



## Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-148



### **PATRIOT PAC-3**

As of December 31, 2010

Defense Acquisition Management  
Information Retrieval  
(DAMIR)

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**UNCLASSIFIED**

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## Program Information

**Designation And Nomenclature (Popular Name)**

Patriot Advanced Capability - 3 (PAC-3)

**DoD Component**

Army

**Joint Participants**

Missile Defense Agency

## Responsible Office

**Responsible Office**

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**Date Assigned** December 1, 2008

## References

**SAR Baseline (Production Estimate)**

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated December 2, 2002

**Approved APB**

DAE Approved Acquisition Program Baseline (APB) dated March 3, 2006

## Mission and Description

Patriot, the centerpiece of the Army's air defense forces, is an extremely capable, long range, low-to-high altitude 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, and advanced aircraft employing saturation, maneuver, sophisticated Electronic Countermeasures (ECM), and low radar cross-section. 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 Threats (ABTs) and TBMs with a high probability of target kill. The 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), and up to sixteen Launching Stations (LS). At the battalion level, command and control is exercised through the Information and Coordination Central (ICC) and associated communications equipment including Communications Relay Group (CRG). The Patriot RS is a multi-function 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. At both the FU and battalion level are dedicated support, communications, and maintenance vehicles.

The Patriot system, in concert with the Patriot Advanced Capability-3 (PAC-3) missile, has been upgraded through a series of integrated, phased system improvements. The PAC-3 missile is a high velocity hit-to-kill, surface-to-air missile capable of intercepting and destroying TBMs and ABTs. The PAC-3 missile provides the range, accuracy, and lethality to effectively defend against TBMs with conventional high explosive, chemical, and nuclear warheads. The PAC-3 missile's leading edge technology uses kinetic energy to destroy targets through its hit-to-kill capability, in lieu of a proximity-fuzed warhead. The missile uses a solid propellant rocket motor, aerodynamic controls, Attitude Control Motors (ACMs), and inertial guidance to navigate. The missile flies to an intercept point specified prior to launch by its ground based fire solution computer embedded in the ECS. Target trajectory is updated during missile flyout through means of a radio frequency uplink/downlink. Shortly before arrival at the intercept point, the PAC-3 missile's on-board Ka-Band seeker acquires the target and selects optimal aimpoint initiating terminal homing guidance. The missile ACMs, which are short-duration, solid propellant rocket motors located in the missile forebody forward of the missile center of gravity, fire explosively to increase the missile's rate of spin and to enable the high resolution maneuvers characteristic of the PAC-3 missile. The combination of a fast missile airframe response and high impulse side thrusters generates a more rapid missile angle of attack than is possible with actuator-driven aerodynamic control surfaces alone.

The Patriot PAC-3 system is deployed worldwide in defense of U.S. forces and allied forces. The PAC-3 missile has been approved for sale to The Netherlands, Japan, Germany, the United Arab Emirates (UAE), and Taiwan.

## Executive Summary

The Patriot PAC-3 production program was scheduled for completion in FY 2009. Development challenges with the Missile Segment Enhancement (MSE) missile within the Patriot/MEADS Combined Aggregate Program (CAP) have delayed initial production until at least FY 2013. Patriot PAC-3 production has therefore been extended through FY 2012. The Project Manager, Lower Tier Project Office, submitted a Program Deviation Report in February 2010 to provide notification of the Acquisition Program Baseline (APB) Procurement cost breach.

The FY 2011 PAC-3 Missile Production contract was awarded on December 20, 2010, to Lockheed Martin Missiles and Fire Control, Dallas, TX, at a value of \$916.1M for Foreign Military Sales (FMS) to the United Arab Emirates (UAE) and Taiwan. On December 23, 2010, the contract was modified to award the U.S. portion at a value of \$146.2M, increasing the total contract award value to \$1,062.3M. The contract includes total production of 284 missiles for both U.S. and FMS requirements, test missiles, launcher modification kits, concurrent spares, and other equipment. This contract award includes the third sale of PAC-3 missiles to the UAE and the second sale of PAC-3 missiles to Taiwan.

There are no significant software related issues with this program at this time.

### Threshold Breaches

APB Breaches	
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<b>Schedule</b>		<input type="checkbox"/>
<b>Performance</b>		<input type="checkbox"/>
<b>Cost</b>	RDT&E	<input type="checkbox"/>
	Procurement	<input checked="" type="checkbox"/>
	MILCON	<input type="checkbox"/>
	Acq O&M	<input type="checkbox"/>
<b>Unit Cost</b>	PAUC	<input type="checkbox"/>
	APUC	<input type="checkbox"/>

