

UNCLASSIFIED



RCS: DD-A&T(Q&A)823-492



Patriot Advanced Capability-3 Missile Segment Enhancement (PAC-3 MSE)

As of FY 2021 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

UNCLASSIFIED

Table of Contents

Common Acronyms and Abbreviations for MDAP Programs	3
Program Information	5
Responsible Office	5
References	6
Mission and Description	7
Executive Summary	7
Threshold Breaches	9
Schedule	10
Performance	11
Track to Budget	15
Cost and Funding	15
Charts	27
Risks	29
Low Rate Initial Production	31
Foreign Military Sales	32
Nuclear Costs	33
Unit Cost	34
Cost Variance	37
Contracts	40
Deliveries and Expenditures	47
Operating and Support Cost	48

Common Acronyms and Abbreviations for MDAP Programs

Acq O&M - Acquisition-Related Operations and Maintenance
ACAT - Acquisition Category
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
\$B - Billions of Dollars
BA - Budget Authority/Budget Activity
Blk - Block
BY - Base Year
CAPE - Cost Assessment and Program Evaluation
CARD - Cost Analysis Requirements Description
CDD - Capability Development Document
CLIN - Contract Line Item Number
CPD - Capability Production Document
CY - Calendar Year
DAB - Defense Acquisition Board
DAE - Defense Acquisition Executive
DAMIR - Defense Acquisition Management Information Retrieval
DoD - Department of Defense
DSN - Defense Switched Network
EMD - Engineering and Manufacturing Development
EVM - Earned Value Management
FOC - Full Operational Capability
FMS - Foreign Military Sales
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
IOC - Initial Operational Capability
Inc - Increment
JROC - Joint Requirements Oversight Council
\$K - Thousands of Dollars
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
\$M - Millions of Dollars
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
O&S - Operating and Support
PAUC - Program Acquisition Unit Cost

PB - President's Budget
PE - Program Element
PEO - Program Executive Officer
PM - Program Manager
POE - Program Office Estimate
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
SCP - Service Cost Position
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting
U.S. - United States
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)

Program Information

Program Name

Patriot Advanced Capability-3 Missile Segment Enhancement (PAC-3 MSE)

DoD Component

Army

Responsible Office

COL Frank J. Lozano
Lower Tier Project Office
Building 5250, Martin Road
Redstone Arsenal, AL 35898-8000

francisco.j.lozano8.mil@mail.mil

Phone: 256-955-3240

Fax: 256-955-3108

DSN Phone: 645-3240

DSN Fax: 645-4656

Date Assigned: July 12, 2017

References

SAR Baseline (Production Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated January 16, 2015

Approved APB

Army Acquisition Executive (AAE) Approved Acquisition Program Baseline (APB) dated July 17, 2018

Mission and Description

The Patriot Advanced Capability-3 Missile Segment Enhancement (PAC-3 MSE) is a high velocity, hit-to-kill, surface-to-air missile capable of intercepting and destroying Tactical Ballistic Missiles (TBM) and air-breathing threats. The PAC-3 MSE is the follow-on variant of the PAC-3 missile. The PAC-3 MSE's improved capability is achieved through a higher performance solid rocket motor, modified lethality enhancer, more responsive control surfaces, upgraded guidance software, and insensitive munitions improvements. The PAC-3 MSE employs kinetic energy to destroy targets through a hit-to-kill capability and provides the range, accuracy, and lethality to effectively defend against TBMs armed with weapons of mass destruction as well as providing expanded battlespace performance against complex threats. Integration of the PAC-3 MSE missile requires minor modifications to the launching station to accommodate cabling changes and an improved canister. Improved PAC-3 MSE kinematic capabilities are realized with system upgrades for Post Deployment Build-8 software and Radar Digital Processor.

Executive Summary

Program Highlights Since Last Report

The PAC-3 MSE requirements are stable and funding is adequate to meet cost, schedule, and performance objectives established in the current approved APB. There are no increased risks to the PAC-3 MSE program since the last SAR.

On July 31, 2019, the Government of the Kingdom of Bahrain signed the Patriot Letter of Acceptance (LOA) to become the 16th Patriot International Partner. The LOA value is \$1.1B.

On August 26, 2019, the OUSD (A&S) signed a memo approving the use of acquisition enablers that would permanently build efficiency into PAC-3 MSE production. These enablers will allow accelerated production to make missiles available earlier for the U.S. and Foreign Partners sooner. In addition, this memo requested to expedite the FY 2020 contract and increase the U.S. and FMS order quantity to 384 MSE missiles.

On December 5, 2019, a FY 2020 PAC-3 MSE Production contract modification was awarded to Lockheed Martin Missiles and Fire Control, Dallas, Texas, for U.S./FMS PAC-3 MSE missiles; U.S./FMS Launcher Modification Kits; and associated hardware. The total amount obligated for this contract action is \$657.5M (\$438.3M U.S./\$219.2M FMS).

On December 30, 2019, an additional FY 2020 PAC-3 MSE Production contract modification was awarded to Lockheed Martin Missiles and Fire Control, Dallas, Texas, for the remaining U.S. PAC-3 MSE missiles and to incorporate the OUSD enablers. The total amount obligated for this contract action is \$113.97M U.S. increasing the total amount obligated on the FY 2020 PAC-3 MSE Production contract to \$1.821B (\$1.105B U.S./\$716M FMS).

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

History of Significant Developments Since Program Initiation	
--	--

History of Significant Developments Since Program Initiation	
Date	Significant Development Description
March 2014	On March 27, 2014, the DAE signed the Milestone C ADM authorizing the PAC-3 MSE to enter Production and Deployment and proceed with LRIP.
March 2014	The FY 2014 PAC-3 MSE Production Fixed Price Incentive Firm Target Unfinalized Contract Action was awarded on March 28, 2014, following approval of the PAC-3 MSE Milestone C.
January 2015	The DAE approved the PAC-3 MSE Production APB.
October 2015	PAC-3 MSE First Unit Equipped was established with 3-2 Air Defense Artillery (ADA) on October 23, 2015.
May 2016	On May 10, 2016, the DAE delegated milestone decision authority for the PAC-3 MSE program to the Secretary of the Army. The PAC-3 MSE program was designated ACAT IC with milestone decision authority assigned to the Army Acquisition Executive (AAE).
July 2016	PAC-3 MSE IOC was established with the 3-2 ADA on July 5, 2016.
August 2016	On August 10, 2016, the AAE approved an increase to the PAC-3 MSE LRIP quantity. This request is a result of multiple annual Congressional increases to procure additional PAC-3 MSE missiles.
December 2017	On December 21, 2017, the AAE as the MDA, concurred with a PDR that provided notification of a deviation from the approved APB Procurement Cost threshold. The PM reported a deviation due to receipt of additional missile procurement funding in FY 2014 through FY 2018. The program increase supports procurement to the Army Acquisition Objective.
January 2018	On January 24, 2018, the PM provided a PDR notifying the AAE of an O&S Cost breach. The cumulative program increases caused the O&S Cost current estimate to exceed the threshold.
January 2018	On January 25, 2018, the AAE approved an increase to the PAC-3 MSE LRIP quantity. This request is a result of multiple annual Congressional increases and OSD reprogramming to procure additional PAC-3 MSE missiles.
April 2018	On April 16, 2018, the AAE chaired the PAC-3 MSE Army System Acquisition Review Council and approved FRP.
June 2018	On June 13, 2018, the AAE signed an ADM authorizing PAC-3 MSE to proceed to FRP.
July 2018	On July 17, 2018, the AAE approved the PAC-3 MSE APB Change 1.
December 2018	On December 21, 2018, the FY 2019 PAC-3 MSE Production contract was awarded to Lockheed Martin Missiles and Fire Control, Dallas, Texas. The contract contains the first PAC-3 MSE FRP quantities. The FY 2019 - FY 2020 contract is a follow-on production contract to the program's previous LRIP contracts awarded FY 2014 through FY 2018.
July 2019	On July 31, 2019, the Government of the Kingdom of Bahrain signed the Patriot Letter of Acceptance (LOA) to become the 16th Patriot International Partner. The LOA value is \$1.1B.
December 2019	On December 5, 2019, a FY 2020 PAC-3 MSE Production contract modification was awarded to Lockheed Martin Missiles and Fire Control, Dallas, Texas, for U.S./FMS PAC-3 MSE missiles; U.S./FMS Launcher Modification Kits; and associated hardware. On December 30, 2019, an additional FY 2020 PAC-3 MSE Production contract modification was awarded to Lockheed Martin Missiles and Fire Control, Dallas, Texas, for the remaining U.S. PAC-3 MSE missiles and to incorporate the OUSD enablers.

