-	-	-	-	-
Engineering	+76.0	-	-	-	+76.0
Estimating	+5.6	+158.1	-	-	+163.7
Other	-	-	-	-	-
Support	-	+12.9	-	-	+12.9
Subtotal	+79.1	+175.5	-	-	+254.6
Total Changes	+615.5	+714.9	-	-54.3	+1276.1
Current Estimate	1703.7	2145.5	-	-	3849.2

(U) Summary (FY 1995 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	O&M	TOTAL
Development Estimate	1030.4	1150.3	-	41.2	2221.9
Previous Changes:					
Quantity	+7.7	+157.7	-	-	+165.4
Schedule	+78.9	-	-	-	+78.9
Engineering	+72.3	-86.3	-	-	-14.0
Estimating	+355.1	+814.1	-	-41.2	+1128.0
Other	-	-	-	-	-
Support	-	-391.2	-	-	-391.2
Subtotal	+514.0	+494.3	-	-41.2	+967.1
Current Changes:					
Quantity	-	+11.0	-	-	+11.0
Schedule	-	-	-	-	-
Engineering	+71.2	-	-	-	+71.2
Estimating	+5.2	+142.0	-	-	+147.2
Other	-	-	-	-	-
Support	-	+10.9	-	-	+10.9
Subtotal	+76.4	+163.9	-	-	+240.3
Total Changes	+590.4	+658.2	-	-41.2	+1207.4
Current Estimate	1620.8	1808.5	-	-	3429.3

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

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices (Economic)	N/A	-2.5
	Increased program scope: Low Cost Data Distribution System (\$15M); Network Expansion (\$12.7M); Modeling and Simulation (\$7.5M); Forward Pass/Remote Launch (\$5M); System Protection (\$10M); Low Cost Planar Array (\$5M); Airborne Antenna Improvements (\$4M); Other Items (\$16.8M) (Engineering)	+71.2	+76.0
	Miscellaneous budget adjustments (Estimating)	+5.2	+5.6
	RDT&E Subtotal	+76.4	+79.1
(2)	<u>Procurement</u>		
	Revised escalation indices (Economic)	N/A	-9.1
	Increased requirements for supply support, "rolling wave" kits, ECP/COTS, Battle Force Tactical Training (BFTT), mobile nodes, site tools, anti-tamper capability, and installation costs (Estimating)	+38.0	+42.5
	Adjustment including increased antenna costs and revised acquisition contracting strategy (Estimating)	+114.9	+128.5
	Procurement of one (1) additional AN/USG-2 system for DDG-108 (Quantity)	+11.0	+13.6
	Correction to align flyaway and support (Estimating)	-10.9	-12.9
	(Support)	+10.9	+12.9
	Procurement Subtotal	+163.9	+175.5

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
14.06	-0.65	-1.79	+0.55	+0.16	+6.06	--	-1.80	+2.53	16.59

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.22	-0.51	-0.52	+0.18	-0.51	+4.74	--	-1.89	+1.49	9.71

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	MAY 1995	N/A	MAY 1995
Milestone II	N/A	MAY 1995	N/A	MAY 1995
Milestone III	N/A	OCT 1998	N/A	JUL 2001
FUE/IOC	N/A	SEP 1996	N/A	SEP 1996
Total Cost	N/A	2573.1	N/A	3822.5
Total Quantity	N/A	183	N/A	232
Prog Acq Unit Cost	N/A	14.06	N/A	16.48

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

a. RDT&E --

(U) E-2C/CEC Integration:

Northrop-Grumman Corp., Bethpage, Long Is., NY  
 N00019-97-C-0069, CPAF  
 Award: March 31, 1997  
 Definitized: March 31, 1998

Initial Contract Price

Target      Ceiling      Qty

\$63.7      N/A      0

Current Contract Price

Target      Ceiling      Qty  
 \$103.2      N/A      0

Estimated Price At Completion

Contractor      Program Manager  
 \$103.2      \$103.2

15a. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.3	\$0.0
Cumulative Variances To Date (11/30/99)	<u>\$1.5</u>	<u>\$-0.9</u>
Net Change	\$1.2	\$-0.9

Explanation of Change:

(U) The indicated cost and schedule variances (net change) are due to greater than anticipated requirements to develop E-2C Mission Computer Upgrade (MCU) computer programs and the need to temporarily and intermittently reassign personnel from E-2C/CEC computer program integration tasks to support MCU computer program development.

(U) Contract Comments:

The E-2C/CEC integration contract is structured as a Cost Plus Award Fee (CPAF) contract. A ceiling price is not applicable (N/A). The contract addresses the development of interfacing computer programs for integration of CEC AN/USG-3 (airborne) equipment with the E-2C Mission Computer Upgrade (MCU) electronic suite.

The contract is structured as a basic with two (2) contract options. The key element of the basic contract is the modification of an existing E-2C aircraft to include the integration of CEC AN/USG-3 (airborne) equipment, as well as development of necessary software. That aircraft was delivered to the Navy on 31 July 1998.

Option 1, priced at \$39.5 million and exercised in December 1998, includes the development of Build 2a computer program to be installed in production aircraft. Functional Qualification Testing (FQT) of the computer program is scheduled for the 1st quarter of 2001.

Option 2, with a contractor proposed price of \$21.2 million for a 2nd CEC-configured E-2C (production representative) aircraft has not been executed.

b. Procurement --

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>LRIP-2:</u> Raytheon Systems Co., St. Petersburg, FL N00024-99-C-5116, FPIF Award: September 28, 1999 Definitized: N/A	\$73.3	N/A	11

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$73.3	N/A	11	\$	\$

15b. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$	\$
Cumulative Variances To Date	\$	\$
Net Change	\$	\$

Explanation of Change:

None.

(U) Contract Comments:

The LRIP-2 contract has not been definitized as of the date this Selected Acquisition Report (SAR) was prepared. The estimated definitization date is April 2000. The initial contract price indicated above is a "not-to-exceed" price which excludes estimated incentive fees which may be earned under the contract. The incentive fees payable have not been defined as of this report, but will be negotiated prior to contract definitization.

The initial Cost Performance Report (CPR) is due to be submitted ninety (90) calendar days after the end of the first full contractor accounting period after initiation of contract performance. Contract cost/schedule variance data was not available as of the date this SAR was prepared.

(U) <u>LRIP-1:</u> Raytheon Systems Co., St. Petersburg FL N00024-98-C-5409, CPAF/IF Award: April 27, 1998 Definitized: April 8, 1999	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$53.2	N/A	7

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$53.2	N/A	7	\$53.2	\$54.3

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$0.5	\$0.0
Cumulative Variances To Date (11/26/99)	\$-2.6	\$-1.1
Net Change	\$-3.1	\$-1.1

Explanation of Change:

(U) The cost and schedule variances reported above are mainly due to problems experienced by subcontractors in the manufacture of Power Amplifiers (PA) for Transmit/Receive (T/R) modules. The T/R modules are subsystem parts included in the design of the CEC antenna.

(U) Contract Comments:

15. (U) Contract Information (Cont'd):

The first two (2) AN/USG-2 systems were delivered to the Navy in October and December 1999 in accordance with the terms of the contract. The delivery of a number of computer parts/accessories from subcontractors/vendors to the Raytheon Systems Company will delay subsequent production deliveries to the Navy. AN/USG-2 units (3) through (7) are projected to be delivered 1-2 months later than contract requirements. The equipment deliveries are scheduled for installation at Land Based Test Sites (LBTS); the Raytheon Systems Company (as Government Furnished Equipment); and the LPD-17 currently under construction.

The late deliveries to LBTS are to integrate CEC into the Distributed Engineering Plant (DEP) and is not expected to impact the CEC operational test schedule. The delayed delivery to the LPD-17 is within the scheduled installation period and will have no impact on the ship construction schedule.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-17)	<u>Total</u>
RDT&E	1212.6	180.0	119.3	191.8	1703.7
Procurement	216.5	154.3	55.9	1718.8	2145.5
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1429.1	334.3	175.2	1910.6	3849.2

b. Annual Summary -- CEC

Appropriation: 1319 - Research, Development, Test + Eval, Navy

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1995 Dollars Nonrec</u>	<u>Flyaway FY 1995 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				203.4	202.2
1995				151.8	153.8
1996				248.4	255.9
1997				215.1	224.3
1998				187.2	196.8
1999				169.3	179.6
2000				167.6	180.0
2001				109.4	119.3

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

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2002				44.4	49.1
2003				43.3	48.8
2004				40.8	46.9
2005				40.1	47.0
Subtotal	11			1620.8	1703.7

(U) a. The above RDT&E,N budget profile does not include funds appropriated by Congress for the integration of CEC with Space Based Infrared Sensors (SBIRS). The CEC/SBIRS integration effort is an expansion of the existing development effort and is not integral to development of CEC. The following amounts have been budgeted for CEC/SBIRS integration and are excluded from the above.

FY 1998        \$ 3.7 million  
 FY 1999        \$10.0 million

b. The above RDT&E budget profile also does not include additional FY 2000 funds of \$9.9 million appropriated by Congress for the Area Air Defense Commander (AADC) development program and added to the CEC program element/project.

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000	7		43.3	43.5	47.4
2001	5		17.8	18.0	19.9
2002	5		17.4	17.5	19.7
2003	5		17.2	17.3	19.9
2004	2		12.8	13.0	15.2
2005	2		12.7	12.9	15.4
2006	4		25.6	26.4	32.2
2007	4		25.6	25.9	32.2
2008	4		25.1	25.4	32.2
2009	4		24.6	24.9	32.2
2010	4		24.0	24.4	32.2
2011	4		23.5	23.9	32.2
2012	4		23.1	23.4	32.2
2013	4		22.6	23.0	32.2
2014	4		22.1	22.5	32.2
2015	4		21.7	22.1	32.2

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

Appropriation: 1506 - Aircraft Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2016	4		21.2	21.7	32.2
2017	5		26.0	26.6	40.3
Subtotal	75		406.3	412.4	532.0

Appropriation: 1611 - Shipbuilding and Conversion, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995			12.9	15.3	15.7
1996			9.6	10.6	11.0
1997					
1998	2		17.4	20.6	21.5
1999	1		12.9	15.3	15.7
2000	4		35.5	44.9	48.2
2001	2		15.0	18.9	20.5
2002	2		14.4	18.1	20.1
2003	4		35.7	44.3	49.6
2004	5		39.6	50.0	57.9
2005	5		39.8	50.1	58.6
2006	1		9.1	11.3	13.6
Subtotal	26		241.9	299.4	332.4

Appropriation: 1810 - Other Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1995 Dollars Nonrec	Flyaway FY 1995 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	5		58.9	67.1	70.9
1999	9		73.5	76.5	81.7
2000	3		52.5	54.2	58.7
2001			14.1	14.1	15.5
2002	11		100.1	101.9	113.8
2003	15		123.3	125.1	142.3
2004	8		93.9	95.6	110.9
2005	11		112.0	113.8	134.6
2006	25		170.0	171.9	207.4
2007	18		117.3	119.1	146.6
2008	15		120.8	122.6	153.9
2009			22.9	24.7	31.6
2010			8.3	10.1	13.2
Subtotal	120		1067.6	1096.7	1281.1



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

(U) There is no planned procurement quantity in FY 2001 or in FY 2009-10. The recurring flyaway costs reported in FY 2001 and FY 2009-10 are planned for the costs of installing AN/USG-2 (shipboard) systems procured in previous fiscal years.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	232		1715.8	3429.3	3849.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	11	11
Procurement	2	2

(U) Percent Total Program Quantities Delivered: 5.6%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 959.3

(U) Percent Total Program Expended: 24.9%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
The CEC O&S costs include applicable costs in accordance with CAIG Operating & Support Cost Estimating Guide of May 1995.

1. MISSION PERSONNEL: The costs of maintenance personnel defined in the CEC Navy Training Plan of December 1993 are included. The costs of operations personnel and other mission personnel are excluded since CEC requires no system specific operators or support personnel.

2. O, I, & D MAINTENANCE: Costs for labor, overhead, material, and repair parts projected to be performed at O, I and D-level maintenance activities have been included.

3. CONTRACTOR SUPPORT: Costs for interim contractor Integrated Logistics Support (ILS) pending establishment of organic Navy capabilities are included.

4. SUSTAINING SUPPORT: The costs of continuing engineering support and software maintenance projected for Navy in-house facilities have been included. Also included are costs to provide, operate and maintain CEC training equipment at projected training sites. Costs for support equipment,

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

and modification kit procurement/installation have not been included since there are no unique support equipment requirements and there are no currently planned modifications to CEC equipment.

5. PERSONNEL SUPPORT: Costs for initial training, permanent change of station (PCS) and medical support have been included. Training course costs for maintenance personnel are also included. There are no specific training course requirements for CEC operator personnel.

b. (U) Costs -- (FY 1995 Constant (Base-Year) Dollars in Millions)

Cost Element	Avg Annual Cost Per CEC Systems	Avg Annual Cost Per Antecedent System
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	0.4	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.3	0.0
Contractor Support	0.1	0.0
Sustaining Support	0.2	0.0
Indirect Costs	N/A	N/A
Total	1.0	0.0

# A-6 BRADLEY UPGRADE

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: BFVS A3 Upgrade

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Bradley Fighting Vehicle Systems (BFVS) M2A3/M3A3 Upgrade
2. DoD Component: Army
3. Responsible Office and Telephone Number:  
PEO, Ground Combat Support Systems COL Paul S. Izzo  
PM, Bradley Fighting Vehicle Systems Assigned: July 24, 1997  
ATTN: SFAE-GCSS-W-BV. DSN 786-5630; COMM (810) 574-5630  
Warren, MI 48397-5000 IZZOP@CC.TACOM.ARMY.MIL
4. Program Elements/Procurement Line Items:  
RDT&E:  
PE 23735 Project 2TT, 332, 371 (Shared)  
PROCUREMENT:  
APPN 2033 ICN G20900 (Army) (Shared)  
APPN 2033 ICN G80717 (Army)  
APPN 2033 ICN GE0163 (Army) (Shared)

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**5. References:**

SAR Baseline (Development Estimate):

AAE Approved Acquisition Program Baseline dated March 8, 1994.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated March 14, 2000.

**6. Mission and Description:**

The upgraded Bradley Fighting Vehicle (BFV), M2A3 Infantry Fighting Vehicle (IFV) and M3A3 Cavalry Fighting Vehicle (CFV) will facilitate enhanced command and control, provide greater lethality, provide mobile protected transport of an infantry squad to critical points on the battlefield and perform cavalry scout and other claimant (Bradley equipped Fire Support Teams) missions in the 21st century. Upgrades in this program include advanced technology in the areas of command and control, lethality, survivability, mobility, and sustainability required to defeat current and future threat forces while remaining operationally compatible with the main battle tank. The M2A3/M3A3 will provide overwatching fires to support the dismounted infantry, and suppress/defeat enemy tanks, reconnaissance vehicles, IFV, armored personnel carriers, bunkers, dismounted infantry, and attack helicopters. The infantry version (M2A3) of the A3 BFV is used most often to close with the enemy by means of fire and maneuver. The primary tasks performed by the cavalry version (M3A3) as part of a troop and/or squadron are reconnaissance, security, and flank guard missions. The Bradley Fire Support Team vehicle (BFIST) variant acquires targets and coordinates all indirect fire support assets.

**7. Executive Summary:**

The Bradley A3 effort is part of the overall Modernization program aimed at upgrading the existing fleet by correcting deficiencies identified in the Battlefield Development Plan, while accomplishing the intent of the Base Sustainment Program approved by the Secretary of Defense as part of the FY94 Amended Budget Submission. The BFVS is on the Department of the Army's Industrial Preparedness Planning List, making it essential to the Army combat needs to domestically remanufacture these vehicles. Acquisition Decision Memorandum (ADM) approval from Milestone II was received on March 29, 1994. The first prototype delivery was October 1, 1996.

The ADM for the M2/M3A3 Bradley Army System Acquisition Review Council (ASARC), signed on July 18, 1997, approved entry into Low Rate Initial Production (LRIP), updated BFVS A3 Exit Criteria for Milestone III, and designated PEO-GCSS as Milestone Decision Authority for the follow-on LRIP decision. The contract for the first year of A3 LRIP was signed with United Defense LP (UDLP) in July 1997, and the second year in November 1997.

The third year (FY99) of the Bradley A3 LRIP program was awarded to UDLP on December 21, 1998 for 73 additional A3 vehicles. The Bradley A3 multi year was then scheduled to begin in FY00 and was to be a three-year multi year effort. However, in September 1999, the CG, Army Test and Evaluation Command (ATEC)

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**7. Executive Summary (Cont'd):**

determined that the Bradley A3 was not ready for Initial Operational Test and Evaluation (IOT&E) and rescheduled the November 1999 IOT&E to 4th Quarter FY00. The primary reason for the delay was to provide additional time to integrate Embedded Battle Command (EBC) software with Bradley platform software. Subsequently, in November 1999, the Bradley shifted its digital command and control (C2) technical approach from EBC to hosting digital C2 (Force XXI Battle Command Brigade and Below (FBCB2)) on a separate processing unit that will interact with critical functions of the A3. This approach was designated Integrated Combat Command and Control (IC3). That change was consistent with the M1A2 SEP shift in approach and insures operational compatibility with the M1A2 SEP and other FBCB2 systems. Due to the shift in approach, and to allow adequate time for training, IOT&E was rescheduled to 1st Quarter FY01 and Milestone III subsequently delayed to 2nd Quarter FY01. This made it necessary to contract for an additional LRIP year for Bradley A3 production. The Army Acquisition Executive (AAE) signed an Acquisition Decision Memorandum (ADM) on December 22, 1999 authorizing PEO-GCSS to procure a total of 230 Bradley A3 vehicles within LRIP, which is approximately 20% of the Army Procurement Objective. The proposed multi year contract will now begin in FY01 and will be a three-year multi year (FY01-FY03).

The FY00 Appropriations Bill moved \$22M from the Procurement Appropriation to RDT&E to fund the program restructure. The bill also cut an additional \$12M from the Procurement Appropriation.

Live Fire Testing was completed in September 1999 with a total of eighteen shots conducted. No major issues have been identified from testing. Limited User Test (LUT) II was completed in August 1999 and results show positive performance for the A3.

**8. Threshold Breaches:**

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

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8. Threshold Breaches (Cont'd):

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milestone IV	JAN 1994	JAN 1994	JAN 1994
Development Contract Award	APR 1994	MAY 1994	MAY 1994
Preliminary Design Review	JUN 1994	MAR 1995	JUL 1995
Critical Design Review	OCT 1994	SEP 1995	JAN 1996
1st Low Rate Initial Production (LRIP Award)	FEB 1996	JUL 1997	JUL 1997
Pre Production Qualification Test (PPQT)			
Start	AUG 1995	OCT 1996	OCT 1996
Complete (Government)	MAY 1996	JUL 1997	JUL 1997
2nd LRIP Award	OCT 1996	MAY 1998	NOV 1997
PQT			
Start	NOV 1997	OCT 1998	DEC 1998
Complete	JUN 1998	JUL 1999	JUN 1999 (Ch-1)
1st LRIP Vehicle Deliveries	AUG 1997	OCT 1998	OCT 1998
3rd LRIP Award	OCT 1997	DEC 1998	DEC 1998
2nd LRIP Vehicle Deliveries	MAY 1998	AUG 1999	NOV 1999 (Ch-2)
Initial Operation Test & Evaluation (IOT&E)			
Start	FEB 1998	OCT 2000	OCT 2000 (Ch-3)
Complete	JUN 1998	NOV 2000	NOV 2000 (Ch-3)
First Unit Equipped (FUE)	SEP 1998	NOV 2000	NOV 2000 (Ch-4)
Milestone III	NOV 1998	MAR 2001	MAR 2001 (Ch-5)
3rd LRIP Vehicle Deliveries	MAY 2000	APR 2000	APR 2000

b. Current Change Explanations --

(Ch-1) Production Verification Test (PVT) (formerly PQT) changed from Nov 1999 to Jun 99 to reflect actual completion date of PVT Phase I.

(Ch-2) 2nd LRIP Vehicle deliveries changed from May 99 to Nov 99 to reflect actual deliveries.

(Ch-3) IOT&E start changed from Aug 00 to Oct 00 and complete changed from Sep 00 to Nov 00 to reflect current test plan and allow integration of Force XXI Battle Command Brigade and Below (FBCB2) into the Bradley platform.

(Ch-4) First Unit Equipped (FUE) changed from Aug 00 to Nov 00 as a result of the adjustment in IOT&E.

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9b. Schedule (Cont'd):

(Ch-5) Milestone III moved from Dec 00 to Mar 01 to accommodate the adjustment in IOT&E.

10. Performance Characteristics:

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
The command & control system must comply with the Army Standard Protocol	MIL-STD-188-220	MIL-STD-188-220	/ MIL-STD-188-220	MIL-STD-188-220	MIL-STD-188-220
The command & control system must communicate fully with the command and control system employed by the armored forces	Combined Arms Command and Control	Combined/ Arms Command and Control	/ Army Brigade and below	TBD	Future Battle Command and Below
<b>Lethality:</b> Command and Control: Improve the target acquisition and fire control system	Dual track and auto track with IBAS and CIV	Dual track and auto track with IBAS and CIV	/ Dual track and auto track with IBAS /	Dual track and auto track with IBAS	Dual track and auto track with IBAS
<b>Survivability:</b> NBC protection for dismount element while in vehicle	Ventilated face pieces	Ventilated face pieces	/ Ventilated face pieces	Ventilated face pieces	Ventilated face pieces
<b>Mobility:</b> Ability of the BFVS to navigate in all weather conditions with GPS (accuracy plus or minus in meters)	16	16	/ 16	16	16
The driver display will present navigational information	GPS information and map	GPS information and map	/ GPS information and map	GPS information	GPS information

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10a. Performance Characteristics (Cont'd):

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>	
Maintain cross-country mobility with main battle tank	M1A2 Tank	M1A2 Tank	/ M1A2 Tank	M1A2 Tank	M1A2 Tank	
RAM (Mean Miles Between Failure)	N/A	500	/ 400	411	411	(Ch-1)
Integrated Logistics Support:						
Systems fault isolation capability to provide unambiguous fault isolation to:	95	95	/ 95	TBD	95	
Mission critical Line Replaceable Units (LRU) (% of the time)						
Non-Mission critical LRUS (% of the time)	90	90	/ 90	TBD	90	

Acronyms:

NBC--Nuclear, Biological, and Chemical

GPS--Global Positioning System

RAM--Reliability, Availability, and Maintainability

Command and Control: Command and control functionality will be demonstrated during Initial Operational Test and Evaluation (IOT&E) in 1st quarter FY01.

Integrated Logistics Support: System fault isolation capability will be demonstrated in the A3 IOT&E 1st quarter FY01.

b. Current Change Explanations --

(Ch-1) Changed from 409 to 411 which was demonstrated during Production Verification Testing through June 1999.

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

a. Cost --	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Development (RDT&E)	394.1	478.2	478.3
Procurement	2703.2	3273.3	3321.3
Non-recurring	(27.9)		(18.0)
Recurring	(2476.8)		(2934.1)
Total Rollaway	(2504.7)		(2952.1)
Training Devices	(53.1)		(58.9)
Other	(58.2)		(157.7)
Total Other Wpn Sys	(111.3)		(216.6)
Peculiar Support	(40.1)		(60.8)
Initial Spares	(47.1)		(91.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1994 Base-Year \$	3097.3	3751.5	3799.6
Escalation	941.5	647.3	583.4
Development (RDT&E)	(31.4)	(26.8)	(26.8)
Procurement	(910.1)	(620.5)	(556.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	4038.8	4398.8	4383.0
b. Quantity --			
Development (RDT&E)	2	0	0
Procurement	<u>1600</u>	<u>1109</u>	<u>1109</u>
Total	1602	1109	1109

Note: Excludes 8 RDT&E prototypes from the SAR Baseline and 8 from the Current Estimate that are not considered fully configured.

Two fully configured vehicles originally planned to be funded by RDT&E have now been funded by the Procurement Appropriation.

The previously approved LRIP quantity was 126. The current approved LRIP quantity is 230, which exceeds 10% of the total procurement quantity due to Army reduction of A3s from 1602 to 1109 and to the additional year of LRIP caused by the delay of IOT&E.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

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BFVS A3 Upgrade, December 31, 1999

12. Unit Cost Summary:

	UCR Baseline (MAR 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1994 BY\$)	3751.5	3799.6	
(2) Quantity	1109	1109	
(3) Unit Cost	3.383	3.426	+1.27
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1994 BY\$)	3273.3	3321.3	
(2) Quantity	1109	1109	
(3) Unit Cost	2.952	2.995	+1.46

13. Cost Variance Analysis:

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

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	425.5	3613.3	-	4038.8
Previous Changes:				
Economic	-18.5	-365.7	-	-384.2
Quantity	-3.1	-1139.6	-	-1142.7
Schedule	-	+266.3	-	+266.3
Engineering	+1.0	+186.4	-	+187.4
Estimating	+88.1	+778.1	-	+866.2
Other	-	-	-	-
Support	-	+233.5	-	+233.5
Subtotal	+67.5	-41.0	-	+26.5
Current Changes:				
Economic	-0.4	-36.5	-	-36.9
Quantity	-	-	-	-
Schedule	+1.0	+73.7	-	+74.7
Engineering	+10.8	+93.2	-	+94.0
Estimating	+0.7	+184.4	-	+185.1
Other	-	-	-	-
Support	-	+0.8	-	+0.8
Subtotal	+12.1	+305.6	-	+317.7
Total Changes	+79.6	+264.6	-	+344.2
Current Estimate	505.1	3877.9	-	4383.0

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BFVS A3 Upgrade, December 31, 1999

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

Summary (FY 1994 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	394.1	2703.2	-	3097.3
Previous Changes:				
Quantity	-3.0	-763.7	-	-766.7
Schedule	-	+117.4	-	+117.4
Engineering	+0.9	+151.1	-	+152.0
Estimating	+74.9	+674.9	-	+749.8
Other	-	-	-	-
Support	-	+175.5	-	+175.5
Subtotal	+72.8	+355.2	-	+428.0
Current Changes:				
Quantity	-	-	-	-
Schedule	+0.8	+37.2	-	+38.0
Engineering	+9.9	+69.8	-	+79.7
Estimating	+0.7	+160.7	-	+161.4
Other	-	-	-	-
Support	-	-4.8	-	-4.8
Subtotal	+11.4	+262.9	-	+274.3
Total Changes	+84.2	+618.1	-	+702.3
Current Estimate	478.3	3321.3	-	3799.6

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.4
One additional year of fixed costs due to rescheduling of IOTE. (Schedule)	+0.8	+1.0
Increased cost due to introduction of IC3. (Engineering)	+9.9	+10.8
Adjustment for Current and Prior Inflation. (Estimating)	+0.4	+0.4
Increased cost required to conduct IOTE testing. (Estimating)	+9.0	+9.8
Adjustments due to actual prior year costs (Estimating)	-8.7	-9.5
RDT&E Subtotal	+11.4	+12.1
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-36.5
Change in annual procurement buy profile. (Schedule)	+37.2	+73.7
Addition of applique computer to support Force XXI Battle Command Brigade and Battalion (FBCB2) (Engineering)	+18.2	+21.7

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

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Additional Post Deployment Software Support (PDSS) to support FBCB2 (Engineering)	+51.6	+61.5
Adjustment for Current and Prior Inflation. (Estimating)	+3.8	+4.1
Elimination of multiyear savings in FY00 (Estimating)	+18.3	+20.3
Revised manufacturing standards (Estimating)	+39.8	+46.8
Revised acquisition strategy (Estimating)	+24.9	+29.4
Adjustment to actual prior year obligations (Estimating)	-3.6	-3.8
Increase to estimate of System Technical Support (STS) requirements (Estimating)	+37.7	+45.4
Increase to estimate of In-house costs (Estimating)	+22.7	+27.3
Increase to System Test & Evaluation (Estimating)	+4.3	+5.0
Revised estimates of contractor's costs (Estimating)	+12.8	+9.9
Adjustment for Current and Prior Inflation. (Support)	+0.3	+0.3
Change in estimated cost of Initial Spares (Support)	-1.5	-1.1
Change in Peculiar Support due to change in procurement profile (Support)	+7.2	+8.9
Change in Training Devices (Support)	-15.8	-17.4
Change in Other support costs due to change in procurement profile. (Support)	+5.0	+10.1
Procurement Subtotal	<u>+262.9</u>	<u>+305.6</u>

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes							PAUC Cur Est	
	Econ	Qty	Sch	Eng	Est	Oth	Spt		Total
2.52	-0.38	+0.09	+0.31	+0.25	+0.95	--	+0.21	+1.43	3.95

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14b. Unit Cost and Other History (Cont'd):

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.26	-0.36	-0.03	+0.31	+0.24	+0.87	--	+0.21	+1.24	3.50

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	JAN 1994	N/A	JAN 1994
Milestone III	N/A	NOV 1998	N/A	MAR 2001
FUE/IOC	N/A	SEP 1998	N/A	NOV 2000
Total Cost	N/A	4038.8	N/A	4383
Total Quantity	N/A	1602	N/A	1109
Prog Acq Unit Cost	N/A	2.52	N/A	3.95

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

a. Procurement --

A3 Production Contract:  
 United Defense L.P., York,, PA  
 DAAEO796CX036, FFP  
 Award: July 25, 1997  
 Definitized: July 25, 1997

Initial Contract Price		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$66.2	N/A	35

Current Contract Price

<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
\$228.8	N/A	126

Estimated Price At Completion	
<u>Contractor</u>	<u>Program Manager</u>
\$228.8	\$228.8

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

Contract Comments:

Contract price increased to \$228.8M due to addition of non-recurring costs and LRIP vehicle configuration change.