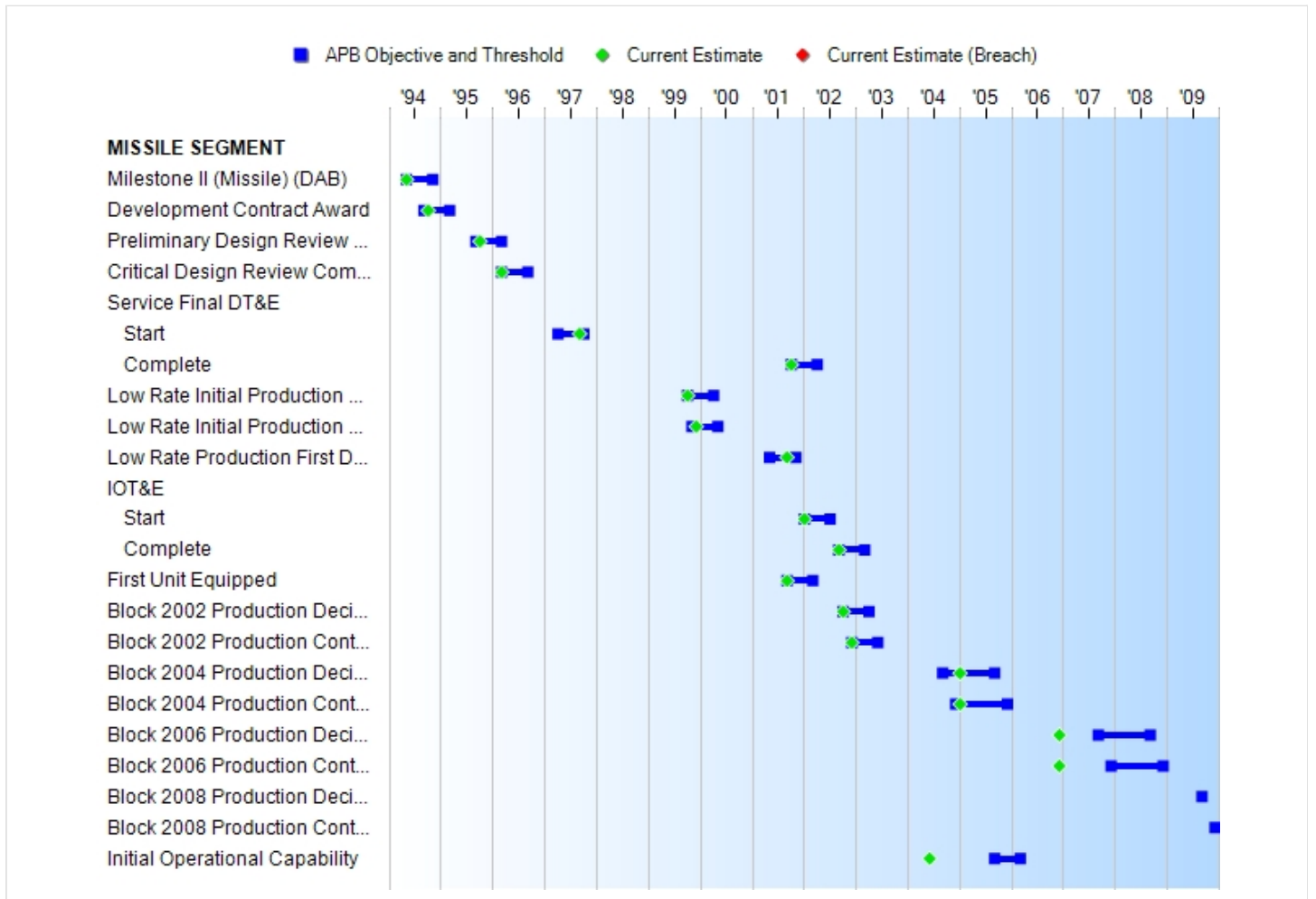
#### Explanation of Breach

Program current estimate for Procurement cost exceeds the Acquisition Program Baseline (APB) threshold and was reported in the December 2009 SAR. The FY 2011 President's Budget extended PATRIOT PAC-3 missile production, thereby exceeding the approved APB Procurement cost threshold. This extension was necessary due to development challenges with the Missile Segment Enhancement (MSE) missile. MSE is a subprogram within the PATRIOT/MEADS Combined Aggregate Program. The Project Manager, Lower Tier Project Office, submitted a Program Deviation Report in February 2010 to provide notification of this cost breach. A revised APB is being planned to amend the program of record for the extended production.

Nunn-McCurdy Breaches	
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<b>Current UCR Baseline</b>		
	PAUC	None
	APUC	None
<b>Original UCR Baseline</b>		
	PAUC	None
	APUC	None

### Schedule



Milestones	SAR Baseline Prod Est	Current APB Production		Current Estimate
		Objective/Threshold		
Milestone II (Missile) (DAB)	MAY 1994	MAY 1994	NOV 1994	MAY 1994
Development Contract Award	SEP 1994	SEP 1994	MAR 1995	OCT 1994
Preliminary Design Review Complete	SEP 1995	SEP 1995	MAR 1996	OCT 1995
Critical Design Review Complete	MAR 1996	MAR 1996	SEP 1996	MAR 1996
Service Final DT&E				
Start	APR 1997	APR 1997	OCT 1997	SEP 1997
Complete	OCT 2001	OCT 2001	APR 2002	OCT 2001
Low Rate Initial Production Decision	OCT 1999	OCT 1999	APR 2000	OCT 1999
Low Rate Initial Production Contract Award	NOV 1999	NOV 1999	MAY 2000	DEC 1999
Low Rate Production First Delivery	MAY 2001	MAY 2001	NOV 2001	SEP 2001
IOT&E				
Start	JAN 2002	JAN 2002	JUL 2002	JAN 2002
Complete	SEP 2002	SEP 2002	MAR 2003	SEP 2002
First Unit Equipped	SEP 2001	SEP 2001	MAR 2002	SEP 2001
Block 2002 Production Decision	OCT 2002	OCT 2002	APR 2003	OCT 2002
Block 2002 Production Contract Award	DEC 2002	DEC 2002	JUN 2003	DEC 2002
Block 2004 Production Decision	SEP 2004	SEP 2004	SEP 2005	JAN 2005
Block 2004 Production Contract Award	DEC 2004	DEC 2004	DEC 2005	JAN 2005
Block 2006 Production Decision	SEP 2007	SEP 2007	SEP 2008	DEC 2006
Block 2006 Production Contract Award	DEC 2007	DEC 2007	DEC 2008	DEC 2006
Block 2008 Production Decision	SEP 2009	N/A	N/A	N/A
Block 2008 Production Contract Award	DEC 2009	N/A	N/A	N/A
Initial Operational Capability	SEP 2005	SEP 2005	MAR 2006	JUN 2004

