Selected Acquisition Report (SAR)

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

Patriot Advanced Capability-3 (PAC-3)

As of December 31, 2012

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Program Information

Program 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

Defense Acquisition Executive (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 (TBMs), 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 integrated into the overall Area Air Defense Plan in support of the Combatant Commanders mission that can include other short-range, low altitude forward area and joint assets for a theater of operations based upon the threat. The PATRIOT system can conduct multiple simultaneous engagements in all weather conditions and hostile ECM environments against high performance Air Breathing Threats (ABTs) and TBMs with a high probability of target kill. System deployment is by Fire Unit (FU) at the battery level, organized within a Battalion. Each FU consists of an Engagement Control Station (ECS), one Radar Set (RS), an Electric Power Plant (EPP), and up to sixteen Launching Stations (LS). The PATRIOT RS is a multi-function phased array radar, which performs a variety of surveillance, acquisition, and guidance tasks and is controlled by the ECS which provides the human interface for control of automated operations. The M902 LS (Configuration 3), with Enhanced Launcher Electronics System (ELES), supports the PAC-3 missile as well as providing backwards compatibility with the PAC-2 missile variant. At the battalion level, command and control is exercised through the Information and Coordination Central (ICC) and associated communications equipment including the Communications Relay Group (CRG). 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 system is deployed worldwide in defense of U.S. forces and allied forces. The PAC-3 missile has been approved for Foreign Military Sales (FMS) 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. The Missile Segment Enhancement (MSE) missile, a subprogram within the PATRIOT/Medium Extended Air Defense System (MEADS) Combined Aggregate Program (CAP), encountered challenges during development which have delayed the Low Rate Initial Production decision until FY 2014. Therefore, PATRIOT PAC-3 production was extended through FY 2013. The Project Manager, Lower Tier Project Office (LTPO), submitted a Program Deviation Report in February 2010 to provide notification of the PAC-3 Procurement cost breach to the approved Acquisition Program Baseline (APB).

On March 30, 2012, the PAC-3 Missile Support Center contract was awarded to Lockheed Martin Missiles and Fire Control, Dallas, Texas, and was definitized on April 1, 2012, with an initial contract value of $7.6M to conduct the PAC-3 Missile Field Surveillance Program for the U.S., The Netherlands, Germany, Japan, Taiwan, and the United Arab Emirates.

On October 24, 2012, the Missile Defense Agency (MDA) conducted the Flight Test Integrated (FTI)-01 mission at Kwajelein Missile Range, which demonstrated simultaneous engagements of ballistic missile and cruise missile targets. PATRIOT soldiers from the 94th Army Air and Missile Defense Command engaged a low-flying MQM-107 (Drone) and a Short Range Ballistic Missile (SRBM). AEGIS engaged a BQM-74 (Drone) and a SRBM, and the Terminal High Altitude Area Defense (THAAD) system engaged a Medium Range Ballistic Missile, all simultaneously. The PATRIOT system successfully killed both the MQM-107 and SRBM targets while receiving command net data from the other systems. The PATRIOT system was able to process the incoming data from the command net and the debris created from the other engagements without impacting PATRIOT system performance.

On December 7, 2012, the U.S. Army successfully conducted two independent PAC-3 Field Surveillance Program (FSP) missile flight tests at White Sands Missile Range (WSMR), New Mexico. In support of both missions, the PATRIOT ground support equipment launched one PAC-3 baseline missile which intercepted a threat representative Tactical Ballistic Missile (TBM) (PATRIOT-As-A-Target (PAAT)). The engaging Fire Unit used tactical Post Deployment Build-7 software to engage and kill each surrogate TBM target. Final data analysis indicates that PAC-3 FSP missile flight test objectives were successfully achieved in both missions.