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

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

<u>Appropriation</u>	<u>Prior Years</u> (FY94-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	480.3	24.8	-	-	505.1
Procurement	575.2	322.8	396.9	2583.0	3877.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>1055.5</b>	<b>347.6</b>	<b>396.9</b>	<b>2583.0</b>	<b>4383.0</b>

b. Annual Summary -- BFVS A3 Upgrade

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Rollaway FY 1994 Dollars Nonrec</u>	<u>Rollaway FY 1994 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1994				60.3	61.2
1995				74.4	77.0
1996				111.3	117.2
1997				82.1	87.4
1998				71.5	76.7
1999				56.1	60.8
2000				22.6	24.8
<b>Subtotal</b>				<b>478.3</b>	<b>505.1</b>

Appropriation: 2033 - Proc of Weapons & Tracked Combat Veh

<u>Fiscal Year</u>	<u>Qty</u>	<u>Rollaway FY 1994 Dollars Nonrec</u>	<u>Rollaway FY 1994 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1997	35	9.7	148.5	160.2	172.2
1998	18	0.2	99.3	103.3	112.1
1999	73	8.1	240.3	266.3	290.9
2000	80		256.6	291.3	322.8
2001	109		294.4	353.3	396.9
2002	142		346.0	361.4	412.8
2003	142		336.7	350.8	408.3
2004	130		318.1	353.7	420.0
2005	143		332.3	345.0	417.8
2006	119		288.1	310.3	383.3
2007	118		273.8	304.1	383.1
2008				64.2	82.5
2009				57.4	75.2
<b>Subtotal</b>	<b>1109</b>	<b>18.0</b>	<b>2934.1</b>	<b>3321.3</b>	<b>3877.9</b>

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BFVS A3 Upgrade, December 31, 1999

16b. Program Funding Summary (Cont'd):

	Qty	Rollaway Dollars Nonrec	Rollaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1109	18.0	2934.1	3799.6	4383.0

17. Delivery/Expenditure Information:

a. Deliveries To Date	Plan	Actual
RDT&E	0	0
Procurement	50	42

Percent Total Program Quantities Delivered: 3.8%

b. Total Expenditures To Date (In Millions of Dollars): \$ 816

Percent Total Program Expended: 18.6%

Eight non-fully configured prototype EMD vehicles have also been delivered.

Vehicle production deliveries have met all PVT and IOTE delivery requirements. A contract mod to adjust the contract delivery schedule to match the current plan which supports current training and fielding milestones is in process.

18. Operating and Support Costs:

a. Assumptions and Ground Rules --  
 Operation and support costs reflect world wide regular Army activity and are presented as an estimate of the average annual cost per fielded M2A3 and M3A3. These costs assume the average operating tempo of 874 miles per year (for the M2A3). The source for this cost estimate is the A3 Army Cost Position (ACP), dated July 1997.

The source for the M2/M3 A2 data is the October 97 Operating and Support Management Information System (OSMIS).

b. Costs -- (FY 1994 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost/Veh Reg Army M2A3/M3A3	Avg Annual Cost/Veh M2A2/M3A2
Mission Pay & Allowances	194.9	194.9
Unit Level Consumption	44.7	24.2
Intermediate Maintenance	0.6	0.6

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18b. Operating and Support Costs (Cont'd):

b. Costs -- (FY 1994 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost/Veh Reg Army M2A3/M3A3	Avg Annual Cost/Veh M2A2/M3A2
Depot Maintenance	1.9	15.4
Contractor Support	5.4	0.0
Sustaining Support	8.9	0.0
Indirect Costs	6.8	2.8
Total	263.2	237.9

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SELECTED ACQUISITION REPORT (RCS: DD-A&T (Q&A) 823)  
PROGRAM: MCS

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

AS OF DATE: Dec 1999

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1. Designation and Nomenclature (Popular Name): MANEUVER CONTROL SYSTEM (MCS)

2. DoD Component: Army

3. Responsible Office and Telephone Number:

PM-ATCCS, SPAE-C3S-AT  
FORT MONMOUTH, NJ 07703-5405

COL STEPHEN HORNER  
Assigned: August 25, 1999  
DSN 992-4041; COMM 732-532-4041  
shorner@c3smail.monmouth.army.mil

4. Program Elements/Procurement Line Items:

RDT&E:  
PE 23740 (Shared) Project D2HT, D484  
PROCUREMENT:  
APPN 2035 ICN BA9320 (Army)  
APPN 2035 ICN BA9710 (Army)  
APPN 2035 ICN BS9710 (Army)

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**5. References:**

MCS BLOCKS I, II & III

SAR Baseline (Development Estimate):

AAE Approved Acquisition Program Baseline dated October 16, 1989.

Approved Program:

Interim Approved Acquisition Program Baseline (APB) dated January 6, 1999.

MCS BLOCK IV

SAR Baseline (Development Estimate):

DAE Approved Acquisition Program Baseline dated December 19, 1997.

Approved Program:

Interim Approved Acquisition Program Baseline (APB) dated January 6, 1999.

**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 Tactical Command and Control System (ATCCS). 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 TCP/AC were transitioned with currently fielded software Version 10.03.1G1, from OPM OPTADS to the Communications-Electronics Command (CECOM) on Oct 4, 1992. The NDI equipment (TCP/AC) will be replaced by Common Hardware (CH). CH is composed of CHS-2 computers which will exceed the capability and the processing of the TCP/AC. These devices are to be fielded to all US Army

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6. Mission and Description (Cont'd):

Tactical Units. They are smaller and lighter and provide ease of transportability to all ATCCS users.

7. Executive Summary:

In 1980, the first elements of the MCS were fielded to VII Corps in Europe, which consisted of Engineering models of the AN/UYQ-30 Tactical Computer Terminal (TCT) with a limited Command, Control and Communications (C3) capability. In 1981 the system was enhanced with additional TCTs and increased software C3 capabilities. In 1982, the MCS program was continued by awarding a MCS System Engineering/Integration and Software Development contract which was awarded to Ford Aerospace and Communication Corporation (FACC). This five year effort continued the MCS evolutionary development. By 1986 the software had evolved to Version 9, was written in Ada, fielded with production TCTs in Europe, and ported to the Tactical Computer Processor (TCP) prototype. In 1986 the production contract for the AN/UYQ-43 (V)1/(V)2 TCP/AC Non- Developmental Item (NDI) was awarded. In 1987 the second five year evolutionary development effort was awarded to FACC (which became Loral Command and Control Systems) for the software effort and a separate contract was awarded to TRW for the system engineering/integration effort. Under these efforts, Version 10 software was completed, and fielded in 1989.

MCS Version 11 software development effort was continued under Loral. However, Loral experienced significant delays in their development effort. As a result, there was little confidence in Loral's ability to deliver Version 11 without further schedule slips and cost growth. The decision was made by the Army to discontinue funding the contract. The Army decided the MCS requirements could best be satisfied by an alternative other than continuing the Loral contract effort. The decision to discontinue the development contract beyond the current target contract price, was approved by the Army Acquisition Executive via a memorandum dated February 24, 1993.

A restructured MCS program strategy was presented to and approved in concept by the OSD C3I Committee on March 11, 1993. OSD formal approval was received via an Acquisition Decision Memorandum (ADM) dated April 6, 1993. The revised approach to complete Block III development is described as MCS Version 12.0. Version 12.0 is a rapid prototype effort which relies on Common Hardware, and a foundation of Common Operating Environment (COE) to support stand alone applications which provide an initial maneuver control capability, supports horizontal interoperability testing with other BFA control systems, and exploits reusable software from MCS Version 11.0.

In August 1994 MCS V12.0 successfully completed an Integrated Interoperability Demonstration (as an MCS Operational Assessment) which was included as a part of the ATCCS level testing at Fort Hood, Texas. The MCS Operational Requirements Document (ORD) (October 26, 1992) remains valid for Block III, Version 12.0. The PEO C3S directed the PM OPTADS to replan the program on December 22, 1994, due to the continued delays in the CHS-2 hardware contract award. This direction required substituting a Limited User Test (LUT) for the the IOT&E. Also, the program was to proceed toward a Low Rate Initial

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**7. Executive Summary (Cont'd):**

Production (LRIP) decision to procure CHS-2 hardware to be used for the MCS IOT&E. This program strategy was subsequently solidified when the MCS program came under the Integrated Product Team process in May 1995. The MCS ORD for Block IV was approved November 15, 1995.

The MCS Block IV contract was awarded to Lockheed Martin Corporation Management and Data Systems Division on September 26, 1996. The Block IV effort is basically a combat developer approved sequencing of pre-planned product improvements to the Block III baseline functionality, providing application and functionality enhancements which reside on the Defense Information Infrastructure Common Operating Environment (DII COE) software infrastructure in line with the migration plan for compliance with the Army Technical Architecture (ATA). Block III application software will be considered as candidate reuse software by the Block IV contractor to satisfy a portion of the overall Block IV functional requirements. Block IV encompasses development of MCS software versions 12.1, 12.2 and 12.3 and fielding of this upgraded functionality to the Army, upon being successfully tested via an Operational Assessment/Operational Test (OA/OT). Software enhancements in Version 12.1 through 12.3 include developing and analyzing basic course of action, tools, war gaming, and embedded training at the operator and staff section level.

On November 22, 1996, a C3I Systems Overarching Integrated Product Team (OIPT) met to review the Army's request to procure hardware, prior to Milestone III for the training base. The Army proposed equipping the training base with MCS in two phases. An Acquisition Decision Memorandum was signed on January 24, 1997 authorizing the Army to acquire initial LRIP quantities of 81 CHS-2 systems for operational assessment in the training base. A DOT&E directed operational assessment on the training base was conducted in May 1997 using these 81 systems with the available MCS Block III software; the assessment concluded that MCS Block III is suitable for use in the TRADOC training base. The MCS IOT&E will be completed prior to a Milestone III decision to field MCS to operational units. The IOT&E can make use of the results of the Limited User Test and the training base operational assessment.

In March 1997, the MCS Block III software was successfully used in Task Force XXI Army Warfighting Experiment (AWE). The lessons that were learned during Task Force XXI AWE, were successfully implemented in software modifications which were used in the Division AWE. MCS Block III, was part of the Army Battle Command System software baseline, which was used during Division AWE in November 1997. This demonstrated the tremendous operational potential of digital technology in achieving Information Dominance. A System Stress Test, of MCS Block III, was held at the Consolidated Technical Support Facility, Ft. Hood, TX in December 1997. This test demonstrated developmental test exit and operational test entrance criteria. The results supported proceeding to the Initial Operational Test and Evaluation in June 1998. The latest MCS Acquisition Decision Memorandum (ADM) was signed on July 16, 1997, authorizing the Army to extract the training base content from the MCS program. In FY 1997 and FY 1998, \$6.0M and \$15.7M, respectively, were extracted from the MCS Acquisition Program Baseline (APB) along with 207 High Capacity Unit (HCU)

7. Executive Summary (Cont'd):

Vls, reducing the quantity from 3156 to 2949.

In June 1998, MCS Block III IOT&E was successfully conducted at Fort Hood, Texas. The IOT&E results were positive with OPTEC recommending Block III be fielded to First Digital Corps (FDC). MCS Block III Y2K certification package was completed 23 December 1998, approved by PEO C3S and forwarded to Y2K authorities. Block III is used for training experiences. Block IV is synchronized with ABCS spiral development efforts for FDD and FDC.

For this period, the DAE approved the changes in the MCS program acquisition strategy, under which the program will continue in EMD. The R&D will be dedicated to support Block IV software development, in accordance with the ADM signed 5 Aug 1999. The ADM authorizes the Army to purchase and support with procurement funds Common Hardware/Software II computers to be used for MCS Block IV development, including participation in those aspects of the Army Experimentation Campaign Plan (AECF) that are essential to MCS development and for operational testing. Block IV is the software to be fielded and is synchronized with ABCS spiral development efforts for FDD and FDC.

This may be the final SAR for this program since the Blocks I, II, III are 100% complete, and the Block IV is below major defense acquisition program dollar thresholds.

8. Threshold Breaches:

MCS BLOCKS I, II & III

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

8. Threshold Breaches (Cont'd):

MCS BLOCK IV

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	Yes
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. Explanation of Breach:

A revised APB has been submitted correcting these breach's. Approval is expected in April 2000.

9. Schedule:

MCS BLOCKS I, II & III

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
BLOCK I			
AN/UYQ-30/30A			
Milestone III ASARC	MAY 83	MAY 83	MAY 1983
Initial Prod Contract Award	JUN 83	N/A	N/A
First Prod Del Initial Contr	FEB 85	N/A	N/A
Follow-on Prod Contr Award	AUG 86	N/A	N/A
FUE/IOC	SEP 86	SEP 86	SEP 1986
Version 9 Software Release	SEP 86	SEP 86	SEP 1986
User Follow-on Test & Eval I	APR 87	APR 87	APR 1987
First Prod Deliv Follow Contr	NOV 87	N/A	N/A
BLOCK II			
AN/UYQ-43 (V)1&(V)2			
IPR Approval	JUN 86	JUN 86	JUN 1986
Initial Production Contract Award	JUN 87	N/A	N/A
First Article Test Start	MAY 88	MAY 88	MAY 1988

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9a. Schedule (Cont'd):  
MCS BLOCKS I, II & III

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Complete	SEP 88	SEP 88	SEP 1988
Production Contract Option Award	SEP 88	N/A	N/A
Version 10 Software Release	OCT 88	OCT 88	OCT 1988
First Prod Deliv Initial Contr	FEB 89	N/A	N/A
FUE\IOC	APR 89	APR 89	APR 1989
First Prod Deliv Prod Option	JUN 89	N/A	N/A
Field Validation	AUG 89	AUG 89	AUG 1989
BLOCK III			
AN/TYQ-45 (CHS)			
CHS Software Verification Test	MAY 91	N/A	N/A
FUE/IOC	NOV 91	N/A	N/A
Follow-on Test & Evaluation	JAN 92	N/A	N/A
Milestone III ASARC	MAY 92	N/A	N/A
First MCS Prod Buy of CHS	JUN 92	N/A	N/A
First Production Deliveries	OCT 92	N/A	N/A
Software Releases			
Version 9	SEP 86	N/A	N/A
Version 10	OCT 88	N/A	N/A
Version 11 (30/30A & 43 (V) 1&2)	NOV 90	N/A	N/A
Version 11 (CHS)	SEP 91	N/A	N/A
First CHS Prototype Delivery (Build I)	DEC 88	DEC 88	DEC 1988
MCS Version 12.0			
MCS Integration and Validation Compliance Test	N/A	SEP 93	SEP 1993
MCS V12.0 Operational Assessment	N/A	AUG 94	AUG 1994

b. Current Change Explanations -- None

MCS BLOCK IV

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
BLOCK III			
MCS VERSION 12.01			
Limited User Test (LUT)	N/A	NOV 96	NOV 1996
System Segment Acceptance Test -1	N/A	FEB 96	FEB 1996
Low Rate Initial Production (LRIP)	N/A	FEB 97	FEB 1997
IOT&E			
Start	N/A	JUN 98	JUN 1998
Completed	N/A	JUL 98	JUL 1998
MILESTONE III DAB			
Issue V12.01 to the Field	N/A	FEB 99	N/A (Ch-1)
IOC	N/A	MAR 99	N/A (Ch-1)
		FEB 00	N/A (Ch-1)
BLOCK IV			
AN/TYQ-45 (CHS)			

9a. Schedule (Cont'd):  
MCS BLOCK IV

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Award MCS Contract	N/A	SEP 1996	SEP 1996 (Ch-3)
PEO C3S Target for 4ID Upgrade	N/A	N/A	SEP 2000 (Ch-2)
IOT&E	N/A	N/A	
Start	N/A	N/A	OCT 2001 (Ch-3)
Complete	N/A	N/A	NOV 2001 (Ch-3)
MS III	N/A	N/A	MAY 2002 (Ch-3)
FUE	N/A	N/A	FEB 2003 (Ch-3)
PEO C3S Target for III Corps Upgrade	N/A	N/A	APR 2004 (Ch-2)

b. Current Change Explanations --

(Ch-1) Due to a change in MCS program acquisition strategy, milestones for the DAB, V12.01 issued to the field, and IOC are no longer applicable for Block III.

(Ch-2) These milestones have been renamed.

	From	To
Block IV		
FDD	FDD	PEO C3S Target for 4ID Upgrade
FDC	FDC	PEO C3S Target for III Corps Upgrade

(Ch-3) These milestones were added to the APB to be approved in April 2000 and did not appear in the previous SAR.

10. Performance Characteristics:

MCS BLOCKS I, II & III

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
BLOCK I				
AN/UYQ-30/30A				
100% Memory Retention during power fluc/loss (at least xx mins)	5	5 / 5	10	5
Purge Memory (within xx mins)	3	3 / 3	1.57	3



10a. Performance Characteristics (Cont'd):  
MCS BLOCKS I, II & III

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
Mean Time to Repair (hrs)				
Organizational	.5	.5 / .5	.5	.5
Direct Support	2.0	2.0 / 2.0	2.0	2.0
Reliability (hrs)				
AN/UYQ-30/30A TCT	433	433 / 433	433	433
AN/UYQ-30/30A TCT'	310	310 / 310	310	310
Operational Availability (Ao)				
AN/UYQ-30 TCT	.88	.88 / .88	.88	.88
AN/UYQ-30 TCT'	.84	.84 / .84	.84	.84
BLOCK II				
AN/UYQ-43 (V)1 & (V)2				
100% Memory Retention during power fluc/loss (at least xx mins)	5	5 / 5	10	5
Emergency Purge Memory (within xx mins)	3	3 / 3	1.32	3
Mean Time to Repair Organizational (Hr)	.5	.5 / .5	.5	.5
Operational Availability (Ao)	.76	.76 / .76	.76	.76

b. Current Change Explanations --  
None

The Dec 94 SAR added performance parameters, which represented the PEO CCS directed re-planned program and were consistent with DA2028 changes that updated the MCS ORD for Block IV.

10a. Performance Characteristics (Cont'd):  
MCS BLOCK IV

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
BLOCK III					
AN/TYQ-45 (CHS)					
100% Memory Retention During Power Fluc/loss (at least xx mins)	5	N/A	/ N/A	TBD	N/A
Purge Memory (within xx mins)	3	N/A	/ N/A	TBD	N/A
Mean Time to Repair Organizational (hr)	.5	N/A	/ N/A	TBD	N/A
Situation Awareness					
Integrity of Common Picture (%)	N/A	95	/ 85	TBD	95
Between Div and Corps Main (sec)	N/A	7200	/ 7200	TBD	7200
Between Adjacent Echelons or Among TAC/Main/Rear w/i an Echelon (sec)	N/A	3600	/ 3600	TBD	3600
Interoperability					
Direct Data Exchange Integrity IAW Applicable UIRs (%)	N/A	95	/ 85	TBD	95
Continuity of Operations					
Commander's Situation Report Availability					
After:					
Planned Outage (min)	N/A	90	/ 90	TBD	90
Unplanned Outage (min)	N/A	180	/ 180	TBD	180
Operational Availability (Ao)	.88	.88	/ .76	TBD	.88
BLOCK IV					
AN/TYQ-45/53 (CHS)					

10a. Performance Characteristics (Cont'd):  
MCS BLOCK IV

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
100% Memory Retention during Power fluc/loss (at least xx mins)	5	N/A	/ N/A	TBD	N/A
Purge Memory (within xx mins)	3	N/A	/ N/A	TBD	N/A
Mean Time to Repair Organizational (hr)	.5	N/A	/ N/A	TBD	N/A
Situation Awareness Integrity of: "Common Picture" (assumes COE compliant input from external sources) (%)	N/A	100	/ 95	TBD	100
Between Army and Joint Echelons (sec)	N/A	8	/ 1800	TBD	8
Adjacent Army and Joint Echelons (sec)	N/A	8	/ 900	TBD	8
Within Army and Joint Echelons (sec)	N/A	8	/ 900	TBD	8
Interoperability Direct data exchange integrity IAW DoD COE Standards (%)	N/A	100	/ 95	TBD	100
Continuity of Operations (hr) Commander's Situation Report Availability After: Planned Outage (min)	N/A	15	/ 30	TBD	15
Unplanned Outage (min)	N/A	45	/ 60	TBD	45

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10a. Performance Characteristics (Cont'd):  
MCS BLOCK IV

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Operational Availability (Ao)	.88	.88 / .76	TBD	.88

b. Current Change Explanations -- None

11. Total Program Cost and Quantity (Dollars in Millions):  
MCS BLOCKS I, II & III

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. Cost --			
Development (RDT&E)	152.1	194.1	220.7
Procurement	266.4	266.2	290.5
Flyaway	(235.7)		(240.6)
Other Wpn System Costs			(0.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(30.7)		(49.9)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1980 Base-Year \$	<u>418.5</u>	<u>460.3</u>	<u>511.2</u>
Escalation	187.7	291.0	266.8
Development (RDT&E)	(56.1)	(119.4)	(113.9)
Procurement	(131.6)	(171.6)	(152.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	<u>606.2</u>	<u>751.3</u>	<u>778.0</u>

LRIP quantities in FY97 are 81 HCU Vls.

b. Quantity --

Development (RDT&E)	0	0	0
Procurement	<u>2002</u>	<u>2002</u>	<u>2002</u>
Total	<u>2002</u>	<u>2002</u>	<u>2002</u>

A unit of measure equates to a mixture of two generations of MCS equipment, Mil Spec TCT/TCT' and the NDI equipment TCP and AC.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

MCS, December 31, 1999

11a. Total Program Cost and Quantity (Cont'd):

MCS BLOCK IV

a. Cost --	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	63.1	65.1	101.4
Procurement	279.1	70.0	447.2
Flyaway	(215.6)		(282.5)
Other Wpn System Costs			(122.1)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(63.5)		(42.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1980 Base-Year \$	<u>342.2</u>	<u>135.1</u>	<u>548.6</u>
Escalation	323.7	152.8	729.4
Development (RDT&E)	(67.0)	(69.3)	(96.0)
Procurement	(256.7)	(83.5)	(633.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	<u>665.9</u>	<u>287.9</u>	<u>1278.0</u>
b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>4567</u>	<u>947</u>	<u>5776</u>
Total	4567	947	5776

A unit of measure equates to one MCS Tactical High Capacity Computer Suite including installation kits, peripherals and common off-the-shelf software and one MCS Lightweight Computer Unit (LCU). No LRIP approved for Block IV.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

MCS, December 31, 1999

12. Unit Cost Summary:

MCS BLOCKS I, II & III

	UCR Baseline (DEC 1997 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1980 BY\$)	460.3	511.2	
(2) Quantity	1798	2002	
(3) Unit Cost	0.256	0.255	-0.39
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1980 BY\$)	266.2	290.5	
(2) Quantity	1798	2002	
(3) Unit Cost	0.148	0.145	-2.03

MCS BLOCK IV

	UCR Baseline (DEC 1997 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1980 BY\$)	135.1	548.6	
(2) Quantity	947	5776	
(3) Unit Cost	0.143	0.095	-33.57
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1980 BY\$)	70.0	447.2	
(2) Quantity	947	5776	
(3) Unit Cost	0.074	0.077	+4.05

13. Cost Variance Analysis:  
MCS BLOCKS I, II & III

a. Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	208.2	398.0	-	606.2
Previous Changes:				
Economic	-6.2	-	-	-6.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+83.0	-	-	+83.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+76.8	-	-	+76.8
Current Changes:				
Economic	-	-	-	-
Quantity	-	+4.6	-	+4.6
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+49.6	+4.2	-	+53.8
Other	-	-	-	-
Support	-	+36.6	-	+36.6
Subtotal	+49.6	+45.4	-	+95.0
Total Changes	+126.4	+45.4	-	+171.8
Current Estimate	334.6	443.4	-	778.0

Summary (FY 1980 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	152.1	266.4	-	418.5
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+42.0	-	-	+42.0
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+42.0	-	-	+42.0
Current Changes:				
Quantity	-	+2.5	-	+2.5
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+26.6	+2.4	-	+29.0
Other	-	-	-	-
Support	-	+19.2	-	+19.2
Subtotal	+26.6	+24.1	-	+50.7
Total Changes	+68.6	+24.1	-	+92.7
Current Estimate	220.7	290.5	-	511.2

This end item, Block I, II and III, is considered 100% fielded and there will

**13a. Cost Variance Analysis (Cont'd):**  
**MCS BLOCKS I, II & III**

be no future reporting.

b. Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised estimate to reflect transfer of Block III B costs to first end item (Block I, II and IIIa). (Estimating)	+26.6	+49.6
	RDT&E Subtotal	<u>+26.6</u>	<u>+49.6</u>
(2)	<u>Procurement</u>		
	Revised estimate to reflect transfer of Block III B costs to first end item (Block I, II and IIIa). (Estimating)	+2.4	+4.2
	Revised estimate to reflect transfer of Block III B support costs to first end item (Block I, II and IIIa). (Support)	+19.2	+36.6
	Revised estimate to reflect transfer of Block III B quantities of 204 units to first end item (Block I, II and IIIa). (Quantity)	+2.5	+4.6
	Procurement Subtotal	<u>+24.1</u>	<u>+45.4</u>



13. Cost Variance Analysis (Cont'd):

MCS BLOCK IV

a. Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	130.1	535.8	-	665.9
Previous Changes:				
Economic	-10.5	+37.2	-	+26.7
Quantity	-	+978.2	-	+978.2
Schedule	-	+482.3	-	+482.3
Engineering	-	+289.8	-	+289.8
Estimating	+121.2	-1798.2	-	-1677.0
Other	-	-	-	-
Support	-	+199.2	-	+199.2
Subtotal	+110.7	+188.5	-	+299.2
Current Changes:				
Economic	+0.8	-12.1	-	-11.3
Quantity	-	-38.2	-	-38.2
Schedule	-	+7.2	-	+7.2
Engineering	-	-	-	-
Estimating	-44.2	+77.8	-	+33.6
Other	-	-	-	-
Support	-	+321.6	-	+321.6
Subtotal	-43.4	+356.3	-	+312.9
Total Changes	+67.3	+544.8	-	+612.1
Current Estimate	197.4	1080.6	-	1278.0

13a. Cost Variance Analysis (Cont'd):  
MCS BLOCK IV

Summary (FY 1980 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	63.1	279.1	-	342.2
Previous Changes:				
Quantity	-	+402.0	-	+402.0
Schedule	-	-24.5	-	-24.5
Engineering	-	+150.2	-	+150.2
Estimating	+60.4	-565.4	-	-505.0
Other	-	-	-	-
Support	-	+80.2	-	+80.2
Subtotal	+60.4	+42.5	-	+102.9
Current Changes:				
Quantity	-	-15.7	-	-15.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-22.1	+35.2	-	+13.1
Other	-	-	-	-
Support	-	+106.2	-	+106.2
Subtotal	-22.1	+125.7	-	+103.6
Total Changes	+38.3	+168.2	-	+206.5
Current Estimate	101.4	447.3	-	548.7

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-1.2
Economic adjustment for negative program change. (Economic)	N/A	+2.0
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.4
Revised estimate to reflect transfer of Block IIIB estimating costs to first end item (Block I, II and IIIa). (Estimating)	-26.6	-49.6
A revised estimate increases RDT&E for Block IV development. (Estimating)	+4.2	+5.0
RDT&E Subtotal	-22.1	-43.4
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-10.4
Economic adjustment for negative program change. (Economic)	N/A	-1.7

13b. Cost Variance Analysis (Cont'd):  
MCS BLOCK IV

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Total Quantity Variance associated with decrease of 514 units from 6290 to 5776, which includes transfer of Block IIIb 204 to 1st end item. (Quantity)	-15.7	-38.2
Stretchout of annual procurement buy profile. (Schedule)	0.0	+7.2
Adjustment for Current and Prior Inflation. (Estimating)	-0.1	-0.1
New funding requirement to pay for hardware replacement, due to increase in hardware technology after 10 years. (Estimating)	+28.3	+58.7
Revised estimate to reflect transfer of Block IIIB costs to first end item (Block I, II and IIIa). (Estimating)	-2.4	-4.2
Adjustment for Current and Prior Inflation. (Support)	+0.3	+0.4
Increase in requirements for Initial Spares to support the 10 year rebuy. (Support)	+22.7	+63.0
A revised estimate resulting from a change in MCS requirements and methodology for ICS, TPF and NETT and for a 10 year rebuy. (Support)	+111.8	+318.2
Revised estimate to reflect transfer of Block IIIB support costs (ICS, TPF and NETT to first end item (Block I, II and IIIa). (Support)	-19.2	-36.6
A correction to align flyaway and support costs. (Support)	0.0	0.0
(Estimating)	-9.4	-23.4
	+9.4	+23.4
Procurement Subtotal	+125.7	+356.3

14. Unit Cost and Other History (Then-Year Dollars in Millions):  
MCS BLOCKS I, II & III

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.30	--	--	--	--	+0.07	--	+0.02	+0.09	0.39

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.20	--	--	--	--	--	--	+0.02	+0.02	0.22

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	MAY 1983	N/A	N/A
FUE/IOC	N/A	SEP 1986	N/A	SEP 1986
Total Cost	N/A	606.2	N/A	778
Total Quantity	N/A	1798	N/A	2002
Prog Acq Unit Cost	N/A	0.34	N/A	0.39

May 1983 represents Block I, Milestone III.