### Acronyms And Abbreviations

DAB - Defense Acquisition Board  
DT&E - Development Test and Evaluation  
IOT&E - Initial Operational Test and Evaluation

### Change Explanations

None

### Memo

Initial Operational Capability for the PAC-3 missile was considered achieved when a PATRIOT battalion, consisting of five Fire Units (FU), was equipped with 32 PAC-3 missiles per FU.

All PAC-3 milestones are complete.



**Performance**

Characteristics	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Demonstrated Performance	Current Estimate
Fire Unit Mean Time Between Failure (hrs)	N/A	60	40	60	60
Joint Interoperability	N/A	Battery and Bn should be capable of integrating into a joint composite tracking network	Tactical Data Link TADIL-J shall be primary protocol for receiving, processing, and transmitting jointly approved tactical Air Missile Defense (AMD) specific messages	Demonstrated via HWIL, ASCIET/JCIET and Roving Sands	Battery and Bn should be capable of integrating into a joint composite tracking network

**Requirements Source:** Operational Capabilities Document (OCD), JROC approved August 22, 2003

**Acronyms And Abbreviations**

ASCIET - All Services Combat Identification and Evaluation Team  
 Bn - Battalion  
 hrs - Hours  
 HWIL - Hardware In The Loop  
 JCIET - Joint Combat Identification and Evaluation Team  
 TADIL-J - Tactical Data Link-Joint

**Change Explanations**

None

Classified Performance information is provided in the classified annex to this submission.

**Track To Budget****RDT&E**

APPN 2040	BA 07	PE 0203801A	(Army)	
	Project 036	Missile/Air Defense Product Improvement Program/PATRIOT Product Improvement Program	(Shared)	(Sunk)
APPN 2040	BA 05	PE 0604865A	(Army)	
	Project 01C	PATRIOT PAC-3 Theater Missile Defense Acq-EMD/PATRIOT Advanced Capability (PAC) - 3		(Sunk)
APPN 0400	BA 03	PE 0603216C	(DoD)	
	Project 2207	Theater and ATBM Defenses (Sunk)/Multimode Missile Program		(Sunk)
	Project 2208	Theater and ATBM Defenses (Sunk)/ERINT-1		(Sunk)
APPN 0400	BA 05	PE 0604225C	(DoD)	
	Project 2207	TMD EMD/PAC-3 Missile (EMD)		(Sunk)
APPN 0400	BA 05	PE 0604865C	(DoD)	
	Project 2014	PAC-3 EMD/PATRIOT		(Sunk)
	Project 2207	PAC-3 EMD/PATRIOT		(Sunk)
	Project 2257	PAC-3 EMD/PATRIOT		(Sunk)
APPN 0400	BA 05	PE 0604866C	(DoD)	
	Project 2257	PAC-3 Risk Mitigation (Sunk)/Risk Reduction and Mitigation		(Sunk)

**Procurement**

APPN 2032	BA 02		(Army)	
	ICN C49200	PATRIOT PAC-3	(Shared)	

APPN 2032	BA 03		(Army)	
	ICN C50700	Patriot Mods	(Shared)	(Sunk)
APPN 2032	BA 04		(Army)	
	ICN CA0267	Patriot Modification Initial Spares	(Shared)	(Sunk)
APPN 0300	BA 02		(DoD)	
	ICN 0208060C	PAC-3 Procurement		(Sunk)
APPN 0300	BA 01		(DoD)	
	ICN 0208865C	PAC-3 Missile Procurement		(Sunk)

Item Control Number (ICN) C49100 is the parent line for ICN C49200.

## Cost and Funding

### Cost Summary

#### Total Acquisition Cost and Quantity

Appropriation	BY2002 \$M			BY2002 \$M	TY \$M		
	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Prod Est	Current APB Production Objective	Current Estimate
RDT&E	3578.2	3481.8	3830.0	3430.2	3302.1	3224.6	3176.2
Procurement	5505.8	5007.2	5507.9	6167.2 <sup>1</sup>	5903.7	5267.4	6825.9
Flyaway	5505.8	--	--	6167.2	5903.7	--	6825.9
Recurring	4928.2	--	--	5714.7	5299.5	--	6373.2
Non Recurring	577.6	--	--	452.5	604.2	--	452.7
Support	0.0	--	--	0.0	0.0	--	0.0
Other Support	0.0	--	--	0.0	0.0	--	0.0
Initial Spares	0.0	--	--	0.0	0.0	--	0.0
MILCON	0.0	0.0	--	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	9084.0	8489.0	N/A	9597.4	9205.8	8492.0	10002.1