The FY 2013 PAC-3 Missile Production contract was awarded on December 27, 2012, to Lockheed Martin Missiles and Fire Control, Dallas, Texas, as a letter contract valued at $755.1M. The effort includes 128 (68 missiles FY 2013 funded and 60 missiles FY 2011 supplemental funded) PAC-3 missiles for the U.S. Army, 40 PAC-3 missiles for international partner, 27 Launcher Modification Kits (LMKs) for international partner, and missile/LMK production tooling. The FY 2013 production letter contract contains provisions to award the remaining U.S. Army requirements for LMKs and any additional PAC-3 missiles contingent upon receipt of U.S. Army and Foreign Military Sales funding.

The FY 2014 President’s Budget includes a program increase of $300M in FY 2013 for procurement of additional PAC-3 missiles and launcher systems to support combatant commanders. Congress approved the program increase in the FY 2013 Appropriations Bill.

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

Threshold Breaches

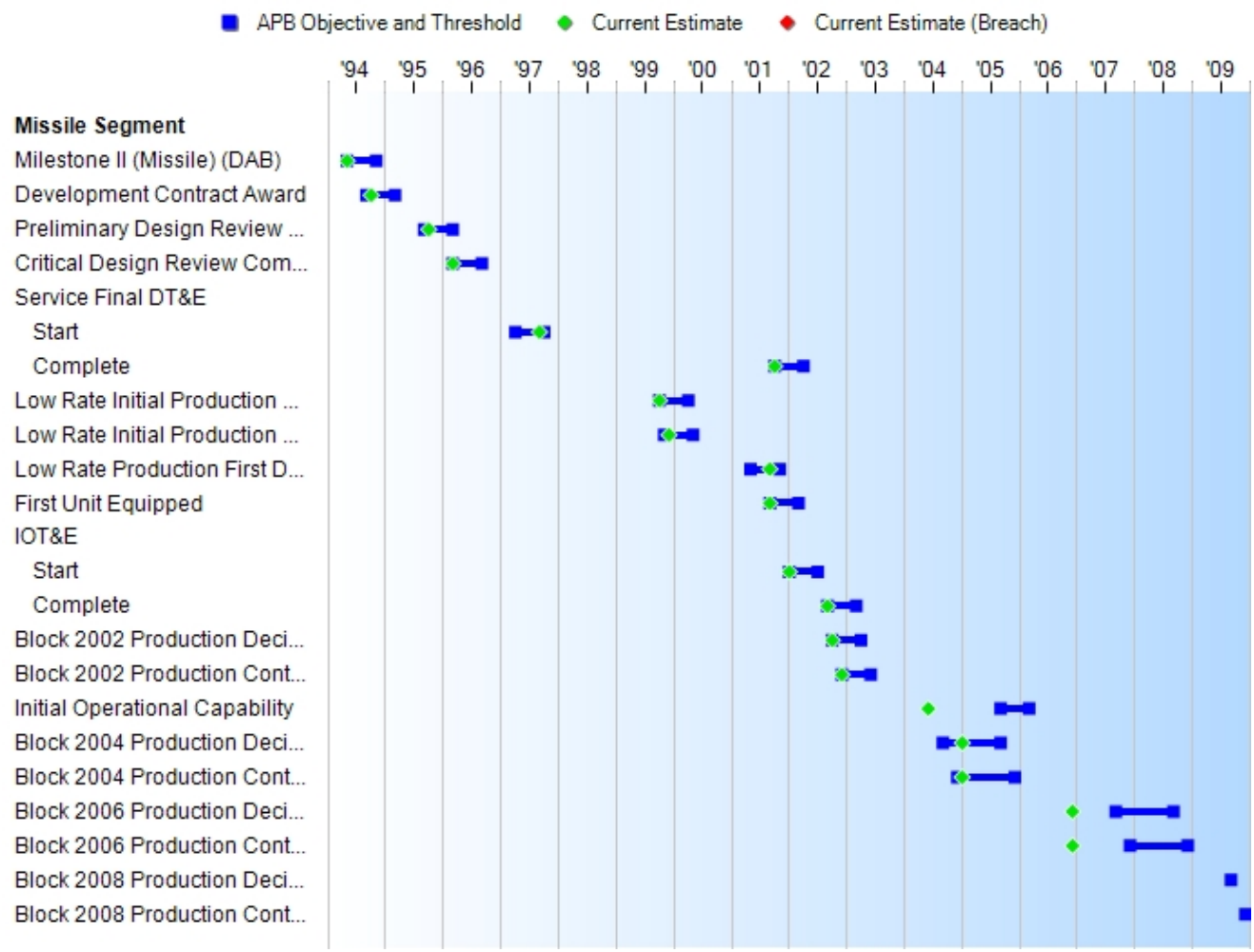
APB Breaches		
Schedule		☐
Performance		☐
Cost	RDT&E	☐
	Procurement	☑
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Explanation of Breach