MCS BLOCK IV

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.15	--	+0.13	+0.08	+0.05	-0.28	--	+0.09	+0.07	0.22

14b. Unit Cost and Other History (Cont'd):  
MCS BLOCK IV

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.12	--	+0.15	+0.08	+0.05	-0.30	--	+0.09	+0.07	0.19

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	MAY 2002
FUE/IOC	N/A	N/A	N/A	JUN 2002
Total Cost	N/A	665.9	N/A	1278
Total Quantity	N/A	4567	N/A	5776
Prog Acq Unit Cost	N/A	0.15	N/A	0.22

15. Contract Information (Then-Year Dollars in Millions):

a. RDT&E -- Maneuver Control System: LOCKHEED MARTIN CORP, TINTON FALLS NJ DAAB07-96-C-E008, CPAF Award: September 26, 1996 Definitized: N/A	Initial Contract Price <u>Target</u> <u>Ceiling</u> <u>Qty</u>
	\$63.1      \$95.1      1
Current Contract Price <u>Target</u> <u>Ceiling</u> <u>Qty</u>	Estimated Price At Completion <u>Contractor</u> <u>Program Manager</u>
\$85.7      \$85.7      9	\$92.3      \$92.3
Previous Cumulative Variances	<u>Cost Variance</u> <u>Schedule Variance</u>
Cumulative Variances To Date	\$0.0      \$0.0
Net Change	\$-0.7      \$-1.0
	\$-0.7      \$-1.0

Explanation of Change:

- Variances are attributable to diversion of resources for:
1. Extended integration activity at Central Test Support Facility (CTSF) at Fort Hood, Texas, due to unanticipated efforts to overcome complex inter dependencies of infrastructure (foundation) software and mission application products.
  2. Support to Army and DoD sponsored demonstrations and events such as

15. Contract Information (Cont'd):

AUSA and MILCOM 2000.

3. Delays associated with finally deliver of GF Products.

Contract Comments:

Current Contract Price is for the CPAF portion of the contract only.

Initial Contract Price reflects the modification to incorporate the First Digitized Division (FDD) implementation plan. The MCS Block IV contract is aligned with the PEO C3S ABCS schedule. The Estimated Price at Completion differs from the Current Contract Price because a modification to the contract is anticipated to capture changes necessary as a result of confirming to the PEO C3S way of doing business. This includes demonstration participation such as AUSA and MILCOM, CTSF integration support supporting user juries and providing training support for the ABCS community, as well as incorporating multiple drops of COE.

16. Program Funding Summary (Current Estimate in Millions of Dollars):

Total Program

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY80-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-23)</u>	<u>Total</u>
RDT&E	391.4	45.8	48.9	45.9	532.0
Procurement	443.4	24.9	22.9	1032.8	1524.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	834.8	70.7	71.8	1078.7	2056.0

MCS BLOCKS I, II & III

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY80-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete</u>	<u>Total</u>
RDT&E	334.6	-	-	-	334.6
Procurement	443.4	-	-	-	443.4
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	778.0	-	-	-	778.0

16a. Program Funding Summary (Cont'd):

MCS BLOCK IV

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY96-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-23)	<u>Total</u>
RDT&E	56.8	45.8	48.9	45.9	197.4
Procurement	-	24.9	22.9	1032.8	1080.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	56.8	70.7	71.8	1078.7	1278.0

b. Annual Summary -- MCS BLOCKS I, II & III

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1980 Dollars Nonrec</u>	<u>Flyaway FY 1980 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1980				8.5	9.0
1981				13.2	15.2
1982				13.6	16.6
1983				15.7	19.9
1984				12.6	16.5
1985				23.5	31.8
1986				8.6	11.9
1987				8.8	12.6
1988				9.4	14.0
1989				7.7	11.9
1990				7.0	11.3
1991				10.6	17.8
1992				21.5	36.8
1993				15.3	26.8
1994				8.9	15.9
1995				9.3	17.0
1996				12.1	22.4
1997				9.2	17.3
1998				5.2	9.9
Subtotal				220.7	334.6

Appropriation: 2035 - Other Procurement, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1980 Dollars Nonrec</u>	<u>Flyaway FY 1980 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1983	34	2.0	18.0	21.0	27.7
1984	31	0.2	20.7	21.8	29.5

16b. Program Funding Summary (Cont'd):  
MCS BLOCKS I, II & III

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY 1980 Dollars Nonrec	Flyaway FY 1980 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985	38	0.2	19.9	21.7	30.4
1986	103	0.4	38.3	45.9	66.0
1987	705	0.1	39.7	47.5	70.6
1988	887	1.1	53.5	73.7	114.3
1989			5.9	5.9	9.6
1990			11.4	11.4	19.1
1991			3.5	3.5	6.0
1992			2.2	4.6	8.0
1993			9.3	9.4	16.8
1994					
1995					
1996	123		7.5	10.0	18.7
1997	81		3.4	7.4	13.9
1998					
1999			3.3	6.7	12.8
Subtotal	2002	4.0	236.6	290.5	443.4

The recurring costs from FY89 through FY93 were for hardware component upgrades and through FY90 for software development. No end items were purchased during these years. FY99 recurring costs were for the MCS Training Base and no end items were purchased.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	2002	4.0	236.6	511.2	778.0

b. Annual Summary -- MCS BLOCK IV

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1980 Dollars Nonrec	Flyaway FY 1980 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996				0.9	1.7
1997				6.7	12.5
1998				7.4	13.9
1999				15.1	28.7
2000				23.7	45.8
2001				25.0	48.9
2002				7.1	14.1



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16b. Program Funding Summary (Cont'd):  
MCS BLOCK IV

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1980 Dollars Nonrec	Flyaway FY 1980 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2003				7.3	14.7
2004				6.4	13.3
2005				1.8	3.8
2006					
Subtotal				101.4	197.4

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Flyaway FY 1980 Dollars Nonrec	Flyaway FY 1980 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996					
2000	239		6.5	12.8	24.9
2001	176		5.6	11.6	22.9
2002	181		5.6	16.6	33.3
2003	362		10.1	18.7	38.3
2004	443		11.3	21.5	44.9
2005	477		12.9	21.1	44.8
2006	630		14.1	24.0	52.1
2007	464		11.8	22.5	49.8
2008	682		15.5	24.3	54.8
2009	502		12.9	23.3	53.6
2010	408		15.9	28.9	67.9
2011	546		16.6	28.0	67.0
2012	553		16.2	26.9	65.6
2013	113		13.1	24.2	60.3
2014			9.4	12.9	32.9
2015			10.8	12.7	32.9
2016			12.1	14.7	38.8
2017			10.0	11.9	32.2
2018			7.5	9.8	27.1
2019			11.1	14.5	40.8
2020			14.3	18.2	52.1
2021			13.4	16.1	47.1
2022			14.4	17.3	51.6
2023			11.4	14.8	44.9
Subtotal	5776		282.5	447.3	1080.6

FY14 through FY23 costs are for the replacement of hardware bought 10 years prior increasing them to latest technology.

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**16b. Program Funding Summary (Cont'd):**

MCS BLOCK IV

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	5776		282.5	548.7	1278.0

**17. Delivery/Expenditure Information:**

MCS BLOCKS I, II & III

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	2002	2002

Percent Total Program Quantities Delivered: 100.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 778

Percent Total Program Expended: 100.0%

MCS BLOCK IV

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

Percent Total Program Quantities Delivered: 0.0%

b. Total Expenditures To Date (In Millions of Dollars): \$ 56.8

Percent Total Program Expended: 4.4%

**18. Operating and Support Costs:**

MCS BLOCKS I, II & III

a. Assumptions and Ground Rules --

The MCS Mil Spec and NDI equipment (total quantity 1798) are obsolete and have been taken out of the Army's inventory. There will be no Operating and Support Costs.

18b. Operating and Support Costs (Cont'd):  
MCS BLOCKS I, II & III

b. Costs -- (FY 1980 Constant (Base-Year) Dollars in Thousands)

Cost Element	MCS Avg Annual Cost Per Equipment	Avg Annual Cost Per Equipment (Antecedent)
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	0.0
Intermediate Maintenance	N/A	0.0
Depot Maintenance	N/A	0.0
Contractor Support	N/A	0.0
Sustaining Support	N/A	0.0
Indirect Costs	N/A	0.0
Software Modifications	N/A	0.0
System Project Management	N/A	0.0
Consumables	N/A	0.0
System Test & Evaluation	N/A	0.0
Other	N/A	0.0
Total	N/A	0.0

MCS BLOCK IV

a. Assumptions and Ground Rules --

MCS operating costs are estimated based upon peacetime usage rates. Costs are based on an operating life of 20 years. CHS-2 equipment will only require Depot Level Re-parables (spares), and Replenishment Consumables (Repair Parts) for the HCU's, LCU's and (RAID, LSP, LSD, Printers, TCIM) once fielded. The O&S costs are supported by the ACP approved Mar 99, addendum # 3 Mar 00.

b. Costs -- (FY 1980 Constant (Base-Year) Dollars in Thousands)

Cost Element	MANEUVER CONTROL SYS Avg Annual Cost Per equipment	Antecedent None
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Personnel Support	23.8	N/A
Depot Level Reparables	25.1	N/A
Software Maintenance/Sup	18.5	N/A
Total	67.4	N/A

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: SADARM

AS OF DATE: December 31, 1999

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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 COL BERNARD E. ELLIS  
 ARTILLERY MUNITIONS SYSTEMS (ARMS) Assigned: October 3, 1997  
 PICATINNY ARSEN, NJ 07806-5000 DSN 880-2573; COMM 973-724-2573  
 BELLIS@PICA.ARMY.MIL
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
 (U) PE 64802 Project D369  
 (U) PE 64814 Project D2ST, D644  
 PROCUREMENT:  
 (U) APPN 2034 ICN E66300 (Army)

**CLEARED AS AMENDED**  
FOR OPEN PUBLICATION

MAR 28 2000 10

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

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Declassify on: OADR~~

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5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE Approved Acquisition Program Baseline, dated 24 July 1989.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated February 17, 2000.

6. (U) Mission and Description:

(U) The SADARM smart munitions will provide an enhanced counterfire capability for the 155mm Howitzer delivery system 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 munition is 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 Munition 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, and in an Operational Requirements Document (ORD) dated 3 August 1994. 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) Executive Summary:

(U) The original SADARM design was for an 8 inch projectile. The Army decided to retire the 8 inch howitzer fleet near the end of the Advanced Technology Demonstration in 1989. The program was changed to a mix of 63,386 155mm Projectiles (2 SADARM submunitions each) and 59,110 Multiple Launch Rocket System (MLRS) Rockets (6 SADARM submunitions each). In 1991, due to a reevaluation of the European threat, the quantities were cut to 39,018 projectiles and 23,712 rockets. In 1993, due to low reliability during technical testing, the program was suspended to determine if it was still viable. The program was reinstated in 1994 after the reliability problems were identified and fixes planned. The MLRS SADARM Rocket portion of the program was terminated, to be potentially resumed sometime in the future. To make up for the lost MLRS Rocket quantities, the 155mm SADARM Projectile quantity was increased to 73,612.

SADARM successfully completed Engineering and Manufacturing Development (EMD) during testing at Yuma Proving Ground, AZ, on April 30, 1996.

The Government began accepting SADARM production projectiles in November 1996. System level production testing continued through 1999.

A SADARM Product Improvement (P1) program was initiated in FY 1997. A sole

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7. (U) Executive Summary (Cont'd):

source development contract was awarded to Aerojet, Azusa, CA, in February 1997. Because the PI SADARM will be more effective than the basic SADARM, the total procurement quantity was reduced from 73,612 projectiles to 50,000 projectiles, resulting in a savings of \$493M.

The SADARM Operational Test (OT) was completed in August 1998. A total of five missions were physically fired in an operational scenario by soldiers from the 1/377th Field Artillery Regiment over actual threat targets at Ft. Greely, Alaska. Only three of the five missions delivered the SADARM projectiles over the target threat array. The average of these three missions attained the Operational Requirements Document (ORD) requirements for unique target kills. Two of the five fire missions failed to deliver the projectiles over the target array. As a result, the Operational Test & Evaluation Command (OPTEC) System Evaluation Report (SER) indicates that the SADARM was not effective or suitable as tested. The primary contributing factors were lower than expected submunition reliability, submunition performance, and delivery inaccuracy due to wind. As a result of OT, PM ARMS has restructured the basic SADARM program to include a robust reliability growth program to provide the warfighter with a needed capability.

Reliability is an ORD requirement, but it is not an APB requirement since it is a component of effectiveness. Effectiveness is an APB requirement because it is a Key Performance Parameter in the ORD. Even with reliability less than that required by the ORD, the SADARM munitions exceed their effectiveness requirement. Effectiveness is measured by the number of kills resulting from firing tactical projectiles.

OPM-ARMS conducted SADARM Reliability Determination and Assurance Testing from September 1999 through January 2000 at Yuma Proving Ground in Arizona. During this test, SADARM demonstrated zone BS reliability of 77%. The ORD requirement is 80%. Furthermore, SADARM had 51 target hits from 42 projectiles, signifying SADARM's capability of killing targets at a rate that exceeds the ORD effectiveness requirement. It would require firing approximately six times as many of the next most effective artillery projectiles in order to meet the SADARM effectiveness requirements, significantly reducing the survivability of our forces.

Except for \$14.9M needed to support prior year's production, all FY 2001 and beyond M898 SADARM production funding was transferred to other programs, with the majority going to the Excalibur XM982 projectile. The Excalibur XM982 is an extended range 155mm artillery projectile that is guided to within a few meters of its intended target using Global Positioning System (GPS) and inertial navigational guidance. This projectile is being designed to carry several different payloads in a modular manner, including SADARM submunitions. It is currently in the Engineering & Manufacturing Development (E&MD) phase with the lowest cost payload - Dual Purpose Improved Conventional Munition (DPICM) grenades. The E&MD phase for the SADARM variant will commence once the guidance sections have been proven. The Excalibur SADARM plans to use the Product Improved (PI) version of the SADARM submunitions, relying on the current development effort to increase their lethal area to three times the

7. (U) Executive Summary (Cont'd):

present size, improve reliability, and drive down unit costs of the expensive electronic components using more up-to-date technology.

As a result of transferring the future production funding to other programs, the M898 SADARM quantity was reduced from 50,000 to 1,063. This also eliminated some future schedule milestones.

The M898 SADARM production deliveries from prior year's funding will continue through FY 2001, having been delayed while reliability problems encountered in OT were fixed. Since SADARM production support (management, engineering & test) costs are funded annually in the years that they occur, there are no quantities associated with the FY 2000 and FY 2001 appropriations.

The APB was updated on Feb 17, 2000 to reflect these programmatic changes.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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9. (U) Schedule:

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>	
Congressional Direction for FSD/Prod	DEC 85	DEC 85	DEC 1985	
DA Approval SADARM (155mm & MLRS) ROC	MAR 86	MAR 86	MAR 1986	
DA In-Process Review for Submunition FSD	SEP 86	SEP 86	SEP 1986	
Competitive Submunition FSD Contract Award	SEP 86	SEP 86	SEP 1986	
Milestone II (ASARC)	NOV 87	NOV 87	NOV 1987	
Milestone II (DAB)	MAR 88	MAR 88	MAR 1988	
Congressional Demonstration Start	JAN 89	JAN 89	JAN 1989	
Complete	APR 89	APR 89	JUL 1989	
Army Decision: keep 2 submun sizes	N/A	NOV 90	NOV 1990	
155mm SADARM Tech Tests Start	MAY 90	AUG 91	JUL 1991	
Complete	JUL 91	FEB 96	APR 1996	
155mm SADARM IOT&E Start	JUL 91	JUN 98	JUN 1998	
Complete	DEC 91	JUL 98	JUL 1998	
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	
LRP Decision	N/A	MAR 95	MAR 1995	
LRP Contract Award	N/A	APR 95	APR 1995	
LRP First Delivery	N/A	OCT 96	NOV 1996	
155mm SADARM Full Scale Production Award	MAY 92	N/A	N/A	(Ch-1)
IOC/First Unit Equipped-155mm SADARM	JUL 93	N/A	N/A	(Ch-2)
Award Product Improvement (PI) Contract	N/A	FEB 97	FEB 1997	
Complete PI Contract	N/A	TBD	TBD	(Ch-3)

(U) ACRONYMS:

DA Department of the Army  
 FSD Full Scale Development  
 ASARC Army Systems Acquisition Review Council  
 DAB Defense Acquisition Board  
 IOTE Initial Operational Test & Evaluation  
 LRP Low Rate Production  
 IOC Initial Operational Capability

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9b. (U) Schedule (Cont'd):

b. Current Change Explanations --

(U) (Ch-1) As a result of eliminating future production funding, there will be no Milestone III ASARC, or 155mm SADARM Full Scale Production award. 155mm Full Scale Production Award was changed from JUN 03 to N/A.

(Ch-2) In order to correct reliability problems encountered during Operational Testing (OT), production deliveries on the FY 1997 and subsequent contracts were delayed until the changes could be incorporated. In addition, additional production quantities will be consumed in testing to demonstrate the fixes. Both of these contributed to reducing the fielded quantity below that estimated to fully equip a unit.

IOC/First Unit Equipped 155mm SADARM was changed from JAN 01 to N/A

(Ch-3) The PI Contract will complete, but will not be transitioned into M898 SADARM production as the M898E1 as planned. It will require restructuring to accommodate the emphasis on the Excalibur XM982.

10. (U) Performance Characteristics:

a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demonstrated Perf	Current Estimate
155 mm EK (SPH) (4 projectiles)	N/A	(b)(1)		
155mm Effectiveness Submunition Pk (secondary tgts)	(b)(1)	N/A / N/A	N/A	N/A
Submunition Perforation (mm RHA)	(b)(1)	N/A / N/A	(b)(1)	(b)(1)
155mm Max Range (km) (M109A1/A2/A3/A4 series howitzers)	N/A	17.9 / 17.9	17.9	17.9
155mm Max Range (km) (M198 and M109A5/A6 series howitzers)	N/A	22.5 / 22.5	22.5	22.5
155mm Max Range (km) (M109A2/A3 w/M185)	17.9	N/A / N/A	N/A	N/A
155mm Max Range (km) (M198 series)	22.5	N/A / N/A	N/A	N/A

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10a. (U) Performance Characteristics (Cont'd):

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u> <u>Obj/Threshold</u>		<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
155mm Max Range (km) (M109 A3/E2 HIP) (M109A6)	22.5	N/A	/ N/A	N/A	N/A
Storage Life (all SADARM munitions) (yrs)	10	N/A	/ N/A	10	10
155mm Carrier Reliability	0.90	N/A	/ N/A	0.98	0.98
Submunition Reliability (155mm)	0.80	N/A	/ N/A	0.77	0.80

(U) The demonstrated reliability has increased from 0.61 to 0.77.

ACRONYMS:

EK	Expected number of Kills
SPH	Self Propelled Howitzer
Pk	Probability of kill
RHA	Rolled Homogeneous Armor
HIP	Howitzer Improvement Program

b. Current Change Explanations -- None

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11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	237.7	389.9	389.9
Procurement	496.0	234.7	234.8
	(248.0)		(0.0)
Recurring Flyaway	(248.0)		(206.7)
Nonrecurring Flyaway	(0.0)		(24.1)
Total Flyaway	(496.0)		(230.8)
Data	(0.0)		(4.0)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(0.0)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1989 Base-Year \$	733.7	624.6	624.7
 Escalation	 -198.6	 115.4	 115.2
Development (RDT&E)	(8.2)	(55.3)	(55.3)
Procurement	(-206.8)	(60.1)	(59.9)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	535.1	740.0	739.9

(U) In addition to the above, \$589.8M (then year) was spent on MLRS SADARM Rocket RDT&E prior to termination.

b. (U) Quantity --

Development (RDT&E)	132	189	189
Procurement	<u>10156</u>	<u>1063</u>	<u>1063</u>
Total	10288	1252	1252

Note: Excludes 772 RDT&E prototypes from the SAR Baseline and 772 from the Current Estimate that are not considered fully configured.

(U) The Low Rate Initial Production (LRIP) quantity planned at the time of the 30 March 1995 DAB was 1287.

The LRIP quantity was decreased to 1,063 due to transfer of funding out of M898 SADARM program.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (Feb 00 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1989 BY\$)	624.6	624.7	
(2) Quantity	1252	1252	
(3) Unit Cost	0.499	0.499	0.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1989 BY\$)	234.7	234.8	
(2) Quantity	1063	1063	
(3) Unit Cost	0.221	0.221	0.00

13. (U) Cost Variance Analysis:

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	245.9	289.2	-	535.1
Previous Changes:				
Economic	-2.5	-224.7	-	-227.2
Quantity	-	+570.1	-	+570.1
Schedule	+18.9	+687.7	-	+706.6
Engineering	+62.8	+212.2	-	+275.0
Estimating	+104.2	+582.5	-	+686.7
Other	-	-	-	-
Support	-	+23.8	-	+23.8
Subtotal	+183.4	+1851.6	-	+2035.0
Current Changes:				
Economic	-0.3	+223.1	-	+222.8
Quantity	-	-953.9	-	-953.9
Schedule	+10.9	-495.8	-	-484.9
Engineering	-	-143.5	-	-143.5
Estimating	+5.3	-457.6	-	-452.3
Other	-	-	-	-
Support	-	-18.4	-	-18.4
Subtotal	+15.9	-1846.1	-	-1830.2
Total Changes	+199.3	+5.5	-	+204.8
Current Estimate	445.2	294.7	-	739.9

13a. (U) Cost Variance Analysis (Cont'd):

(U) Summary (FY 1989 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	237.7	248.0	-	485.7
Previous Changes:				
Quantity	-	+462.0	-	+462.0
Schedule	+15.1	+204.2	-	+219.3
Engineering	+47.8	+144.8	-	+192.6
Estimating	+76.9	+376.6	-	+453.5
Other	-	-	-	-
Support	-	+15.0	-	+15.0
Subtotal	+139.8	+1202.6	-	+1342.4
Current Changes:				
Quantity	-	-462.9	-	-462.9
Schedule	+8.2	-203.3	-	-195.1
Engineering	-	-136.7	-	-136.7
Estimating	+4.2	-401.9	-	-397.7
Other	-	-	-	-
Support	-	-11.0	-	-11.0
Subtotal	+12.4	-1215.8	-	-1203.4
Total Changes	+152.2	-13.2	-	+139.0
Current Estimate	389.9	234.8	-	624.7

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-0.3
Adjustment for Current and Prior Inflation. (Estimating)	+0.3	+0.3
Revised Schedule as a result of budget reductions. (Schedule)	+8.2	+10.9
Required new test : Limited User Test (LUT) due to poor performance during Operational Testing (Estimating)	+3.9	+5.0
RDT&E Subtotal	+12.4	+15.9
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-24.5
Economic adjustment for negative program change. (Economic)	N/A	+247.6
Total Quantity Variance associated with decrease of 48937 units from 50,000 to 1,063.	-1322.5	-2224.2
Quantity decrease of -48937 units. (Quantity)	-462.9	-953.9
Allocation to Schedule variance resulting from Quantity Change. (QR) (Schedule)	-203.3	-495.8
Allocation to Engineering variance resulting from Quantity Change. (QR) (Engineering)	-144.2	-153.0

13b. (U) Cost Variance Analysis (Cont'd):

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Allocation to Estimating variance resulting from Quantity Change. (QR) (Estimating)	-375.0	-419.9
Adjustment for Current and Prior Inflation. (Estimating)	+0.6	+0.7
Eliminated Nonrecurring Flyaway due to quantity reduction. (QR) (Estimating)	-27.5	-38.4
Pay for Engineering Change Proposals for Lethal Mechanism & Electronics Design. (Engineering)	+7.5	+9.5
Change in Peculiar Support resulting from quantity decrease. (QR) (Support)	-2.6	-4.2
Decrease in Data requirements due to quantity decrease. (QR) (Support)	-8.4	-14.2
Procurement Subtotal	<u>-1215.8</u>	<u>-1846.1</u>

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.05	--	+0.06	+0.18	+0.11	+0.19	--	--	+0.54	0.59

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.03	--	-0.12	+0.18	+0.06	+0.12	--	+0.01	+0.25	0.28

14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	MAR 1988	N/A	MAR 1988
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	JUL 1993	N/A	N/A
Total Cost	N/A	535.1	N/A	739.9
Total Quantity	N/A	10288	N/A	1252
Prog Acq Unit Cost	N/A	0.05	N/A	0.59

15. (U) Contract Information (Then-Year Dollars in Millions):

a. RDT&E --		Initial Contract Price		
(U) <u>SADARM Product Imprvmnt:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Aerojet, Azusa, CA				
DAAE30-97-C-1017, CPAF		\$46.7	N/A	
Award: February 24, 1997				
Definitized: February 24, 1997				
Current Contract Price		Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$44.6	N/A	\$44.0	\$43.6	
Previous Cumulative Variances		<u>Cost Variance</u> <u>Schedule Variance</u>		
Cumulative Variances To Date (12/31/99)		\$0.8	\$-0.5	
Net Change		\$0.8	\$-0.5	
		\$0.0	\$0.0	

Explanation of Change:

(U) Variances are insignificant.

b. Procurement --		Initial Contract Price		
(U) <u>SADARM LRP2 BASIC:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Aerojet, Azusa, CA				
DAAE30-97-C-1005, FFP		\$81.6	N/A	600
Award: February 6, 1997				
Definitized: February 6, 1997				
Current Contract Price		Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$81.6	N/A	\$81.6	\$81.6	

Explanation of Change:

15. (U) Contract Information (Cont'd):

None.

Cost and Schedule variance reporting is not required on this FFP contract.

16. (U) Program Funding Summary (Current Estimate in Millions of Dollars):

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY86-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02)	<u>Total</u>
RDT&E	397.0	24.1	21.2	2.9	445.2
Procurement	264.9	14.9	14.9	-	294.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	661.9	39.0	36.1	2.9	739.9

b. Annual Summary -- 155mm SADARM Projectile

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1989 Dollars Nonrec</u>	<u>Flyaway FY 1989 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1986				2.7	2.5
1987				14.9	14.2
1988				24.2	24.0
1989				37.8	39.0
1990				48.3	51.7
1991				28.6	31.8
1992				55.3	62.9
1993				19.3	22.5
1994				35.1	41.6
1995				33.5	40.5
1996				12.8	15.8
1997				7.8	9.7
1998				8.4	10.5
1999				23.9	30.3
2000				18.8	24.1
2001				16.3	21.2
2002				2.2	2.9
Subtotal	189			389.9	445.2

(U) Due to commonality, the RDT&E costs for submunitions for the 155mm Projectile and MLRS Rocket have been allocated to each system based on the



16b. (U) Program Funding Summary (Cont'd):

total quantity of submunitions to be procured for each end item. All MLRS SADARM Rocket efforts have been terminated. The following table shows the sunk RDT&E costs allocated to the MLRS SADARM Rocket:

FY	BY89 \$M	TY \$M
1986	34.3	31.7
1987	60.1	57.3
1988	76.7	76.1
1989	101.9	105.2
1990	77.6	83.1
1991	68.0	75.6
1992	74.9	85.2
1993	64.6	75.2
1994	0.3	0.4
<b>TOTAL</b>	<b>558.4</b>	<b>589.8</b>

Appropriation: 2034 - Procurement of Ammunition, Army

Fiscal Year	Qty	Flyaway FY 1989 Dollars Nonrec	Flyaway FY 1989 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995	110	6.3	18.7	24.5	29.8
1996	123	6.7	32.9	36.4	44.9
1997	600	2.2	85.0	74.8	93.6
1998	200	3.9	50.4	51.7	65.3
1999	30	5.0	19.7	24.6	31.3
2000				11.5	14.9
2001				11.3	14.9
<b>Subtotal</b>	<b>1063</b>	<b>24.1</b>	<b>206.7</b>	<b>234.8</b>	<b>294.7</b>

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
<b>Grand Total</b>	<b>1252</b>	<b>24.1</b>	<b>206.7</b>	<b>624.7</b>	<b>739.9</b>

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date	Plan	Actual
RDT&E	189	132
Procurement	860	315

(U) Percent Total Program Quantities Delivered: 35.7%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 505.7

(U) Percent Total Program Expended: 68.3%

17. (U) Delivery/Expenditure Information (Cont'd):

Expenditures to date exclude \$589.8M spent on MLRS SADARM Rocket.

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
 The 155mm SADARM munitions are considered "wooden rounds" and have no operational costs. The only O&S costs are for depot storage and stockpile testing. O&S costs are less than \$15 (BY89) per round per year. There is no antecedent.

b. (U) Costs -- (FY 1989 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per 155mm SADARM/year	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	0.0	0.0
Intermediate Maintenance	N/A	N/A
Depot Maintenance	N/A	N/A
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	0.0	0.0

A-12 FMTV

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A) 823)  
PROGRAM: FMTV

AS OF DATE: December 31, 1999

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1. Designation and Nomenclature (Popular Name): Family of Medium Tactical Vehicles (FMTV)
2. DoD Component: Army
3. Responsible Office and Telephone Number:  
PEO, Ground Combat & Support Systems COL Robert B. Lees, Jr.  
PM, Medium Tactical Vehicles Assigned: July 30, 1999  
ATTN: SFAB-GCSS-W-MTV DSN 786-5332; COMM (810) 574-5332  
Warren, MI 48397-5000 leesrob@acom.army.mil
4. Program Elements/Procurement Line Items:  
RDT&E:  
PE 64604 (Shared) Item H07  
PROCUREMENT:  
APPN 2035 ICN D15500 (Army)  
APPN 2035 ICN DS1010 (Army)  
APPN 2035 ICN DV0310 (Army)  
APPN 2035 ICN DV0320 (Army)

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DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

- 1 -

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00-C-0855

FMTV, December 31, 1999

**5. References:**

SAR Baseline (Production Estimate):

AAE Approved Acquisition Program Baseline dated September 11, 1995.