Threshold Breaches

APB Breaches

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

Nunn-McCurdy Breaches

Current UCR Baseline

PAUC	None
APUC	None

Original UCR Baseline

PAUC	None
APUC	None

Schedule



Schedule Events				
Events	SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Current Estimate	
Acquisition Increment 2				
MSE First Intercept	Feb 2010	Feb 2010	Feb 2010	Feb 2010
MSE FUE	Dec 2015	Oct 2015	Oct 2015	Oct 2015
MSE Milestone C	Mar 2014	Mar 2014	Mar 2014	Mar 2014
MSE IOC	Dec 2016	Jul 2016	Jul 2016	Jul 2016
MSE FRP	Dec 2017	Apr 2018	Apr 2018	Apr 2018

Change Explanations

None

Notes

MSE FUE is achieved when the first Patriot Fire Unit is equipped with 12 MSE missiles.

MSE IOC is considered achieved when a Patriot Battalion, consisting of four Fire Units, is equipped with 12 MSE missiles per Fire Unit.

Acronyms and Abbreviations

FUE - First Unit Equipped

Performance

Performance Characteristics				
SAR Baseline Production Estimate	Current APB Production Objective/Threshold	Demonstrated Performance	Current Estimate	
System Training				
Proficiency Level				
Soldiers (Operators, Maintainers, and Leaders) are able to perform critical tasks to standard 95% of the time after training.	Soldiers (Operators, Maintainers, and Leaders) are able to perform critical tasks to standard 95% of the time after training.	(T=O) Soldiers (Operators, Maintainers, and Leaders) are able to perform critical tasks to standard 95% of the time after training.	Soldiers (Operators, Maintainers, and Leaders) were able to perform critical tasks to standard 95% of the time after training during logistics demonstration and test unit training.	Soldiers (Operators, Maintainers, and Leaders) are able to perform critical tasks to standard 95% of the time after training.
Time to Train				
Duration of institutional training shall be no more than 20 weeks for AOC 14A and MOSs 14E, H, T, 140A, 35 weeks for MOS 140E to train to use the system capabilities properly.	Duration of institutional training shall be no more than 20 weeks for AOC 14A and MOSs 14E, H, T, 140A, 35 weeks for MOS 140E to train to use the system capabilities properly.	(T=O) Duration of institutional training shall be no more than 20 weeks for AOC 14A and MOSs 14E, H, T, 140A, 35 weeks for MOS 140E to train to use the system capabilities properly.	Fire Centers of Excellence currently conducts AOC 14A in 18 weeks 3 days, 14E in 19 weeks 4 days, 14H in 11 weeks 3 days, 14T in 10 weeks, 140A in 19 weeks 2 days and 140E in 35 weeks and 4 days.	Duration of institutional training shall be no more than 20 weeks for AOC 14A and MOSs 14E, H, T, 140A, 35 weeks for MOS 140E to train to use the system capabilities properly.
Training Retention				
Soldier sustainment training to maintain proficiency shall be required quarterly, semi-annually, and annually.	Soldier sustainment training to maintain proficiency shall be required quarterly, semi-annually, and annually.	(T=O) Soldier sustainment training to maintain proficiency shall be required quarterly, semi-annually, and annually.	Soldier sustainment training to maintain proficiency shall be required quarterly, semi-annually, and annually in accordance with FM 3-01.86, Air Defense Artillery Patriot Brigade Gunnery Program.	Soldier sustainment training to maintain proficiency shall be required quarterly, semi-annually, and annually.
Training Support				
Training resources shall be capable of providing 95% of training individual	Training resources shall be capable of providing 95% of training individual	Training resources shall be capable of providing 90% of training individual	All training support materials to include preliminary technical manuals, New	Training resources shall be capable of providing 95% of training individual

and collective critical tasks (march-order and emplacement, operations, maintenance, force operations, and engagement operations) related to tactically deployed systems while missiles are loaded.	and collective critical tasks (march-order and emplacement, operations, maintenance, force operations, and engagement operations) related to tactically deployed systems while missiles are loaded.	and collective critical tasks (march-order and emplacement, operations, maintenance, force operations, and engagement operations) related to tactically deployed systems while missiles are loaded.	Equipment Training Plans, Task Analysis', and Doctrine Impact Reports were provided to Fires Center of Excellence Directorate of Training Development and Doctrine.	and collective critical tasks (march-order and emplacement, operations, maintenance, force operations, and engagement operations) related to tactically deployed systems while missiles are loaded.
---	---	---	---	---

Training Interoperability

System specific training capabilities shall interoperate with and support collective training with existing live, virtual, and constructive training environments throughout the system lifecycle.	System specific training capabilities shall interoperate with and support collective training with existing live, virtual, and constructive training environments throughout the system lifecycle.	(T=O) System specific training capabilities shall interoperate with and support collective training with existing live, virtual, and constructive training environments throughout the system lifecycle.	The Patriot weapons system supports live, virtual and constructive training environments by using TADSS to conduct multi-level training for both operators and maintenance personnel. With the addition of DIS and TADIL-J demonstrated the ability to participate in a virtual environment in both AC-12 and JC-14. The constructive environment was demonstrated during PoP Test 1 (connected two PCOFT labs in different states) and PoP Test 2 (connected two PCOFT labs in different countries.)	System specific training capabilities shall interoperate with and support collective training with existing live, virtual, and constructive training environments throughout the system lifecycle.
--	--	--	---	--

