PATRIOT ADVANCED CAPABILITY-3 MISSILE SEGMENT ENHANCEMENT (PAC-3 MSE)

December 2021 Selected Acquisition Report (SAR)

December 31, 2021

Department of The Army

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Executive Summary

Program Highlights Since Last Report (Congress): 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 April 30, 2020, the US Government awarded Lockheed Martin Missiles and Fire Control a Firm Fixed Price contract for the FY 2021 - FY 2023 production of U.S. and Foreign Military Sales (FMS) PAC-3 MSE missiles and ancillary hardware with a total potential contract value of $9.5B. At time of award, 954 FMS PAC-3 MSE missiles were procured.

Effective June 30, 2020, PEO Missiles and Space transferred Operational Control of the PAC-3 MSE program from the Lower Tier Project Office to the Short and Intermediate Effectors for Layered Defense Project Office.

On December 23, 2020, the initial FY 2021 U.S. production contract option was exercised, procuring 134 U.S. PAC-3 MSE missiles and U.S./FMS ancillary hardware. Due to the limitations of the Continuing Resolution in place at the time of initial U.S. production award, an additional option to procure the remaining 12 FY 2021 U.S. PAC-3 MSE missiles was exercised on March 31, 2021.

On April 5, 2021, a Letter of Offer and Acceptance (LOA) was signed with Kuwait for the procurement of PAC-3 MSE missiles.

On July 12, 2021, a LOA was signed with the Netherlands for the procurement of PAC-3 MSE missiles. Contract funding and quantities for each case will be determined when funds are placed on contract.

On October 18, 2021, Lockheed Martin completed production of the 1000th PAC-3 MSE missile at their Camden, Arkansas facility.

The FY 2022 PAC-3 MSE production contract option was exercised in December 2021.

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

History of Significant Developments Since Program Initiation:

Date	Description
Mar-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.
Mar-2014	The FY 2014 PAC-3 MSE Production Fixed Price Incentive Firm Target Undefinitized Contract Action was awarded on March 28, 2014, following approval of the PAC-3 MSE Milestone C.
Jan-2015	On January 16, 2015, the DAE approved the PAC-3 MSE Production APB.
Oct-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).
Jul-2016	PAC-3 MSE IOC was established with the 3-2 ADA on July 5, 2016.
Aug-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.
Dec-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.
Jan-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.
Jan-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.
Apr-2018	On April 16, 2018, the AAE chaired the PAC-3 MSE Army System Acquisition Review Council and approved FRP.
Jun-2018	On June 13, 2018, the AAE signed an ADM authorizing PAC-3 MSE to proceed to FRP.
Jul-2018	On July 17, 2018, the AAE approved the PAC-3 MSE APB Change 1.
Dec-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.
Jul-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.
Dec-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.
Apr-2020	On April 30, 2020, the U.S. Government awarded Lockheed Martin Missiles and Fire Control a Firm Fixed Price contract for the FY 2021 - FY 2023 production of U.S. and FMS PAC-3 MSE missiles and ancillary hardware with a total potential contract value of $9.5B.
Oct-2021	On October 18, 2021, Lockheed Martin completed production of the 1000th PAC-3 MSE missile at their Camden, Arkansas facility.

Schedule

Schedule Events

Event Title (or Header)	Current Objective	Current Threshold	Current Estimate/ Actual Date	Deviation?
MSE First Intercept	Feb-2010	Feb-2010	Feb-2010	
MSE First Unit Equipped (FUE)	Oct-2015	Oct-2015	Oct-2015	
MSE Milestone C	Mar-2014	Mar-2014	Mar-2014	
MSE IOC	Jul-2016	Jul-2016	Jul-2016	
MSE FRP	Apr-2018	Apr-2018	Apr-2018	

Schedule Notes:	*Schedule Deviation Explanations:*
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.	