The Procurement cost breach was previously reported in the December 2009 SAR.

Schedule


APB Objective and Threshold
Current Estimate
Current Estimate (Breach)
'94
'95
'96
'97
'98
'99
'00
'01
'02
'03
'04
'05
'06
'07
'08
'09
Missile Segment
Milestone II (Missile) (DAB)
Development Contract Award
Preliminary Design Review ...
Critical Design Review Com...
Service Final DT&E
Start
Complete
Low Rate Initial Production ...
Low Rate Initial Production ...
Low Rate Production First D...
First Unit Equipped
IOT&E
Start
Complete
Block 2002 Production Deci...
Block 2002 Production Cont...
Initial Operational Capability
Block 2004 Production Deci...
Block 2004 Production Cont...
Block 2006 Production Deci...
Block 2006 Production Cont...
Block 2008 Production Deci...
Block 2008 Production Cont...

Milestones	SAR Baseline Prod Est	Current APB Production Objective/Threshold		Current Estimate
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
First Unit Equipped	SEP 2001	SEP 2001	MAR 2002	SEP 2001
IOT&E				
Start	JAN 2002	JAN 2002	JUL 2002	JAN 2002
Complete	SEP 2002	SEP 2002	MAR 2003	SEP 2002
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
Initial Operational Capability	SEP 2005	SEP 2005	MAR 2006	JUN 2004
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

Acronyms And Abbreviations

DAB - Defense Acquisition Board
DT&E - Development Test and Evaluation
IOT&E - Initial Operational Test and Evaluation
N/A - None Applicable

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 AMD specific messages	Met threshold in HWIL testing, ASCIET/ JCIET and Roving Sands exercises.	Battery and Bn should be capable of integrating into a joint composite tracking network

Requirements Source: Operational Capability Document (OCD) dated August 22, 2003

Acronyms And Abbreviations

AMD - Air Missile Defense
ASCIET - All Services Combat Identification and Evaluation Team
Bn - Battalion
hrs - Hours
HWIL - Hardware In The Loop
JCIET - Joint Combat Identification and Evaluation Team
N/A - Not Applicable
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 2040	BA 07	PE 0607865A	(Army)	
	Project DV8	Patriot Product Improvement	(Shared)	(Sunk)
APPN 0400	BA 03	PE 0603216C	(DoD)	
	Project 2207	Theater and ATBM Defenses/Mulitmode Missile Program		(Sunk)
	Project 2208	Theater and ATBM Defenses/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/Risk Reduction and Mitigation		(Sunk)

Procurement

APPN 2032	BA 02		(Army)	
	ICN C49200	PATRIOT PAC-3	(Shared)	(Sunk)
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	**6936.4** [1]	5903.7	5267.4	7831.1
Flyaway	5505.8	--	--	6936.4	5903.7	--	7831.1
Recurring	4928.2	--	--	6483.9	5299.5	--	7378.4
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	10366.6	9205.8	8492.0	11007.3

[1] ***APB Breach***

Funding for additional PAC-3 missile quantities in FY 2010 - FY 2013 was transferred from the PATRIOT/Medium Extended Air Defense System (MEADS) Combined Aggregate Program (CAP) Missile Subprogram procurement funding line in the respective years.