Approved Program:

AAE Approved Acquisition Program Baseline (APB) dated October 6, 1999.

**6. Mission and Description:**

The Family of Medium Tactical Vehicles (FMTV) is a complete series of trucks based on a common chassis, varied by payload and mission. The Light Medium Tactical Vehicle (LMTV) has a 2-1/2 ton capacity consisting of cargo and van models. The Medium Tactical Vehicle (MTV) has a 5 ton capacity and consists of cargo, tractor, van, wrecker, tanker and dump truck models. Subvariants provide Air Drop capability for contingency and rapid deployment operations. Trailer airdrop capability and a new truck variant, a water tanker, were approved by TRADOC in May 1997 for introduction later in the program. Over 80% commonality of parts between variants significantly reduces operational and support costs. FMTV, intended to replace obsolete and maintenance-intensive trucks currently in the fleet, performs local and line haul, unit mobility, unit resupply, and other missions in combat, combat support, and combat service support units. The system is designed to be rapidly deployable worldwide and operate on primary and secondary roads, trails, and cross-country terrain, in all climatic conditions.

**7. Executive Summary:**

The FMTV program was initiated in 1984. The FMTV Army Systems Acquisition Review Council (ASARC) approval was obtained in August 1987, with further program approval from the Defense Acquisition Board (DAB) in May 1988, which led to the prototype contracts being awarded in October 1988.

The FMTV ASARC IIIA milestone review was completed in September 1991, granting approval to proceed to Low Rate Initial Production. The FMTV initial production contract was awarded to Stewart & Stevenson Services Inc. of Houston, TX on October 11, 1991. The production facility is located in Sealy, TX.

The ASARC IIIB for Full Rate Production and Type Classification Standard was approved in August 1995, and the production APB was approved on September 11, 1995. First Unit Equipped (FUE) occurred in January 1996 at Ft. Bragg, NC. Production under this contract was completed in November 1998.

In September 1997, the Army Acquisition Executive approved a two-phase acquisition strategy for FMTV which would result in a second-source production qualification phase awarded competitively to two contractors in FY98, to be followed by the down-selection to one second source for a three-year, multiyear procurement in FY00. Phase I of the second source acquisition was implemented with contract awards to AM General and Oshkosh Truck Corporation in October 1998, with test trucks delivered in July 1999. Testing has been completed and

FMTV, December 31, 1999

7. Executive Summary (Cont'd):

the vehicles are in storage due to a subsequent change in acquisition strategy.

In March 1998, a safety of use message was issued to units with FMTVs in their fleets concerning the vehicle driveline. A combined government, contractor, scientific and academic group evaluated the problem and developed a joint, final solution. Retrofit is in process, with vehicles to be retrofitted at the plant and in the field.

The negotiated, sole-source, four-year, multiyear rebuy contract with Stewart & Stevenson was awarded on October 14, 1998. Vehicle production began in September 1999, and vehicles produced under this contract have the improved driveline components.

The FY00 DOD Authorization Act conference report provided additional guidance to the Army regarding the second source acquisition strategy. It directed the SECARMY to terminate the second source strategy and develop an acquisition strategy using competitive procedures. The FY00 Appropriation Conference Report provided additional guidance to be used in formulating a strategy. As a result, the new acquisition strategy, which was approved by the Army Acquisition Executive on January 22, 2000, will be based on full and open competition. It will begin with a Competitive Evaluation phase in FY01 to select competitors for production, followed by the award of a multiyear production contract in FY02.

As of the week ending January 2, 2000, a total of 8,324 vehicles FMTVs have been fielded to units.

8. Threshold Breaches:

a. Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

8. Threshold Breaches (Cont'd):

b. Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. Schedule:

a. Milestones --

	Production Estimate (SAR)	Approved Program (APB)	Current Estimate	
Milestone I/II (ASARC)	MAY 87	MAY 87	MAY 1987	
DAB Program Review	MAY 88	MAY 88	MAY 1988	
Prototype Contract Awards	OCT 88	OCT 88	OCT 1988	
First Prototype Delivery	JAN 90	JAN 90	JAN 1990	
PSD Development Testing	N/A	N/A		
Start	JAN 90	N/A	JAN 1990	
Complete	DEC 90	N/A	DEC 1990	
Early User Test and Evaluation	N/A	N/A		
Start	MAY 90	N/A	MAY 1990	
Complete	OCT 90	N/A	OCT 1990	
ASARC IIIA	SEP 91	SEP 91	SEP 1991	
Production Award (MYP)	OCT 91	OCT 91	OCT 1991	
Call up 2nd Year of MYP	AUG 92	N/A	AUG 1992	
Production Qualification Test (PQT)	N/A	N/A		
Start	MAY 92	N/A	MAY 1992	
Complete	NOV 92	N/A	NOV 1992	
First Production Delivery	MAY 93	MAY 93	MAY 1993	
Initial Production Test (IPT)	N/A	N/A		
Start	MAY 93	N/A	MAY 1993	
Complete	JUL 95	N/A	JUL 1995	
IOT&E	N/A	N/A		
Start	APR 95	N/A	APR 1995	
Complete	JUL 95	N/A	JUL 1995	
Call Up 3rd Year of MYP Increment 1	SEP 93	N/A	SEP 1993	
ASARC IIIB	AUG 95	AUG 95	AUG 1995	
Call Up 3rd Year of MYP Increment 2	JUL 95	N/A	JUL 1995	
Organic Support Capability	DEC 95	DEC 95	DEC 1995	
First Unit Equipped (FUE)/Initial Operational Capability (IOC)-FMTV	DEC 95	DEC 95	JAN 1996	
Call up 4th Year of MYP Increment 1	JUL 95	N/A	JUL 1995	
Call up 4th Year of MYP Increment 2	SEP 95	N/A	SEP 1995	
Call Up 5th Year of MYP	JUL 96	N/A	AUG 1996	
Production Decision Review Van, Tanker, & Trailer	JUN 96	N/A	NOV 1996	
PQT, Van & Tanker	N/A	N/A		
Start	NOV 99	N/A	N/A	(Ch-1)
Complete	DEC 99	N/A	N/A	(Ch-1)
IPT, Van & Tanker	N/A	N/A		
Start	FEB 00	N/A	N/A	(Ch-1)

9a. Schedule (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>	
Complete	OCT 00	N/A	N/A	(Ch-1)
IOT&E, Van & Tanker	N/A	N/A		
Start	APR 00	N/A	N/A	(Ch-1)
Complete	AUG 00	N/A	N/A	(Ch-1)
PQT, Trailer	N/A	N/A		
Start	NOV 99	N/A	N/A	(Ch-1)
Complete	DEC 99	N/A	N/A	(Ch-1)
IPT Trailer	N/A	N/A		
Start	FEB 00	N/A	N/A	(Ch-1)
Complete	OCT 00	N/A	N/A	(Ch-1)
IOT&E, Trailer	N/A	N/A		
Start	APR 00	N/A	N/A	(Ch-1)
Complete	AUG 00	N/A	N/A	(Ch-1)
JSOR Amendment	N/A	MAY 97	MAY 1997	
Rebuy Contract Award	N/A	OCT 98	OCT 1998	
2nd Source Phase I Awards	N/A	OCT 98	OCT 1998	
Van Award	N/A	JAN 00	N/A	(Ch-2)
2nd Source Phase II	N/A	JUN 00	N/A	(Ch-3)
FUE Rebuy Contract	N/A	MAR 00	MAY 2000	(Ch-4)
FUE 2nd Source	N/A	JAN 03	N/A	(Ch-3)
FUE Van	N/A	APR 02	N/A	(Ch-2)
Follow-on Contracts	N/A	NOV 02	NOV 2001	(Ch-5)

ASARC - Army Systems Acquisition Review Council  
DAB - Defense Acquisition Board  
IPT - Initial Production Test  
MYP - Multiyear Procurement  
FUE - First Unit Equipped  
IOC - Initial Operational Capability

b. Current Change Explanations --

(Ch-1) N/A in the Current Estimate indicates milestones which are historical and internal to the first FMTV acquisition, or for contracts no longer planned. These milestones are no longer being tracked and have been removed from the October 6, 1999 Acquisition Program Baseline.

(Ch-2) Van Award changed from Jan 2000 to N/A and FUE Van from Apr 2002 to N/A. The revised acquisition strategy approved by the AAE in Jan 2000 delays the purchase of this truck model until the next multiyear procurement in FY02.

(Ch-3) 2nd Source Phase II changed from Jun 2000 to N/A and FUE Second Source from Jan 2003 to N/A. Congress terminated the second source program.

(Ch-4) FUE Rebuy Contract changed from Mar 2000 to May 2000. Delay is to

9b. Schedule (Cont'd):

allow incorporation of applicable vehicle changes in production as a result of the House Appropriations Committee Surveys & Investigations Team review.

(Ch-5) Follow-on Contract changed from Nov 2002 to Nov 2001. The revised acquisition strategy approved by the AAE in Jan 2000 accelerates the next procurement contract to FY02.

10. Performance Characteristics:

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Highway Speed on 2% Grade at GVW (mph)	55	55 / 55	54.8	55
Highway Speed on 3% Grade at GVW (mph)	45	45 / 45	48.7	45
Highway Speed on 2% Grade at GCW (mph)	40	40 / 40	45.5	40
Highway Speed on 3% Grade at GCW (mph)	30	30 / 30	35.8	35
LMTV Payload (tons)	2.5	2.5 / 2.5	2.5	2.5
MTV Payload (tons)	5	5 / 5	5	5
LMTV Towed Load (lbs)	7500	12000 / 12000	7500	12000
MTV Towed Load (lbs)	21000	21000 / 21000	21000	21000
Longitudinal Grade Operation (%)	60	60 / 60	60	60
Slide Slope Operation (%)	30	30 / 30	30	30
Fording Without Kit (inches)	30	30 / 30	30	30
Fording With Kit (inches)	60	N/A / N/A	N/A	N/A
Operating Range on Integral Fuel at GCW (miles)	300	300 / 300	300	300
Reliability:		/ N/A	TBD	
MMBHMP (miles)				
Truck, Cargo (LMTV)	3000	5500 / 5500	12000	5500
Truck, Cargo (MTV)	2700	5500 / 5500	12000	5500
Tractor	3300	3800 / 3800	4800	3800
Wrecker	2300	2800 / 2800	4800	2800
Trailer (LMTV)	2800	2800 / 2800	5000	2800
Trailer (MTV)	2600	2600 / 2600	5000	2600
MMBOMF (miles)				
Truck, Cargo (LMTV)	2228	2228 / 2228	>8279	2228
Truck, Cargo (MTV)	2035	2035 / 2035	6386	2035
Tractor	2480	2480 / 2480	3606	2480



10a. Performance Characteristics (Cont'd):

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>		<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Wrecker	1875	1875	/ 1875	4720	1875
Trailer (LMTV)	2056	2056	/ 2056	5000	2056
Trailer (MTV)	1913	1913	/ 1913	5000	1913
<b>MMHPOM</b>					
Truck, Cargo (LMTV)	.01	.0044	/ .0044	.0037	.0044
Truck, Cargo (MTV)	.011	.0055	/ .0055	.0048	.0055
Tractor	.012	.0065	/ .0065	.0062	.0065
Wrecker	.015	.0064	/ .0064	.0069	.0064
Trailer (LMTV)	.003	.0017	/ .0017	.0003	.0017
Trailer (MTV)	.003	.0017	/ .0017	.0006	.0017
<b>Transportability:</b>					
Surface Transportation (Highway, Ship & Rail)	H, S&R	H, S&R	/ H, S&R	H,S&R	H,S&R
Air Transportation	C-141 N/A	C-141 N/A	/ C-141	C-141 TBD	C-141 C-130
<b>Mobility: (vehicle cone index)</b>					
Truck Cargo	25	25	/ 25	25	25
Truck & Trailer Combination	35	35	/ 35	30	35

- GVW - Gross Vehicle Weight
- GCW - Gross Combined Weight
- MMBHMf - Mean Miles Between Hardware Mission Failure
- MMBOMf - Mean Miles Between Operational Mission Failure
- MMHPOM - Maintenance Man hours/Operating Mile (Unit Level)

b. Current Change Explanations -- None

FMTV, December 31, 1999

11. Total Program Cost and Quantity (Dollars in Millions):

a. Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	121.8	120.5	120.3
Procurement	11472.4	14156.4	13874.3
Rollaway	(10677.1)		(13399.8)
Other Wpn Systems Cost	(777.3)		(474.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(18.0)		(0.2)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1996 Base-Year \$	<u>11594.2</u>	<u>14276.9</u>	<u>13994.6</u>
 Escalation	 7327.1	 4106.7	 3794.8
Development (RDT&E)	(-6.2)	(-7.7)	(-7.8)
Procurement	(7333.3)	(4114.4)	(3802.6)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	<u>18921.3</u>	<u>18383.6</u>	<u>17789.4</u>
 b. Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>85488</u>	<u>86916</u>	<u>83185</u>
Total	85488	86916	83185

Note: Excludes 51 RDT&E prototypes from the SAR Baseline and 51 from the Current Estimate that are not considered fully configured.

Total LRIP quantities produced prior to Milestone III, Full Rate Production Decision were 1,804 LMTV trucks and 779 MTV trucks, at a rate not to exceed 200 per month.

c. Foreign Military Sales --  
FMTV Foreign Military Sales through December 31, 1999:

<u>Country</u>	<u>Quantity</u>	<u>Estimated Cost</u>
Saudi Arabia	99	\$13.5M
Taiwan	3	.4M
Thailand	117	22.8M
Greece	4	.6M

d. Nuclear Costs -- None.

**12. Unit Cost Summary:**

	UCR Baseline (OCT 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	14276.9	13994.6	
(2) Quantity	86916	83185	
(3) Unit Cost	0.164	0.168	+2.44
b. Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	14156.4	13874.3	
(2) Quantity	86916	83185	
(3) Unit Cost	0.163	0.167	+2.45

**13. Cost Variance Analysis:**

a. Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	115.6	18805.7	-	18921.3
Previous Changes:				
Economic	-2.3	-3289.8	-	-3292.1
Quantity	-	+716.2	-	+716.2
Schedule	+1.5	-671.1	-	-669.6
Engineering	-	+661.8	-	+661.8
Estimating	-2.0	+2583.0	-	+2581.0
Other	-	+11.6	-	+11.6
Support	-	-546.6	-	-546.6
Subtotal	-2.8	-534.9	-	-537.7
Current Changes:				
Economic	-0.2	+21.5	-	+21.3
Quantity	-	-1166.1	-	-1166.1
Schedule	-	+207.4	-	+207.4
Engineering	-	+313.3	-	+313.3
Estimating	-0.1	-11.7	-	-11.8
Other	-	-	-	-
Support	-	+41.7	-	+41.7
Subtotal	-0.3	-593.9	-	-594.2
Total Changes	-3.1	-1128.8	-	-1131.9
Current Estimate	112.5	17676.9	-	17789.4

13a. Cost Variance Analysis (Cont'd):

Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	121.8	11472.4	-	11594.2
Previous Changes:				
Quantity	-	+539.6	-	+539.6
Schedule	+0.2	+42.6	-	+42.8
Engineering	-	+486.8	-	+486.8
Estimating	-1.5	+1954.7	-	+1953.2
Other	-	+11.1	-	+11.1
Support	-	-350.8	-	-350.8
Subtotal	-1.3	+2684.0	-	+2682.7
Current Changes:				
Quantity	-	-529.4	-	-529.4
Schedule	-	-	-	-
Engineering	-	+241.8	-	+241.8
Estimating	-0.2	-24.5	-	-24.7
Other	-	-	-	-
Support	-	+30.0	-	+30.0
Subtotal	-0.2	-282.1	-	-282.3
Total Changes	-1.5	+2401.9	-	+2400.4
Current Estimate	120.3	13874.3	-	13994.6

b. Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Across the Board Budget Reduction (Estimating)	-0.2	-0.1
Revised escalation indices (Economic)	N/A	-0.2
RDT&E Subtotal	-0.2	-0.3
(2) <u>Procurement</u>		
Revised escalation indices (Economic)	N/A	-286.0
Reduction in Army Acquisition Objective by 3,730 trucks (QR) (Quantity)	-529.4	-858.6
Economic Adjustment for Negative Program Change (QR)		
(Economic)	N/A	+307.5
(Quantity)	0.0	-307.5
Change in annual procurement buy profile (Schedule)	0.0	+207.4
Vehicle configuration changes (Engineering)	+241.8	+313.3
Recategorization of Production Qualification from Support to Estimating	0.0	0.0
(Estimating)	+4.2	+4.4
(Support)	-4.2	-4.4
Increase in Federal Retail Excise Tax (FRET) for additional CONUS fieldings (Estimating)	+4.1	+4.1

13b. Cost Variance Analysis (Cont'd):

b. Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Revised estimates for known configuration changes (Estimating)	+60.1	+80.2
Hardware-related costs due to acquisition strategy change (Estimating)	-127.6	-138.2
Testing and government and contractor support costs due to acquisition strategy change (Estimating)	-34.5	-50.3
Increase in government and contractor engineering support (Estimating)	+64.2	+82.8
Current & Prior Inflation Adjustment (Estimating)	+5.0	+5.3
Other Weapon Systems cost changes associated with field support (Support)	+51.2	+65.0
Change in requirement for Initial Spares (Support)	-17.1	-19.0
Current & Prior Inflation Adjustment (Support)	+0.1	+0.1
Procurement Subtotal	-282.1	-593.9

QR = Quantity related changes.

14. Unit Cost and Other History (Then-Year Dollars in Millions):

a. Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.22	-0.04	+0.01	-0.01	+0.01	+0.03	--	-0.01	-0.01	0.21

b. Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.22	-0.04	+0.01	0.01	+0.01	+0.03	--	-0.01	-0.01	0.21

14c. Unit Cost and Other History (Cont'd):

c. Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	N/A	AUG 1987	MAY 1987	MAY 1987
Milestone II	N/A	AUG 1987	MAY 1987	MAY 1987
Milestone III	N/A	MAR 1993	AUG 1995	AUG 1995
FUE/IOC	N/A	APR 1993	DEC 1995	JAN 1996
Total Cost	0	8568.6	18921.3	17789.4
Total Quantity	0	119542	85488	83185
Prog Acq Unit Cost	0	0.07	0.22	0.21

In the Development Estimate, the unit of measure for the PAUC and APUC included truck and trailer quantities. The unit of measure was changed to only truck quantities in the December 1993 SAR. This unit of measure continues to be used in the Production Estimate and Current Estimate cost columns.

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, FFP-EPA Award: October 11, 1991 Definitized: October 11, 1991	\$1196.2	N/A	10843

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$1398.0	N/A	10843	\$	\$

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP-EPA contract.

FMTV:	Initial Contract Price		
	Target	Ceiling	Qty
Stewart & Stevenson Serv, Houston TX DAAE07-98-C-M005, FFP Award: October 14, 1998 Definitized: October 14, 1998	\$1016.8	N/A	5390

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$1020.5	N/A	5390	\$	\$

15. Contract Information (Cont'd):

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this PFP contract.

Contract Comments:

Contract DAAE07-98-C-M005 consists of 5,390 trucks and 1,040 trailers. To maintain consistency with the official unit of measure for FMTV - trucks only - the truck quantity is shown in this section.

16. Program Funding Summary (Current Estimate in Millions of Dollars):

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY88-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-22)	<u>Total</u>
RDT&E	90.7	2.0	2.0	17.8	112.5
Procurement	1855.2	424.1	438.3	14959.3	17676.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	<b>1945.9</b>	<b>426.1</b>	<b>440.3</b>	<b>14977.1</b>	<b>17789.4</b>

b. Annual Summary -- FMTV

Appropriation: 2040 - Research, Development, Test + Eval, Army

<u>Fiscal Year</u>	<u>Qty</u>	<u>Rollaway FY 1996 Dollars Nonrec</u>	<u>Rollaway FY 1996 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1988				12.0	9.8
1989				31.8	27.0
1990				22.1	19.5
1991				10.7	9.8
1992				11.6	10.9
1993				0.7	0.7
1994				7.4	7.2
1995				4.3	4.3
1996				1.5	1.5
1997					
1998					
1999					

16b. Program Funding Summary (Cont'd):

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Rollaway FY 1996 Dollars Nonrec	Rollaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2000				1.9	2.0
2001				1.9	2.0
2002				1.8	2.0
2003				1.8	2.0
2004				1.7	1.9
2005				1.6	1.9
2006					
2007					
2008					
2009					
2010					
2011				2.0	2.6
2012				3.6	4.8
2013				1.9	2.6
Subtotal				120.3	112.5

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Rollaway FY 1996 Dollars Nonrec	Rollaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1991	394	20.0	55.4	81.1	76.2
1992	1301	9.9	153.9	187.6	180.1
1993	2008	12.1	239.1	262.7	257.3
1994	183	2.6	24.7	33.4	33.2
1995	3351	11.9	344.7	365.7	370.2
1996	825	46.8	101.6	161.2	164.7
1997	1821	5.7	211.1	228.8	236.3
1998	1170	46.1	137.6	193.4	201.6
1999	1439	26.9	282.7	318.9	335.6
2000	2115	25.8	361.9	398.6	424.1
2001	2042	37.2	354.0	405.7	438.3
2002	2255	41.6	368.5	424.2	465.9
2003	3260	40.1	567.8	623.1	697.3
2004	3405	19.4	559.6	597.4	681.9
2005	3325	19.4	532.3	569.4	662.9
2006	4101	33.3	642.4	692.9	822.8
2007	3354	23.9	531.5	575.1	696.6
2008	3353	21.8	520.9	559.8	691.6
2009	3353	18.7	515.7	551.6	695.1
2010	3353	18.7	501.1	537.0	690.3
2011	3353	32.6	491.1	541.0	709.3
2012	3342	23.9	538.9	580.2	775.9



16b. Program Funding Summary (Cont'd):

Appropriation: 2035 - Other Procurement, Army

Fiscal Year	Qty	Rollaway FY 1996 Dollars Nonrec	Rollaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2013	3342	21.7	528.5	566.6	772.9
2014	3342	18.7	518.1	553.2	769.7
2015	3342	18.7	507.9	543.1	770.7
2016	3342	32.6	497.9	547.0	791.8
2017	3343	23.9	534.0	574.3	848.0
2018	3343	21.7	523.7	560.9	844.8
2019	3343	18.7	513.2	547.7	841.3
2020	3343	18.8	503.2	537.6	842.4
2021	3342	18.7	492.9	527.4	843.0
2022		12.0		27.7	45.1
2023					
Subtotal	83185	743.9	12655.9	13874.3	17676.9

The FMTV Revised AAO is 83,170 trucks. The total quantity of 83,185 includes 15 chassis which are not part of the AAO.

	Qty	Rollaway Dollars Nonrec	Rollaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	83185	743.9	12655.9	13994.6	17789.4

17. Delivery/Expenditure Information:

a. Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	11550	11550

Percent Total Program Quantities Delivered: 13.9%

b. Total Expenditures To Date (In Millions of Dollars): \$ 1715.4

Percent Total Program Expended: 9.6%

Delivery refers to the number of Army trucks accepted or conditionally accepted to date.

**18. Operating and Support Costs:**

**a. Assumptions and Ground Rules --**

The average miles/vehicle/year for the LMTV truck is 2,300 miles and for the MTV truck, 2,900 miles. These revised operating tempos were based on data provided by the office of the Army Deputy Chief of Staff for Operations and Plans (DCSOPS) in Sep 99. 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. Trailers do not have dedicated crew.

The current Baseline Cost Estimate, June 1995, was used to develop the costs in Section 18b, with the exception of Unit Level Consumption and Petroleum, Oil and Lubricants (POL), which reflect Army budgeting factors to support the FY01 President's Budget, provided by the Army Cost and Economic Analysis Center. The standard unit of measure for this program - the quantity of trucks only - has been used in developing O&S costs reported below.

**b. Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)**

Cost Element	Avg Annual Cost Per LMTV	Ave Annual Cost Per MTV
Mission Pay & Allowances	5.4	8.6
Unit Level Consumption	2.2	4.6
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.1	0.2
Indirect Costs	2.7	3.9
Total	10.4	17.3

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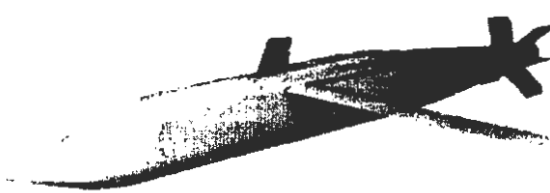
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SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: JSOW

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Joint Standoff Weapon Program (JSOW)

2. (U) DoD Component: Navy

Joint Participants:  
Air Force

3. (U) Responsible Office and Telephone Number:

Conventional Strike Weapons, PMA 201 Bldg 2272	CAPT R.O. Wirt, Jr., USN
47123 Buse Road Unit #IPT	Assigned: April 23, 1999
Patuxent River, MD 20670-1547	DSN 757-7477; COMM (301)757-7477
	Wirtro@navair.navy.mil

4. (U) Program Elements/Procurement Line Items:

RDT&E:

- (U) PE 0604727F
- (U) PE 0604727N

PROCUREMENT:

- (U) APPN 1507 ICN 223000 (Navy)
- (U) APPN 3020 ICN JSOW00 (Air Force)

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Declassification: X3

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DEPARTMENT OF DEFENSE

00-C-0032

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5. (U) References:

Baseline/BLU-108

SAR Baseline (Production Estimate):

(U) (U) SAR Baseline (Production Estimate): Acquisition Decision Memorandum (ADM) dated 30 October 1998, subject: Authorization for JSOW Baseline variant Full Rate Production (FRP) and LRIP for JSOW BLU-108 variant.

Approved Program:

(U) NAE Approved Acquisition Program Baseline (APB) dated July 9, 1999.

Unitary

SAR Baseline (Development Estimate):

(U) (U) Acquisition Decision Memorandum (ADM) dated June 23, 1992, subject: Authorization for Milestone II.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated July 9, 1999.

6. (U) Mission and Description:

(U) The JSOW is an air-to-ground weapon designed to attack a variety of targets during day, night, and adverse weather conditions. JSOW enhances aircraft survivability by providing the capability for launch aircraft to standoff outside the range of most target area surface-to-air threat systems. The JSOW launch-and-leave capability allows several target kills per aircraft sortie.

The JSOW program developed a Baseline weapon for use against fixed area targets. The JSOW Baseline variant includes a kinematically efficient airframe and integrated Global Positioning System (GPS)/Inertial Navigation System (INS) navigation capability, and a BLU-97/B submunition payload. This weapon is designed to allow for pre-planned product improvements. The JSOW/BLU-108 variant incorporates the Sensor Fuzed Weapon submunition (BLU-108) into the baseline vehicle. The JSOW/BLU-108 variant provides a standoff delivery capability against massed armor and land combat vehicles.

The Unitary BLU-111 warhead allows the warfighter to attack blast/frag sensitive and point targets. Unitary uses an imaging infrared seeker with embedded Autonomous Targeting Acquisition (ATA) software, increasing accuracy and lethality. The ATA algorithms afford the mission planner precise aimpoint selection and target discrimination.

Through adherence to international standards for weapons interfaces and minimized weight and dimension considerations, JSOW is compatible with Air Force and NATO aircraft. JSOW is a joint Navy/Air Force program.

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7. (U) Executive Summary:

(U) The original JSOW Acquisition Plan (AP), AP-88-21, was approved on July 1, 1988. The JSOW program was reviewed by the Defense Acquisition Board (DAB) on June 5, 1989 and was granted Milestone I approval to enter an 18 month Demonstration/Validation (DEM/VAL) phase for the JSOW Baseline program. The program name was changed from Advanced Interdiction Weapon System (AIWS) to Joint Standoff Weapon (JSOW).

JSOW (AGM-154A) OPEVAL report was completed during October 1997. COMOPTEVFOR found JSOW operationally effective, operationally suitable, and ready for fleet introduction.

An Acquisition Program Baseline (APB) was signed on December 10, 1997 incorporating BLU-108 test schedule changes.

JSOW (AGM-154A) Low Rate Initial Production (LRIP I) deliveries were completed in December 1998. Lot II production contract was awarded to Raytheon Systems Company on December 30, 1997. The contract was accelerated to complete the total year Navy buy of 135 weapons by August 1999. Remaining Air Force LRIP II are scheduled to be delivered by February 2000.

On October 30, 1998, the Navy approved Full Rate Production (FRP) of the JSOW Baseline (AGM-154A) variant and Low Rate Initial Production of the JSOW BLU-108 (AGM-154B). The FY 99 contract was awarded on December 30, 1998 for 403 AGM 154A weapons and 24 AGM-154B weapons (including testing articles). The FRP II contract was awarded December 30, 1999 for 414 Navy JSOW Baseline weapons (AGM-154A) and 74 Air Force JSOW Baseline weapons.

JSOW Baseline (AGM-154A) had been deployed with U.S. Naval Forces and was utilized for the first time in combat in January 1999. As of February 2000, 64 JSOW Baseline weapons have been launched during combat operations in Iraq and Yugoslavia. The weapon functions as designed with extremely favorable feedback from fleet operators.

In the summer of 1998, the JSOW Unitary program implemented Cost-As-An-Independent Variable (CAIV) principles to lower the cost of the weapon while maintaining the key performance parameters. The new Unitary variant still covers 95% of the original target set at 55% of cost. On March 19, 1999, Dr. Gansler, USD(A&T), concurred with the OIPT's report recommendation to continue support of the modified JSOW Unitary program. The JROC approved this modification and validated the Unitary JORD on March 25, 1999 reducing the weapon inventory objective from 7800 to 3000.