<sup>1</sup> APB Breach

Quantity	SAR Baseline Prod Est	Current APB Production	Current Estimate
RDT&E	0	0	0
Procurement	1159	961	1210
Total	1159	961	1210

## Cost and Funding

### Funding Summary

#### Appropriation and Quantity Summary FY2012 President's Budget / December 2010 SAR (TY\$ M)

Appropriation	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	To Complete	Total
RDT&E	3176.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3176.2
Procurement	5683.5	480.2	662.2	0.0	0.0	0.0	0.0	0.0	6825.9
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2012 Total	8859.7	480.2	662.2	0.0	0.0	0.0	0.0	0.0	10002.1
PB 2011 Total	8843.7	480.2	2.2	0.0	0.0	0.0	0.0	0.0	9326.1
Delta	16.0	0.0	660.0	0.0	0.0	0.0	0.0	0.0	676.0

Funding reported in the December 2010 SAR is associated only with the PAC-3 Missile Subprogram.

Funding for additional PAC-3 missile quantities in FYs 2010, 2011, and 2012 was transferred from the PATRIOT/MEADS Combined Aggregate Program (CAP) Missile Subprogram procurement funding line in the respective years.

Quantity	Undistributed	Prior	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	1044	78	88	0	0	0	0	0	1210
PB 2012 Total	0	1044	78	88	0	0	0	0	0	1210
PB 2011 Total	0	1028	78	0	0	0	0	0	0	1106
Delta	0	16	0	88	0	0	0	0	0	104

## Cost and Funding

### Annual Funding By Appropriation

#### Annual Funding TY\$

#### 2040 | RDT&E | Research, Development, Test, and Evaluation, Army

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
2004	--	--	--	--	--	--	151.3
2005	--	--	--	--	--	--	60.4
<b>Subtotal</b>	--	--	--	--	--	--	<b>211.7</b>

**Annual Funding BY\$**

**2040 | RDT&E | Research, Development, Test, and Evaluation, Army**

<b>Fiscal Year</b>	<b>Quantity</b>	<b>End Item Recurring Flyaway BY 2002 \$M</b>	<b>Non End Item Recurring Flyaway BY 2002 \$M</b>	<b>Non Recurring Flyaway BY 2002 \$M</b>	<b>Total Flyaway BY 2002 \$M</b>	<b>Total Support BY 2002 \$M</b>	<b>Total Program BY 2002 \$M</b>
2004	--	--	--	--	--	--	143.5
2005	--	--	--	--	--	--	55.7
<b>Subtotal</b>	--	--	--	--	--	--	<b>199.2</b>

## Annual Funding TY\$

## 0400 | RDT&amp;E | Research, Development, Test, and Evaluation, Defense-Wide

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
1983	--	--	--	--	--	--	33.3
1984	--	--	--	--	--	--	24.1
1985	--	--	--	--	--	--	20.4
1986	--	--	--	--	--	--	15.1
1987	--	--	--	--	--	--	30.2
1988	--	--	--	--	--	--	18.0
1989	--	--	--	--	--	--	65.2
1990	--	--	--	--	--	--	38.3
1991	--	--	--	--	--	--	127.5
1992	--	--	--	--	--	--	239.0
1993	--	--	--	--	--	--	200.2
1994	--	--	--	--	--	--	194.1
1995	--	--	--	--	--	--	276.1
1996	--	--	--	--	--	--	311.6
1997	--	--	--	--	--	--	328.1
1998	--	--	--	--	--	--	234.1
1999	--	--	--	--	--	--	237.3
2000	--	--	--	--	--	--	220.7
2001	--	--	--	--	--	--	81.9
2002	--	--	--	--	--	--	130.4
2003	--	--	--	--	--	--	138.9
<b>Subtotal</b>	--	--	--	--	--	--	<b>2964.5</b>



**Annual Funding BY\$**

**0400 | RDT&E | Research, Development, Test, and Evaluation, Defense-Wide**

<b>Fiscal Year</b>	<b>Quantity</b>	<b>End Item Recurring Flyaway BY 2002 \$M</b>	<b>Non End Item Recurring Flyaway BY 2002 \$M</b>	<b>Non Recurring Flyaway BY 2002 \$M</b>	<b>Total Flyaway BY 2002 \$M</b>	<b>Total Support BY 2002 \$M</b>	<b>Total Program BY 2002 \$M</b>
1983	--	--	--	--	--	--	51.6
1984	--	--	--	--	--	--	36.0
1985	--	--	--	--	--	--	29.5
1986	--	--	--	--	--	--	21.2
1987	--	--	--	--	--	--	41.3
1988	--	--	--	--	--	--	23.9
1989	--	--	--	--	--	--	83.1
1990	--	--	--	--	--	--	46.9
1991	--	--	--	--	--	--	149.8
1992	--	--	--	--	--	--	273.2
1993	--	--	--	--	--	--	225.3
1994	--	--	--	--	--	--	214.3
1995	--	--	--	--	--	--	299.1
1996	--	--	--	--	--	--	331.6
1997	--	--	--	--	--	--	344.7
1998	--	--	--	--	--	--	244.0
1999	--	--	--	--	--	--	244.6
2000	--	--	--	--	--	--	224.0
2001	--	--	--	--	--	--	82.0
2002	--	--	--	--	--	--	129.3
2003	--	--	--	--	--	--	135.6
<b>Subtotal</b>	--	--	--	--	--	--	<b>3231.0</b>