Significant Schedule Risks

Event	Date	Description

Performance

Performance Attributes					
Current Objective	Current Threshold	Current Estimate	Deviation?	Demonstrated Performance	Date
Attribute Title:	Proficiency Level			KPP	
Soldiers (Operators, Maintainers, and Leaders) are	(T=O) Soldiers (Operators, Maintainers, and Leaders)	Soldiers (Operators, Maintainers, and Leaders)		Soldiers (Operators, Maintainers, and Leaders) were	

able to perform critical tasks to standard 95% of the time after training.	are able to perform critical tasks to standard 95% of the time after training.	are able to perform critical tasks to standard 95% of the time after training.		able to perform critical tasks to standard 95% of the time after training during logistics demonstration and test unit training.	
Attribute Title:	Time to Train			KPP	
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.	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.	
Attribute Title:	Training Retention			KPP	
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.		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.	
Attribute Title:	Training Support			KPP	
Training resources shall be capable of providing 95% of training individual and collective critical tasks (march-	Training resources shall be capable of providing 90% of training individual and collective critical tasks	Training resources shall be capable of providing 95% of training individual and collective critical tasks		All training support materials to include preliminary technical manuals, New Equipment Training Plans, Task Analysis,	

order and emplacement, operations, maintenance, force operations, and engagement operations) related to tactically deployed systems while missiles are loaded.	(march-order and emplacement, operations, maintenance, force operations, and engagement operations) related to tactically deployed systems while missiles are loaded.	(march-order and emplacement, operations, maintenance, force operations, and engagement operations) related to tactically deployed systems while missiles are loaded.		and Doctrine Impact Reports were provided to Fires Center of Excellence Directorate of Training Development and Doctrine.	
Attribute Title:	Training Interoperability			KPP	
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.	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.)	

Attribute Title:	Net Ready			KPP	
The PAC-3 Increment 2 system must fully support execution of all operational activities and information exchanges identified in the DoD Enterprise Architecture and 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.	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 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.	The PAC-3 Increment 2 system must fully support execution of all operational activities and information exchanges identified in the DoD Enterprise Architecture and 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.		TBD. The Net Ready KPP applies to the integration of the PATRIOT command and control system into IBCS and is not specific to the performance of the MSE missile. Demonstrated Performance will coincide with IBCS First Unit Equipped.	
Attribute Title:	Sustainment Reliability			KPP	
The material sustainment reliability will	The material sustainment reliability will	The material sustainment reliability will		Will be demonstrated during Post	

exceed 41 hours MTBCMF.	exceed 20 hours MTBCMF.	exceed 20 hours MTBCMF.		Deployment Build-8 and Radar Digital Processor-Configuration Operational testing.	

Performance Notes:	*Performance Deviation Explanations:*
Patriot Advanced Capability-3 (PAC-3) Increment 2 CPD dated January 24, 2013 Acronyms: 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 IBCS - Integrated Air & Missile Defense Battle Command System 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	

Acquisition Budget Estimate

Total Acquisition Cost

Budget Year: 2023 Base Year: 2014

Appropriation Category ($Millions)	Objective Base Year (Current APB)	Threshold Base Year (Current APB)	Budget Estimate Base Year	Budget Estimate Then Year	Deviation?
RDT&E	$ 927.8	$ 1,020.6	$ 933.2	$ 869.8	
Procurement	$ 12,134.50	$ 13,348.0	$ 11,484.2	$ 13,869.0	
MILCON	$ 25.3	$ 27.8	$ 24.4	$ 30.0	
Acq O&M	$ 36.1	$ 39.7	$ 35.2	$ 45.8	
Total Acquisition	$ 13,123.7		$ 12,477.0	$ 14,814.6	
PAUC	$ 4.233	$ 4.656	$ 4.025	$ 4.779	
APUC	$ 3.914	$ 4.305	$ 3.705	$ 4.474	

Total End Item Quantity

Quantity	Current APB	Current Estimate
Development Qty	0	0
Procurement Qty	3,100	3,100

Budget Notes:

Army Acquisition Executive approved Current APB, July 17, 2018.

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.

The changes in the Procurement and Acq O&M cost estimates since the December 2019 SAR are due to adjustments to the procurement buy profile and revised escalation indices.

The changes in the Base Year 2014 $ cost estimates for RDT&E and MILCON since the December 2019 SAR are due to the change in methodology used to develop weighted indices.

Quantity Notes:

Cost Deviation Explanations:

Risk and Sensitivity Analysis

Current Procurement Risks:
DASA(CE) directed that the current baseline includes 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.