On July 9, 1999, the JSOW APBA and the Unitary SAMP were approved. In November 1999, the Unitary Seeker/ATA configuration cost/schedule/technical review was accomplished.

8. (U) Threshold Breaches:

Baseline/BLU-108

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

Unitary

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

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9. (U) Schedule:

Baseline/BLU-108

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I	JUN 1989	JUN 1989	JUN 1989
DEMVAL Contract Award	JUN 1989	JUN 1989	JUN 1989
Early Operational Assessment (OT-I)			
Start	MAR 1991	MAR 1991	MAR 1991
Complete (Report)	OCT 1991	OCT 1991	OCT 1991
Milestone II	APR 1992	APR 1992	JUN 1992
E&MD Contract Award	MAY 1992	MAY 1992	JUN 1992
Preliminary Design Review	NOV 1992	NOV 1992	JAN 1993
Critical Design Review	DEC 1994	DEC 1994	APR 1995
IOT&E (OT-IIA)			
Start	DEC 1995	DEC 1995	FEB 1996
Complete (Report)	JUL 1996	JUL 1996	DEC 1996
TECHEVAL (DT-IIC)			
Start	NOV 1995	NOV 1995	FEB 1996
Complete (Report)	JUL 1996	JUL 1996	DEC 1996
Functional Configuration Audit	OCT 1995	OCT 1995	DEC 1995
Production Verification Review	APR 1996	APR 1996	JAN 1996
Production Readiness Review	JUN 1996	JUN 1996	OCT 1996
LRIP Contract Option Exercised	OCT 1996	OCT 1996	FEB 1997
LRIP First Delivery	MAY 1998	MAY 1998	MAY 1998
OPEVAL (OT-IIB)			
Start	AUG 1996	AUG 1996	FEB 1997
Complete (Report)	JUL 1997	JUL 1997	SEP 1997
Organizational Level Support	APR 2000	APR 2000	JUN 2000
Intermediate Level Support	JUL 2000	JUL 2000	SEP 2000
Milestone III	JUL 1998	JUL 1998	OCT 1998
IOC	(b)(1)		
BLU-108 SYSTEM			
Pre-E&MD Contract Award	MAY 1993	MAY 1993	N/A
Preliminary Fit Checks	JUN 1993	JUN 1993	JUN 1993
Eng Dev Test Vehicle Delivery	FEB 1994	FEB 1994	FEB 1994
F-16 Flight Tests	MAR 1994	MAR 1994	MAR 1994
F-15E Flight Tests	MAY 1994	MAY 1994	MAY 1994
Systems Design Review	APR 1995	APR 1995	JUN 1994
Milestone II	APR 1995	APR 1995	APR 1995
E&MD Contract Mod	JUN 1995	JUN 1995	JUN 1995
Preliminary Design Review	OCT 1995	OCT 1995	OCT 1995
Critical Design Review	OCT 1996	OCT 1996	APR 1997
DT&E			
Start	DEC 1995	DEC 1995	FEB 1996
Complete (Report)	JUN 1998	JUN 1998	SEP 1998
Operational Assessment			
Start	DEC 1995	DEC 1995	APR 1996
Complete (Report)	SEP 1996	SEP 1996	FEB 1997

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9a. (U) Schedule (Cont'd):  
Baseline/BLU-108

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
LRIP Contract Option Exercised	JAN 2000	JAN 2000	DEC 1998
LRIP First Delivery	JUL 2001	JUL 2001	JUL 2000
Milestone III	OCT 2001	OCT 2001	APR 2001 (Ch-1)
Initial Operational Capability	(b)(1)	(b)(1)	(b)(1) (Ch-2)
IOT&E			
Start	JUL 2000	JUL 2000	AUG 2000 (Ch-3)
Complete (report)	MAR 2001	MAR 2001	JAN 2001 (Ch-4)

b. Current Change Explanations --

(U) (Ch-1) Milestone III changed from Nov 00 to Apr 01 to reflect schedule adjustment due to the Congressional FY 00 funding reduction that eliminated LRIP 2 procurement and changed the required MS III planned date.

(Ch-2) IOC changed from Sep 02 to Feb 03 to reflect the new plan due to the Congressional mark that eliminated the procurement of missiles in FY 00 and delayed IOC.

(Ch-3) IOT&E (Start) changed from Apr 00 to Aug 00 to reflect revised plan due to the Congressional FY 00 mark that reduced the moderate risk plan for MOT&E.

(Ch-4) IOT&E (Complete) changed from Sep 00 to Jan 01 to reflect revised plan due to the Congressional FY 00 mark that reduced the moderate risk plan for MOT&E.

Unitary

a. Milestones --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone II	APR 1995	APR 1995	APR 1995
E&MD Contract Award	JUL 1995	JUL 1995	AUG 1995
Critical Process Review #1	FEB 1996	FEB 1996	JUN 1996
Critical Process Review #2	DEC 1998	N/A	N/A
Critical Process Review #3	AUG 2000	FEB 2000	AUG 2000
System Flight Test			
Start	JAN 2001	JAN 2001	JAN 2001
Complete (Report)	SEP 2001	SEP 2001	SEP 2001
LRIP Contract Option Exercised	OCT 2000	OCT 2001	DEC 2001
LRIP First Delivery	APR 2002	DEC 2002	DEC 2002
OPEVAL (OT-IIB)			
Start	NOV 2001	NOV 2001	JAN 2002
Complete (Report)	MAY 2002	MAY 2002	JUL 2002
Milestone III	SEP 2002	SEP 2002	DEC 2002
Initial Operational Capability	(b)(1)	(b)(1)	(b)(1)
Organization Level Support	TBD	N/A	N/A



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9a. (U) Schedule (Cont'd):

Unitary

	Development <u>Estimate (SAR)</u>	Approved <u>Program (APB)</u>	Current <u>Estimate</u>
Intermediate Level Support	TBD	N/A	N/A
Depot Level Support	TBD	N/A	N/A

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

Baseline/BLU-108

a. Performance --

	Production <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>	Demon- strated <u>Perf</u>	Current <u>Estimate</u>
Launch Envelope Airspeed (TMN/KCAS)	(b)(1)			
Off Axis Launch Angle Survivability	(b)(1)			
Accuracy (CEP) Weapon (Air Vehicle) (ft) Reliability System Mission Range (nm from launch at specified conditions) Low Altitude (NM)  High (NM @30K ft MSL, .8 IMN) BLU-108 System Weapon Effective- ness (Kill per Weapon) Non- Countermeasures Environment Reliability System Mission	(b)(1)			

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10b. (U) Performance Characteristics (Cont'd):

Baseline/BLU-108

b. Current Change Explanations -- None

Unitary

a. Performance --

	<u>Development Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Launch Envelope	(b)(1)			
Airspeed (IMN/KCAS)				
Off Axis Launch Angle (deg)	(b)(1)			
Survivability				
Accuracy (CEP)	(b)(1)			
Weapon (ft)				
Weapon (Air Vehicle) (ft)				
Range (nm from launch at specified conditions)				
Low Altitude (NM)				
High (NM @ 30K ft MSL, .8 IMN)				
Reliability				
System Mission				

b. Current Change Explanations -- None

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11. (U) Total Program Cost and Quantity (Dollars in Millions):  
Baseline/BLU-108

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
a. (U) Cost --			
Development (RDT&E)	554.0	554.0	561.5
Procurement	2990.5	2990.5	2985.6
Recurring	(2876.7)		(2862.3)
Nonrecurring	(78.7)		(92.4)
Total Flyaway	(2955.4)		(2954.7)
Fleet Support	(34.2)		(30.3)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.9)		(0.6)
Construction (MILCON)	21.8	21.8	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1990 Base-Year \$	3566.3	3566.3	3547.1
Escalation	1332.4	1332.4	1246.9
Development (RDT&E)	(91.0)	(91.0)	(78.6)
Procurement	(1234.6)	(1234.6)	(1168.3)
Construction (MILCON)	(6.8)	(6.8)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	4898.7	4898.7	4794.0
b. (U) Quantity --			
Development (RDT&E)	N/A	N/A	0
Procurement	<u>16124</u>	<u>16124</u>	<u>16114</u>
Total	16124	16124	16114

Note: Excludes 69 RDT&E prototypes from the SAR Baseline and 69 from the Current Estimate that are not considered fully configured.

(U) Note: 16,114 procurement units includes 8800 Navy Baselines (\$1428.7M), 1200 Navy BLU-108's (\$309.6M), 3,000 Air Force Baselines (\$423.1M), and 3,114 Air Force BLU-108's (\$824.2M).

Note: The Program Manager plans to procure less than 261 BLU-108s during LRIP. This does not represent 10% or more of the planned buy quantities.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

11a. (U) Total Program Cost and Quantity (Cont'd):

Unitary

	<u>Development</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program (APB)</u>	<u>Current</u> <u>Estimate</u>
a. (U) Cost --			
Development (RDT&E)	257.2	209.7	215.0
Procurement	3103.7	612.4	611.6
Recurring Flyaway	(2825.2)		(597.1)
Nonrecurring Flyaway	(102.1)		(7.9)
Total Flyaway	(2927.3)		(605.0)
Fleet Support	(35.5)		(0.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(140.9)		(5.8)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1990 Base-Year \$	3360.9	822.1	826.6
Escalation	2946.3	327.5	313.7
Development (RDT&E)	(79.1)	(44.8)	(43.6)
Procurement	(2867.2)	(282.7)	(270.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	6307.2	1149.6	1140.3
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>7800</u>	<u>3000</u>	<u>3000</u>
Total	7800	3000	3000

Note: Excludes 7 RDT&E prototypes from the SAR Baseline and 7 from the Current Estimate that are not considered fully configured.

(U)

Note: LRIP quantities approved at Milestone II are 140 for Unitary. This does not represent 10% or more of the planned buy quantities.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

Baseline/BLU-108

	UCR Baseline (JUL 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1990 BY\$)	3566.3	3547.1	
(2) Quantity	16124	16114	
(3) Unit Cost	0.221	0.220	-0.45
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1990 BY\$)	2990.5	2985.6	
(2) Quantity	16124	16114	
(3) Unit Cost	0.185	0.185	0.00

Unitary

	UCR Baseline (JUL 1999 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1990 BY\$)	822.1	826.6	
(2) Quantity	3000	3000	
(3) Unit Cost	0.274	0.276	+0.73
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1990 BY\$)	612.4	611.6	
(2) Quantity	3000	3000	
(3) Unit Cost	0.204	0.204	0.00

13. (U) Cost Variance Analysis:

Baseline/BLU-108

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	645.0	4225.1	28.6	4898.7
Previous Changes:				
Economic	-	-	-	-
Quantity	-	-	-	-
Schedule	-	-	+0.4	+0.4
Engineering	-	-	-	-
Estimating	-	-2.4	-29.0	-31.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	-	-2.4	-28.6	-31.0
Current Changes:				
Economic	+0.2	-68.4	-	-68.2
Quantity	-	-3.2	-	-3.2
Schedule	-	+11.7	-	+11.7
Engineering	-	-	-	-
Estimating	-5.1	-2.4	-	-7.5
Other	-	-	-	-
Support	-	-6.5	-	-6.5
Subtotal	-4.9	-68.8	-	-73.7
Total Changes	-4.9	-71.2	-28.6	-104.7
Current Estimate	640.1	4153.9	-	4794.0

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	554.0	2990.5	21.8	3566.3
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+11.3	-	-21.8	-10.5
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+11.3	-	-21.8	-10.5
Current Changes:				
Quantity	-	-1.7	-	-1.7
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-3.8	+1.0	-	-2.8
Other	-	-	-	-
Support	-	-4.2	-	-4.2
Subtotal	-3.8	-4.9	-	-8.7
Total Changes	+7.5	-4.9	-21.8	-19.2
Current Estimate	561.5	2985.6	-	3547.1

13b. (U) Cost Variance Analysis (Cont'd):  
Baseline/BLU-108

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Economic adjustment for negative program change. (Economic)	N/A	+0.2
	Reflects reductions to program controls for SBIR, budget adjustments, and Congressional rescissions. (Estimating)	-3.8	-5.1
	RDT&E Subtotal	-3.8	-4.9
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-75.8
	Economic adjustment for negative program change. (Economic)	N/A	+7.4
	Total Quantity Variance associated with the decrease of 10 units for Air Force from 6124 to 6114 units. (Quantity)	-1.7	-3.2
	Stretchout of annual procurement buy profile. (Schedule)	0.0	+11.7
	Adjustment for Current and Prior Inflation. (Estimating)	+1.8	+2.3
	Reflects higher unit cost than previously negotiated for Full Rate Production II contract with Raytheon. (Estimating)	+28.8	+46.5
	Reflects elimination of LRIP II Air Force procurement as a result of a Congressional Reduction. (Estimating)	-29.6	-51.2
	Updated previous life cycle cost estimate to better reflect an accurate representation of the latest weapon configuration requirements. (Support)	-4.2	-6.5
	Procurement Subtotal	-4.9	-68.8

13. (U) Cost Variance Analysis (Cont'd):

Unitary

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	336.3	5970.9	-	6307.2
Previous Changes:				
Economic	-18.5	-356.0	-	-374.5
Quantity	-	-1321.4	-	-1321.4
Schedule	-	-99.1	-	-99.1
Engineering	-	-	-	-
Estimating	-63.3	-3010.6	-	-3073.9
Other	-	-	-	-
Support	-	-288.7	-	-288.7
Subtotal	-81.8	-5075.8	-	-5157.6
Current Changes:				
Economic	-2.3	-10.5	-	-12.8
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+6.4	+12.5	-	+18.9
Other	-	-	-	-
Support	-	-15.4	-	-15.4
Subtotal	+4.1	-13.4	-	-9.3
Total Changes	-77.7	-5089.2	-	-5166.9
Current Estimate	258.6	881.7	-	1140.3



13a. (U) Cost Variance Analysis (Cont'd):  
Unitary

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	257.2	3103.7	-	3360.9
Previous Changes:				
Quantity	-	-782.0	-	-782.0
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-47.5	-1549.7	-	-1597.2
Other	-	-	-	-
Support	-	-159.6	-	-159.6
Subtotal	-47.5	-2491.3	-	-2538.8
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+5.3	+9.4	-	+14.7
Other	-	-	-	-
Support	-	-10.2	-	-10.2
Subtotal	+5.3	-0.8	-	+4.5
Total Changes	-42.2	-2492.1	-	-2534.3
Current Estimate	215.0	611.6	-	826.6

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-2.3
Adjustment for Current and Prior Inflation. (Estimating)	+0.7	+0.8
Reflects estimating change to match Unitary restructure. (Estimating)	+4.6	+5.6
RDT&E Subtotal	+5.3	+4.1
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-11.7
Economic adjustment for negative program change. (Economic)	N/A	+1.2
Change associated with the restructure of the Unitary program. (Estimating)	+9.4	+12.5
Support estimate changed to reflect revised and verified life cycle cost. (Support)	-10.2	-15.4
Procurement Subtotal	-0.8	-13.4

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14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

Baseline/BLU-108

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.30	--	--	--	--	--	--	--	--	0.30

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.26	--	--	--	--	--	--	--	--	0.26

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PDE)	Current Estimate
Milestone I	JUN 1989	JUN 1989	JUN 1989	JUN 1989
Milestone II	MAR 1991	APR 1992	APR 1992	JUN 1992
Milestone III	JUN 1994	JUL 1998	JUL 1998	OCT 1998
FUE/IOC	(b)(1)			
Total Cost	260	2969.2	4898.7	4794
Total Quantity	0	8800	16124	16114
Prog Acq Unit Cost	0	0.34	0.3	0.3

Unitary

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.81	-0.13	+0.85	-0.03	--	-1.02	--	-0.10	-0.43	0.38

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14b. (U) Unit Cost and Other History (Cont'd):

Unitary

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.77	-0.12	+0.77	-0.03	--	-1.00	--	-0.10	-0.48	0.29

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	APR 1995	N/A	APR 1995
Milestone III	N/A	SEP 2002	N/A	DEC 2002
FUE/IOC	N/A	(b)(1)	N/A	(b)(1)
Total Cost	0	6307.2	0	1140.3
Total Quantity	0	7800	0	3000
Prog Acq Unit Cost	0	0.81	0	0.38

15. (U) Contract Information (Then-Year Dollars in Millions):

(U) E&MD contract N00019-91-C-0196 is 100 percent completed and is no longer being reported.

a. RDT&E --  
 (U) JSOW UNITARY E&MD:  
 Raytheon TI Systems, Dallas, TX  
 N00019-95-C-0120, CPFF  
 Award: January 31, 1999  
 Definitized: January 31, 1999

Initial Contract Price		
Target	Ceiling	Qty
\$211.5	N/A	0

Current Contract Price		
Target	Ceiling	Qty
\$206.9	N/A	0

Estimated Price At Completion	
Contractor	Program Manager
\$184.6	\$194.0

	Cost Variance	Schedule Variance
Previous Cumulative Variances	\$2.9	\$-1.0
Cumulative Variances To Date (12/31/99)	\$1.6	\$-0.6
Net Change	\$-1.3	\$0.4

Explanation of Change:

(U) Cost Variance: The net change for cost variance is due to work performed and billed in Seeker Design and Software and LC-GEU Test Equipment.

15. (U) Contract Information (Cont'd):

Schedule Variance: The positive net change in schedule variance is due to work performed in Seeker Design and Software and LC-GEU Test Equipment to regain schedule. Raytheon will continue upgrading the test capability through January 2000 to achieve full testing capability.

There is no impact to the contract or JSOW program for these variances.

b. Procurement --			Initial Contract Price	
(U) JSOW LRIP II:	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	
Raytheon TI Systems, Dallas, TX				
N00019-98-C-0008, FPIF	\$86.0	\$86.0	180	
Award: December 31, 1997				
Definitized: December 31, 1997				
Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$86.4	\$86.4	180	\$73.3	\$77.0
Previous Cumulative Variances			<u>Cost Variance</u>	<u>Schedule Variance</u>
Cumulative Variances To Date (12/31/99)			\$6.1	\$-0.6
Net Change			<u>\$5.1</u>	<u>\$-0.5</u>
			\$-1.0	\$0.1

Explanation of Change:

(U) (U) Cost Variance: The net change for cost variance is largely due to Manufacturing and Engineering support labor underruns and reduced manufacturing overhead rates.

(U) Schedule Variance: The net change for schedule variance has improved and is a result of RTIS shop tooling regaining schedule.

16. (U) Program Funding Summary (Current Estimate in Millions of Dollars):

Total Program

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY87-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-13)	<u>Total</u>
RDT&E	830.2	40.6	22.3	5.6	898.7
Procurement	341.3	145.0	240.4	4308.9	5035.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1171.5	185.6	262.7	4314.5	5934.3

Baseline/BLU-108

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY87-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-13)	<u>Total</u>
RDT&E	627.7	10.9	1.5	-	640.1
Procurement	341.3	145.0	238.3	3429.3	4153.9
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	969.0	155.9	239.8	3429.3	4794.0

(U) Funding does not include Seek Eagle or BRU-57 funds which are include in the P-1 documentation.

Unitary

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY92-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-10)	<u>Total</u>
RDT&E	202.5	29.7	20.8	5.6	258.6
Procurement	-	-	2.1	879.6	881.7
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	202.5	29.7	22.9	885.2	1140.3

16b. (U) Program Funding Summary (Cont'd):

b. Annual Summary -- Baseline/BLU-108

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1987				1.1	1.0
1988				20.3	19.2
1989				13.7	13.5
1990				7.8	8.0
1991				15.6	16.5
1992				42.0	45.8
1993				52.6	58.7
1994				71.1	80.9
1995				90.0	104.3
1996				39.8	46.9
1997				29.5	35.2
1998				6.8	8.2
1999				4.4	5.4
2000				0.6	0.7
2001					
2002					
Subtotal				395.3	444.3

Appropriation: 3600 - Research, Development, Test + Eval, AF

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1993				4.8	5.4
1994				20.3	23.1
1995				45.8	53.1
1996				35.4	41.8
1997				18.4	22.0
1998				17.9	21.5
1999				14.1	17.2
2000				8.3	10.2
2001				1.2	1.5
Subtotal				166.2	195.8

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16b. (U) Program Funding Summary (Cont'd):  
Baseline/BLU-108

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1996		21.1		21.1	25.2
1997	100	9.8	42.3	54.7	65.9
1998	135	3.8	54.3	63.1	76.8
1999	328	2.6	89.7	96.5	118.9
2000	454	2.5	89.6	92.1	115.1
2001	636	4.0	130.3	133.7	169.8
2002	747	5.0	135.2	140.9	182.1
2003	709	3.7	130.2	134.2	176.8
2004	603	1.4	104.6	106.5	143.1
2005	504	1.8	80.4	82.5	113.1
2006	893	2.8	132.4	135.2	189.0
2007	981	3.4	149.0	152.4	217.4
2008	675	1.4	79.2	80.7	117.4
2009	675	1.8	78.4	80.2	119.0
2010	675	1.4	84.3	85.8	129.8
2011	675	1.7	92.9	94.6	146.1
2012	675	1.3	89.7	93.9	147.9
2013	535	1.6	87.3	90.2	142.9
Subtotal	10000	71.1	1649.8	1738.3	2396.3

Appropriation: 3020 - Missile Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1998	45	1.7	14.4	16.6	20.2
1999	86	2.5	23.7	27.8	34.3
2000	74	1.7	19.7	23.9	29.9
2001	174	3.1	45.4	53.9	68.5
2002	164	2.7	41.2	49.0	63.3
2003	216	2.5	55.9	58.1	76.6
2004	454	2.0	105.5	97.2	130.6
2005	561	1.4	138.9	129.9	178.1
2006	717	0.7	137.1	135.3	189.1
2007	696	0.7	120.4	125.9	179.6
2008	976	0.7	191.5	200.6	291.8
2009	1018	0.4	198.3	208.3	309.0
2010	311	0.4	37.2	37.3	56.4
2011	311	0.4	41.7	41.7	64.4
2012	311	0.4	41.6	41.8	65.8
Subtotal	6114	21.3	1212.5	1247.3	1757.6

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16b. (U) Program Funding Summary (Cont'd):  
Baseline/BLU-108

(U) Funding does not include Seek Eagle or BRU-57 funds which are include in the P-1 documentation.

Service	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Navy	10000	71.1	1649.8	2133.6	2840.6
USAF	6114	21.3	1212.5	1413.5	1953.4
Grand Total	16114	92.4	2862.3	3547.1	4794.0

b. Annual Summary -- Unitary

Appropriation: 1319 - Research, Development, Test + Eval, Navy

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1992				1.7	1.9
1993				4.1	4.6
1994				2.1	2.4
1995				8.9	10.3
1996				26.2	30.9
1997				39.4	47.0
1998				54.8	65.9
1999				32.5	39.5
2000				24.2	29.7
2001				16.7	20.8
2002				4.4	5.6
Subtotal				215.0	258.6

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001			1.6	1.7	2.1
2002	15		14.8	14.8	19.1
2003	30		13.7	13.7	18.1
2004	60		18.4	18.5	24.8
2005	70		19.0	19.1	26.2
2006	405	1.5	92.2	94.8	132.5
2007	605	1.8	119.8	123.1	175.5
2008	605	1.4	109.8	112.6	163.8
2009	605	1.8	105.4	108.5	161.0
2010	605	1.4	102.4	104.8	158.6



16b. (U) Program Funding Summary (Cont'd):

Unitary

Appropriation: 1507 - Weapons Procurement, Navy

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal	3000	7.9	597.1	611.6	881.7

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	3000	7.9	597.1	826.6	1140.3

17. (U) Delivery/Expenditure Information:

Baseline/BLU-108

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	235	268

(U) Percent Total Program Quantities Delivered: 1.7%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 665.5

(U) Percent Total Program Expended: 13.9%

Unitary

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	0	0

(U) Percent Total Program Quantities Delivered: 0.0%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 170.6

(U) Percent Total Program Expended: 15.0%

18. (U) Operating and Support Costs:

Baseline/BLU-108

a. (U) Assumptions and Ground Rules --

SOURCE: Operations and Support requirements analysis dated December 1996.

ASSUMPTIONS:

There is no antecedent system.  
 No additional operational/maintenance personnel at O-Level.  
 No I-Level Maintenance.  
 60 JSOW expenditures per year.  
 Deployed aboard 10 CVBG each year - 100 JSOW per CV.  
 20 year missile life.

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per JSOW Unit	Avg Annual Cost Per ANTECEDENT
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.4	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.1	0.0
Indirect Costs	0.0	0.0
Total	0.5	0.0

Unitary

a. (U) Assumptions and Ground Rules --

SOURCE: Operations and Support requirements analysis dated April 1995.

ASSUMPTIONS:

There is no antecedent system.  
 Unitary will be integrated with the established Baseline program.  
 10 Unitary expenditures per year.  
 Deployed aboard 10 CVBG each year, 50 JSOW Unitary per CV.  
 Twenty year missile operating life.  
 No additional operational/maintenance personnel at O-Level.  
 No I-Level Maintenance  
 Contractor Depot Component Repair Program.

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JSOW, December 31, 1999

18b. (U) Operating and Support Costs (Cont'd):  
Unitary

b. (U) Costs -- (FY 1990 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per JSOW Unitary	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	0.0	0.0
Unit Level Consumption	0.3	0.0
Intermediate Maintenance	0.1	0.0
Depot Maintenance	0.0	0.0
Contractor Support	0.0	0.0
Sustaining Support	0.3	0.0
Indirect Costs	0.0	0.0
Total	0.7	0.0

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# AF-15 MILSTAR

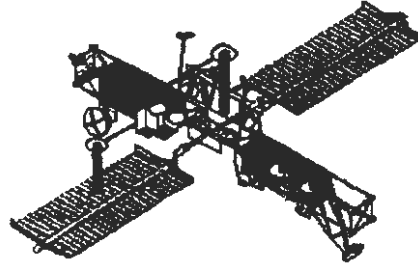
\*\*\* ~~SECRET~~ \*\*\*

SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)  
PROGRAM: MILSTAR

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): Milstar Satellite Communications Systems
2. (U) DoD Component: USAF
3. (U) Responsible Office and Telephone Number:  
 SMC/MC  
 2420 Vela Way  
 Suite 1467-A8  
 Los Angeles AFB, CA 90245-4659  
 BGen Craig R. Cooning  
 Assigned: November 30, 1998  
 DSN 833-4877; COMM 310-336-4877  
 Craig.Cooning@losangeles.af.mil
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
 (U) PE 0303603F  
 (U) PE 0604479F  
 PROCUREMENT:  
 (U) APPN 3080 ICN 836780 (Air Force)

SAF/...

00-0746

DDA823  
CONGRESS...

**CLEARED**  
FOR OPEN PUBLICATION

MAR 13 2000 4

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

~~Classified by Milstar Security Classification Guide, 10 Sep 93  
Downgrade instructions: NOT APPLICABLE - Automatic Downgrade  
Declassify on: Originating Agency Determination Required (OADR)~~

(THIS PAGE IS UNCLASSIFIED)

\*\*\* ~~SECRET~~ \*\*\*

00-C-0745

5. (U) References:

SAR Baseline (Development Estimate):

(U) DAE approved Acquisition Program Baseline dated October 28, 1992.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated February 6, 1995.

6. (U) Mission and Description:

(U) The Milstar Satellite Communications System, which in part takes over the mission of DSCS and AFSATCOM, is a joint service program to develop and acquire the Milstar satellite, its mission control segment, and Army, Navy and Air Force communications terminals. The Milstar system will provide survivable, jam-resistant, worldwide secure communications for the National Command Authorities and Commanders-in-Chief to command and control their tactical and strategic forces at all levels of conflict.

7. (U) Executive Summary:

(U) In 1983, the Milstar Satellite Communications System program was designated with the highest national priority. After a short feasibility study, the Space and Mission Control program proceeded directly into the Full Scale Development (FSD) phase. The FSD contract was awarded in June of 1983.

In the National Defense Authorization Act for FY91, Congress directed the Department of Defense to restructure the Milstar system to reduce cost, increase the utility of the system for tactical users, and eliminate enduring nuclear warfighting capabilities. As a result, the number of satellites, mission control stations and terminals was reduced. Furthermore, features associated with nuclear hardness and survivability were reduced and capabilities to support tactical requirements were added. A contract for the Milstar II satellite development was awarded in October 1992 following a successful October 1992 Defense Acquisition Board (DAB) Program Review. The Milstar II satellite will incorporate the Low Data Rate payload of the original Milstar satellite and add a new Medium Data Rate payload.

Flight 1, (formally Sat 1) launched on February 7, 1994 successfully completed Air Force Operational Test and Evaluation Center's (AFOTEC) Dedicated Asset Test (DAT) and Navy's Follow-On Operational Test and Evaluation (FOT&E) on September 9, 1994. The program office turned over Satellite Control Authority (SCA) to Air Force Space Command (AFSPC) on November 1, 1994.

In a January 17, 1995 memo, the Defense Acquisition Executive (DAE) directed the program office to decouple the Advanced EHF and Milstar programs, and to appropriately revise the Milstar Acquisition Program Baseline to only include the 2 Milstar block I and 4 Milstar block II satellites. In addition, the revised baseline incorporated the current approved test plan and established new milestones in accordance with the approved Milstar Streamlined Acquisition Strategy Report. The revised Milstar APB was approved by the DAE on February 6, 1995.