## Annual Funding TY\$

## 2032 | Procurement | Missile Procurement, Army

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
2004	135	578.9	--	38.1	617.0	--	617.0
2005	108	497.0	--	--	497.0	--	497.0
2006	112	475.9	--	--	475.9	--	475.9
2007	112	470.4	24.2	--	494.6	--	494.6
2008	108	469.7	--	--	469.7	--	469.7
2009	124	510.6	--	--	510.6	--	510.6
2010	59	341.3	--	--	341.3	--	341.3
2011	78	480.2	--	--	480.2	--	480.2
2012	88	662.2	--	--	662.2	--	662.2
<b>Subtotal</b>	<b>924</b>	<b>4486.2</b>	<b>24.2</b>	<b>38.1</b>	<b>4548.5</b>	<b>--</b>	<b>4548.5</b>

## Annual Funding BY\$

## 2032 | Procurement | Missile Procurement, Army

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2002 \$M	Non End Item Recurring Flyaway BY 2002 \$M	Non Recurring Flyaway BY 2002 \$M	Total Flyaway BY 2002 \$M	Total Support BY 2002 \$M	Total Program BY 2002 \$M
2004	135	536.1	--	35.3	571.4	--	571.4
2005	108	447.7	--	--	447.7	--	447.7
2006	112	419.5	--	--	419.5	--	419.5
2007	112	406.9	20.9	--	427.8	--	427.8
2008	108	400.4	--	--	400.4	--	400.4
2009	124	431.0	--	--	431.0	--	431.0
2010	59	284.3	--	--	284.3	--	284.3
2011	78	393.8	--	--	393.8	--	393.8
2012	88	534.3	--	--	534.3	--	534.3
<b>Subtotal</b>	<b>924</b>	<b>3854.0</b>	<b>20.9</b>	<b>35.3</b>	<b>3910.2</b>	<b>--</b>	<b>3910.2</b>

## Annual Funding TY\$

## 0300 | Procurement | Procurement, Defense-Wide

Fiscal Year	Quantity	End Item Recurring Flyaway TY \$M	Non End Item Recurring Flyaway TY \$M	Non Recurring Flyaway TY \$M	Total Flyaway TY \$M	Total Support TY \$M	Total Program TY \$M
1997	--	--	--	105.1	105.1	--	105.1
1998	20	183.3	--	--	183.3	--	183.3
1999	--	--	--	87.8	87.8	--	87.8
2000	32	306.7	--	--	306.7	--	306.7
2001	40	291.5	--	--	291.5	--	291.5
2002	72	487.5	--	210.1	697.6	--	697.6
2003	122	593.8	--	11.6	605.4	--	605.4
<b>Subtotal</b>	<b>286</b>	<b>1862.8</b>	<b>--</b>	<b>414.6</b>	<b>2277.4</b>	<b>--</b>	<b>2277.4</b>

**Annual Funding BY\$**

**0300 | Procurement | Procurement, Defense-Wide**

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2002 \$M	Non End Item Recurring Flyaway BY 2002 \$M	Non Recurring Flyaway BY 2002 \$M	Total Flyaway BY 2002 \$M	Total Support BY 2002 \$M	Total Program BY 2002 \$M
1997	--	--	--	109.9	109.9	--	109.9
1998	20	189.8	--	--	189.8	--	189.8
1999	--	--	--	89.8	89.8	--	89.8
2000	32	309.2	--	--	309.2	--	309.2
2001	40	290.3	--	--	290.3	--	290.3
2002	72	478.8	--	206.4	685.2	--	685.2
2003	122	571.7	--	11.1	582.8	--	582.8
<b>Subtotal</b>	<b>286</b>	<b>1839.8</b>	<b>--</b>	<b>417.2</b>	<b>2257.0</b>	<b>--</b>	<b>2257.0</b>

**Low Rate Initial Production**

	Initial LRIP Decision	Current Total LRIP
<b>Approval Date</b>	5/19/1994	10/20/2001
<b>Approved Quantity</b>	90	164
<b>Reference</b>	Milestone II/IV	USD(AT&L) approved Acquisition Strategy
<b>Start Year</b>	1998	1998
<b>End Year</b>	1999	2002

The Low Rate Initial Production (LRIP) quantity is 164 PAC-3 missiles as approved by the Under Secretary of Defense (Acquisition, Technology and Logistics) on October 20, 2001. The LRIP missile quantity exceeded 10% of the total planned production quantity because this was the minimum LRIP quantity needed to avoid a production break.

## Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Memo
Taiwan	12/20/2010	96	406.5	Twenty-four missile 4-packs, ground support equipment, and spares.
United Arab Emirates	12/20/2010	130	446.6	Thirty-two missile 4-packs, 2 test missiles, ground support equipment, and spares.
Taiwan	12/30/2009	96	355.5	Twenty-four missile 4-packs, ground support equipment, and spares.
United Arab Emirates	12/30/2009	98	406.7	Twenty-four missile 4-packs, 2 test missiles, ground support equipment, and spares.
United Arab Emirates	12/23/2008	64	302.3	Sixteen missile 4-packs.
Germany	12/13/2007	24	79.6	Six missile 4-packs.
Netherlands	12/13/2007	16	53.9	Four missile 4-packs.
Germany	4/6/2007	1	6.5	One test missile, telemetry kit, and spares.
Japan	1/27/2005	16	52.3	Eight missile 2-packs.
Netherlands	1/27/2005	32	99.7	Eight missile 4-packs.

The FY 2005 PAC-3 Missile Production contract included requirements for 32 and 16 missiles for The Netherlands and Japan, respectively. Production deliveries were completed in 4QFY07.

The FY 2007 PAC-3 Missile Production contract included a requirement for 1 test missile for Germany.

The FY 2008 PAC-3 Missile Production contract included requirements for 16 and 24 missiles for The Netherlands and Germany, respectively. Production deliveries began in 1QFY10.

The FY 2009 PAC-3 Missile Production contract included requirements for 64 missiles for the United Arab Emirates (UAE). Production deliveries began in 2QFY11.

The FY 2010 PAC-3 Missile Production contract includes requirements for 98 and 96 missiles for UAE and Taiwan, respectively. Production deliveries are scheduled to begin in 4QFY11 for UAE and in 1QFY12 for Taiwan.

The FY 2011 PAC-3 Missile Production contract includes requirements for 130 and 96 missiles for UAE and Taiwan, respectively. Production deliveries are scheduled to begin in 2QFY13 for UAE and in 4QFY12 for Taiwan.

## Nuclear Cost

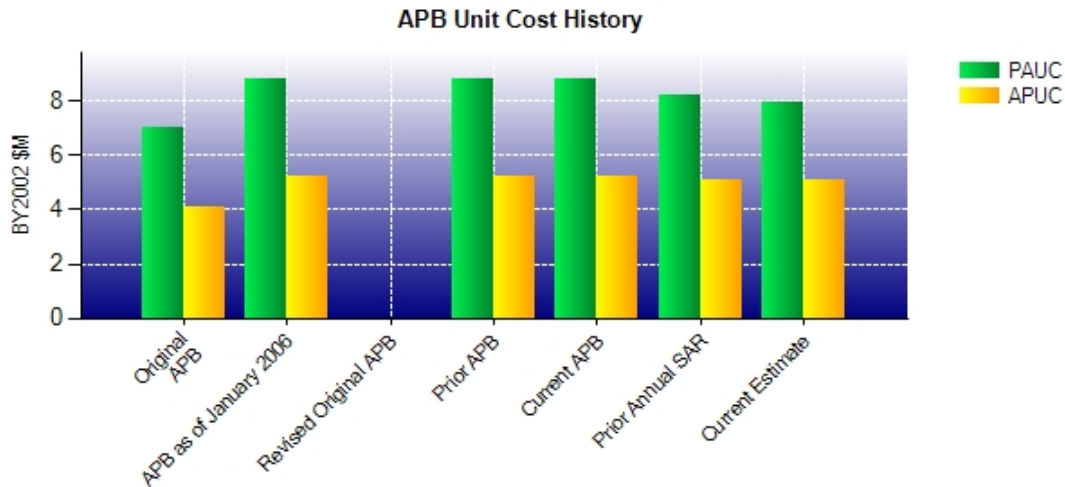
None

**Unit Cost****Unit Cost Report**

	BY2002 \$M	BY2002 \$M	
Unit Cost	Current UCR Baseline (MAR 2006 APB)	Current Estimate (DEC 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	8489.0	9597.4	
Quantity	961	1210	
Unit Cost	8.834	7.932	-10.21
Average Procurement Unit Cost (APUC)			
Cost	5007.2	6167.2	
Quantity	961	1210	
Unit Cost	5.210	5.097	-2.17

	BY2002 \$M	BY2002 \$M	
Unit Cost	Original UCR Baseline (MAR 2000 APB)	Current Estimate (DEC 2010 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	7084.0	9597.4	
Quantity	1012	1210	
Unit Cost	7.000	7.932	+13.31
Average Procurement Unit Cost (APUC)			
Cost	4156.4	6167.2	
Quantity	1012	1210	
Unit Cost	4.107	5.097	+24.11

### Unit Cost History



	Date	BY2002 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
<b>Original APB</b>	MAR 2000	7.002	4.107	7.086	4.465
<b>APB as of January 2006</b>	NOV 2004	8.834	5.210	8.837	5.481
<b>Revised Original APB</b>	N/A	N/A	N/A	N/A	N/A
<b>Prior APB</b>	NOV 2004	8.834	5.210	8.837	5.481
<b>Current APB</b>	MAR 2006	8.834	5.210	8.837	5.481
<b>Prior Annual SAR</b>	DEC 2009	8.189	5.082	8.432	5.560
<b>Current Estimate</b>	DEC 2010	7.932	5.097	8.266	5.641

### SAR Unit Cost History

#### Initial SAR Baseline to Current SAR Baseline (TY \$M)

Initial PAUC Dev Est	Changes								PAUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
3.530	-0.166	0.867	0.480	0.421	2.811	0.000	0.000	4.413	7.943

#### Current SAR Baseline to Current Estimate (TY \$M)

PAUC Prod Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
7.943	0.137	0.000	0.071	0.000	0.115	0.000	0.000	0.323	8.266