Unit Cost

Current Baseline Compared with Current Estimate

Current Baseline Base Year: 2014

Category ($ Millions)	Current Baseline	Current Estimate	% Change	Breach? Significant or Critical
Program Acquisition Unit Cost				
Acquisition Cost	$ 13,123.7	$ 12,477.0		
Program Quantity	3,100	3,100		
PAUC	$ 4.233	$ 4.025	-4.93%	None
Average Procurement Unit Cost				
Procurement Cost	$ 12,134.5	$ 11,484.2		
Procurement Quantity	3,100	3,100		
APUC	$ 3.914	$ 3.705	-5.36%	None

Original Baseline Compared with Current Estimate

Original Baseline Base Year: 2004

Category ($ Millions)	Original Baseline	Current Estimate	% Change	Breach? Significant or Critical
Program Acquisition Unit Cost				
Acquisition Cost	$ 6,220.9	$ 10,227.8		
Program Quantity	1,528	3,100		
PAUC	$ 4.071	$ 3.299	-18.97%	None
Average Procurement Unit Cost				
Procurement Cost	$ 5,760.0	$ 9,414.0		
Procurement Quantity	1,528	3,100		
APUC	$ 3.770	$ 3.037	-19.44%	None
Impacts of Schedule Changes on Unit Cost:				
Unit Cost Notes:				

Contracts

Contract Number:	W31P4Q-17-C-0006	**Order Number:**		**Contract Title:**	FY 2018 PAC-3/MSE Production		
CAGE Code	64059	City	Dallas	Contracting Office			
CAGE Legal Name	Lockheed Martin Missiles and Fire Control	State/Province	TX	Contract Strategy			
Effort Number	2						
Supportive Phase	Production	Latest Modification Number	P00087	Definitization Date	12/3/2019		
Contract Type	Fixed-Price Incentive (Firm Target)	Latest Modification Date	12/19/2019	Work Start Date	12/21/2017		
Technical Data Rights	None	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 (LMK), 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 $647M for additional missiles and hardware. On March 30, 2018, FY 2018 PAC-3 MSE Production Contract Option Three was exercised and FY 2018 NTE requirements were added. FY 2018 PAC-3 MSE deliveries began in 3rd Quarter FY 2020 and concluded 3rd Quarter FY 2021.				
Contract/Effort Price, Quantity and Performance ($M)							
Initial Target Price		Current Target Price	$ 1,791.75	Contractor's EAC	$ 1,516.52		
Initial Ceiling Price		Current Ceiling Price	$ 1,843.72	PM's EAC	$ 1,516.52		
Initial Quantity		BAC	$ 1,574.55	BCWP	$ 1,391.25	Work Completed	88.36%
Current Quantity	268	ACWP	$ 1,329.72	BCWS	$ 1,500.63	Cost Variance	$ 61.53

Delivered Quantity	268					Schedule Variance	-$ 109.38

Factors Contributing to Cost Variance and Projected Effects on Program Costs:	Factors Contributing to Schedule Variance and Projected Effects on Program Schedule:
The unfavorable net change in cost variance is due to overruns in the PAC-3 CRI Four-Pack Munitions Integration & Assembly and the Systems Engineering areas.	The unfavorable net change in schedule variance is due to delays in the Command and Launch Control and Boeing seeker subcontract areas.

Contract Number:	W31P4Q-19-C-0011	**Order Number:**		**Contract Title:**	FY 2019 PAC-3/MSE Production
CAGE Code	64059	City	Dallas	Contracting Office	
CAGE Legal Name	Lockheed Martin Missiles and Fire Control	State/Province	TX	Contract Strategy	
Effort Number	1				
Supportive Phase	Production	Latest Modification Number	P00029	Definitization Date	
Contract Type	Fixed-Price Incentive (Firm Target)	Latest Modification Date	12/30/2019	Work Start Date	12/21/2018
Technical Data Rights	None	Notes	The FY 2019 PAC-3 MSE Production contract was awarded on December 21, 2018. The USG issued a continuation of contract modification (continuation of FY17/18 PAC-3 Production contract W31P4Q-17-C-0006), W31P4Q-19-C-0011, to exercise the FY19 option for PAC-3 Production. The FY19 PAC-3 Production option includes: US and FMS PAC-3 MSE missiles, FMS PAC-3 Cost Reduction Initiative missiles, US and FMS Launcher Modification Kits (LMKs), and associated ground support equipment. On August 23, 2021, FY19 funds that were held to cover contingent liability for FY19 FPIF contract ceiling were released and realigned to the FY21 missile production contract after a successful bilateral agreement to reduce contract ceiling was achieved. The corresponding FY21 funds that were released will be obligated in early FY22. FY 2019 PAC-3 MSE deliveries began in 3rd Quarter FY 2021.		