Quantity	SAR Baseline Prod Est	Current APB Production	Current Estimate
RDT&E	0	0	0
Procurement	1159	961	1354
Total	1159	961	1354

FY 2011 supplemental funds in the amount of $210.4M were received for 60 additional missiles, which were awarded on the FY 2013 PAC-3 Missile Production contract.

Cost and Funding

Funding Summary

Appropriation and Quantity Summary
FY2014 President's Budget / December 2012 SAR (TY$ M)

Appropriation	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
RDT&E	3176.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3176.2
Procurement	7184.5	646.6	0.0	0.0	0.0	0.0	0.0	0.0	7831.1
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 2014 Total	10360.7	646.6	0.0	0.0	0.0	0.0	0.0	0.0	11007.3
PB 2013 Total	10150.3	646.6	0.0	0.0	0.0	0.0	0.0	0.0	10796.9
Delta	210.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	210.4

Program funding and production quantities listed in this SAR are consistent with the FY 2014 President's Budget (PB). The FY 2014 PB did not reflect the enacted DoD appropriation for FY 2013, nor sequestration; it reflected the President's requested amounts for FY 2013.

Quantity	Undistributed	Prior	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	1270	84	0	0	0	0	0	0	1354
PB 2014 Total	0	1270	84	0	0	0	0	0	0	1354
PB 2013 Total	0	1210	84	0	0	0	0	0	0	1294
Delta	0	60	0	0	0	0	0	0	0	60

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
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**211.7**

Annual Funding BY$
2040 | RDT&E | Research, Development, Test, and Evaluation, 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	--	--	--	--	--	--	143.5
2005	--	--	--	--	--	--	55.7
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**199.2**

Annual Funding TY$
0400 | RDT&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
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**2964.5**

Annual Funding BY$
0400 | RDT&E | Research, Development, Test, and Evaluation, 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
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
Subtotal	**--**	**--**	**--**	**--**	**--**	**--**	**3231.0**

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	138	838.8	--	--	838.8	--	838.8
2012	88	662.2	--	--	662.2	--	662.2
2013	84	646.6	--	--	646.6	--	646.6
Subtotal	**1068**	**5491.4**	**24.2**	**38.1**	**5553.7**	**--**	**5553.7**

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	406.8	20.9	--	427.7	--	427.7
2008	108	399.8	--	--	399.8	--	399.8
2009	124	429.3	--	--	429.3	--	429.3
2010	59	281.8	--	--	281.8	--	281.8
2011	138	678.7	--	--	678.7	--	678.7
2012	88	525.4	--	--	525.4	--	525.4
2013	84	498.1	--	--	498.1	--	498.1
Subtotal	**1068**	**4623.2**	**20.9**	**35.3**	**4679.4**	**--**	**4679.4**

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
Subtotal	**286**	**1862.8**	**--**	**414.6**	**2277.4**	**--**	**2277.4**

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
Subtotal	**286**	**1839.8**	**--**	**417.2**	**2257.0**	**--**	**2257.0**

Low Rate Initial Production

	Initial LRIP Decision	Current Total LRIP
Approval Date	5/19/1994	10/20/2001
Approved Quantity	90	164
Reference	Milestone II/IV ADM	Acquisition Strategy
Start Year	1998	1998
End Year	1999	2002

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the fact that this was the minimum LRIP quantity needed to avoid a production break.

The LRIP quantity is 164 PAC-3 missiles as approved by the Under Secretary of Defense (Acquisition, Technology and Logistics) on October 20, 2001.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost $M	Memo
Taiwan	10/12/2011	386	1664.5	FMS Case TW-B-YYV, Amendment 4, ninety-six PAC-3 missile 4-packs, PAC-3 missile test 2 pack, ground support equipment, and spares.
United Arab Emirates	11/20/2008	292	1480.2	FMS Case AE-B-ZUG , seventy-two PAC-3 missile 4-packs, two PAC-3 missile test 2 packs, ground support equipment, and spares.
Germany	11/21/2007	25	87.1	FMS Case GY-B-WZC, six PAC-3 missile 4-packs, and one test missile.
Japan	12/9/2004	16	56.8	FMS Case JA-B-WYN, eight PAC-3 missile 2-packs.
Netherlands	4/21/2004	32	99.1	FMS Case NE-B-WBV, eight PAC-3 missile 4-packs.