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MILSTAR, December 31, 1999

7. (U) Executive Summary (Cont'd):

On May 11, 1995 the Office of the Joint Chiefs of Staff (JCS) certified the Milstar Low Data Rate (LDR) system for Emergency Action Message (EAM) dissemination and force feedback.

On November 6, 1995 Flight 2 was successfully launched from Cape Canaveral on a Titan IV/Centaur booster. The satellite arrived at its initial testing location at 90 degrees West longitude and completed early on-orbit operations. On December 15, 1995 Milstar demonstrated unprecedented communication capability with a message sent from the JCS to the CINCs without the use of vulnerable ground relays. The message was sent from the National Military Command Center's terminal at Ft. Belvoir, VA to the Flight 1, then crosslinked to Flight 2, and downlinked to the CINCs. Satellite Control Authority (SCA) was transferred to Air Force Space Command (AFSPC) on March 22, 1996.

The fourth Space Operations Squadron deployment of the mobile Constellation Control Station to Europe (with our support) started in May 1997 and operations completed in June 1997. The mission was highly successful and proved the capability to perform command and control of the entire constellation worldwide.

In the Spring of 1997, the MILSATCOM Joint Program Office (MJPO) and AFSPC successfully completed a demonstration of Milstar's ability to operate autonomously for a sustained period without ground commands. Milstar's performance exceeded requirements and specifications. Autonomy is one of Milstar's key survivability features and one of several critical operational parameters that was formally tested during the Phase II IOT&E program.

The Defense Information Services Agency sponsored Milstar Advanced Narrowband Voice Terminal/Defense Red Switch Network (ANDVT/DRSN) demo was held in September 1997 and was a success. Local conferencing was demonstrated. MJPO will provide technical support per Joint Staff direction in CONOPS and baseband implementation.

In the Spring of 1998, work on the Milstar I contract was completed. Contract closeout activities have begun.

Flight 3 launched on schedule 30 April 1999. Due to a Centaur failure, the satellite did not reach geo-synchronous orbit and was declared a mission failure. As a result of this loss, the MJPO is developing acquisition strategies and associated cost estimates for potential mission replacements. The current APB milestones of Milstar II IOT&E Complete, IOC II and FOC will be breached because of this failure. FOC is currently defined as a four Milstar Block II satellite constellation. Without a Flight 3 replacement satellite we cannot meet the current definition of FOC. The Program Deviation Report detailing these breaches was forwarded to OSD. An out-of-cycle SAR was submitted in June 1999 due to the program breach.

The JROC met December 13, 1999 and elected to consider the AEHF "Pathfinder" concept for a Milstar Flight 3 replacement. This concept explores the

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7. (U) Executive Summary (Cont'd):

potential of accelerating (Dec 2004 launch) a "stripped down" version of AEHF as a mitigation of the Milstar Flight 3 loss, followed by delivery of four additional fully capable AEHF satellites. An Integrating Integrated Product Team (IIPT), Overarching Integrated Product Team (OIPT), and Defense Acquisition Executive (DAE) review will be scheduled to consider the merits of terminating the AEHF competition in favor of a sole source award to a team consisting of the contractors currently participating in the competition (the same team that currently produces the Milstar II).

Flight 4 successfully completed satellite-level thermal vacuum testing 20 days early, 11 May 1999. The flight remains on-schedule to support the August 2000 launch date. Flight 5 completed satellite Final Assembly and is now in Baseline Integrated Satellite Test. Flight 6 Low Data Rate (LDR) and Medium Data Rate (MDR) payloads are scheduled for delivery from the sub-contracts to Lockheed Martin Missiles and Space (LMMS) in April 2000.

\*\*\*This is the final Milstar SAR due to program expenditure greater than 90%\*\*\*

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	Yes
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

Milstar Flight 3 launched on schedule 30 April 1999. Due to a Centaur failure, the satellite did not reach geo-synchronous orbit and was declared a mission failure. The Flight 3 mission failure will cause a breach to the current Milstar II IOT&E Complete, IOC II, and FOC APB milestones. A Program Deviation Report has been forwarded to OSD. FOC is currently defined as a four Milstar Block II satellite constellation. Without a Flight 3 replacement satellite we

8c. (U) Threshold Breaches (Cont'd):

cannot meet the current definition of FOC. An out of cycle SAR was submitted in June 1999 due to the program breach. An update to the Acquisition Program Baseline will be made once FOC has been redefined.

9. (U) Schedule:

a. Milestones --

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
Milstar I Dev Contract Award	JUN 1983	JUN 1983	JUN 1983
LDR Payload/Bus CDR	JUL 1987	JUL 1987	JUL 1987
Mission Control Segment CDR	AUG 1988	AUG 1988	AUG 1988
DAB Program Review	SEP 1992	OCT 1992	OCT 1992
Milstar II Contract Award	OCT 1992	OCT 1992	OCT 1992
Satellite 1 Delivery	DEC 1992	DEC 1992	DEC 1992
Satellite 1 On-Orbit DT&E			
Start	JUL 1993	FEB 1994	FEB 1994
Complete	JAN 1994	JUN 1994	JUN 1994
Milstar I Phase 1 IOT&E			
Start	FEB 1994	AUG 1994	AUG 1994
Dedicated Asset Test			
Start	N/A	AUG 1994	AUG 1994
Complete	N/A	SEP 1994	SEP 1994
Complete	AUG 1994	SEP 1995	AUG 1995
Milstar I Phase 2 IOT&E			
Start	MAY 1995	MAR 1996	JUN 1996
Complete	NOV 1995	SEP 1996	MAR 1997
IOC I	MAR 1996	JAN 1997	JUL 1997
Mission Control Organic Support Capability	SEP 1996	SEP 1996	SEP 1996
Milstar II IOT&E			
Start	APR 1999	AUG 1999	AUG 1999
Complete	SEP 1999	FEB 2000	TBD
Milstar II MS III	SEP 1999	N/A	N/A
IOC II	OCT 2000	OCT 2000	TBD
Constellation Control Organic Support	DEC 2000	DEC 2000	DEC 2000
FOC	DEC 2004	DEC 2004	TBD

(U) Acronyms & Abbreviations:

- \*\*\*\*\*
- CDR - Critical Design Review Capability
  - DAB - Defense Acquisition Board
  - Dev - Development
  - DT&E - Developmental Test and Evaluation
  - FOC - Full Operational Capability
  - IOC - Initial Operational Capability
  - IOT&E - Initial Operational Test and Evaluation
  - LDR - Low Data Rate



9a. (U) Schedule (Cont'd):

MS - Milestone

b. Current Change Explanations -- None

10. (U) Performance Characteristics:

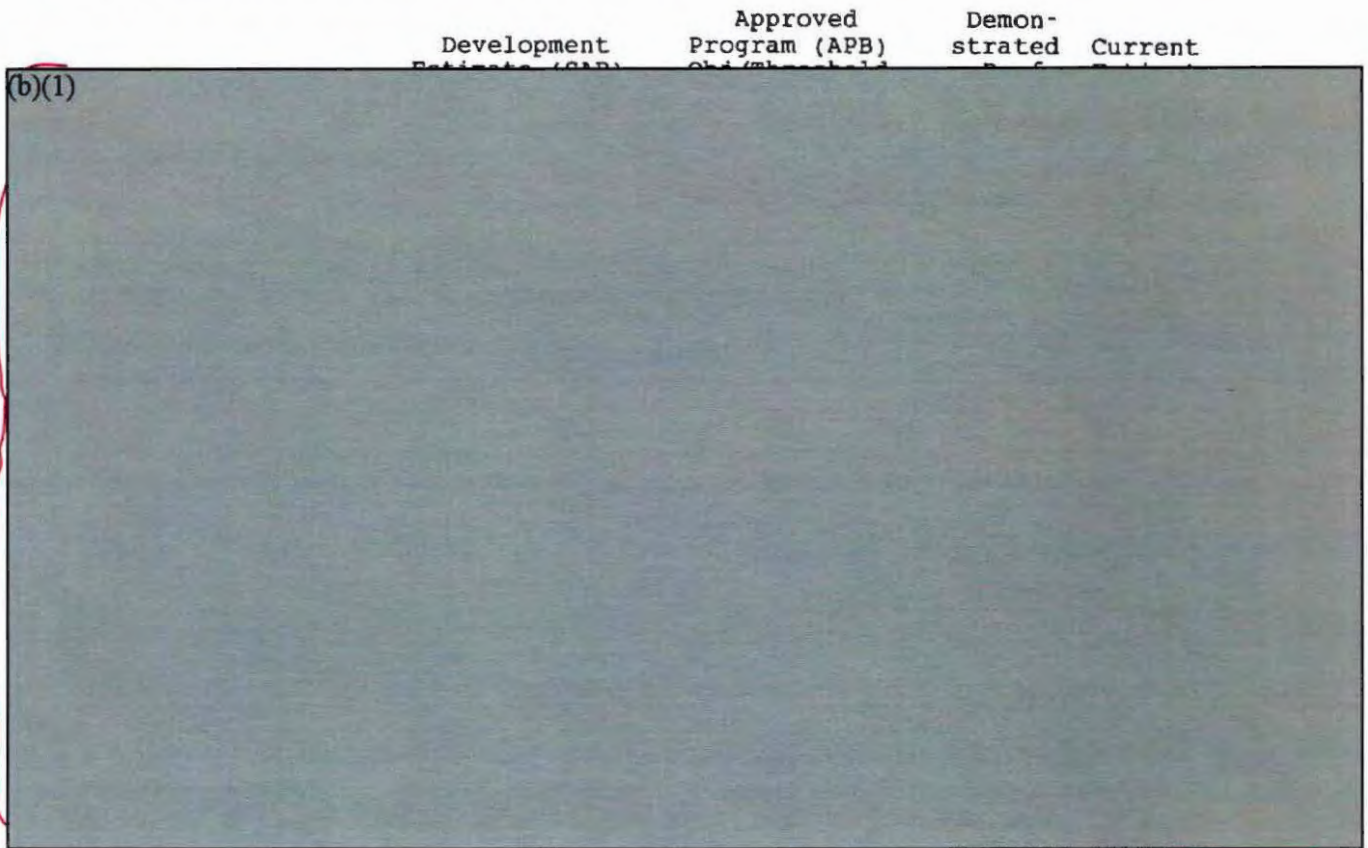
a. Performance --

	Development Estimate (SAR)	Approved Program (APB) Obj/Threshold	Demon- strated Perf	Current Estimate
<b>Polar</b>				
Coverage	65N-90N	65N-90N / 65N-90N	65N-90N	65N-90N
Hrs/day	24	24 / 16	16	16
Capacity Payload				
Uplink	TBD	TBD / TBD	TBD	TBD
Downlink	TBD	TBD / TBD	TBD	TBD
Crosslink	TBD	TBD / TBD	TBD	TBD
UHF	TBD	TBD / TBD	TBD	TBD
Anti-jam Capability	TBD	TBD / TBD	TBD	TBD
Scintillation Protection	TBD	TBD / TBD	TBD	TBD
<b>Mid Latitude</b>				
Coverage	65S-65N	65S-65N / 65S-65N	65N-65N	65S-65N
LDR				
Hrs/day	24	24 / 24	24	24
Capacity/Payload (Kbps)				
Uplink	315	315 / 225	237.3	237.3
Downlink	485	485 / 340	604.8	604.8
Crosslink	170	170 / 115	133.5	133.5
MDR				
Hrs/day	24	24 / 24	24	24
Capacity/Payload	1 WSA & +1 ECA & +3 MSA & +4 LSA	1 WSA & / +1 ECA & / +3 MSA & / +4 LSA /	1 WSA & +3 MSA	1 WSA & +3 MSA
Uplink (Mbps)	57	57 / 43	71.6	71.6
WSA	40	40 / 30	35.8	35.8
MSA	12	12 / 6	8.9	8.9
Downlink (Mbps)	76	76 / 38	45	45
Crosslink (Mbps)	6.3	6.3 / 3.2	5	5
Antijam Capability				
LDR: (EIRP, dBW)				



(b)(1)

10a. (U) Performance Characteristics (Cont'd):



	Development Estimate (SEP)	Approved Program (APB) Obj (Threshold)	Demonstrated	Current
LDR UHF Compatibility	AFSATCOM FLTBCDST	AFSATCOM/ FLTBCDST/	AFSATCOM FLTBCDST	AFSATCOM FLTBCDST
Capacity (links @ bps)	4 @ 75 & 1 @ 1200	4 @ 75 &/ 1 @ 1200/	4 @ 75 & 1 @ 1200 & 1 @ 1200	4 @ 75 & 1 @ 1200
LDR Interoperability	MIL-STD 1582C MJCS1-87	MIL-STD / 1582C / MJCS1-87/	MIL-STD 1582C MJCS1-87	MIL-STD 1582C MJCS1-87
MMD (months)				
LDR	84	84 / 84	84	84
MDR	84	84 / 84	84	84
Constellation Control Stations R&M (MCE + Fixed CP) (hrs)				
MTBCF (hrs)	221	221 / 221	297	297

10a. (U) Performance Characteristics (Cont'd):

	Development <u>Estimate (SAR)</u>	Approved Program (APB) <u>Obj/Threshold</u>		Demon- strated <u>Perf</u>	Current <u>Estimate</u>
MTTRF (hrs)	1.0	1.0	/ 1.0	1.0	1.0
Satellite Design Weight (lbs)	10000	N/A	/ N/A	N/A	N/A
Milstar I Weight (lbs)	N/A	TitanIV// Centaur	TitanIV/ Centaur ble / ble	TitanIV/ Centaur compati- ble	TitanIV/ Centaur compati- ble
Milstar II Weight (lbs)	N/A	TitanIV// Centaur	TitanIV/ Centaur ble / compati- ble	TitanIV/ Centaur compati- ble	TitanIV/ Centaur compati- ble

(U) Acronyms & Abbreviations

\*\*\*\*\*

- dBW - decibel Watts
- EAM - Emergency Action Message
- ECA - Earth Coverage Area
- EIRP - Effective Isotropic Radiated Power
- Kbps - Kilo bits per second
- LDR - Low Data Rate
- LSA - Local Service Area
- Mbps - Mega bits per second
- MCE - Mission Control Element
- MDR - Medium Data Rate
- MIL-STD 1582C - Military Standard (Milstar Waveform)
- MJCS - Joint Chiefs of Staff Memo
- MMD - Mean Mission Duration
- MSA - Medium Service Area
- MTBCF - Mean Time Between Critical Failure
- MTTRF - Mean Time To Restore Function
- NCGS - Nuclear Criteria Group Secretariat
- R&M - Reliability and Maintainability
- SCT - Single Channel Transponder
- UHF - Ultra High Frequency
- WSA - Wide Service Area

10b. (U) Performance Characteristics (Cont'd):

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

	Development Estimate (SAR)	Approved Program (APB)	Current Estimate
a. <del>Cost</del> Cost --			
Development (RDT&E)	(b)(1)		
Procurement	3961.4	39.0	41.2
Flyaway	(3913.9)		(0.0)
Total Other Wpn Sys			(0.0)
Peculiar Support	(47.5)		(38.7)
Initial Spares	(0.0)		(2.5)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1990 Base-Year \$	(b)(1)		
Escalation	4234.9	1054.0	609.4
Development (RDT&E)	(1807.0)	(1047.1)	(604.3)
Procurement	(2427.9)	(6.9)	(5.1)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	(b)(1)		
b. (U) Quantity --			
Development (RDT&E)	7	6	6
Procurement	4	0	0
Total	11	6	6

(U) Note: All satellites are being procured with RDT&E funding. Procurement funding is for Mission Control Segment support equipment.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (FEB 1995 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (S) Prog. Acq. Unit Cost (PAUC)	(b)(1)		
(1) Cost (FY 1990 BY\$)			
(2) Quantity			
(3) Unit Cost			-4.62
b. (S) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1990 BY\$)	39.0	41.2	
(2) Quantity	0	0	
(3) Unit Cost	N/A	N/A	N/A

(U) Note: Per 1993 Defense Planning Guidance resulting from the SECDEF's Bottom-Up Review, the Milstar II program will terminate after Flight 6 and transition to a lower cost Advanced EHF satellite with first launch no later than FY06. As a result of this direction, the Milstar II program will no longer build production satellites (7 through 11). Consequently, procurement unit cost is not applicable to the Milstar space segment. Most recently, the JROC met 13 December 1999 and elected to consider the AEHF "Pathfinder" concept for a Milstar Flight 3 replacement.

13. (U) Cost Variance Analysis:

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	(b)(1)			
Previous Changes:				
Economic	-358.1	-249.8	-	-607.9
Quantity	-1022.8	-5980.3	-	-7003.1
Schedule	-61.2	-	-	-61.2
Engineering	-500.6	-	-	-500.6
Estimating	-1298.9	-103.9	-	-1402.8
Other	-	-	-	-
Support	-315.9	-9.0	-	-324.9
Subtotal	-3557.5	-6343.0	-	-9900.5
Current Changes:				
Economic	-6.1	-1.1	-	-7.2
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+63.0	+1.1	-	+64.1
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+56.9	-	-	+56.9
Total Changes	-3500.6	-6343.0	-	-9843.6
Current Estimate	(b)(1)			

(U) Summary (FY 1990 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Development Estimate	(b)(1)			
Previous Changes:				
Quantity	-743.1	-3832.1	-	-4575.2
Schedule	-32.9	-	-	-32.9
Engineering	-325.2	-	-	-325.2
Estimating	-1034.1	-81.8	-	-1115.9
Other	-	-	-	-
Support	-212.2	-7.3	-	-219.5
Subtotal	-2347.5	-3921.2	-	-6268.7
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	+49.6	+1.0	-	+50.6
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+49.6	+1.0	-	+50.6
Total Changes	-2297.9	-3920.2	-	-6218.1
Current Estimate	(b)(1)			

13b. (U) Cost Variance Analysis (Cont'd):

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>RDT&amp;E</u>		
Revised escalation indices. (Economic)	N/A	-6.1
Adjustment for Current and Prior Inflation. (Estimating)	+2.6	+3.3
New Estimating Change (Estimating)	+47.0	+59.7
RDT&E Subtotal	+49.6	+56.9
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-1.1
Adjustment for Current and Prior Inflation. (Estimating)	+1.0	+1.1
Procurement Subtotal	+1.0	0.0

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. ~~(U)~~ Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Dev Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
(b)(1)	102.52	+465.42	-10.20	-83.43	-223.12	--	-54.15	-8.00	(b)(1)

b. ~~(U)~~ Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Dev Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1597.32	--	--	--	--	--	--	--	--	N/A

14c. (U) Unit Cost and Other History (Cont'd):

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	JUN 1983	N/A	JUN 1983
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	OCT 2000	N/A	(b)(1)
Total Cost	0	(b)(1)	0	(b)(1)
Total Quantity	0	(b)(1)	0	(b)(1)
Prog Acq Unit Cost	0	(b)(1)	0	(b)(1)

(U) The current estimate for the declaration of IOC II changed from Oct 00 to TBD as a result of the Flight 3 mission failure. IOC II is defined as two operational Milstar Block II satellites. A Program Deviation Report has been forwarded to OSD.

15. (U) Contract Information (Then-Year Dollars in Millions):

a. RDT&E --		Initial Contract Price		
(U) <u>Milstar II Satellites:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Lockheed MSL & Space Co, Sunnyvale CA		\$1659.5	N/A	1
F04701-92-C-0049, CPAF				
Award: October 30, 1992				
Definitized: October 30, 1992				
Current Contract Price		Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Contractor</u>	<u>Program Manager</u>	
\$3886.9	N/A	\$3748.3	\$3748.3	
			<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances		\$75.9	\$-9.4	
Cumulative Variances To Date (11/30/99)		\$80.1	\$-6.9	
Net Change		\$4.2	\$2.5	

Explanation of Change:

(U) The favorable change in Cost Variance is due to an improvement in the cost performance of the Satellite Space Segment portion of the contract.

The favorable change in Schedule Variance is due to schedule recovery in the Satellite Space Segment portion of the contract.

There is no major impact to the contract or the program.



16. (U) Program Funding Summary (Current Estimate in Millions of Dollars):

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY92-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-05)	<u>Total</u>
RDT&E	(b)(1)	357.2	236.8	211.5	(b)(1)
Procurement	46.3	-	-	-	46.3
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
<b>Total</b>	(b)(1)	357.2	236.8	211.5	(b)(1)

b. Annual Summary -- Satellites

Appropriation: 3600 - Research, Development, Test + Eval, AF

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1990 Dollars Nonrec</u>	<u>Flyaway FY 1990 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1992				(b)(1)	(b)(1)
1993				816.5	915.5
1994				725.5	827.3
1995				500.3	581.2
1996				450.1	532.3
1997				548.9	657.7
1998				505.6	609.7
1999				422.3	514.0
2000				289.9	357.2
2001				189.3	236.8
2002				106.9	135.8
2003				56.4	72.8
2004				1.1	1.5
2005				1.0	1.4
<b>Subtotal</b>	6			(b)(1)	(b)(1)

(U) The FY92 line includes FY92 and prior year information.

Appropriation: 3080 - Other Procurement, Air Force

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1990 Dollars Nonrec</u>	<u>Flyaway FY 1990 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1992				7.8	8.5
1993				4.3	4.8
1994				28.2	32.0
1995				0.9	1.0

16b. (U) Program Funding Summary (Cont'd):

Appropriation: 3080 - Other Procurement, Air Force

Fiscal Year	Qty	Flyaway FY 1990 Dollars Nonrec	Flyaway FY 1990 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Subtotal				41.2	46.3

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	6			(b)(1)	(b)(1)

17. (U) Delivery/Expenditure Information:

a. <del>(S)</del> Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	3	3
Procurement	0	0

~~(S)~~ Percent Total Program Quantities Delivered: 50.0%

b. ~~(S)~~ Total Expenditures To Date (In Millions of Dollars):

~~(S)~~ Percent Total Program Expended

(U) The third satellite, Milstar Flight 3, was delivered and launched on-schedule 30 April 1999. Due to a Centaur failure, the satellite did not reach geo-synchronous orbit and was declared a mission failure.

\*\*\*This is the final Milstar SAR due to program expenditure greater than 90%\*\*\*

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --  
 The Operating & Support (O & S) period covers phase-in to Full Operation Capability (FOC) FY92-99 plus 12 steady state years. This estimate covers the cost of 12 Satellite Mission Control Subsystems in a steady-state condition. The maintenance concept consists of two levels for hardware and software. A constellation consists of four satellites. Support costs are derived from the August 25, 1992 Program Life Cycle Cost Estimate (PLCCE).  
 There is no antecedent for this system.

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MILSTAR, December 31, 1999

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 Constellation	Avg Annual Cost Per Antecedent
Mission Pay & Allowances	17.9	0.0
Unit Level Consumption	2.9	0.0
Intermediate Maintenance	0.0	0.0
Depot Maintenance	0.1	0.0
Contractor Support	9.5	0.0
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Total	30.4	0.0

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# A-16 LONGBOW APACHE

\*\*\* ~~SECRET~~ \*\*\*

SELECTED ACQUISITION REPORT (RCS: DD-A&T(O&A)823)

PROGRAM: LONGBOW APACHE

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): AH-64D LONGBOW APACHE
2. (U) DoD Component: Army
3. (U) Responsible Office and Telephone Number:  
APACHE ATTACK HELICOPTER COL HOWARD T. BRAMBLETT  
ATTN: SFAE-AV-AAH Assigned: July 15, 1998  
BLDG 5681 DSN 897-4200; COMM 205-313-4200  
Redstone Arsenal, AL 35898-5000 brambletth@peoavn.redstone.army.mil
4. (U) Program Elements/Procurement Line Items:  
RDT&E:  
(U) PE 23744 Project D423  
(U) PE 63776 Project D472  
(U) PE 64816 Project D2DT, DC27, DC31, DC87  
PROCUREMENT:  
(U) APPN 2031 ICN AA0978 (Army)  
(U) APPN 2031 ICN AA6605 (Army)  
(U) APPN 2031 ICN AA6607 (Army)  
(U) APPN 2031 ICN AA6608 (Army)

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FOR OPEN PUBLICATION

MAR 27 2000 10

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

*\* As amended*

~~Classified By: \_\_\_\_\_  
Downgrade instructions: Apache Attack Helicopter SCG - Dated 24 Feb 97  
Declassify on: \_\_\_\_\_~~

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- 1 -

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Longbow Apache, December 31, 1999

5. (U) References:

Airframe Modifications

SAR Baseline (Production Estimate):

(U) DAE Approved Acquisition Program Baseline dated November 27, 1995.

Approved Program:

(U) AAE Approved Acquisition Program Baseline (APB) dated March 23, 1998.

FCR MISSION KIT

SAR Baseline (Production Estimate):

(U) DAE Approved Acquisition Program Baseline dated November 27, 1995.

Approved Program:

(U) DAE Approved Acquisition Program Baseline (APB) dated November 27, 1995.

6. (U) Mission and Description:

(U) The Longbow consists of a mast-mounted Fire Control Radar (FCR) that 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 with 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 Air-Land Battlefield. 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. A total of 320 aircraft will be modified with all of the Longbow improvements including the FCR and the 701-C engine integrated onto an AH-64 airframe. An additional 210 aircraft will be modified to incorporate all of the Longbow improvements except the FCR and the 701-C engines.

7. (U) Executive Summary:

(U) On August 16, 1996, the Apache Project Manager signed a multi-year contract with McDonnell Douglas Helicopter Systems, now the Boeing Company. This contract, currently priced at \$2.1B, provides for the production of 232 aircraft over five years. As of 31 December 1999, 103 production AH-64D aircraft have been delivered by the Boeing Company.

Multiyear contracts for Lots 3-7, for both the Fire Control Radar (FCR) and the Radar Frequency Interferometer (RFI) were awarded November 26, 1997. As of 31 December 1999, 38 FCRs and 54 RFIs have been delivered cumulatively.

The 24th AH-64D Longbow Apache was delivered to 1-227 Attack Helicopter

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7. (U) Executive Summary (Cont'd):

Battalion on 15 July 98. This met the requirement for First Unit Equipped on time.

The following tests were completed during calendar year 1999: Gun Accuracy Tests (2 tests), Environmental Control System (ECS) test, Cold Weather test, Target Acquisition and Designation System (TADS) Electronic Display and control test, Tactical Engagement and Simulation System (TESS) test, Intermediate Gear Box (IGB) Fan test, Stinger Integration test, High Frequency Radio Integration test, Voice Maintenance Data Recorder (MDR) test, and Flight Load Survey test.

The first Longbow Apache battalion, 1-227th, was certified as C-1 Combat ready in November 1998 by the successful completion of the Unit Fielding and Training Program (UFTP) at Ft. Hood, Tx. This Initial Operational Capability (IOC) makes the 1-227th by far the most lethal attack battalion in the world. The unit successfully completed several challenging collective training events during a demanding External Evaluation and exceeded the Army maintenance standard for the AH-64 during the exercise.

The apparent Nunn-McCurdy Unit Cost Breaches reflected in 12a. and b. for the airframe and in 12b. for the FCR mission kit are remnants of the breaches we reported to Congress in the December 1998 SAR. The request for a revision to the Approved Program Baseline (APB) was submitted in January 1999. After the recent aviation study and "Army Vision" are complete, we will staff a revised APB to incorporate the results. These actions, once complete, will resolve the current unit cost anomalies.

8. (U) Threshold Breaches:

Airframe Modifications

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	Yes
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	Yes
-- Average Procurement Unit Cost (APUC)	Yes

8. (U) Threshold Breaches (Cont'd):

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The apparent Nunn-McCurdy Unit Cost Breaches reflected in 12a. and b. for the airframe and in 12b. for the FCR mission kit are remnants of the breaches we reported to Congress in the December 1998 SAR. The request for a revision to the Approved Program Baseline (APB) was submitted in January 1999. After the recent aviation study and "Army Vision" are complete, we will staff a revised APB to incorporate the results. These actions, once complete, will resolve the current unit cost anomalies.

FCR MISSION KIT

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	Yes
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	Yes

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

c. (U) Explanation of Breach:

The apparent Nunn-McCurdy Unit Cost Breaches reflected in 12a. and b. for the airframe and in 12b. for the FCR mission kit are remnants of the breaches we reported to Congress in the December 1998 SAR. The request for a revision to the Approved Program Baseline (APB) was submitted in January 1999. After the recent aviation study and "Army Vision" are complete, we will staff a revised APB to incorporate the results. These actions, once complete, will resolve the current unit cost anomalies.