Contract/Effort Price, Quantity and Performance ($M)							
Initial Target Price		Current Target Price	$ 1,791.75	Contractor's EAC	$ 1,516.52		
Initial Ceiling Price		Current Ceiling Price	$ 1,843.72	PM's EAC	$ 1,516.52		
Initial Quantity		BAC	$ 1,574.55	BCWP	$ 1,391.25	Work Completed	88.36%

Current Quantity	288	ACWP	$ 1,329.72	BCWS	$ 1,500.63	Cost Variance	$ 61.53
Delivered Quantity	142					Schedule Variance	-$ 109.38

Factors Contributing to Cost Variance and Projected Effects on Program Costs:	Factors Contributing to Schedule Variance and Projected Effects on Program Schedule:
The favorable net change in cost variance is due to efficiencies realized in the Project Management and Operations Services areas.	The unfavorable net change in schedule variance is due to delays in the Multiband RF and Aft Section Electrical areas.

Contract Number:	W31P4Q-19-C-0011	**Order Number:**		**Contract Title:**	FY 2020 PAC-3/MSE Production
CAGE Code	64059	City	Dallas	Contracting Office	
CAGE Legal Name	Lockheed Martin Missiles and Fire Control	State/Province	TX	Contract Strategy	
Effort Number	2				
Supportive Phase	Production	Latest Modification Number	P00027	Definitization Date	12/30/2019
Contract Type	Fixed-Price Incentive (Firm Target)	Latest Modification Date	12/30/2019	Work Start Date	3/1/2019
Technical Data Rights	None	Notes	On December 21, 2018, the USG issued a continuation of contract modification (continuation of FY 2017/2018 PAC-3 Production contract W31P4Q-17-C-0006), W31P4Q-19-C-0011, to exercise the FY 2019 option and to incorporate FY 2020 priced options for PAC-3 Production. On March 21, 2019, the FY 2020 Option was partially exercised, awarding 67 MSE missiles. On May 14, 2019, the FY 2020 Option was partially exercised, awarding an additional 50 MSE missiles. On September 9, 2019, the FY 2020 Option was partially exercised, awarding 120 FMS MSE missiles. On December 5, 2019, the FY 2020 Option was partially exercised, awarding the ground support equipment. On February 27, 2020, the FY 2020 Option was fully exercised. FY 2020 PAC-3 MSE deliveries are scheduled to begin in 4th Quarter FY 2022. Remaining available Not-To-Exceed line items are scheduled to be definitized by February 28, 2022.		

Contract/Effort Price, Quantity and Performance ($M)							
Initial Target Price		Current Target Price	$ 1,593.12	Contractor's EAC	$ 1,541.35		
Initial Ceiling Price		Current Ceiling Price	$ 1,826.94	PM's EAC	$ 1,541.35		
Initial Quantity		BAC	$ 1,574.55	BCWP	$ 394.81	Work Completed	25.07%
Current Quantity	312	ACWP	$ 377.02	BCWS	$ 304.71	Cost Variance	$ 17.79
Delivered Quantity						Schedule Variance	$ 90.10

Factors Contributing to Cost Variance and Projected Effects on Program Costs:	Factors Contributing to Schedule Variance and Projected Effects on Program Schedule:
The favorable net change in cost variance is due to efficiencies in the Systems Engineering area.	The favorable net change in schedule variance is due to work in the Command & Launch area completing ahead of schedule as well as early completion of Seeker work.

