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Department of Defense
OFFICE OF PREPUBLICATION AND SECURITY REVIEW



STANDARD MISSILE – 6 (SM-6)

December 2021 Selected Acquisition Report (SAR)



DECEMBER 31, 2021
DEPARTMENT OF THE NAVY

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Common Acronyms and Abbreviations

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(A&S) - Under Secretary of Defense (Acquisition and Sustainment)
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

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Program Manager

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Mission and Description

The STANDARD Missile-6 (SM-6) is a tri-mission capable (Anti-Air Warfare (AAW), Sea-Based Terminal Defense (SBT), and Anti-Surface Warfare (ASuW)) missile that provides for over-the-horizon engagements, enhanced capability at extended ranges and increased firepower with an active guidance section. Launched from AEGIS Cruisers and Destroyers. SM-6 provides timely, precise, accurate and lethal fire power against cruise missile threats and launch platforms in a fleet area defense role and is capable of successfully engaging manned and unmanned, fixed or rotary wing aircraft, and land attack or Anti-Ship Cruise Missiles (ASCM) in flight. SM-6 is an evolutionary acquisition program with requirements for future Block upgrades. Raytheon Missile Systems (RMS) is the sole source contractor for SM-6.

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Executive Summary

Significant Accomplishments:

SM-6 Program is in FRP for the SM-6 Block I and the more capable SM-6 Block IA variant.

The FY 2023 PB reflects a funding profile for an authorized Multi-year Procurement (MYP) beginning in FY 2019 and completing in FY 2023. Advance Procurement (AP) is captured in the funding phasing to address economic order quantity material requirements. MYP and AP were approved in the FY 2019 National Defense Authorization Act.

The FY 2023 PB reflects a proposed follow-on five year MYP starting in FY 2024 for SM-6 Block IA. The SM-6 Block IB will transition from the Middle Tier of Acquisition to the Major Capability Acquisition pathway and will be designated as a major subprogram of the existing SM-6 Acquisition Category (ACAT) IC program. This designation will be effective upon receipt of an ADM for Milestone B (MS B) and an approved Acquisition Program Baseline (APB) reflecting the establishment of the subprogram.

The SM-6 FRP Block IA MYP Engineering Change Proposal (ECP) FY 2021 contract was awarded June 2021.

The SM-6 FRP Block I/IA MYP FY 2021 Production contract was awarded June 2021.

The SM-6 FRP Block IA MYP ECP FY 2022 contract was awarded April 2022.

The SM-6 FRP Block I/IA MYP FY 2022 Production contract was awarded April 2022.

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
July 2004	Milestone B Acquisition Decision Memorandum
September 2004	System Development and Demonstration (SD&D) contract awarded to Raytheon Missile Systems
August 2009	Milestone C Acquisition Decision Memorandum
September 2009	Letter contract to establish Not-to-Exceed prices for the LRIP contract FY 2009 Low-Rate Initial Production (LRIP) SM-6 Block I awarded to Raytheon Missile Systems
January 2010	Land Based Testing completed
July 2010	LRIP SM-6 Block I (Lot 1) contract definitized with an FY 2010 (Lot 2) option awarded to Raytheon Missile Systems
January 2011	Developmental Testing (DT) Flight Testing completed
June 2011	LRIP FY 2011 (Lot 3) SM-6 Block I option awarded to Raytheon Missile Systems
October 2011	Operational Testing (OT) Flight Testing completed
May 2012	Undefinitized Contract Action (UCA) for FY 2012 LRIP SM-6 Block I
March 2013	Navy Electronic Resources and Requirements Review Board (ER3B) memorandum authorizing increase in procurement profile from 1200 to 1800 missiles