Net Ready

The PAC-3 Increment 2 system must fully support execution of all operational activities and information exchanges identified in the DoD Enterprise Architecture and	The PAC-3 Increment 2 system must fully support execution of all operational activities and information exchanges identified in the DoD Enterprise Architecture and	The PAC-3 Increment 2 system must fully support execution of joint critical operational activities and information exchanges identified in the DoD Enterprise Architecture and	TBD	The PAC-3 Increment 2 system must fully support execution of all operational activities and information exchanges identified in the DoD Enterprise Architecture and
---	---	--	-----	---

<p>solution architectures based on integrated DoDAF content, and must satisfy the technical requirements for transition to Net-Centric military operations to include: (1) Solution architecture products; (2) Compliant with Net-Centric data strategy and Net-Centric Services strategy; (3) Compliant with GIG Technical Guidance; (4) Information assurance requirements; (5) Supportability requirements.</p>	<p>solution architectures based on integrated DoDAF content, and must satisfy the technical requirements for transition to Net-Centric military operations to include: (1) Solution architecture products; (2) Compliant with Net-Centric data strategy and Net-Centric Services strategy; (3) Compliant with GIG Technical Guidance; (4) Information assurance requirements; (5) Supportability requirements.</p>	<p>solution architectures based on integrated DoDAF content, and must satisfy the technical requirements for transition to Net-Centric military operations to include: (1) Solution architecture products; (2) Compliant with Net-Centric data strategy and Net-Centric Services strategy; (3) Compliant with GIG Technical Guidance; (4) Information assurance requirements; (5) Supportability requirements.</p>		<p>solution architectures based on integrated DoDAF content, and must satisfy the technical requirements for transition to Net-Centric military operations to include: (1) Solution architecture products; (2) Compliant with Net-Centric data strategy and Net-Centric Services strategy; (3) Compliant with GIG Technical Guidance; (4) Information assurance requirements; (5) Supportability requirements.</p>
Sustainment Reliability				
<p>The material sustainment reliability will exceed 41 hours MTBCMF.</p>	<p>The material sustainment reliability will exceed 41 hours MTBCMF.</p>	<p>The material sustainment reliability will exceed 20 hours MTBCMF.</p>	<p>Will be demonstrated during Post Deployment Build-8 and Radar Digital Processor-Configuration Operational testing.</p>	<p>The material sustainment reliability will exceed 20 hours MTBCMF.</p>

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

Requirements Reference

Patriot Advanced Capability-3 (PAC-3) Increment 2 CPD dated January 24, 2013

Change Explanations

None

Acronyms and Abbreviations

AC-12 - Austere Challenge 2012
AOC - Area of Concentration
DIS - Distributive Interactive Simulation
DoDAF - Department of Defense Architecture Framework
FM - Field Manual
GIG - Global Information Grid
JC-14 - Juniper Cobra 2014
MOS - Military Occupational Specialty
MTBCMF - Mean Time Between Critical Mission Failure
O - Objective
PCOFT - Patriot Conduct of Fire Trainer
PoP - Proof of Principle
T - Threshold
TADIL-J - Tactical Digital Information Link-Joint
TADSS - Training Aids, Devices, Simulators and Simulations

Track to Budget

RDT&E

Appn	BA	PE	
Army	2040	05	0605456A
	Project	Name	
	PA3	PATRIOT PAC-3/Missile Segment Enhancement (Sunk)	

Procurement

Appn	BA	PE	
Army	2032	02	0605456A
	Line Item	Name	
	C53101	MSE Missile	

MILCON

Appn	BA	PE	
Army	2050	01	0072896A
	Project	Name	
	85904	Industrial Base Recapitalization Construction	

Acq O&M

Appn	BA	PE	
Army	2020	04	0702806A
	Subactivity Group	Name	
	435	Acquisition and Management Support: LTPO (Shared)	

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2014 \$M			BY 2014 \$M	TY \$M		
	SAR Baseline Production Estimate	Current APB Production Objective/Threshold		Current Estimate	SAR Baseline Production Estimate	Current APB Production Objective	Current Estimate
RDT&E	940.8	927.8	1020.6	932.8	871.1	864.5	869.8
Procurement	5087.2	12134.5	13348.0	11995.2	5840.7	14809.6	14577.5
Flyaway	--	--	--	10305.3	--	--	12444.0
Recurring	--	--	--	10223.9	--	--	12362.8
Non Recurring	--	--	--	81.4	--	--	81.2
Support	--	--	--	1689.9	--	--	2133.5
Other Support	--	--	--	1689.9	--	--	2133.5
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	9.0	25.3	27.8	24.9	10.5	30.0	30.0
Acq O&M	0.0	36.1	39.7	35.8	0.0	45.9	45.9
Total	6037.0	13123.7	N/A	12988.7	6722.3	15750.0	15523.2

Current APB Cost Estimate Reference

Army Cost Position dated April 06, 2018

Cost Notes

CAPE Cost Risks: A Program Office Estimate was completed to reflect programmatic changes to the procurement buy profile. The program baseline estimate included the effect of notional FMS requirements in addition to U.S. requirements when determining total quantities for costing. If FMS quantities do not materialize, then the U.S. procurement costs could increase, impacting quantities to be procured. Leveraging FMS investments enables cost sharing, contract pricing synergies, production efficiencies, and mitigates risks of future production gaps.

FY 2018 Procurement funding included \$363.2M Above Threshold Reprogramming to procure 103 additional missiles. Due to production capacity constraints in FY 2018, 36 missiles were procured in FY 2019 and 67 missiles will be procured in FY 2020.

FY 2019 Procurement funding included \$260.0M Overseas Contingency Operations (OCO) funding to procure additional missiles.

FY 2020 Procurement funding includes \$37.938M OCO funding to procure additional missiles.

FY 2021 Procurement funding includes \$176.585M OCO funding to procure additional missiles.

Starting in FY 2021, procurement funding from the pre-MSE PAC-3 family of missiles will be realigned to the MSE funding line to provide continued support for the missile field surveillance program and missile support center efforts.

Total Quantity			
Quantity	SAR Baseline Production Estimate	Current APB Production	Current Estimate
RDT&E	0	0	0
Procurement	1057	3100	3100
Total	1057	3100	3100

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2021 President's Budget / December 2019 SAR (TY\$ M)									
Appropriation	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
RDT&E	869.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	869.8
Procurement	5081.3	702.5	779.7	765.9	1008.8	908.7	804.3	4526.3	14577.5
MILCON	0.0	0.0	30.0	0.0	0.0	0.0	0.0	0.0	30.0
Acq O&M	3.1	3.2	3.1	3.0	3.0	3.1	2.8	24.6	45.9
PB 2021 Total	5954.2	705.7	812.8	768.9	1011.8	911.8	807.1	4550.9	15523.2
PB 2020 Total	5956.3	739.8	800.6	752.6	1002.8	901.2	512.7	5123.1	15789.1
Delta	-2.1	-34.1	12.2	16.3	9.0	10.6	294.4	-572.2	-265.9