9. (U) Schedule:

Airframe Modifications

a. Milestones --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Milestone I In Process Review	AUG 1985	AUG 1985	AUG 1985
Prelimin Design Contract Award	NOV 1985	NOV 1985	NOV 1985
Contract Award (Proof of Principle)	AUG 1986	AUG 1986	AUG 1986
LBA Phase I Contract Award	AUG 1988	AUG 1988	AUG 1988
Milestone IB (DAB)	JUL 1989	JUL 1989	JUL 1989
LBA Phase 2 Contract Award	AUG 1989	AUG 1989	AUG 1989
IDP Contract Award	SEP 1989	SEP 1989	SEP 1989
Dev Test/Early User Test and Eval			
Start	FEB 1990	FEB 1990	FEB 1990
Complete	APR 1990	APR 1990	APR 1990
Milestone II/IV (DAB)	DEC 1990	DEC 1990	DEC 1990
Full Scale Development Contract Award	DEC 1990	DEC 1990	DEC 1990
Verification of Apache Action Tm Fixes			
Start	APR 1991	APR 1991	APR 1991
Complete	JUL 1991	JUL 1991	JUL 1991
First Flight of Prototype w/o Longbow	APR 1992	APR 1992	APR 1992
Prelim Airworthiness Eval			
Start	MAR 1993	MAR 1993	MAR 1993
Complete	AUG 1993	AUG 1993	JUN 1993
LBA Initial Prod Readiness Rev	JUL 1992	JUL 1992	JUL 1992
First Flight w/ Longbow	AUG 1993	AUG 1993	AUG 1993
Component Qualification	JUN 1994	JUN 1994	DEC 1993
LBA Long Lead IPR	OCT 1994	OCT 1994	OCT 1994
First Flight (AH-64D w/o FCR)	JAN 1994	JAN 1994	JAN 1994
Long Lead Time Items Contract Award	DEC 1994	DEC 1994	DEC 1994
Development Test			
Start	JUL 1994	JUL 1994	JUL 1994
Complete	SEP 1994	SEP 1994	SEP 1994
Force Dev Test and Experimentation			
Start	OCT 1994	OCT 1994	OCT 1994
Complete	NOV 1994	NOV 1994	NOV 1994
Production Readiness Review	JUN 1995	JUN 1995	JUN 1995
IOT&E			
Start	JAN 1995	JAN 1995	JAN 1995
Complete	MAR 1995	MAR 1995	MAR 1995
Milestone III (DAB)	OCT 1995	OCT 1995	OCT 1995
Lot 1 Contract Award	NOV 1995	NOV 1995	DEC 1995
First Production Delivery (LBA & FCR)	MAR 1997	MAR 1997	MAR 1997
First Unit Equipped	OCT 1997	JUL 1998	JUL 1998
IOC	SEP 1998	SEP 1998	NOV 1998



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Longbow Apache, December 31, 1999

9b. (U) Schedule (Cont'd):

Airframe Modifications

b. Current Change Explanations -- None

FCR MISSION KIT

a. Milestones --

	<u>Production</u>	<u>Approved</u>	<u>Current</u>
	<u>Estimate (SAR)</u>	<u>Program (APB)</u>	<u>Estimate</u>
Milestone I In Process Review	AUG 1985	AUG 1985	AUG 1985
Preliminary Design Contract Award	NOV 1985	NOV 1985	NOV 1985
Contract Award (Proof of Principle)	AUG 1986	AUG 1986	AUG 1986
Milestone IB DAB	JUL 1989	JUL 1989	JUL 1989
IDP Contract Award	SEP 1989	SEP 1989	SEP 1989
Development Test/Early User Test & Experimentation			
Start	FEB 1990	FEB 1990	FEB 1990
Complete	APR 1990	APR 1990	APR 1990
Milestone II/IV	DEC 1990	DEC 1990	DEC 1990
Full Scale Development Award	DEC 1990	DEC 1990	DEC 1990
Long Lead Time Items Contract Award	NOV 1994	NOV 1994	DEC 1994
Lot 1 Contract Award	NOV 1995	NOV 1995	MAR 1996
First Production Delivery	FEB 1997	FEB 1997	MAR 1997

(U) Acronyms used in Schedule Milestones

LBA - Longbow Apache  
IDP - Initial Design Phase  
IPR - In process review  
DAB - Defense Acquisition Board  
FCR - Fire Control Radar  
IOT&E - Initial Operational Test & Evaluation  
IOC - Initial Operational Capability

b. Current Change Explanations -- None

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10. (U) Performance Characteristics:

Airframe Modifications

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Vertical Rate of Climb for AH-64D with FCR Mission Kit (ft/min)	450	450 / 450	705	450
Ordnance Load (primary mission config)				
Hellfire (no.)	16	16 / 12	8	12
Target Handover degradation	No	No / 15%	13%	No
Engagement time (RF Hellfire) in seconds	(b)(1)	(b)(1)	(b)(1)	(b)(1)
Ao, Operational Availability (%) of AH-64D w/FCR Kit	79	79 / 75	91.4	79

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(U) The objective for Ordnance Load (primary mission configuration) refers to AH-64A goal. The Longbow primary mission configuration is 8 Longbow Hellfire missiles, and 320 30mm rounds.

b. Current Change Explanations -- None

FCR MISSION KIT

a. Performance --

	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB) Obj/Threshold</u>	<u>Demonstrated Perf</u>	<u>Current Estimate</u>
Probability of Detection Ground Targets, Benign Conditions Stationary @6KM /2 Moving @6KM /2/3	(b)(1)	(b)(1)	(b)(1)	(b)(1)

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LONGBOW APACHE, December 31, 1999

10b. (U) Performance Characteristics (Cont'd):  
FCR MISSION KIT

b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):  
Airframe Modifications

a. (U) Cost --	<u>Production Estimate (SAR)</u>	<u>Approved Program (APB)</u>	<u>Current Estimate</u>
Development (RDT&E)	638.4	635.1	759.0
Procurement	5052.2	6272.0	5264.4
Flyaway	(4161.5)		(3761.4)
Non recurring Flyaway			(240.2)
Total Flyaway	(4161.5)		(4001.6)
Other Weapon System	(737.4)		(1166.7)
Peculiar Support	(42.6)		(29.5)
Initial Spares	(110.7)		(66.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1996 Base-Year \$	5690.6	6907.1	6023.4
Escalation	1337.2	852.9	439.4
Development (RDT&E)	(-46.1)	(-38.0)	(-27.8)
Procurement	(1383.3)	(890.9)	(467.2)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	7027.8	7760.0	6462.8

b. (U) Quantity --

Development (RDT&E)	N/A	0	0
Procurement	758	758	530
Total	758	758	530

Note: Excludes 6 RDT&E prototypes from the SAR Baseline and 6 from the Current Estimate that are not considered fully configured.

(U) Low Rate Initial Production (LRIP) was not approved for this program.

c. (U) Foreign Military Sales --  
Foreign Military Sales

**Netherlands**

Effective Date February 11, 1994  
Quantity - 30 Net estimated cost - \$649M

**Singapore**

Effective Date - February 26, 1999  
Quantity - 8 Net estimated cost - \$399M

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Longbow Apache, December 31, 1999

11d. (U) Total Program Cost and Quantity (Cont'd):  
Airframe Modifications

d. Nuclear Costs -- None.

FCR MISSION KIT

a. (U) Cost --	Production Estimate (SAR)	Approved Program (APB)	Current Estimate
Development (RDT&E)	885.2	885.2	863.6
Procurement	813.9	813.9	1383.6
Flyaway	(741.3)		(1053.1)
Non recurring Flyaway			(170.2)
Total Flyaway	(741.3)		(1223.3)
Other Weapon System	(22.2)		(43.7)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(50.4)		(116.6)
Construction (MILCON)	0.0	0.0	0.0
Acquisition O&M	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Total FY 1996 Base-Year \$	1699.1	1699.1	2247.2
Escalation	2.3	2.3	45.7
Development (RDT&E)	(-117.5)	(-117.5)	(-101.7)
Procurement	(119.8)	(119.8)	(147.4)
Construction (MILCON)	(0.0)	(0.0)	(0.0)
Acquisition O&M	<u>(0.0)</u>	<u>(0.0)</u>	<u>(0.0)</u>
Total Then Year \$	1701.4	1701.4	2292.9
b. (U) Quantity --			
Development (RDT&E)	0	0	0
Procurement	<u>227</u>	<u>227</u>	<u>320</u>
Total	227	227	320

Note: Excludes 10 RDT&E prototypes from the SAR Baseline and 10 from the Current Estimate that are not considered fully configured.

(U) Low Rate Initial Production (LRIP) was not approved for this program.

c. (U) Foreign Military Sales --  
None.

d. (U) Nuclear Costs --  
None.

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LONGBOW APACHE, December 31, 1999

12. (U) Unit Cost Summary:

Airframe Modifications

	UCR Baseline (MAR 1998 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	6907.1	6023.4	
(2) Quantity	758	530	
(3) Unit Cost	9.112	11.365	+24.73
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	6272.0	5264.4	
(2) Quantity	758	530	
(3) Unit Cost	8.274	9.933	+20.05

(U) The apparent Nunn-McCurdy Unit Cost Breaches reflected in 12a. and b. for the airframe are remnants of the breaches we reported to Congress in the December 1998 SAR. After the recent aviation study and "Army Vision" are complete, we will staff a revised APB to incorporate the results. These actions, once complete, will resolve the current unit cost anomalies.

FCR MISSION KIT

	UCR Baseline (NOV 1995 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1996 BY\$)	1699.1	2247.2	
(2) Quantity	227	320	
(3) Unit Cost	7.485	7.022	-6.19
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1996 BY\$)	813.9	1383.6	
(2) Quantity	227	320	
(3) Unit Cost	3.585	4.324	+20.61

(U) The apparent Nunn-McCurdy Unit Cost Breach reflected in 12b for the FCR mission kit is a remnant of the breach we reported to Congress in the December 1998 SAR. After the recent aviation study and "Army Vision" are complete, we will staff a revised APB to incorporate the results. These actions, once complete, will resolve the current unit cost anomalies.

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LONGBOW APACHE, December 31, 1999

13. (U) Cost Variance Analysis:

Airframe Modifications

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	592.3	6435.5	-	7027.8
Previous Changes:				
Economic	-0.1	-331.4	-	-331.5
Quantity	-	-1822.0	-	-1822.0
Schedule	-	+10.7	-	+10.7
Engineering	+115.3	+621.8	-	+737.1
Estimating	+4.9	+506.7	-	+511.6
Other	-	-	-	-
Support	-	+305.7	-	+305.7
Subtotal	+120.1	-708.5	-	-588.4
Current Changes:				
Economic	-0.9	-31.7	-	-32.6
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+19.6	-	-	+19.6
Estimating	+0.1	-46.7	-	-46.6
Other	-	-	-	-
Support	-	+83.0	-	+83.0
Subtotal	+18.8	+4.6	-	+23.4
Total Changes	+138.9	-703.9	-	-565.0
Current Estimate	731.2	5731.6	-	6462.8

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	638.4	5052.2	-	5690.6
Previous Changes:				
Quantity	-	-1464.6	-	-1464.6
Schedule	-	-	-	-
Engineering	+105.2	+519.1	-	+624.3
Estimating	-3.2	+815.0	-	+811.8
Other	-	-	-	-
Support	-	+300.3	-	+300.3
Subtotal	+102.0	+169.8	-	+271.8
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	+18.5	-	-	+18.5
Estimating	+0.1	-29.4	-	-29.3
Other	-	-	-	-
Support	-	+71.8	-	+71.8
Subtotal	+18.6	+42.4	-	+61.0
Total Changes	+120.6	+212.2	-	+332.8
Current Estimate	759.0	5264.4	-	6023.4

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13b. (U) Cost Variance Analysis (Cont'd):  
Airframe Modifications

b. (U) Current Change Explanations --

		(Dollars in Millions)	
		<u>Base-Year</u>	<u>Then-Year</u>
(1)	<u>RDT&amp;E</u>		
	Revised escalation indices. (Economic)	N/A	-0.9
	Adjustment for Current and Prior Inflation. (Estimating)	+0.1	+0.1
	Addition of research and development costs for the Second Generation FLIR effort. (Engineering)	+18.5	+19.6
	RDT&E Subtotal	<u>+18.6</u>	<u>+18.8</u>
(2)	<u>Procurement</u>		
	Revised escalation indices. (Economic)	N/A	-39.3
	Economic adjustment for negative program change. (Economic)	N/A	+7.6
	Adjustment for Current and Prior Inflation. (Estimating)	+5.5	+6.9
	Increased OPTEMPO. Proposed increase of monthly flying hours had a direct effect on Initial Spares Requirement. (Support)	+12.5	+16.1
	Correction to the December 98 SAR to reconcile Flyaway and Support. (Support)	+13.6	+17.7
	(Estimating)	-13.6	-17.7
	Partial funding of outstanding Second Generation FLIR (SGF) unfunded requirements. Increases in the program were offset by setting aside SGF production kits purchased with this increased funding but to be installed on aircraft other than the AH-64D. (Estimating)	-2.7	-5.3
	Refinement of flyaway estimates, and unfunding lower priority requirements due to affordability. (Estimating)	-18.6	-30.6
	Partial funding for outstanding AH-64D Digitization unfunded requirements (Digital Mapping). (Support)	+22.0	+24.0
	Obsolescence unfunded requirement (UFR) is now funded. (Support)	+21.8	+23.2
	Adjustment for Current and Prior Inflation. (Support)	+1.9	+2.0
	Procurement Subtotal	<u>+42.4</u>	<u>+4.6</u>

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LONGBOW APACHE, December 31, 1999

13. (U) Cost Variance Analysis (Cont'd):

FCR MISSION KIT

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	767.7	933.7	-	1701.4
Previous Changes:				
Economic	-	-39.6	-	-39.6
Quantity	-	+395.4	-	+395.4
Schedule	-	+26.2	-	+26.2
Engineering	-	+39.0	-	+39.0
Estimating	-5.8	-103.2	-	-109.0
Other	-	-	-	-
Support	-	+243.8	-	+243.8
Subtotal	-5.8	+561.6	-	+555.8
Current Changes:				
Economic	-	-4.3	-	-4.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+185.3	-	+185.3
Other	-	-	-	-
Support	-	-145.3	-	-145.3
Subtotal	-	+35.7	-	+35.7
Total Changes	-5.8	+597.3	-	+591.5
Current Estimate	761.9	1531.0	-	2292.9

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13a. (U) Cost Variance Analysis (Cont'd):  
FCR MISSION KIT

(U) Summary (FY 1996 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Production Estimate	885.2	813.9	-	1699.1
Previous Changes:				
Quantity	-	+328.9	-	+328.9
Schedule	-	-	-	-
Engineering	-	+34.5	-	+34.5
Estimating	-21.6	-40.3	-	-61.9
Other	-	-	-	-
Support	-	+205.4	-	+205.4
Subtotal	-21.6	+528.5	-	+506.9
Current Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-	-	-	-
Estimating	-	+158.9	-	+158.9
Other	-	-	-	-
Support	-	-117.7	-	-117.7
Subtotal	-	+41.2	-	+41.2
Total Changes	-21.6	+569.7	-	+548.1
Current Estimate	863.6	1383.6	-	2247.2

b. (U) Current Change Explanations --

(Dollars in Millions)  
Base-Year Then-Year

(1) <u>Procurement</u>		
Adjustment for Current and Prior Inflation. (Estimating)	+1.8	+1.8
Cancelled Engineering due to increased OPTEMPO. (Estimating)	-15.5	-16.9
Revised government furnished equipment (GFE) estimates (Estimating)	-0.8	-1.2
Increased OPTEMPO. Proposed increase of monthly flying hours had a direct effect on initial spares requirement. (Support)	+15.6	+18.5
Economic adjustment for negative program change. (Economic)	N/A	+7.3
Other support changes (Support)	-3.1	-3.4
Revised escalation indices. (Economic)	N/A	-11.6
Correction to the December 98 SAR to reconcile Flyaway and Support (Support)	-173.4	-201.6
(Estimating)	+173.4	+201.6
Accelerated and new support requirements for production beyond current multiyear. Includes costs for fleet safety, manufacturing support items, and engineer	+43.2	+41.2

13b. (U) Cost Variance Analysis (Cont'd):  
FCR MISSION KIT

b. (U) Current Change Explanations --

(Dollars in Millions)

Base-Year Then-Year

change orders. (Support)

Procurement Subtotal +41.2      +35.7

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):  
Airframe Modifications

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.34	-1.22	--	-0.41	--	+3.28	--	+0.28	+1.93	9.27

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
9.27	-0.69	+0.55	+0.02	+1.43	+0.88	--	+0.73	+2.92	12.19

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.77	-1.13	--	-0.41	--	+2.98	--	+0.28	+1.72	8.49

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
8.49	-0.69	+0.22	+0.02	+1.17	+0.87	--	+0.73	+2.32	10.81

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LONGBOW APACHE, December 31, 1999

14c. (U) Unit Cost and Other History (Cont'd):  
Airframe Modifications

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	JUL 1989	JUL 1989	JUL 1989
Milestone II	N/A	DEC 1990	DEC 1990	DEC 1990
Milestone III	N/A	NOV 1995	OCT 1995	OCT 1995
FUE/IOC	N/A	APR 1997	SEP 1998	NOV 1998
Total Cost	N/A	5564.4	7027.8	6462.8
Total Quantity	N/A	758	758	530
Prog Acq Unit Cost	N/A	7.34	9.27	12.19

FCR MISSION KIT

a. (U) Program Acquisition Unit Cost (PAUC) History

Initial SAR Baseline to Current SAR Baseline

PAUC Init Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.36	-1.03	--	+0.08	--	+2.51	--	-0.42	+1.13	7.50

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Prod Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.50	-0.14	-0.94	+0.08	+0.12	+0.24	--	+0.31	-0.33	7.17

b. (U) Procurement Unit Cost (PUC) History

Initial SAR Baseline to Current SAR Baseline

PUC Init Est	Changes								PUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
2.96	-0.63	--	+0.08	--	+2.12	--	-0.42	+1.15	4.11

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Longbow Apache, December 31, 1999

14b. (U) Unit Cost and Other History (Cont'd):  
FCR MISSION KIT

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Prod Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.11	-0.14	+0.04	+0.08	+0.12	+0.26	--	+0.31	+0.67	4.78

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	JUL 1989	JUL 1989	JUL 1989
Milestone II	N/A	DEC 1990	DEC 1990	DEC 1990
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	N/A	N/A	N/A	N/A
Total Cost	N/A	1442.6	1701.4	2292.9
Total Quantity	N/A	227	227	320
Prog Acq Unit Cost	N/A	6.36	7.5	7.17

15. (U) Contract Information (Then-Year Dollars in Millions):

a. Procurement -- Initial Contract Price  
(U) FIRE CONTROL RADAR LOT 1: Target Ceiling Qty  
LONGBOW LTD LIABILITY CO., ORLANDO FL \$133.9 N/A 10  
DAAJ09-95-C-A002, FFP  
Award: March 4, 1996  
Definitized: June 28, 1996

Current Contract Price			Estimated Price At Completion	
Target	Ceiling	Qty	Contractor	Program Manager
\$134.3	N/A	10	\$134.3	\$134.3

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) Contract Comments:

This contract is more than 90% expended and delivered, and will not appear in subsequent SARs.

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Longbow Apache, December 31, 1999

15. (U) Contract Information (Cont'd):

(U) <u>AH64D Multiyr Production:</u> Boeing Company, Mesa, AZ DAAJ09-95-C-A001, FFP Award: December 12, 1994 Definitized: August 16, 1996	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$1690.3	N/A	232

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$2077.5	N/A	232	\$2078.8	\$2078.8

Explanation of Change:

(U) Cost increase due to additional funds for the following:  
Over and above, maintenance voice data recorder, hangar bearings, and parts  
obsolescence.

Cost and Schedule variance reporting is not required on this  
FFP contract.

(U) <u>FCR Lot 2 Production:</u> Longbow Limited Liability, Orlando FL DAAJ09-96-C-0114, FFP Award: July 15, 1996 Definitized: January 31, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$82.5	N/A	11

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$83.1	N/A	11	\$83.1	\$83.1

Explanation of Change:

(U) This contract is more than 90% expended and delivered and will not appear  
in subsequent SARs.

Cost and Schedule variance reporting is not required on this  
FFP contract.

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Longbow Apache, December 31, 1999

15. (U) Contract Information (Cont'd):

(U) <u>AH-64D REI Multiyr Prod:</u> Lockheed Martin Federal, Owego, NY DAAJ09-97-C-0124, FFP Award: November 26, 1997 Definitized: November 26, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$92.3	N/A	207

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$94.5	N/A	207	\$94.5	\$94.5

Explanation of Change:

None.

Cost and Schedule variance reporting is not required on this FFP contract.

(U) <u>AH-64D FCR Multiyr Prod:</u> Longbow LLC, Orlando, FL DAAH23-98-C-0008, FFP Award: November 11, 1997 Definitized: November 11, 1997	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$565.3	N/A	207

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$565.9	N/A	207	\$565.9	\$565.9

Explanation of Change:

(U) Price increase due to additional requirements for time and material, and over and above.

Cost and Schedule variance reporting is not required on this FFP contract.

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Longbow Apache, December 31, 1999

16. (U) Program Funding Summary (Current Estimate in Millions of Dollars):

Total Program

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY85-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	1359.0	37.1	17.4	79.6	1493.1
Procurement	2100.8	789.4	757.6	3614.8	7262.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	3459.8	826.5	775.0	3694.4	8755.7

Airframe Modifications

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY88-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	597.1	37.1	17.4	79.6	731.2
Procurement	1633.4	659.2	628.0	2811.0	5731.6
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	2230.5	696.3	645.4	2890.6	6462.8

FCR MISSION KIT

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years</u> (FY85-99)	<u>Budget Year</u> (FY00)	<u>Budget Year</u> (FY01)	<u>Balance To Complete</u> (FY02-09)	<u>Total</u>
RDT&E	761.9	-	-	-	761.9
Procurement	467.4	130.2	129.6	803.8	1531.0
MILCON	-	-	-	-	-
O&M	-	-	-	-	-
Total	1229.3	130.2	129.6	803.8	2292.9

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Longbow Apache, December 31, 1999

16b. (U) Program Funding Summary (Cont'd):

b. Annual Summary -- Airframe Modifications

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1988				22.9	18.7
1989				55.3	47.0
1990				78.1	68.9
1991				62.0	56.8
1992				78.1	73.2
1993				105.2	100.9
1994				89.0	86.9
1995				112.5	112.0
1996				21.7	22.0
1997				10.4	10.7
1998					
1999					
2000				35.1	37.1
2001				16.2	17.4
2002				35.3	38.4
2003				37.2	41.2
Subtotal				759.0	731.2

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995		39.5		74.9	75.6
1996	24	118.0	163.4	331.4	338.9
1997	24	67.3	195.9	304.4	314.5
1998	44	11.4	266.9	376.4	392.3
1999	66	3.5	402.0	488.6	512.1
2000	74	0.5	485.1	620.8	659.2
2001	60		427.2	582.6	628.0
2002	66		458.6	653.1	715.8
2003	72		480.6	639.3	713.8
2004	72		502.1	614.4	699.7
2005	28		267.6	335.2	389.4
2006			71.2	136.8	162.1
2007			11.8	50.8	61.4
2008			28.9	51.5	63.5
2009				4.2	5.3
Subtotal	530	240.2	3761.3	5264.4	5731.6

(U) Fiscal years 2006 through 2008 contain recurring flyaway costs for the

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LONGBOW APACHE, December 31, 1999

16b. (U) Program Funding Summary (Cont'd):  
Airframe Modifications

Second Generation FLIR with no associated end item quantities. The Second Generation FLIR is an integral component of the AH-64 weapon system.

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	530	240.2	3761.3	6023.4	6462.8

b. Annual Summary -- FCR MISSION KIT

Appropriation: 2040 - Research, Development, Test + Eval, Army

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1985				19.9	14.7
1986				39.7	30.2
1987				98.8	77.6
1988				101.6	83.0
1989				100.7	85.6
1990				106.0	93.5
1991				86.3	79.0
1992				82.2	77.0
1993				124.0	118.9
1994				82.2	80.3
1995				22.2	22.1
Subtotal				863.6	761.9

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1995		14.0		40.9	41.3
1996	10	5.3	88.9	94.2	96.3
1997	10	14.5	62.8	92.6	95.7
1998	21		100.8	108.6	113.2
1999	40		104.2	115.4	120.9
2000	45		118.6	122.6	130.2
2001	44		112.4	120.2	129.6
2002	57		102.5	113.5	124.4
2003	14	26.0	51.4	90.5	101.1
2004		31.9		41.4	47.1
2005		22.8		71.1	82.6
2006	34	39.2	162.5	175.3	207.7

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Longbow Apache, December 31, 1999

16b. (U) Program Funding Summary (Cont'd):  
FCR MISSION KIT

Appropriation: 2031 - Aircraft Procurement, Army

Fiscal Year	Qty	Flyaway FY 1996 Dollars Nonrec	Flyaway FY 1996 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2007	20	7.3	78.7	100.4	121.4
2008	25	9.2	70.3	93.9	115.7
2009				3.0	3.8
Subtotal	320	170.2	1053.1	1383.6	1531.0

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	320	170.2	1053.1	2247.2	2292.9

17. (U) Delivery/Expenditure Information:

Airframe Modifications

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	100	103

(U) Percent Total Program Quantities Delivered: 19.4%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 1681.8

(U) Percent Total Program Expended: 26.0%

FCR MISSION KIT

a. (U) Deliveries To Date	<u>Plan</u>	<u>Actual</u>
RDT&E	0	0
Procurement	37	38

(U) Percent Total Program Quantities Delivered: 11.9%

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 900.8

(U) Percent Total Program Expended: 39.3%

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18. (U) Operating and Support Costs:  
Airframe Modifications

a. (U) Assumptions and Ground Rules --  
Assumes 498 fielded operational aircraft each flying 18.0 hours per month. Maintenance concept is 2 level maintenance, contractor depot support. The airframe Mean Time Between Failure (MTBF) goal is 19.5 hours at Maturity (50,000 flight hours). Source: Currently proposed Army Cost Position. The Longbow aircraft system has no antecedent.

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Longbow aircraft	Avg Annual Cost Per antecedent system
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	3.0	0.0
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Replenishment	559.2	0.0
Military Personnel	795.0	0.0
Other	226.0	0.0
Total	1583.2	0.0

FCR MISSION KIT

a. (U) Assumptions and Ground Rules --  
Assumes 320 fielded operational Fire Control Radars each flying 18.0 hours per month. Maintenance concept is 2 level maintenance, contractor depot support. At maturity (50,000 flight hours), the Fire Control Radar Mean Time Between Failure (MTBF) goal is 150 hours. Source: Army Cost Position Update (Sep 95). The Longbow Fire Control Radar system has no antecedent.

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Fire Control Radar	Avg Annual Cost Per antecedent system
Mission Pay & Allowances	N/A	N/A
Unit Level Consumption	N/A	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	0.0	0.0
Contractor Support	N/A	N/A
Sustaining Support	N/A	N/A
Indirect Costs	N/A	N/A
Replenishment	48.2	0.0
Other	3.6	0.0

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LONGBOW APACHE, December 31, 1999

18b. (U) Operating and Support Costs (Cont'd):  
FCR MISSION KIT

b. (U) Costs -- (FY 1996 Constant (Base-Year) Dollars in Thousands)

Cost Element	Avg Annual Cost Per Fire Control Radar	Avg Annual Cost Per antecedent system
Total	51.8	0.0

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DoD-3 NMD

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SELECTED ACQUISITION REPORT (RCS: DD-A&T(Q&A)823)  
PROGRAM: NMD

AS OF DATE: December 31, 1999

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1. (U) Designation and Nomenclature (Popular Name): National Missile Defense (NMD)
2. (U) DoD Component: BMDO
3. (U) Responsible Office and Telephone Number:  
 Ballistic Missile Defense Org.      MG Willie B. Nance, Jr.  
 NMD Joint Program Office      Assigned: July 30, 1998  
 1725 Jefferson Davis Dr., Suite 809      DSN 664-3225; COMM (703) 604-3225  
 Arlington, VA 22202-4102      willie.nance@bmdo.osd.mil
4. (U) Program Elements/Procurement Line Items:  
 RDT&E:  
 (U) PE 0603871C  
 PROCUREMENT:  
 (U) APPN 0300 ICN (DCA/DNA)  
 MILCON:  
 (U) PE 0603871C

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MAR 31 2000 4

DIRECTORATE FOR FREEDOM OF INFORMATION  
AND SECURITY REVIEW  
DEPARTMENT OF DEFENSE

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00-C-0868

NMD, December 31, 1999

5. (U) References:

SAR Baseline (Planning Estimate):

(U) Acquisition Decision Memorandum (ADM) dated August 11, 1997, Subject: National Missile Defense (NMD) Acquisition Decision Memorandum.

SAR Baseline (Development Estimate): DAE Approved Acquisition Program Baseline (APB) dated June 17, 1999

Approved Program / Development Estimate (DE):

(U) DAE Approved Acquisition Program Baseline (APB) dated March 28, 2000.

6. (U) Mission and Description:

(U) The National Missile Defense (NMD) acquisition program objective is to develop, demonstrate, and deploy, if directed, an initial system capable of protecting the United States against small scale attacks by ballistic missiles from rogue nations. A deployment decision may be made in 2000 to field an initial capability (C1) in FY2005 and an expanded C1 capability in FY 2007.

The FY2005 fielding date requires the NMD site to be selected at the FY2000 Deployment Readiness Review. The program will start site construction in early FY2001 and procure long-lead material for the X-band radar (XBR), Battle Management Command, Control, & Communications, and Upgraded Early Warning Radar elements. Weapon production will begin in FY2002, except for the interceptors, which will enter production in FY2003.

7. (U) Executive Summary:

(U) A critical element of the broad United States strategy to counter nuclear proliferation is a capability to deal with the emergence of a ballistic missile threat from rogue states. To achieve this capability, the Secretary of Defense established the National Missile Defense (NMD) Program. The NMD Program contributes to the nation's strategy to deal with proliferation. The Joint Requirements Oversight Council (JROC) validated the Capstone Requirements Document (CRD) during the fourth quarter of FY1996 and the Operational Requirements Document (ORD) during the second quarter of FY1997. The Development Phase will be compliant with the 1972 Anti-Ballistic Missile (ABM) Treaty, modifications to which will be sought for deployment.

Transition of the legacy contracts continued as the Raytheon and Boeing Exoatmospheric Kill Vehicle (EKV) contracts were transitioned to the Lead System Integrator (LSI) in March 1999. The Boeing EKV became a back-up subcontract under the Raytheon subcontract. The Lockheed Martin Missiles & Space Payload Launch Vehicle (PLV) contract transitioned in June 1999. All legacy contracts scheduled for transition have now been included as LSI subcontracts.