The FY 2005 PAC-3 Missile Production contract was awarded on January 27, 2005 and included requirements for 16 missiles for The Netherlands and 16 missiles for Japan. Production deliveries were completed in 4Q FY 2007.

The FY 2007 PAC-3 Missile Production contract was modified on April 6, 2007 to include a requirement for 1 test missile for Germany.

The FY 2008 PAC-3 Missile Production contract was awarded on December 13, 2007 and included requirements for 16 missiles for The Netherlands and 24 missiles for Germany. Production deliveries began in 1Q FY 2010.

The FY 2009 PAC-3 Missile Production contract was awarded on December 23, 2008 and included requirements for 64 missiles for the United Arab Emirates (UAE). Production deliveries began in 2Q FY 2011.

The FY 2010 PAC-3 Missile Production contract was awarded on December 30, 2009 and included requirements for 96 missiles for Taiwan and 98 missiles for UAE. Production deliveries began in 1Q FY 2012 for Taiwan and in 2Q FY 2012 for UAE.

The FY 2011 PAC-3 Missile Production contract was awarded on December 20, 2010 and included requirements for 130 missiles for UAE and 96 missiles for Taiwan. Production deliveries began in 2Q FY 2013 for Taiwan and UAE.

The FY 2012 PAC-3 Missile Production contract was awarded on December 15, 2011 and included requirements for 154 missiles for Taiwan. Production deliveries are scheduled to begin in 1Q FY 2014.

The FY 2013 PAC-3 Missile Production contract was awarded on December 27, 2012 and included requirements for 40 missiles for Taiwan. Production deliveries are scheduled to begin in 3Q FY 2015.

Total cost represents PAC-3 missile costs for respective cases.

Nuclear Cost

None

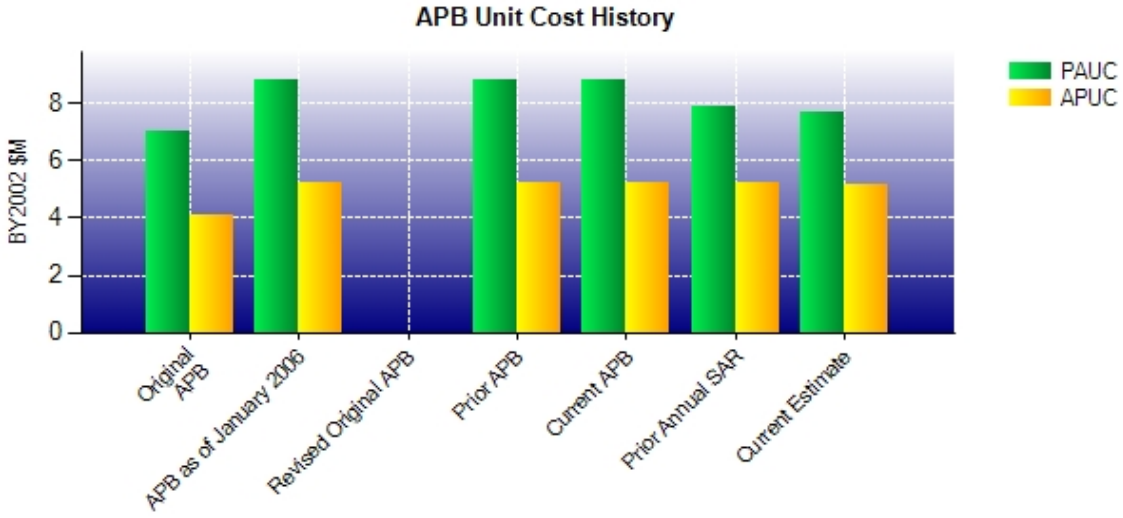
Unit Cost

Unit Cost Report

Unit Cost	BY2002 $M Current UCR Baseline (MAR 2006 APB)	BY2002 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	8489.0	10366.6	
Quantity	961	1354	
Unit Cost	8.834	7.656	-13.33
Average Procurement Unit Cost (APUC)			
Cost	5007.2	6936.4	
Quantity	961	1354	
Unit Cost	5.210	5.123	-1.67