**Initial SAR Baseline to Current SAR Baseline (TY \$M)**

Initial APUC Dev Est	Changes								APUC Prod Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
1.880	-0.184	0.943	0.244	0.166	2.045	0.000	0.000	3.214	5.094

**Current SAR Baseline to Current Estimate (TY \$M)**

APUC Prod Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5.094	0.129	0.120	0.071	0.000	0.227	0.000	0.000	0.547	5.641

**SAR Baseline 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	MAY 1994	MAY 1994
Milestone III	N/A	AUG 1998	OCT 2002	OCT 2002
IOC	N/A	NOV 1999	SEP 2005	JUN 2004
Total Cost (TY \$M)	N/A	4236.2	9205.8	10002.1
Total Quantity	N/A	1200	1159	1210
Prog. Acq. Unit Cost (PAUC)	N/A	3.530	7.943	8.266

The PAC-3 Milestone III was redefined as the Block 2002 Production Decision to reflect the evolutionary development acquisition approach approved at the October 31, 2002, Defense Acquisition Board.

**Cost Variance****Cost Variance Summary**

<b>Summary Then Year \$M</b>				
	<b>RDT&amp;E</b>	<b>Proc</b>	<b>MILCON</b>	<b>Total</b>
SAR Baseline (Prod Est)	3302.1	5903.7	--	9205.8
Previous Changes				
Economic	+2.3	+157.5	--	+159.8
Quantity	--	+6.9	--	+6.9
Schedule	--	+43.4	--	+43.4
Engineering	--	--	--	--
Estimating	-128.2	+38.4	--	-89.8
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-125.9	+246.2	--	+120.3
Current Changes				
Economic	+6.5	-0.9	--	+5.6
Quantity	--	+398.4	--	+398.4
Schedule	--	+42.8	--	+42.8
Engineering	--	--	--	--
Estimating	-6.5	+235.7	--	+229.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	+676.0	--	+676.0
Total Changes	-125.9	+922.2	--	+796.3
CE - Cost Variance	3176.2	6825.9	--	10002.1
CE - Cost & Funding	3176.2	6825.9	--	10002.1

Summary Base Year 2002 \$M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Prod Est)	3578.2	5505.8	--	9084.0
Previous Changes				
Economic	--	--	--	--
Quantity	--	+3.3	--	+3.3
Schedule	--	+46.8	--	+46.8
Engineering	--	--	--	--
Estimating	-141.8	+64.5	--	-77.3
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-141.8	+114.6	--	-27.2
Current Changes				
Economic	--	--	--	--
Quantity	--	+322.2	--	+322.2
Schedule	--	+36.4	--	+36.4
Engineering	--	--	--	--
Estimating	-6.2	+188.2	--	+182.0
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-6.2	+546.8	--	+540.6
Total Changes	-148.0	+661.4	--	+513.4
CE - Cost Variance	3430.2	6167.2	--	9597.4
CE - Cost & Funding	3430.2	6167.2	--	9597.4

Previous Estimate: December 2009

RDT&E	\$M	
	Base Year	Then Year
<b>Current Change Explanations</b>		
Revised escalation indices. (Economic)	N/A	+6.5
Adjustment for current and prior escalation. (Estimating)	-6.2	-6.5
RDT&E Subtotal	-6.2	0.0

Procurement	\$M	
	Base Year	Then Year
<b>Current Change Explanations</b>		
Revised escalation indices. (Economic)	N/A	-0.9
Total Quantity variance resulting from procurement of an increase of 104 PAC-3 Missiles from 820 to 924 (Army). (Subtotal)	+390.8	+483.2
Quantity variance resulting from procurement of an increase of 104 PAC-3 Missiles from 820 to 924 (16 missiles in FY 2009 and 88 missiles in FY 2012) (Army). (Quantity)	(+322.2)	(+398.4)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(+36.4)	(+45.0)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(+32.2)	(+39.8)
Revised estimate for procurement of 36 launcher modification kits in FY 2012. (Estimating)	+120.7	+149.6
Revised estimate for increase in systems engineering and integrated logistics in FY 2012. (Estimating)	+34.5	+45.4
Acceleration of procurement buy profile (Army). (Schedule)	0.0	-2.2
Adjustment for current and prior escalation. (Estimating)	+0.8	+0.9
Procurement Subtotal	+546.8	+676.0

(QR) Quantity Related

**Contracts**

**Appropriation: Procurement**

Contract Name **FY 2008 PAC-3 Production**  
 Contractor Lockheed Martin  
 Contractor Location Dallas, TX 75265  
 Contract Number, Type W31P4Q-06-C-0180/3, FFP/CPFF  
 Award Date December 13, 2007  
 Definitization Date December 13, 2007

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
485.1	N/A	148	485.1	N/A	148	485.1	485.1

**Cost And Schedule Variance Explanations**

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

**Contract Comments**

The FY 2008 PAC-3 Missile Production contract was awarded on December 13, 2007, to Lockheed Martin Missiles and Fire Control, Dallas, TX, for \$485.1M. The U.S. portion of this contract was awarded for \$330.9M. This contract includes procurement of 108 missiles for the U.S. and procurement of 16 and 24 missiles, respectively, for The Netherlands and Germany.