Contract Number:	W31P4Q-20-C-0023	**Order Number:**		**Contract Title:**	FY 21/FY 22/FY 23 PAC-3/MSE Production
CAGE Code	64059	City	Dallas	Contracting Office	
CAGE Legal Name	Lockheed Martin Missiles and Fire Control	State/Province	TX	Contract Strategy	
Effort Number					
Supportive Phase	Production	Latest Modification Number	P00017	Definitization Date	3/31/2021
Contract Type	Firm-Fixed-Price	Latest Modification Date	3/31/2021	Work Start Date	3/31/2021
Technical Data Rights	None	Notes	On April 30, 2020, the U.S. Government awarded Lockheed Martin Missiles and Fire Control a Firm Fixed Price contract for the FY 2021-FY 2023 production of U.S. and FMS PAC-3 MSE missiles and ancillary hardware with a total potential contract value of $9.5B. In this award, the FMS missile requirements were awarded. On June 12, 2020, modification P00001 added Cost Plus Fixed Fee (CPFF) NTEs for Seeker Block V and the Integrated Guidance System (IGS). This modification has not yet been definitized. These two CLINs are reported separately on the following pages and are not included in the $4,465.6M price of the FFP CLIN listed above. On October 6, 2020, modification P00004 added the missile tooling and obsolescence associated with the missile production. On December 23, 2020, the initial FY 2021 U.S. production contract option was exercised, procuring 134 U.S. PAC-3		

			MSE missiles and U.S./FMS ancillary hardware. Due to the limitations of the Continuing Resolution in place at the time of initial U.S. production award, an additional option to procure the remaining 12 FY 2021 U.S. PAC-3 MSE missiles was exercised on March 31, 2021. The FY 2021/FY 2022/FY 2023 contract consists of three annual production contract options. The total quantity of 1,100 US and FMS missiles will be procured across those options. FY 2021 PAC-3 MSE deliveries are scheduled to begin 3rd Quarter FY 2023.

Contract/Effort Price, Quantity and Performance ($M)							
Initial Target Price	$ 4,196.90	Current Target Price	$ 4,465.60	Contractor's EAC			
Initial Ceiling Price		Current Ceiling Price		PM's EAC			
Initial Quantity	1,088	BAC		BCWP		Work Completed	0.00%
Current Quantity	1,100	ACWP		BCWS		Cost Variance	
Delivered Quantity						Schedule Variance	

Factors Contributing to Cost Variance and Projected Effects on Program Costs:	Factors Contributing to Schedule Variance and Projected Effects on Program Schedule:

Contract Number:	W31P4Q-20-C-0023	**Order Number:**		**Contract Title:**	Seeker Block V
CAGE Code	64059	City	Dallas	Contracting Office	
CAGE Legal Name	Lockheed Martin Missiles and Fire Control	State/Province	TX	Contract Strategy	
Effort Number	1				
Supportive Phase	Production	Latest Modification Number	P00001	Definitization Date	
Contract Type	Cost-Plus-Fixed-Fee	Latest Modification Date	6/12/2020	Work Start Date	6/12/2020
Technical Data Rights	None	Notes	Contract W31P4Q-20-C-0023 was modified on June 6, 2020 to add NTEs for Seeker Block V and the Integrated Guidance Subsystem (IGS). This modification has not yet been definitized. The Seeker Block V effort represented here is 16.5% US funded and 83.5% FMS funded.		

				On June 4, 2021, the NTE for the Seeker Block V Backwards Compatibility effort was added.			
Contract/Effort Price, Quantity and Performance ($M)							
Initial Target Price	$ 405.00	Current Target Price	$ 421.40	Contractor's EAC	$ 421.40		
Initial Ceiling Price		Current Ceiling Price		PM's EAC	$ 421.40		
Initial Quantity		BAC	$ 421.40	BCWP	$ 78.23	Work Completed	18.57%
Current Quantity		ACWP	$ 79.86	BCWS	$ 86.48	Cost Variance	-$ 1.63
Delivered Quantity						Schedule Variance	-$ 8.25
Factors Contributing to Cost Variance and Projected Effects on Program Costs:				Factors Contributing to Schedule Variance and Projected Effects on Program Schedule:			
The unfavorable net change in cost variance is due to cost overruns in the Boeing seeker and GPU-R software areas.				The unfavorable net change in schedule variance is due to delays in the Boeing seeker area.			