Quantity Summary										
FY 2021 President's Budget / December 2019 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	1143	147	168	166	241	217	190	828	3100
PB 2021 Total	0	1143	147	168	166	241	217	190	828	3100
PB 2020 Total	0	1090	147	169	167	243	219	118	947	3100
Delta	0	53	0	-1	-1	-2	-2	72	-119	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding							
2040 RDT&E Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2004	--	--	--	--	--	--	62.5
2005	--	--	--	--	--	--	53.2
2006	--	--	--	--	--	--	101.8
2007	--	--	--	--	--	--	113.9
2008	--	--	--	--	--	--	60.5
2009	--	--	--	--	--	--	75.6
2010	--	--	--	--	--	--	115.7
2011	--	--	--	--	--	--	125.1
2012	--	--	--	--	--	--	67.2
2013	--	--	--	--	--	--	25.3
2014	--	--	--	--	--	--	33.0
2015	--	--	--	--	--	--	33.7
2016	--	--	--	--	--	--	2.3
Subtotal	--	--	--	--	--	--	869.8

Annual Funding 2040 RDT&E Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	BY 2014 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2004	--	--	--	--	--	--	74.5
2005	--	--	--	--	--	--	61.6
2006	--	--	--	--	--	--	114.7
2007	--	--	--	--	--	--	125.4
2008	--	--	--	--	--	--	65.3
2009	--	--	--	--	--	--	80.6
2010	--	--	--	--	--	--	121.5
2011	--	--	--	--	--	--	128.9
2012	--	--	--	--	--	--	68.2
2013	--	--	--	--	--	--	25.2
2014	--	--	--	--	--	--	32.3
2015	--	--	--	--	--	--	32.4
2016	--	--	--	--	--	--	2.2
Subtotal	--	--	--	--	--	--	932.8

Annual Funding 2032 Procurement Missile Procurement, Army							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2012	--	--	--	70.4	70.4	--	70.4
2013	--	--	--	10.8	10.8	--	10.8
2014	92	508.9	--	--	508.9	39.1	548.0
2015	108	492.7	--	--	492.7	39.9	532.6
2016	112	464.5	--	--	464.5	50.4	514.9
2017	170	731.4	--	--	731.4	76.8	808.2
2018	387	1281.0	--	--	1281.0	184.1	1465.1
2019	274	961.6	--	--	961.6	169.7	1131.3
2020	147	626.1	--	--	626.1	76.4	702.5
2021	168	663.7	--	--	663.7	116.0	779.7
2022	166	668.7	--	--	668.7	97.2	765.9
2023	241	858.1	--	--	858.1	150.7	1008.8
2024	217	772.9	--	--	772.9	135.8	908.7
2025	190	684.0	--	--	684.0	120.3	804.3
2026	117	456.1	--	--	456.1	73.8	529.9
2027	92	398.8	--	--	398.8	68.9	467.7
2028	92	393.4	--	--	393.4	74.1	467.5
2029	92	390.5	--	--	390.5	75.5	466.0
2030	80	350.1	--	--	350.1	67.6	417.7
2031	80	355.3	--	--	355.3	66.8	422.1
2032	80	361.2	--	--	361.2	67.9	429.1
2033	80	366.6	--	--	366.6	66.5	433.1
2034	80	370.4	--	--	370.4	66.8	437.2
2035	35	206.8	--	--	206.8	34.6	241.4
2036	--	--	--	--	--	70.9	70.9
2037	--	--	--	--	--	71.7	71.7
2038	--	--	--	--	--	72.0	72.0
Subtotal	3100	12362.8	--	81.2	12444.0	2133.5	14577.5

Annual Funding 2032 Procurement Missile Procurement, Army							
Fiscal Year	Quantity	BY 2014 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2012	--	--	--	70.8	70.8	--	70.8
2013	--	--	--	10.6	10.6	--	10.6
2014	92	496.3	--	--	496.3	38.1	534.4
2015	108	473.7	--	--	473.7	38.4	512.1
2016	112	438.0	--	--	438.0	47.5	485.5
2017	170	676.0	--	--	676.0	71.0	747.0
2018	387	1161.4	--	--	1161.4	167.0	1328.4
2019	274	854.8	--	--	854.8	150.9	1005.7
2020	147	545.7	--	--	545.7	66.6	612.3
2021	168	564.8	--	--	564.8	98.8	663.6
2022	166	557.9	--	--	557.9	81.1	639.0
2023	241	701.9	--	--	701.9	123.3	825.2
2024	217	619.8	--	--	619.8	108.9	728.7
2025	190	537.8	--	--	537.8	94.6	632.4
2026	117	351.6	--	--	351.6	56.9	408.5
2027	92	301.4	--	--	301.4	52.0	353.4
2028	92	291.5	--	--	291.5	54.9	346.4
2029	92	283.6	--	--	283.6	54.9	338.5
2030	80	249.3	--	--	249.3	48.1	297.4
2031	80	248.1	--	--	248.1	46.6	294.7
2032	80	247.2	--	--	247.2	46.5	293.7
2033	80	246.0	--	--	246.0	44.6	290.6
2034	80	243.7	--	--	243.7	43.9	287.6
2035	35	133.4	--	--	133.4	22.3	155.7
2036	--	--	--	--	--	44.8	44.8
2037	--	--	--	--	--	44.4	44.4
2038	--	--	--	--	--	43.8	43.8
Subtotal	3100	10223.9	--	81.4	10305.3	1689.9	11995.2

Annual Funding 2050 MILCON Military Construction, Army	
Fiscal Year	TY \$M
	Total Program
2021	30.0
Subtotal	30.0

Annual Funding 2050 MILCON Military Construction, Army	
Fiscal Year	BY 2014 \$M
	Total Program
2021	24.9
Subtotal	24.9

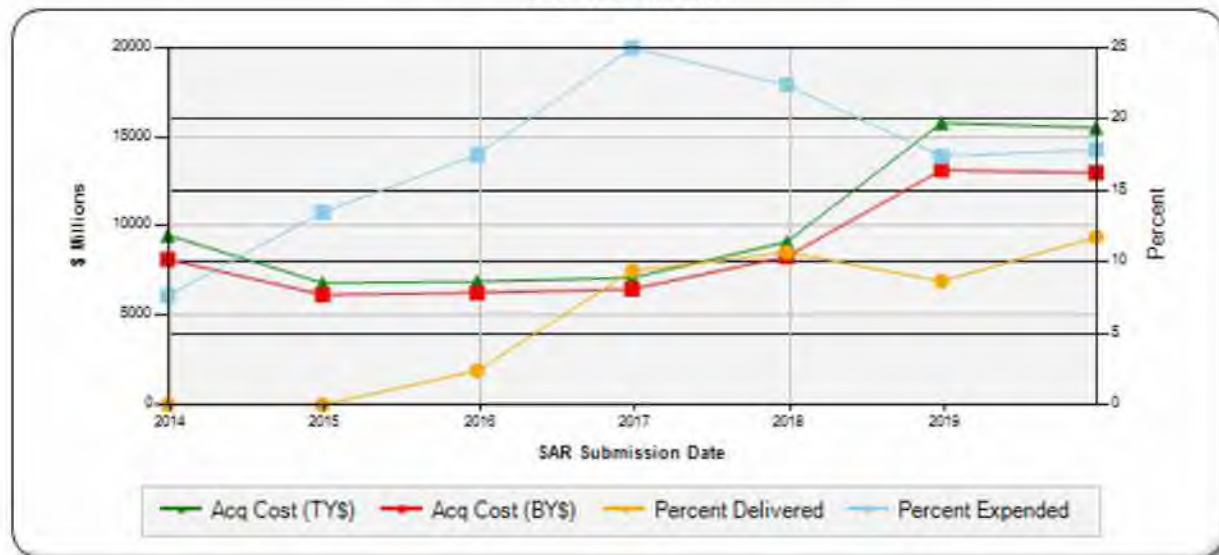
Annual Funding		
2020	Acq O&M	Operation and Maintenance, Army
Fiscal Year	TY \$M	
	Total Program	
2019		3.1
2020		3.2
2021		3.1
2022		3.0
2023		3.0
2024		3.1
2025		2.8
2026		2.4
2027		2.5
2028		2.5
2029		2.6
2030		2.0
2031		2.0
2032		2.0
2033		2.1
2034		2.1
2035		2.2
2036		1.2
2037		0.7
2038		0.3
Subtotal		45.9