The Deployment Readiness Review Criteria (DRR) and Single Acquisition Management Plan (SAMP) were approved by the Department on June 17, 1999. The current Acquisition Program Baseline (APB) was approved on March 28, 2000 and

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7. (U) Executive Summary (Cont'd):

reflects the restructured program outlined in the FY2001 President's Budget.

Integrated Flight Test-3, the system's first intercept attempt, was successfully conducted on October 3, 1999 Universal Time Coordinated (UTC), at the United States Army Kwajalein Atoll (USAKA) in the Marshall Islands. The objectives of the test were to demonstrate EKV flight test performance, to demonstrate NMD integrated prototype Element and System functional capability (reduce risk for subsequent tests) and to collect data. The Weapon System consisted of the Raytheon Missile Systems EKV and the Lockheed Martin Missiles & Space Payload Launch Vehicle, which was launched from Meck Island. The target complex, which included a Medium Reentry Vehicle (MRV), was launched from Vandenberg Air Force Base. The EKV acquired the target complex, discriminated, tracked and destroyed the MRV. The intercept was confirmed by multiple sensors.

The Draft Environmental Impact Statement (EIS) was published and appears in the Federal Registry. This was completed after public scoping in Alaska and the continental United States in the fall of 1998 and 1999. Public hearings were conducted in Alaska, North Dakota, and Washington, DC during October-November 1999. A final EIS is on schedule for completion in the third quarter of FY2000.

A Defense Acquisition Executive (DAE) decision resulted in the expansion of the NMD Program. To support the DRR schedule planned for July 2000, the program is being revised to an "Expanded Capability 1". The additional funding will provide 100 ground-based interceptors by the end of FY2007, provide an upgraded X-band Radar, and support the five Early Warning Radar facilities. It also provides additional planning and design construction funding to support a larger weapon system complex in Alaska.

Integrated Flight Test 4 (IFT-4) was conducted on January 19, 2000, UTC at the USAKA in the Marshall Islands. The objectives of the test were to integrate the system elements and functionality, to demonstrate Kill Vehicle (KV) flight test performance, to collect data and to provide risk reduction data for the initial Integrated System Test (IFT-5). After a nominal PLV launch, the KV separated from the booster. The KV acquired the target complex upon entering acquisition mode. No intercept occurred as a result of this test. Data review and investigations continue.

8. (U) Threshold Breaches:

a. (U) Acquisition Program Baseline (APB):

Item	Breach
Schedule	No
Performance	No
Cost -- RDT&E	No
-- Procurement	No
-- MILCON	No
-- O&M	No
-- Program Acquisition Unit Cost (PAUC)	No
-- Average Procurement Unit Cost (APUC)	No

b. (U) Nunn-McCurdy Unit Cost:

Item	Breach
Program Acquisition Unit Cost	No
Average Procurement Unit Cost	No

9. (U) Schedule:

a. Milestones --

	Planning Estimate (SAR)	Approved Program/DE	Current Estimate
NMD Integrated System Test	SEP 1999	JAN 2000	JUN 2000 (Ch-1)
Deployment Review	MAR 2000	JUN 2000	JUL 2000 (Ch-2)
IOC	TBD	N/A	N/A
FY01 DAB	N/A	JUN 2001	JUN 2001
FY03 DAB	N/A	MAR 2003	MAR 2003
IOC (C1)	N/A	SEP 2005	SEP 2005

(U) Capability 1 (C1) consists of 20 deployed ground based interceptors, one (1) C1 capable XBR, associated BMC3, and five (5) UEWRs. The Expanded Capability, with an FY07 deployment, consists of one hundred (100) deployed ground based interceptors, one (1) C2 capable X-Band Radar, associated BMC3, and five (5) upgraded Early Warning Radar facilities. It also provides additional planning and design and site construction to support a larger weapon system complex.

b. Current Change Explanations --

(U) (Ch-1) - The NMD Integrated System Test (IFT-5) change from JAN 2000 to JUN 2000 is because of two circumstances. The first IST delay, from January 2000 to April 2000, resulted from the IFT-3 delay from June 1999 to October 1999 because of EKV development and ground testing setup delays. The second IST delay, from April 2000 to June 2000, was the result of the post-test analysis needed to determine the cause of the unsuccessful IFT-4 intercept attempt in January, 2000.



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9b. (U) Schedule (Cont'd):

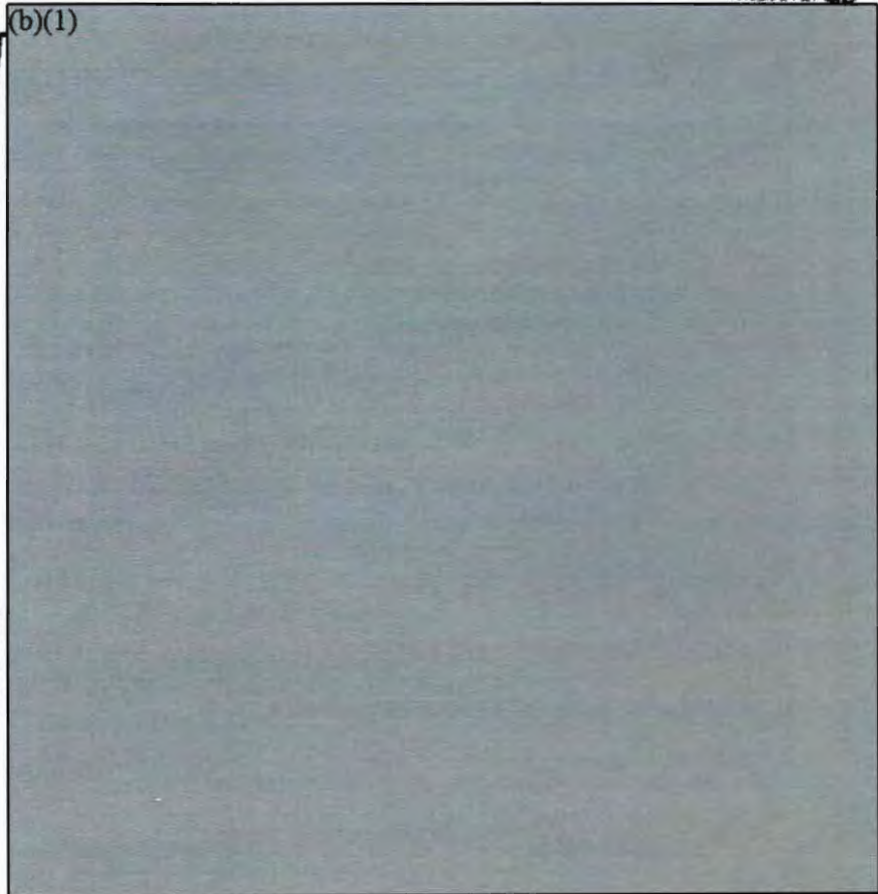
(Ch-2) - The Deployment Readiness Review (DRR) change from JUN 2000 to JUL 2000 was also the result of the post-test analysis needed to determine the cause of the unsuccessful IFT-4 intercept attempt in January, 2000.

10. (U) Performance Characteristics:

a. Performance --

	<u>Planning</u> <u>Estimate (SAR)</u>	<u>Approved</u> <u>Program;DE</u> <u>Obj/Threshold</u>	<u>Demon-</u> <u>strated</u> <u>Perf</u>	<u>Current</u> <u>Estimate</u>
--	------------------------------------------	--------------------------------------------------------------	------------------------------------------------	-----------------------------------

- 1 KPP 1: Operational Effectiveness for the Strategic Defense of the US
- 1 Provide protection to all
- 1 Against limited ballistic missile attacks of (RVs)
- 1 With threat characterization
- 1 To a negation probability of
- 1 At a performance probability of
- 1 Mission duration (hrs)
- 1 Key functions (TBD) restored within (mins)
- 1 System survivability
- 1 KPP 2: HIC Parameter (sec)
- 1 Selected employment options
- 1 Kill assessment data (seconds)
- 1 Safeguards to prevent inadvertent launches
- 1 KPP 3: ABMDS Parameter (sec)
- 1 System Life Cycle (yrs)
- 1 KPP 3: ABMC3 Parameter (sec)



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10a. ~~1~~ Performance Characteristics (Cont'd):

(b)(1)



b. Current Change Explanations -- None

11. (U) Total Program Cost and Quantity (Dollars in Millions):

a. (U) Cost --	Planning Estimate (SAR)	Approved Program	Current Estimate
Development (RDT&E)	6395.3	11502.1	11502.1
Procurement	0.0	6770.4	6770.4
Flyaway			(4128.1)
Other Weapon System			(2385.8)
Peculiar Support	(0.0)		(0.0)
Initial Spares	(0.0)		(256.5)
Construction (MILCON)	0.0	462.0	462.0
Acquisition O&M	0.0	0.0	0.0
Total FY 1999 Base-Year \$	<u>6395.3</u>	<u>18734.5</u>	<u>18734.5</u>
Escalation	233.7	1517.7	1517.7
Development (RDT&E)	(233.7)	(459.4)	(459.4)
Procurement	(0.0)	(1021.9)	(1021.9)
Construction (MILCON)	(0.0)	(36.4)	(36.4)
Acquisition O&M	(0.0)	(0.0)	(0.0)
Total Then Year \$	<u>6629.0</u>	<u>20252.2</u>	<u>20252.2</u>

(U) The Planning Estimate in the previous SAR was expressed in FY88 base year dollars. A conversion factor of 1.3073 was used to convert last year's estimate to the base year FY99 figure above.

b. (U) Quantity --

Development (RDT&E)	N/A	0	0
Procurement	N/A	1	1
Total	N/A	<u>1</u>	<u>1</u>

(U) The NMD system is an integrated, evolving system that will be tested, accepted, deployed, upgraded, and supported as a single, integrated C1 Expanded system. Subject to completion of the environmental impact assessment process, negotiated modifications to the ABM Treaty, and host nation support for foreign based elements, the system is anticipated to include the following elements:

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11b. (U) Total Program Cost and Quantity (Cont'd):

(100) Weapons, BMC3 with (3) IFICS sites, (1) XBR Radar (Shemya), (5) UEWRs (Clear, Beale, NW Tier, Cape Cod, NE Tier), and the Defense Support Program/SBIRS High.

c. Foreign Military Sales -- None.

d. Nuclear Costs -- None.

12. (U) Unit Cost Summary:

	UCR Baseline (MAR 2000 APB)	Current Estimate (Dec 1999 SAR)	Percent Change
a. (U) Prog. Acq. Unit Cost (PAUC)			
(1) Cost (FY 1999 BY\$)	18734.5	18734.5	
(2) Quantity	1	1	
(3) Unit Cost	18734.500	18734.500	0.00
b. (U) Avg. Proc. Unit Cost (APUC)			
(1) Cost (FY 1999 BY\$)	6770.4	6770.4	
(2) Quantity	1	1	
(3) Unit Cost	6770.400	6770.400	0.00

13. (U) Cost Variance Analysis:

a. (U) Summary (Current (Then-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	6629.0	-	-	6629.0
Previous Changes:				
Economic	-180.3	-	-	-180.3
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-287.1	-	-	-287.1
Estimating	+2646.8	-	-	+2646.8
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2179.4	-	-	+2179.4
Current Changes:				
Economic	-21.1	-48.1	+6.2	-63.0
Quantity	-	+1507.1	-	+1507.1
Schedule	+407.0	-20.9	-	+386.1
Engineering	-	-	-	-
Estimating	+2767.2	+876.6	+9.6	+3653.4
Other	-	-	-	-
Support	-	+442.6	-	+442.6
Subtotal	+3153.1	+2757.3	+15.8	+5926.2
Total Changes	+5332.5	+2757.3	+15.8	+8105.6
Adjustments	-	+5035.0	+482.6	+5517.6
Current Estimate	11961.5	7792.3	498.4	20252.2

13a. (U) Cost Variance Analysis (Cont'd):

(U) Summary (FY 1999 Constant (Base-Year) Dollars in Millions)

	RDT&E	PROC	MILCON	TOTAL
Planning Estimate	6395.3	-	-	6395.3
Previous Changes:				
Quantity	-	-	-	-
Schedule	-	-	-	-
Engineering	-265.4	-	-	-265.4
Estimating	+2475.4	-	-	+2475.4
Other	-	-	-	-
Support	-	-	-	-
Subtotal	+2210.0	-	-	+2210.0
Current Changes:				
Quantity	-	+1345.5	-	+1345.5
Schedule	+395.6	+0.1	-	+395.7
Engineering	-	-	-	-
Estimating	+2501.2	+698.6	+6.8	+3206.6
Other	-	-	-	-
Support	-	+209.9	-	+209.9
Subtotal	+2896.8	+2254.1	+6.8	+5157.7
Total Changes	+5106.8	+2254.1	+6.8	+7367.7
Adjustments	-	+4516.3	+455.2	+4971.5
Current Estimate	11502.1	6770.4	462.0	18734.5

(U) The Planning Estimate in the previous SAR was expressed in FY88 base year dollars. A conversion factor of 1.3073 was used to covert last year's estimate to the base year FY99 figure above.

b. (U) Current Change Explanations --

(1) RDT&E	(Dollars in Millions)	
	Base-Year	Then-Year
Revised escalation indices. (Economic)	N/A	-21.1
Adjustment for Current and Prior Inflation. (Estimating)	-5.7	-5.7
Refinement of the estimate from the FY00 President's Budget to the approved NMD Program estimate (Acquisition Program Baseline). (Estimating)	-81.9	-97.4
Increased System capability included additional weapons for flight tests and additional production facility capability to handle increased missile quantity requirements. (QR) (Estimating)	+728.7	+822.4

13b. (U) Cost Variance Analysis (Cont'd):

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Additional weapon system sustaining engineering, production verification testing, system-level sustaining engineering, and program management attributable to additional quantities and expanded delivery schedule. (QR) (Estimating)	+1056.8	+1175.7
Additional Ground Based X-Band Radar hardware and software design requirements to support component quantity increases. (QR) (Estimating)	+87.3	+91.0
Battle Management Command, Control, and Communications upgraded to meet the increased system capability. (QR) (Estimating)	+45.0	+47.2
Added recommended test infrastructure requirements and additional flight tests to support the expanded capability. (Estimating)	+671.0	+734.0
Government furnished assets were less mature than the Lead System Integrator contractor anticipated. (Schedule)	+395.6	+407.0
RDT&E Subtotal	<u>+2896.8</u>	<u>+3153.1</u>
(2) <u>Procurement</u>		
Revised escalation indices. (Economic)	N/A	-48.1
Total Quantity Variance associated with an increase from 20 to 100 deployed missiles. (Quantity)	+1345.5	+1507.1
Rephase of annual missile procurement buy profile. (Schedule)	+0.1	-20.9
Revised Estimate for initial spares. (QR) (Support)	-50.1	-41.6
Change in production support. (QR) (Support)	+260.0	+484.2
Ground Based X-Band Radar component quantity increases to support control of increased number of engagements (e.g., transmit/receive modules, cooling system, power supply). (QR) (Estimating)	+401.1	+494.0
Additional Program Management and award fee resulting from expanded system capability. (QR) (Estimating)	+297.5	+382.6
Procurement Subtotal	<u>+2254.1</u>	<u>+2757.3</u>
(3) <u>MILCON</u>		
Revised escalation indices. (Economic)	N/A	+6.2

13b. (U) Cost Variance Analysis (Cont'd):

b. (U) Current Change Explanations --

	(Dollars in Millions)	
	<u>Base-Year</u>	<u>Then-Year</u>
Adjustment for Current and Prior Inflation. (Estimating)	-0.3	-0.3
Refinement of estimate. (Estimating)	+7.1	+9.9
MILCON Subtotal	<u>+6.8</u>	<u>+15.8</u>

QR = Quantity related changes.

14. (U) Unit Cost and Other History (Then-Year Dollars in Millions):

a. (U) Program Acquisition Unit Cost (PAUC) History

Current SAR Baseline to Current Estimate

PAUC Plan Est	Changes								PAUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	--	20252.20

b. (U) Procurement Unit Cost (PUC) History

Current SAR Baseline to Current Estimate

PUC Plan Est	Changes								PUC Cur Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
N/A	--	--	--	--	--	--	--	--	7792.30

c. (U) Schedule, Cost, and Quantity History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone I	N/A	N/A	N/A	N/A
Milestone II	N/A	N/A	N/A	N/A
Milestone III	N/A	N/A	N/A	N/A
FUE/IOC	TBD	SEP 2005	TBD	SEP 2005
Total Cost	6629	14228.6	0	20250.2
Total Quantity	0	1	0	1
Prog Acq Unit Cost	0	14228.6	0	20250.2

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15. (U) Contract Information (Then-Year Dollars in Millions):

a. RDT&E --		Initial Contract Price		
(U) <u>NMD GBR-P:</u>		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
Raytheon Company, Bedford, MA		\$142.2	N/A	0
DASG60-92-C-0184, CPFF				
Award: November 9, 1994				
Definitized: April 18, 1997				
Current Contract Price		Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$162.4	N/A	0	\$176.5	\$176.5
Previous Cumulative Variances		<u>Cost Variance</u> <u>Schedule Variance</u>		
Cumulative Variances To Date (12/31/99)		\$-4.9	\$-1.8	
Net Change		<u>\$-6.2</u>	<u>\$-1.0</u>	
		\$-1.3	\$0.8	

Explanation of Change:

(U) This contract was originally awarded in November 1994 and the GBR-P portion was definitized in April 1997. The Initial Contract Target Price reflects the April 1997 definitization. Since this contract is over 90% complete, this is the last SAR in which this contract will be reported.

The cumulative cost variance of -\$6.2M (-4.5%) reflects an unfavorable change of -\$1.3M since the last report. This was primarily due to higher than expected cost for flight test preparations, software support to Kwajalien, and the remaining most difficult software integration problems.

The cumulative schedule variance of -\$1.0M (-0.7%) reflects a favorable change of \$0.8M since the last report. The improvement is attributed to the completion of several object classifications analysis milestones and sim-over-live design milestones.

The Program Manager's Estimated Price at Completion of \$176.5M reflects an increase of \$2.8M since the last report and is primarily the result of the Raised Radome effort, additional flight test support, and systems engineering test and integration analysis support at Kwajalien.

(U) <u>NMD FLY-EKV:</u>		Initial Contract Price		
Lockheed Martin, Sunnyvale, CA		<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
DASG60-86-C-0014, CPFF		\$232.2	N/A	0
Award: January 31, 1990				
Definitized: January 31, 1990				
Current Contract Price		Estimated Price At Completion		
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$263.4	N/A	0	\$339.8	\$339.8



15. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-42.7	\$-0.4
Cumulative Variances To Date (04/30/99)	<u>\$-0.1</u>	<u>\$-0.6</u>
Net Change	\$42.6	\$-0.2

Explanation of Change:

(U) This contract was transitioned to the LSI in June, 1999. The contract was rebaselined prior to the transition, which resulted in the net change in the cumulative cost variance shown above. This is the last report for this contract.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>NMD EKV:</u> Boeing North American, Downey, CA DASG60-90-C-0165, CPFF Award: October 2, 1990 Definitized: October 2, 1990	\$310.1	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$366.9	N/A	0	\$442.1	\$442.1

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-4.2	\$-3.2
Cumulative Variances To Date (02/28/99)	<u>\$-4.6</u>	<u>\$-6.0</u>
Net Change	\$-0.4	\$-2.8

Explanation of Change:

(U) This contract was transitioned to the LSI effective effective March 31, 1999. This is the last report for this contract.

	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
(U) <u>NMD EKV:</u> Raytheon Missile Systems, Tucson AZ DASG60-90-C-0166, CPFF Award: October 2, 1990 Definitized: October 2, 1990	\$329.8	N/A	0

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$383.8	N/A	0	\$390.2	\$390.2

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15. (U) Contract Information (Cont'd):

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-22.1	\$-12.0
Cumulative Variances To Date (02/28/99)	<u>\$-22.9</u>	<u>\$0.0</u>
Net Change	\$-0.8	\$12.0

Explanation of Change:

(U) This contract was terminated for the convenience of the government on February 28, 1999. The remaining effort was transitioned to the LSI with no break in performance. This is the last report for this contract.

(U) <u>Multi-Serv. Launch Syst.:</u> Lockheed Martin Corp., Denver, CO F4704-92-C-0013, CPAF Award: May 18, 1992 Definitized: May 13, 1992	Initial Contract Price		
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>
	\$30.8	N/A	1

Current Contract Price			Estimated Price At Completion	
<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
\$107.7	N/A	8	\$117.9	\$117.9

	<u>Cost Variance</u>	<u>Schedule Variance</u>
Previous Cumulative Variances	\$-30.4	\$-0.6
Cumulative Variances To Date (12/31/99)	<u>\$-28.6</u>	<u>\$0.0</u>
Net Change	\$1.8	\$0.6

Explanation of Change:

(U) This contract is managed by the Air Force and there are currently three launch missions remaining under this contract.

The historical cost variance is due primarily to the demo flight delay and a quantity reduction from forty to eight. This variance predates NMD involvement and is not expected to grow in the future. The last three missions were re-baselined on December 30, 1996. The total renegotiated price for each of these missions is \$7M.

The cumulative cost variance, currently -\$28.6M (-40.9%), experienced a \$1.8M favorable change mainly because of "Stretchout-6" definitization, which aligned the flight tests to the revised NMD flight test dates. The cumulative schedule variance, currently \$0.0M (0.0%) improved \$0.6M and is also part of a bottoms-up and reforecasting of remaining efforts to match the latest flight test schedules.

15. (U) Contract Information (Cont'd):

	Initial Contract Price				
(U) <u>LSI:</u>	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>		
Boeing North American, Downey, CA					
HQ0006-98-C-0003, CPAF	\$1649.5	N/A	0		
Award: April 30, 1998					
Definitized: April 30, 1998					
	Current Contract Price			Estimated Price At Completion	
	<u>Target</u>	<u>Ceiling</u>	<u>Qty</u>	<u>Contractor</u>	<u>Program Manager</u>
	\$1650.3	N/A	0	\$2510.0	\$2510.0
				<u>Cost Variance Schedule Variance</u>	
Previous Cumulative Variances				\$8.1	\$-10.4
Cumulative Variances To Date (12/31/99)				<u>\$-93.7</u>	<u>\$-44.1</u>
Net Change				\$-101.8	\$-33.7

Explanation of Change:

(U) This contract was awarded on April 30, 1998. The Lead System Integrator (LSI) is responsible for the development, integration, and deployment of the NMD system. As indicated previously in this report, transition of the government's major legacy contracts (EKV-Raytheon, EKV-Boeing, and PLV-Lockheed) as subcontracts under the LSI were completed during the year.

The cumulative cost variance, currently -\$93.7M (-11.5%), worsened by -\$101.8 since the previous report. This change can be broken down into three main components. The first is because of performance measurement, which in the LSI's case, deviated from the plan. This category is comprised of variances resulting from the Booster Vehicle delay, LSI Distributed Simulation (LIDS) delay, IFT-3 test preparation and associated replanning costs, launch facilities preparation, and an indirect rate cost increase. The second component of the decline are cost variances associated with the LSI's subcontractors use of Boeing facilities. Although this is an overall cost savings for the government, it is driving part of the cost variance. The third category, which comprises the largest portion of the cost variance decline, is attributed to contract cost growth. Specifically, an equitable adjustment was required for XBR, UEWR, and EKV because government furnished assets were less mature than the LSI had anticipated. Cost variances associated with the non-baselined work may be nullified following subcontractor definitizations.

The cumulative schedule variance, currently -\$44.1M (-5.1%), declined -\$33.7 since the last report. This decline is attributed to a combination of EKV delays, Booster Vehicle redesign, flight test replanning, System Preliminary Design Review delays, and A-Spec requirements flow down delays.

The current Price at Completion is based on the LSI's preliminary estimates of the major subcontract proposal negotiation estimates. These will not be formalized until definitization, which is expected in the March 2000 time frame. Again, variances attributed to non-baselined work will be

15. (U) Contract Information (Cont'd):

nullified.

16. (U) Program Funding Summary (Current Estimate in Millions of Dollars):

a. Appropriation Summary (Then-Year Dollars in Millions)

<u>Appropriation</u>	<u>Prior Years (FY91-99)</u>	<u>Budget Year (FY00)</u>	<u>Budget Year (FY01)</u>	<u>Balance To Complete (FY02-26)</u>	<u>Total</u>
RDT&E	4716.6	950.2	1740.2	4554.5	11961.5
Procurement	-	-	74.5	7717.8	7792.3
MILCON	9.7	15.0	101.6	372.1	498.4
O&M	-	-	-	-	-
Total	4726.3	965.2	1916.3	12644.4	20252.2

b. Annual Summary -- NMD

Appropriation: 0400 - RDT&E, Defense Agencies

<u>Fiscal Year</u>	<u>Qty</u>	<u>Flyaway FY 1999 Dollars Nonrec</u>	<u>Flyaway FY 1999 Dollars Rec</u>	<u>Total Program Base-Year \$</u>	<u>Total Program Then-Year \$</u>
1991				97.9	86.3
1992				209.1	189.3
1993				153.0	141.7
1994				106.0	100.1
1995				203.6	196.1
1996				592.2	579.6
1997				817.6	809.9
1998				936.8	935.4
1999				1664.4	1678.2
2000				930.5	950.2
2001				1678.4	1740.2
2002				807.2	850.0
2003				738.7	791.7
2004				629.9	688.6
2005				610.9	681.2
2006				593.5	675.0
2007				262.0	304.0
2008				235.8	279.0
2009				154.1	186.0
2010				80.4	99.0
Subtotal				11502.0	11961.5

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16b. (U) Program Funding Summary (Cont'd):

Appropriation: 0300 - Procurement, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1999 Dollars Nonrec	Flyaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
2001			71.2	71.2	74.5
2002		87.2	1068.1	1445.4	1536.5
2003		134.0	690.1	1128.4	1221.5
2004		16.6	786.3	1121.5	1238.2
2005	1	2.6	564.4	957.7	1078.6
2006		1.0	260.4	538.9	619.0
2007		0.4	74.4	259.5	304.0
2008		0.1	14.5	153.1	183.0
2009		0.2	12.3	150.9	184.0
2010			17.8	178.5	222.0
2011			18.9	55.2	70.0
2012			19.2	27.8	36.0
2013			19.5	28.0	37.0
2014			19.1	32.7	44.0
2015			19.3	24.8	34.0
2016			19.5	57.1	80.0
2017			20.0	26.6	38.0
2018			19.8	159.9	233.0
2019			19.5	45.1	67.0
2020			20.0	50.1	76.0
2021			19.5	40.1	62.0
2022			19.6	93.8	148.0
2023			20.0	27.4	44.0
2024			19.5	26.8	44.0
2025			19.7	36.5	61.0
2026			33.4	33.4	57.0
Subtotal	1	242.1	3886.0	6770.4	7792.3

Appropriation: 0500 - Military Construction, Defense Agencies

Fiscal Year	Qty	Flyaway FY 1999 Dollars Nonrec	Flyaway FY 1999 Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
1999				9.5	9.7
2000				14.4	15.0
2001				96.2	101.6
2002				178.6	191.9
2003				115.5	126.5
2004				34.4	38.4
2005				13.4	15.3
Subtotal				462.0	498.4

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16b. (U) Program Funding Summary (Cont'd):

	Qty	Flyaway Dollars Nonrec	Flyaway Dollars Rec	Total Program Base-Year \$	Total Program Then-Year \$
Grand Total	1	242.1	3886.0	18734.4	20252.2

17. (U) Delivery/Expenditure Information:

a. (U) Deliveries To Date - None.

(U) Percent Total Program Quantities Delivered: N/A

b. (U) Total Expenditures To Date (In Millions of Dollars): \$ 3438.4

(U) Percent Total Program Expended: 17.0%

18. (U) Operating and Support Costs:

a. (U) Assumptions and Ground Rules --

1. 20 years steady-state O&S commencing in FY2006 and continuing through FY2025
2. 1 Site in Alaska with 100 missiles
3. 1 XBR site in Alaska operating 24 hours a day, 7 days a week
4. 5 Early Warning Radars (EWR) performing present mission in addition to NMD's
5. Base operation and security performed by Army National Guard (ANG)
6. Interceptor, radar and BMC3 operation by ANG
7. No NMD Unit Level or Intermediate Level Maintenance
8. Software maintenance completed at single-site by contractor(s)
9. NMD will only support EWR upgrades, not legacy portion
10. Includes consumables for Weapon, BMC3, and XBR
11. Includes energy and Petroleum Oil & Lubricants for interceptor, BMC3 and base operations
12. Includes cost to support for 2 Army Service Practice (ASP) per year (except interceptor)
13. Maintains program office support throughout life-cycle
14. Does not include Disposal and Demilitarization

b. (U) Costs -- (FY 1999 Constant (Base-Year) Dollars in Millions)

Cost Element	NMD Average Annual Cost:	N/A
Mission Pay & Allowances	30.9	N/A
Unit Level Consumption	21.8	N/A
Intermediate Maintenance	N/A	N/A
Depot Maintenance	6.6	N/A
Contractor Support	76.7	N/A

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18b. (U) Operating and Support Costs (Cont'd):

b. (U) Costs -- (FY 1999 Constant (Base-Year) Dollars in Millions)

Cost Element	NMD	
	Average Annual Cost:	N/A
Sustaining Support	324.1	N/A
Indirect Costs	101.4	N/A
Risk	13.1	N/A
Total	574.6	N/A

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