Contract Number:	W31P4Q-20-C-0023	**Order Number:**		**Contract Title:**	Integrated Guidance Subsystem (IGS)
CAGE Code	64059	City	Dallas	Contracting Office	
CAGE Legal Name	Lockheed Martin Missiles and Fire Control	State/Province	TX	Contract Strategy	
Effort Number	2				
Supportive Phase	Production	Latest Modification Number	P00001	Definitization Date	
Contract Type	Fixed-Price Incentive (Firm Target)	Latest Modification Date	6/12/2020	Work Start Date	6/10/2020
Technical Data Rights	None	Notes	Contract W31P4Q-20-C-0023 was modified on 6 June 2020 to add NTEs for Seeker Block V and the Integrated Guidance Subsystem (IGS). This modification has not yet been definitized. The IGS effort represented here is 100% FMS funded. On June 4,2021, the NTE for the IGS Backwards Compatibility effort was added.		
Contract/Effort Price, Quantity and Performance ($M)					
Initial Target Price	$ 147.10	Current Target Price	$ 163.30	Contractor's EAC	$ 163.30

Initial Ceiling Price		Current Ceiling Price		PM's EAC	$ 163.30		
Initial Quantity		BAC	$ 163.30	BCWP	$ 23.94	Work Completed	14.66%
Current Quantity		ACWP	$ 29.31	BCWS	$ 25.27	Cost Variance	-$ 5.37
Delivered Quantity						Schedule Variance	-$ 1.33

Factors Contributing to Cost Variance and Projected Effects on Program Costs:	Factors Contributing to Schedule Variance and Projected Effects on Program Schedule:
The unfavorable net change in cost variance is due to cost overruns in the Electrical Engineering and Software Engineering areas.	The favorable net change in schedule variance is due to completion of tasks in the Systems Engineering Guidance and Engagement Analysis and receipt of Materials for the Mutilband Data Link area.

Technologies and Systems Engineering

Significant Technical Risks

Event	Date	Description
MS C	3/31/2014	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.
MS C	3/31/2014	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	12/31/2021	PAC-3 MSE Obsolescence. The program actively manages obsolescence redesign efforts. The PAC-3 MSE risk is assessed as Low.

Deliveries and Expenditures

Quantities	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	0.00%
Procurement	906	906	3,100	29.23%
Total	906	906	3,100	29.23%

Years Appropriated to date	19	Total Years Appropriated Funding (Current Baseline):	35	Percent Years Appropriated:	54.29%

Appropriation Category ($Millions)	Then Year Appropriated Amount	Then Year Expended Amount
RDT&E	869.80	869.80
Procurement	6,801.80	3,822.12
MILCON	30.00	
Acq O&M	9.40	9.40
Total Appropriated/Expended	7,671.6	4,691.92
Percent Appropriated/Expended	52.05%	31.73%

Delivery and Expenditure Notes:

MILCON is not executed at the PM level, and no product-specific expenditures are available. Deliveries and Expenditures as of March 31,2022.

Low-Rate Initial Production

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

Rationale if quantity exceeds 10% of the total number of articles to be produced: CUI: ____

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.

Quantity Note: CUI: ____

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.

Operating and Support (O&S) Cost

Total Program O&S Costs Compared with Baseline

	Current Base Year Objective	Current Base Year Threshold	Current Base Year Estimate	Current Then Year Estimate	Deviation?
Total O&S ($Millions)	$ 5,155.70	$ 5,671.30	$ 5,152.55	$ 8,850.96	

Deviation Explanation:

Operating and Support Cost Breakdown

Category (Base Year $Millions)	System Name: PAC-3 MSE	System Name:
Unit-Level Manpower		
Unit Operations		
Maintenance	$ 4,085.50	
Sustaining Support	$ 379.60	
Continued System Improvements	$ 687.50	
Other		
Total O&S	$ 5,152.60	

Cost Estimate Source

Type: Component Cost Position

Approval Authority and Date: Assistant Secretary of the Army (Financial Management and Comptroller), April 06, 2018.

Note: Army Cost Position dated April 06, 2018.

O&S Notes:
The PAC-3 MSE current O&S cost estimate was revised since the December 2019 SAR to reflect the shift in the procurement buy profile. 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.

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, decanning, 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.