Annual Funding 2020 Acq O&M Operation and Maintenance, Army		
Fiscal Year	BY 2014 \$M	
	Total Program	
2019		2.8
2020		2.8
2021		2.7
2022		2.6
2023		2.5
2024		2.5
2025		2.3
2026		1.9
2027		1.9
2028		1.9
2029		1.9
2030		1.5
2031		1.4
2032		1.4
2033		1.4
2034		1.4
2035		1.5
2036		0.8
2037		0.4
2038		0.2
Subtotal		35.8

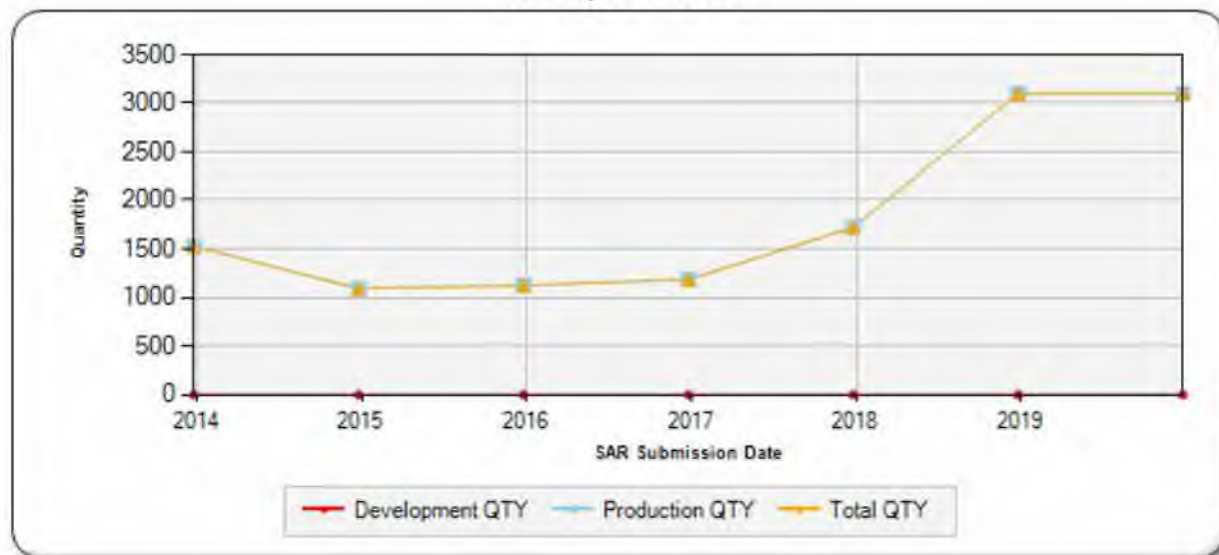
Charts

PAC-3 MSE first began SAR reporting in December 2013

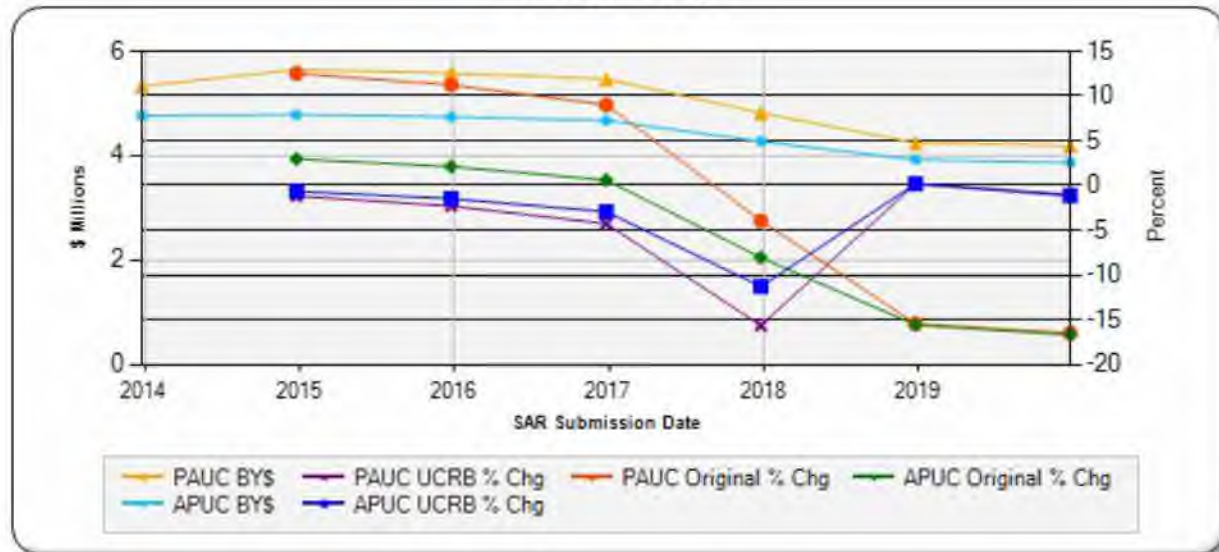
Program Acquisition Cost - PAC-3 MSE
Base Year 2014 \$M



Quantity - PAC-3 MSE



Unit Cost - PAC-3 MSE
Base Year 2014 \$M



Risks

Significant Schedule and Technical Risks

Significant Schedule and Technical Risks	
Milestone C (March 2014)	
1.	Supplier Viability. The supplier of missile thermal batteries is experiencing financial issues that may affect its ability to supply product for the PAC-3 MSE program. If interruptions occur, then missile production may be impacted. The missile prime contractor, Lockheed Martin, is assessing supplier health and seeking potential second source. Mitigation actions include using prime contractor internal funding to initiate early turn-on to support initial production quantities and identifying alternate source and conducting vendor qualification to support FY 2015 production requirements.
2.	Supplier Quality Management. The supplier of missile actuators is experiencing product quality issues that are creating cost and schedule program impacts to the PAC-3 MSE program. The current Vendor Rating/Supply Chain Management System has not prevented recent issues. The U.S. Government and Prime Contractor are leading a quality focus team to ensure high visibility on quality concerns. The supplier initiated the Achieving Competitive Excellence (ACE) Operating System at the Vergennes, VT facility. The supplier conducted purchase order flow-down reviews and First Article refresh activities with key suppliers. The suppliers are to execute controlled hardware builds and process certification activities.
Current Estimate (December 2019)	
1.	PAC-3 MSE Obsolescence. The program currently has two obsolescence redesign efforts ongoing: Seeker Block IV and Fuze and Ignition Device. These risks are assessed as Low. Mitigation: Obsolescence activities include closely monitoring on-hand component inventory, qualification timeliness, and time available to cut the redesigned subcomponents into production. Leveraging FMS investment for cost sharing and production efficiencies are managed for technical adherence to ensure timely developments occur to prevent future production gaps.