Unit Cost	BY2002 $M Original UCR Baseline (MAR 2000 APB)	BY2002 $M Current Estimate (DEC 2012 SAR)	BY % Change
Program Acquisition Unit Cost (PAUC)			
Cost	7084.0	10366.6	
Quantity	1012	1354	
Unit Cost	7.000	7.656	+9.37
Average Procurement Unit Cost (APUC)			
Cost	4156.4	6936.4	
Quantity	1012	1354	
Unit Cost	4.107	5.123	+24.74

Unit Cost History



		BY2002 $M		TY $M	
	Date	PAUC	APUC	PAUC	APUC
Original APB	MAR 2000	7.002	4.107	7.086	4.465
APB as of January 2006	NOV 2004	8.834	5.210	8.837	5.481
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	NOV 2004	8.834	5.210	8.837	5.481
Current APB	MAR 2006	8.834	5.210	8.837	5.481
Prior Annual SAR	DEC 2011	7.887	5.236	8.344	5.889
Current Estimate	DEC 2012	7.656	5.123	8.129	5.784

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	0.145	-0.432	0.078	0.000	0.395	0.000	0.000	0.186	8.129

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	0.139	-0.021	0.078	0.000	0.494	0.000	0.000	0.690	5.784

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	11007.3
Total Quantity	N/A	1200	1159	1354
Prog. Acq. Unit Cost (PAUC)	N/A	3.530	7.943	8.129

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

Summary Then Year $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Prod Est)	3302.1	5903.7	--	9205.8
Previous Changes				
Economic	+8.8	+176.2	--	+185.0
Quantity	--	+731.7	--	+731.7
Schedule	--	+108.8	--	+108.8
Engineering	--	--	--	--
Estimating	-134.7	+700.3	--	+565.6
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-125.9	+1717.0	--	+1591.1
Current Changes				
Economic	--	+11.9	--	+11.9
Quantity	--	+232.9	--	+232.9
Schedule	--	-3.2	--	-3.2
Engineering	--	--	--	--
Estimating	--	-31.2	--	-31.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	+210.4	--	+210.4
Total Changes	-125.9	+1927.4	--	+1801.5
CE - Cost Variance	3176.2	7831.1	--	11007.3
CE - Cost & Funding	3176.2	7831.1	--	11007.3

Summary Base Year 2002 $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Prod Est)	3578.2	5505.8	--	9084.0
Previous Changes				
Economic	--	--	--	--
Quantity	--	+579.9	--	+579.9
Schedule	--	+100.8	--	+100.8
Engineering	--	--	--	--
Estimating	-148.0	+588.9	--	+440.9
Other	--	--	--	--
Support	--	--	--	--
Subtotal	-148.0	+1269.6	--	+1121.6
Current Changes				
Economic	--	--	--	--
Quantity	--	+179.4	--	+179.4
Schedule	--	+9.8	--	+9.8
Engineering	--	--	--	--
Estimating	--	-28.2	--	-28.2
Other	--	--	--	--
Support	--	--	--	--
Subtotal	--	+161.0	--	+161.0
Total Changes	-148.0	+1430.6	--	+1282.6
CE - Cost Variance	3430.2	6936.4	--	10366.6
CE - Cost & Funding	3430.2	6936.4	--	10366.6