The CPFF portion of this contract is below the dollar threshold for cost and schedule variance reporting.

Deliveries began in 1QFY10 and were completed in 3QFY10. This contract is more than 90% complete; therefore, this is the final report for this contract.

**Appropriation: Procurement**

Contract Name **FY 2009 PAC-3 Production**  
 Contractor Lockheed Martin  
 Contractor Location Dallas, TX 75265  
 Contract Number, Type W31P4Q-09-C-0002, FFP  
 Award Date December 23, 2008  
 Definitization Date December 23, 2008

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
774.8	N/A	172	774.8	N/A	172	774.8	774.8

**Cost And Schedule Variance Explanations**

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

**Contract Comments**

The FY 2009 PAC-3 Missile Production contract was awarded on December 23, 2008, to Lockheed Martin Missiles and Fire Control, Dallas, TX, for \$774.8M. The U.S. portion of this contract was awarded for \$476.6M. This contract includes procurement of 108 missiles for the U.S. and 64 missiles for the United Arab Emirates. Also included in this contract are launcher modification kits, spares, and other equipment.

Deliveries began in 3QFY10.

**Appropriation: Procurement**

Contract Name	<b>FY 2010 PAC-3 Production</b>
Contractor	Lockheed Martin
Contractor Location	Dallas, TX 75265
Contract Number, Type	W31P4Q-10-C-0002, FFP
Award Date	December 30, 2009
Definitization Date	December 30, 2009

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
968.7	N/A	253	968.7	N/A	253	968.7	968.7

**Cost And Schedule Variance Explanations**

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

**Contract Comments**

The FY 2010 PAC-3 Missile Production contract was awarded on December 30, 2009, to Lockheed Martin Missiles and Fire Control, Dallas, TX, for \$968.7M. This contract includes U.S. requirements and Foreign Military Sales for the United Arab Emirates (UAE), Taiwan, and Germany. The contract was awarded for production of 253 missiles, 20 launcher modification kits, concurrent spares, and other equipment. This contract award includes the second sale of the PAC-3 missile to the UAE for \$406.7M, and the first sale of the PAC-3 missile to Taiwan for \$355.6M. Germany purchased spares in the amount of \$58K. The U.S. portion includes 59 missiles and was awarded for \$206.3M.

Deliveries are scheduled to begin in 4QFY11.

**Appropriation: Procurement**

Contract Name **FY 2011 PAC-3 Production**  
 Contractor Lockheed Martin  
 Contractor Location Dallas, TX 75265  
 Contract Number, Type W31P4Q-11-C-0001, FFP  
 Award Date December 20, 2010  
 Definitization Date December 20, 2010

Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
916.1	N/A	226	1062.3	N/A	284	1062.3	1062.3

**Cost And Schedule Variance Explanations**

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

**Contract Comments**

The FY 2011 PAC-3 Missile Production contract was awarded on December 20, 2010, to Lockheed Martin Missiles and Fire Control, Dallas, TX, at a value of \$916.1M for Foreign Military Sales (FMS) to the United Arab Emirates (UAE) and Taiwan. On December 23, 2010, the contract was modified to award the U.S. portion at a value of \$146.2M, increasing the total contract award value to \$1,062.3M. The contract includes total production of 284 missiles for both U.S. and FMS requirements, test missiles, launcher modification kits, concurrent spares, and other equipment. This contract award includes the third sale of PAC-3 missiles to the UAE and the second sale of PAC-3 missiles to Taiwan.

Deliveries are scheduled to begin in 4QFY13.

This is the first time this contract is being reported.



## Deliveries and Expenditures

Deliveries To Date	Plan To Date	Actual To Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	911	963	1210	79.59%
Total Program Quantities Delivered	911	963	1210	79.59%

Expenditures and Appropriations (TY \$M)			
Total Acquisition Cost	10002.1	Years Appropriated	29
Expenditures To Date	8350.4	Percent Years Appropriated	96.67%
Percent Expended	83.49%	Appropriated to Date	9339.9
Total Funding Years	30	Percent Appropriated	93.38%

Deliveries and Expenditures are current as of December 31, 2010.

## Operating and Support Cost

### Assumptions And Ground Rules

The PAC-3 O&S cost estimate was updated for the October 2002 Full Rate Production decision. The O&S estimate is based on a total missile quantity of 1159 missiles, and a lifecycle estimate of 50 years. The O&S estimate covers FY 1980 through FY 2033 (PAC-1 and PAC-2 variants); therefore, an antecedent system is not applicable for the PAC-3 missile O&S cost projection. The majority of the Depot Maintenance cost is attributed to the missile recertification requirement every ten years. An updated O&S cost estimate will accompany the planned Acquisition Program Baseline (APB) revision to amend the program of record for extended production.

Costs BY2002 \$K		
Cost Element	MISSILE SEGMENT Average Annual Cost Per Missile	No Antecedent System
Unit-Level Manpower	--	--
Unit Operations	10.4	--
Maintenance	30.3	--
Sustaining Support	5.7	--
Continuing System Improvements	--	--
Indirect Support	14.6	--
Other	--	--
Total Unitized Cost (Base Year 2002 \$)	61.0	--

Total O&S Costs \$M	MISSILE SEGMENT	No Antecedent System
Base Year	3534.5	--
Then Year	4687.6	--