Risks

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Baseline Estimate (July 2018)	
1.	The July 17, 2018, Army-approved PAC-3 MSE FRP APB Change 1 established the program baseline estimate, which reflects the Army Cost Position approved at the FRP decision. The Deputy Assistant Secretary of the Army for Cost and Economics (DASA(CE)) directed the program baseline estimate to include the effect of notional FMS requirements in addition to U.S. requirements when determining total quantities to be costed. Concurrent FMS quantities create contract pricing synergies.
Original Baseline Estimate (August 2004)	
1.	The August 6, 2004, Patriot/MEADS Combined Aggregate Program (CAP) Milestone B ADM directed the Army to fully fund to the OSD Cost Analysis Improvement Group estimate. At the time, no cost risks were documented.
Revised Original Estimate (N/A)	
1.	N/A
Current Procurement Cost (December 2019)	
1.	DASA(CE) directed that the current baseline include notional FMS quantities. If FMS quantities do not materialize due to low FMS participation, then the procurement costs will increase potentially impacting the quantity to be procured.

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	8/6/2004	1/25/2018
Approved Quantity	148	750
Reference	Milestone B ADM	Army Acquisition Executive ADM
Start Year	2010	2014
End Year	2011	2018

The Current Total LRIP Quantity is more than 10% of the total production quantity due to receipt of additional Congressional funding and OSD reprogramming to buy additional missiles.

Notes

The March 27, 2014, Milestone C ADM approved a PAC-3 MSE LRIP quantity of 330 based on the Army Acquisition Objective of 3,376 missiles.

On August 10, 2016, the MDA approved a PAC-3 MSE LRIP increase from 330 to 600 missiles.

On January 25, 2018, the MDA approved a PAC-3 MSE LRIP increase from 600 to 750 missiles.

Foreign Military Sales

Country	Date of Sale	Quantity	Total Cost \$M	Description
Korea	11/7/2018	20	70.5	FMS Case: KS-B-ZGT - 20 MSE Missiles
Sweden	8/10/2018	16	56.5	FMS Case: SW-B-WBA - 16 MSE Missiles
Poland	3/28/2018	40	140.5	FMS Case: PL-B-UCW - 40 MSE Missiles
United Arab Emirates	2/19/2018	60	217.1	FMS Case: AE-B-ZUG - 60 MSE Missiles
Romania	11/29/2017	24	85.4	FMS Case: RO-B-UEM - 24 MSE Missiles
Qatar	7/14/2014	118	469.5	FMS Case: QA-B-UAP - 118 MSE missiles

Notes

PAC-3 MSE was approved for FMS to all 16 existing PATRIOT partners and numerous potential partners. Current PAC-3 MSE FMS partners include Bahrain, Germany, Korea, Poland, Qatar, Romania, Sweden, and UAE. Specific international interest is expressed from the following existing Patriot partners: Japan, Kingdom of Saudi Arabia, Kuwait, Taiwan, and the Netherlands; and the following potential partners: Norway, Morocco, and Switzerland.

Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2014 \$M	BY 2014 \$M	% Change
	Current UCR Baseline (Jul 2018 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	13123.7	12988.7	
Quantity	3100	3100	
Unit Cost	4.233	4.190	-1.02
Average Procurement Unit Cost			
Cost	12134.5	11995.2	
Quantity	3100	3100	
Unit Cost	3.914	3.869	-1.15
Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2014 \$M	BY 2014 \$M	% Change
	Original UCR Baseline (Aug 2004 APB)	Current Estimate (Dec 2019 SAR)	
Program Acquisition Unit Cost			
Cost	7664.0	12988.7	
Quantity	1528	3100	
Unit Cost	5.016	4.190	-16.47
Average Procurement Unit Cost			
Cost	7096.2	11995.2	
Quantity	1528	3100	
Unit Cost	4.644	3.869	-16.69



APB Unit Cost History					
Item	Date	BY 2014 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Aug 2004	5.016	4.644	5.272	4.957
APB as of January 2006	Aug 2004	5.016	4.644	5.272	4.957
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	Jan 2015	5.711	4.813	6.360	5.526
Current APB	Jul 2018	4.233	3.914	5.081	4.777
Prior Annual SAR	Dec 2018	4.241	3.921	5.093	4.788
Current Estimate	Dec 2019	4.190	3.869	5.007	4.702

SAR Unit Cost History

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial PAUC Development Estimate	Changes								PAUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5.272	0.311	0.411	0.398	0.000	0.126	0.000	-0.158	1.088	6.360

Current SAR Baseline to Current Estimate (TY \$M)									
PAUC Production Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
6.360	0.004	-0.954	-0.244	0.000	-0.681	0.000	0.522	-1.353	5.007

Initial SAR Baseline to Current SAR Baseline (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Production Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
4.957	0.287	0.286	0.398	0.000	-0.244	0.000	-0.158	0.569	5.526

Current SAR Baseline to Current Estimate (TY \$M)									
APUC Production Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
5.526	0.004	-0.404	-0.244	0.000	-0.702	0.000	0.522	-0.824	4.702

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A		N/A	N/A	N/A
Milestone B		N/A	N/A	N/A
Milestone C			Mar 2014	Mar 2014
IOC			Dec 2016	Jul 2016
Total Cost (TY \$M)			8056.0	15523.2
Total Quantity			1528	3100
PAUC			5.272	5.007

Cost Variance

Summary TY \$M					
Item	RDT&E	Procurement	MILCON	Acq O&M	Total
SAR Baseline (Production Estimate)	871.1	5840.7	10.5	--	6722.3
Previous Changes					
Economic	-0.6	-11.8	--	--	-12.4
Quantity	--	+10037.8	--	--	+10037.8
Schedule	--	-642.2	--	--	-642.2
Engineering	--	--	--	--	--
Estimating	-0.7	-2079.3	+19.5	+45.9	-2014.6
Other	--	--	--	--	--
Support	--	+1698.2	--	--	+1698.2
Subtotal	-1.3	+9002.7	+19.5	+45.9	+9066.8
Current Changes					
Economic	--	+23.7	--	--	+23.7
Quantity	--	--	--	--	--
Schedule	--	-113.0	--	--	-113.0
Engineering	--	--	--	--	--
Estimating	--	-97.3	--	--	-97.3
Other	--	--	--	--	--
Support	--	-79.3	--	--	-79.3
Subtotal	--	-265.9	--	--	-265.9
Total Changes	-1.3	+8736.8	+19.5	+45.9	+8800.9
Current Estimate	869.8	14577.5	30.0	45.9	15523.2