Previous Estimate: December 2011

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	+11.9
Acceleration of procurement buy profile in FY 2011. (Army). (Schedule)	0.0	-15.9
Total Quantity variance resulting from an increase of 60 missiles from 1008 to 1068 (Army). (Subtotal)	+252.1	+327.3
Quantity variance resulting from an increase of 60 missiles from 1008 to 1068 (Army). (Quantity) (QR)	(+179.4)	(+232.9)
Allocation to Schedule resulting from Quantity change. (Schedule) (QR)	(+9.8)	(+12.7)
Allocation to Estimating resulting from Quantity change. (Estimating) (QR)	(+62.9)	(+81.7)
Adjustment for current and prior escalation. (Estimating)	-9.3	-11.9
Supplemental funding in FY 2011 to procure 60 additional missiles. (Estimating)	-86.6	-107.1
Revised unit cost estimate. (Estimating) (QR)	+4.8	+6.1
Procurement Subtotal	+161.0	+210.4

(QR) Quantity Related

Contracts

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 difference between the Initial Contract Price Target and the Current Contract Price Target is due to contract modification for U.S. production.

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.

This contract is more than 90% complete; therefore, this is the final report for this contract.

Appropriation: Procurement

Contract Name	**FY 2012 PAC-3 Production**
Contractor	Lockheed Martin
Contractor Location	Dallas, TX 75265
Contract Number, Type	W31P4Q-12-C-0002, FFP
Award Date	December 15, 2011
Definitization Date	December 15, 2011

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
921.3	N/A	242	921.3	N/A	242	921.3	921.3

Cost And Schedule Variance Explanations

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

Contract Comments

The FY 2012 PAC-3 Missile Production contract was awarded on December 15, 2011, to Lockheed Martin Missiles and Fire Control, Dallas, TX, for Foreign Military Sales (FMS) requirements and was modified on December 19, 2011, December 23, 2011, and January 13, 2012, to award the U.S. requirements based on FY 2012 funding availability. The total contract award value is $921.3M for the production of 242 PAC-3 missiles for both U.S. and Taiwan FMS requirements, and includes test missiles, Launcher Modification Kits, tooling, and parts library.

Deliveries are expected to begin in 4Q FY 2013.

Appropriation: Procurement

Contract Name	**FY 2013 PAC-3 Production**
Contractor	Lockheed Martin
Contractor Location	Dallas, TX 75265
Contract Number, Type	W31P4Q-13-C-0068, FFP
Award Date	December 27, 2012
Definitization Date	August 31, 2013

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
755.1	N/A	168	755.1	N/A	168	755.1	755.1

Cost And Schedule Variance Explanations

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

Contract Comments

This is the first time this contract is being reported.

The FY 2013 PAC-3 Missile Production contract was awarded on December 27, 2012, to Lockheed Martin MIssiles and Fire Control, Dallas, TX,as a letter contract valued at $755.1M. The U.S. portion of this contract is $470.1M for 128 (68 missiles FY 2013 funded and 60 missiles FY 2011 supplemental funded) PAC-3 missiles, and 40 PAC-3 missiles for international partner, 27 Launcher Modification Kits (LMKs) for international partner, and missile/LMK production tooling. The FY 2013 production letter contract contains provisions to award the remaining U.S. Army requirements for LMKs and 16 additional PAC-3 missiles contingent upon receipt of U.S. Army and Foreign Military Sales funding.

Deliveries are expected to begin in 4Q FY 2014.

Appropriation: Procurement

Contract Name	**CY12 PAC-3 Missile Support Center**
Contractor	Lockheed Martin Corporation
Contractor Location	1701 W Marshall Dr Dallas, TX 75265
Contract Number, Type	W31P4Q-12-C-0100, CPIF/CPFF
Award Date	March 30, 2012
Definitization Date	April 01, 2012

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
7.6	N/A	N/A	58.9	N/A	N/A	56.4	59.5

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (2/24/2013)	+0.9	-0.5
Previous Cumulative Variances	--	--
Net Change	+0.9	-0.5

Cost And Schedule Variance Explanations

The favorable cumulative cost variance is due to efficiencies for technical support involving reduced travel.

The unfavorable cumulative schedule variance is due to a delay from original plan in material purchases for the munitions auxiliary task.