Summary BY 2014 \$M					
Item	RDT&E	Procurement	MILCON	Acq O&M	Total
SAR Baseline (Production Estimate)	940.8	5087.2	9.0	--	6037.0
Previous Changes					
Economic	--	--	--	--	--
Quantity	--	+7644.6	--	--	+7644.6
Schedule	--	-250.0	--	--	-250.0
Engineering	--	--	--	--	--
Estimating	-8.0	-1618.8	+15.9	+35.8	-1575.1
Other	--	--	--	--	--
Support	--	+1291.6	--	--	+1291.6
Subtotal	-8.0	+7067.4	+15.9	+35.8	+7111.1
Current Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	--	-104.9	--	--	-104.9
Other	--	--	--	--	--
Support	--	-54.5	--	--	-54.5
Subtotal	--	-159.4	--	--	-159.4
Total Changes	-8.0	+6908.0	+15.9	+35.8	+6951.7
Current Estimate	932.8	11995.2	24.9	35.8	12988.7

Previous Estimate: December 2018

Procurement	\$M	
	Base Year	Then Year
Current Change Explanations		
Revised escalation indices. (Economic)	N/A	+23.7
Acceleration of procurement buy profile from FY 2018 through FY 2025. (Schedule)	0.0	-113.0
Revised estimate for economic order quantity effects and FMS synergies as a result of the shift in the procurement buy profile. (Estimating)	-107.8	-99.5
Adjustment for current and prior escalation. (Estimating)	+2.9	+2.2
Adjustment for current and prior escalation. (Support)	+0.7	+1.7
Decrease in Other Support due to adjustments to the procurement buy profile. (Support)	-55.2	-81.0
Procurement Subtotal	-159.4	-265.9

Contracts

Contract Identification

Appropriation: Procurement
Contract Name: FY 2016 PAC-3/MSE Production
Contractor: Lockheed Martin Missiles and Fire Control
Contractor Location: P.O. Box 650003
 Dallas, TX 75265-0003
Contract Number: W31P4Q-14-C-0034/3
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 16, 2015
Definitization Date: June 29, 2018

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1210.0	N/A	336	1412.5	1472.0	336	1417.6	1417.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to the exercise of the FY 2016 Option on multiple occasions to realign hardware requirements and definitization of multiple Not-To-Exceed orders during FY 2016 and FY 2017.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/22/2019)	-15.6	-5.9
Previous Cumulative Variances	+24.3	-36.7
Net Change	-39.9	+30.8

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to cost overruns in the seeker section.

The favorable net change in the schedule variance is due to early completion of support equipment tasks.

Notes

On December 14, 2015, the contract was modified to exercise the FY 2016 option production requirements to include: U.S. PAC-3 MSE missiles, U.S. associated ground support equipment, FMS PAC-3 Cost Reduction Initiative (CRI) missiles, FMS associated ground support equipment, and FMS PAC-3 Launcher Modification Kits (LMK).

The contract was modified several times in FY 2016 to realign U.S. and FMS requirements including: U.S. and FMS PAC-3 MSE missiles, FMS miscellaneous hardware, U.S. PAC-3 MSE initial spares, FMS PAC-3 CRI missiles, and U.S. FMS LMKs.

PAC-3 MSE deliveries began 3rd Quarter FY 2018.

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

Contract Identification

Appropriation: Procurement
Contract Name: FY 2017 PAC-3/MSE Production
Contractor: Lockheed Martin Missiles and Fire Control
Contractor Location: P.O. Box 650003
 Dallas, TX 75265-0003
Contract Number: W31P4Q-17-C-0006/1
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 22, 2016
Definitization Date: August 28, 2019

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1453.0	N/A	263	1232.3	1292.4	298	1232.3	1232.3

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to definitization of FY 2017 hardware pricing at less than planned target and contract modifications of FY 2017 Not-To-Exceed (NTE) orders.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/22/2019)	+20.1	-47.7
Previous Cumulative Variances	--	--
Net Change	+20.1	-47.7

Cost and Schedule Variance Explanations

The favorable cumulative cost variance is due to cost efficiencies in the aft section and actuator set.

The unfavorable cumulative schedule variance is due to subassembly production shortages. The program manager is working with the prime contractor to improve production rates to recover schedule.

The contract was fully definitized since the prior SAR; therefore, cost and schedule performance data is being reported for the first time.

Notes

The FY 2017 PAC-3 MSE Production contract was awarded on December 22, 2016, to Lockheed Martin Missiles and Fire Control as an undefinitized contract action. This award added only a part of the total requirements due to Continuing Resolution Authority limitations in effect at the time of award. The FY 2017 requirements included: U.S. and FMS PAC-3 MSE missiles, associated ground support equipment, U.S. PAC-3 Cost Reduction Initiative (CRI) test missiles; FMS PAC-3 CRI missiles; FMS Launcher Modification Kits (LMK); FMS Missile Round Trainers and Empty Round Trainers; FMS Telemetry Kits, and U.S. and FMS initial spares.

The FY 2017 PAC-3 MSE Production contract was modified on July 14, 2017, to incorporate Congressional missile plus-ups and Continuing Resolution Authority funding.

The FY 2017 PAC-3 MSE Production contract was modified on December 21, 2017, to definitize most of the FY 2017 requirements and to exercise the first FY 2018 Option Production requirements.

The FY 2017 PAC-3 MSE Production contract was modified on March 30, 2018, to add FY 2017 NTE requirements.

The FY 2017 production contract was definitized on August 28, 2019.

FY 2017 PAC-3 MSE deliveries began 1st Quarter FY 2020.

Contract Identification

Appropriation: Procurement
Contract Name: FY 2018 PAC-3/MSE Production
Contractor: Lockheed Martin Missiles and Fire Control
Contractor Location: P.O. Box 650003
 Dallas, TX 75265-0003
Contract Number: W31P4Q-17-C-0006/2
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 21, 2017
Definitization Date: December 03, 2019

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1403.0	N/A	418	1819.4	1892.3	418	1819.4	1819.4

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to exercising production contract options to add remaining U.S. ancillary and support requirements, FMS requirements, and FY 2018 Not-To-Exceed (NTE) requirements.

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FPIF) contract.

General Contract Variance Explanation

Tailored cost reporting for this contract is expected to begin 90 days after contract definitization.

Notes

The FY 2017 PAC-3 MSE Production contract was modified on December 21, 2017, to definitize most of the FY 2017 requirements and to exercise the first FY 2018 Option Production requirements. The FY 2018 requirements include: U.S. and FMS PAC-3 MSE missiles, FMS PAC-3 Cost Reduction Initiative missiles; U.S. and FMS Launcher Modification Kits, and associated tooling. The Estimated Price at Completion includes total contract requirements.

The second option to the FY 2017/2018 PAC-3 MSE Production Contract was exercised on February 6, 2018, to incorporate a Congressional increase of \$647M for additional missiles and hardware.

On March 30, 2018, FY 2018 PAC-3 MSE Production Contract Option Two was exercised and FY 2018 NTE requirements were added.

FY 2018 PAC-3 MSE deliveries are scheduled to begin in 4th Quarter FY 2020.

Contract Identification

Appropriation: Procurement
Contract Name: FY 2019 PAC-3/MSE Production
Contractor: Lockheed Martin Missiles and Fire Control
Contractor Location: P.O. Box 650003
 Dallas, TX 75265-0003
Contract Number: W31P4Q-19-C-0011/1
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 21, 2018
Definitization Date:

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1808.1	N/A	454	2157.2	2589.7	454	2464.0	2464.0

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to exercising production contract options to add remaining U.S. and FMS ancillary and support requirements.

Contract Variance			
Item	Cost Variance		Schedule Variance
Cumulative Variances To Date (12/22/2019)	-6.6		+5.4
Previous Cumulative Variances	--		--
Net Change	-6.6		+5.4

Cost and Schedule Variance Explanations

The unfavorable cumulative cost variance is due to seeker section obsolescence rework.

The favorable cumulative schedule variance is due to solid rocket motor tasks completing ahead of schedule.

Tailored cost reporting began 180 days after initial contract award. The contract is projected to be fully definitized in June 2020.

Notes

This contract is not new to the PAC-3 MSE SAR; the effort number was corrected since the prior SAR.

The FY 2019 PAC-3 MSE Production contract was awarded on December 21, 2018. A continuation of contract modification (continuation of FY 2017/2018 PAC-3 MSE Production contract), was issued to exercise the FY 2019 option and to incorporate FY 2020 priced options for PAC-3 MSE Production. The FY 2019 PAC-3 MSE Production option includes: U.S. and FMS PAC-3 MSE missiles, FMS PAC-3 Cost Reduction Initiative missiles; U.S. and FMS Launcher Modification Kits, and associated ground support equipment.

FY 2019 PAC-3 MSE deliveries are scheduled to begin in 4th Quarter FY 2021.

Contract Identification

Appropriation: Procurement
Contract Name: FY 2020 PAC-3/MSE Production
Contractor: Lockheed Martin Missiles and Fire Control
Contractor Location: P.O. Box 650003
 Dallas, TX 75265-0003
Contract Number: W31P4Q-19-C-0011/2
Contract Type: Fixed Price Incentive(Firm Target) (FPIF)
Award Date: December 30, 2019
Definitization Date:

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
1567.4	N/A	384	1567.4	1635.8	384	1567.4	1567.4

Cost and Schedule Variance Explanations

Cost and Schedule Variance reporting is not required on this (FPIF) contract.

General Contract Variance Explanation

Cost and schedule variances are not reported for this contract, because EVM reporting will not begin until 180 days after initial contract award.

Notes

On December 5, 2019, a FY 2020 PAC-3 MSE Production contract modification was awarded to Lockheed Martin Missiles and Fire Control, Dallas, Texas, for U.S./FMS PAC-3 MSE missiles; U.S./FMS Launcher Modification Kits; and associated hardware. The total amount obligated for this contract action is \$657.5M (\$438.3M U.S./\$219.2M FMS).

On December 30, 2019, an additional FY 2020 PAC-3 MSE Production contract modification was awarded to Lockheed Martin Missiles and Fire Control, Dallas, Texas, for the remaining U.S. PAC-3 MSE missiles and to incorporate the OUSD enablers. The total amount obligated for this contract action is \$113.97M U.S. increasing the total amount obligated on the FY 2020 PAC-3 MSE Production contract to \$1.821B (\$1.105B U.S./\$716M FMS).

FY 2020 PAC-3 MSE deliveries are expected to begin in 4th Quarter FY 2022.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	356	364	3100	11.74%
Total Program Quantity Delivered	356	364	3100	11.74%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	15523.2	Years Appropriated	17
Expended to Date	2771.6	Percent Years Appropriated	48.57%
Percent Expended	17.85%	Appropriated to Date	6659.9
Total Funding Years	35	Percent Appropriated	42.90%

The above data is current as of February 10, 2020.

Notes

The decrease in expenditures from the previous SAR is due to adjustments to correct DFAS billing errors that occurred in prior budget years.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	January 08, 2020
Source of Estimate:	POE
Quantity to Sustain:	3100
Unit of Measure:	Total Quantity
Service Life per Unit:	30.00 Years
Fiscal Years in Service:	FY 2015 - FY 2067

The PAC-3 MSE current O&S cost estimate was revised since the December 2018 SAR to reflect program quantity adjustments. The estimate includes the costs of repair and recertification of PAC-3 MSE missiles, all sustainment costs needed to maintain the missile through its service life, and demilitarization costs.

Sustainment Strategy

The missile is transported and operates in a hermetically sealed canister as a self-contained major end item. There is no missile field maintenance; however, Preventive Maintenance Checks and Services are conducted only on the external canister. Removal and Replacement of failed exterior canister minor hardware components, approved "render safe" procedures, and semi-annual Missile Field Test status testing are completed by the Patriot user. All other maintenance is considered sustainment (depot) level maintenance. The missile will be certified twice, at ten-year intervals, within its 30-year planned service life. Interim Contractor Support will be the sustainment strategy until an organic capability is established in FY 2025. Once established, missiles will be shipped to Letterkenny Army Depot for diagnosis/testing, de-canning, repair and return of faulty or degraded missile subassemblies, reassembly, re-coating, and re-canning. Checkout and fault detection/isolation will be accomplished using depot test, measurement, and diagnostic equipment and peculiar test/support equipment. Missile sub-assemblies (five major sections) are returned to the original equipment manufacturer for repair. After the missile is repaired, an inspection will be performed prior to reinserting the missile into its canister to verify that current tactical software was uploaded as required.

Antecedent Information

No Antecedent

Cost Element	Annual O&S Costs BY2014 \$M	
	PAC-3 MSE Average Annual Cost Per Total Quantity	No Antecedent (Antecedent)
Unit-Level Manpower	--	--
Unit Operations	--	--
Maintenance	76.890	--
Sustaining Support	6.930	--
Continuing System Improvements	12.330	--
Indirect Support	0.050	--
Other	--	--
Total	96.200	--

Item	Total O&S Cost \$M			
	PAC-3 MSE			No Antecedent (Antecedent)
	Current Production APB Objective/Threshold		Current Estimate	
Base Year	5155.7	5671.3	5098.6	N/A
Then Year	9211.7	N/A	9016.5	N/A

Disposal Cost is included in the Operating and Support Cost of the current APB objective and threshold for this program.

Equation to Translate Annual Cost to Total Cost

Total Missile O&S = \$96.200M (Average Annual O&S Cost) x 53 (years of service life) = \$5098.6M

O&S Cost Variance		
Category	BY 2014 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2018 SAR	5143.4	
Programmatic/Planning Factors	-44.8	Adjustments to procurement buy profile.
Cost Estimating Methodology	0.0	
Cost Data Update	0.0	
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	-44.8	
Current Estimate	5098.6	

Disposal Estimate Details

Date of Estimate: September 06, 2018
Source of Estimate: POE
Disposal/Demilitarization Total Cost (BY 2014 \$M): 21.8

Demilitarization costs were provided by Army Environmental Command.