Contract Comments

This is the first time this contract is being reported.

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to additional modifications added to include requirements for repair/recertification, storage and aging, and stockpile reliability testing.

This contract was awarded to Lockheed Martin Missiles and Fire Control, Dallas, TX, on March 30, 2012, and was definitized on April 1, 2012, with an initial contract value of $7.6M to conduct the PAC-3 Missile Field Surveillance Program for the U.S., The Netherlands, Germany, Japan, Taiwan, and the United Arab Emirates.

Deliveries and Expenditures

Deliveries To Date	Plan To Date	Actual To Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	1354	1120	1354	82.72%
Total Program Quantities Delivered	1354	1120	1354	82.72%

Expenditures and Appropriations (TY $M)			
Total Acquisition Cost	11007.3	Years Appropriated	31
Expenditures To Date	9293.0	Percent Years Appropriated	100.00%
Percent Expended	84.43%	Appropriated to Date	11007.3
Total Funding Years	31	Percent Appropriated	100.00%

The above data is current as of 3/29/2013.

Operating and Support Cost

Missile Segment

Assumptions and Ground Rules

Cost Estimate Reference:

The PAC-3 Operating and Support (O&S) cost estimate was established in the December 2, 2002, Acquisition Program Baseline (APB) and has been updated since the December 2011 SAR to reflect the program procurement quantity current estimate. The O&S estimate covers a life cycle of 42 years, FY 2002 through FY 2044, and includes cost to support PAC-3 variant missiles. The estimate was completed in Automated Cost Estimating-Integrated Tools (ACEIT), the Army approved cost estimating software, and is based on actual costs for repair and recertification of the PAC-3 missile. The estimate also uses a historical factor to estimate the quantity of missiles that will require annual repair and the program losses for operational use, flight testing, and planned field surveillance.

Sustainment Strategy:

The PAC-3 missile procurement quantity current estimate is 1,354. The missile will be recertified twice, at ten-year intervals, within its 30-year planned service life. Contractor Logistics Support (CLS) is used to support maintenance and repair of PAC-3 certified missile rounds. The missile is a self-contained major end item and does not require sustainment in the field. There are no intermediate-level maintenance tasks for the missile and the organic depot/agency does not possess the required repair capacity, tools, and test equipment for depot level sustainment, supply support, and software support. Missile subsystems are required to be shipped to subcontractor facilities for repair and replacement of subsystem components. The Government has limited technical data rights and relies on CLS for missile sustainment.

Antecedent Information:

There is no antecedent system for the PAC-3 missile.

Unitized O&S Costs BY2002 $M		
Cost Element	**Missile Segment Average Annual Cost of All Missiles**	**No Antecedent System (Antecedent) N/A**
Unit-Level Manpower	0.0	0.0
Unit Operations	0.0	0.0
Maintenance	46.1	0.0
Sustaining Support	3.2	0.0
Continuing System Improvements	14.0	0.0
Indirect Support	3.3	0.0
Other	0.0	0.0
Total	66.6	--

Unitized Cost Comments:

Unitized costs are calculated based on total O&S current cost estimate of $2,793.2M (BY 2002) distributed over planned service life of 42 years. The Unitized Annual O&S Cost reflects O&S for total inventory/year of 1,354 missiles.

The variance in unitized cost from the FY 2011 SAR to the FY 2012 SAR is due to the fact that the O&S unitized costs listed in the FY 2011 SAR were not listed in the appropriate category. In addition to refining the estimate for the FY 2012 SAR, the unitized costs were input into the proper cost category

	Total O&S Cost $M			
	Current Production APB Objective/Threshold		**Current Estimate**	
	Missile Segment		**Missile Segment**	**No Antecedent System (Antecedent)**
Base Year	3534.5	3888.0	2793.2	N/A
Then Year	4687.6	N/A	4564.5	N/A

Total O&S Costs Comments:

The differences between the current estimate and the APB are attributed to change in quantity and refinement of estimate using actual cost.

Disposal Costs

The disposal costs are to be determined.