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July 2013	LRIP FY 2012 SM-6 Block I contract award
August 2013	Full Rate Production (FRP) Acquisition Decision Memorandum
September 2013	FRP FY 2013 SM-6 Block I contract
November 2013	Initial Operational Capability (IOC) achieved
June 2014	FRP FY 2014 SM-6 Block I contract
May 2015	FRP FY 2015 SM-6 Block I/IA contract
May 2015	UCA for FY 2015 SM-6 Block IA Engineering Change Proposal (ECP) LRIP
February 2016	FRP FY 2016 SM-6 Block I/IA contract
January 2017	LRIP FY 2015 - FY 2016 SM-6 Block IA ECP contract award
December 2017	Full Operational Capability (FOC) achieved
September 2018	FRP FY 2017 - FY 2018 SM-6 Block I/IA contract award
October 2018	FY 2019 National Defense Authorization Act (NDAA) authorized a Multi-Year Procurement (MYP) and Advanced Procurement (AP) beginning with the FY 2019 program year for the procurement of up to 625 missiles, completing in the FY 2023 program year
December 2018	Resource Management Decision included an emergent requirement to increase the SM-6 Block IA procurement from 125 to 180 All Up Rounds per year starting in FY 2024
December 2018	FRP FY 2017 - FY 2018 SM-6 Block IA ECP contract award
October 2019	SM-6 Block IA achieved IOC
December 2019	FRP FY 2019 - FY 2023 MYP SM-6 Block IA ECP contract award
December 2019	FRP FY 2019 - FY 2023 MYP SM-6 Block I/IA contract award
April 2020	FRP FY 2020 SM-6 MYP BLK IA ECP contract modification award
April 2020	FRP FY2020 MYP BLK I/IA contract modification award
June 2021	FRP FY 2021 SM-6 MYP BLK IA ECP contract modification award
June 2021	FRP FY2021 MYP BLK I/IA contract modification award
April 2022	FRP FY 2022 SM-6 MYP BLK IA ECP contract modification award
April 2022	FRP FY2022 MYP BLK I/IA contract modification award

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Schedule

Schedule Events

Schedule Events					
Events	Production APB Objective	Current APB Production Objective/Threshold		Current Estimate/Actual	Deviation
Milestone B Review	Jun 2004	Jun 2004	Dec 2004	Jun 2004 / Jun 2004	
Milestone C Review	Jun 2009	Jun 2009	Dec 2009	Aug 2009 / Aug 2009	
Land Based Testing					
Start	Apr 2008	Apr 2008	Oct 2008	Apr 2008 / Apr 2008	
Complete	Oct 2009	Oct 2009	Apr 2010	Jan 2010 / Jan 2010	
Development Testing and Combines Development and Operational Testing					
Start	Feb 2010	Feb 2010	Aug 2010	May 2010 / May 2010	
Complete	Apr 2010	Jan 2011	Jul 2011	Jan 2011 / Jan 2011	
Proof of Manufacturing Final Review	Oct 2010	Oct 2010	Apr 2011	Apr 2011 / Apr 2011	
Operational Testing					
Start	Aug 2010	Jul 2011	Jan 2012	Jul 2011 / Jul 2011	
Complete	Sep 2010	Oct 2011	Apr 2012	Oct 2011 / Oct 2011	
Initial Operating Capability (IOC)	Mar 2011	May 2013	Nov 2013	Nov 2013 / Nov 2013	
Full Rate Production Review	Jun 2011	May 2013	Nov 2013	May 2013 / May 2013	
Full Operational Capability (FOC)	Sep 2015	Sep 2015	Mar 2016	Dec 2017 / Dec 2017	1

Schedule Notes:

SM-6 successfully achieved FOC on December 27, 2017.

Deviation Explanations:

1. The schedule breach was first reported in the December 2015 SAR. SM-6 successfully achieved FOC on December 27, 2017.

Performance

Performance Notes:

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

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Acquisition Budget Estimate

Total Acquisition Cost

Category	Base Year	Original UCR Baseline (7/12/2004)	Current UCR Baseline (8/9/2013)		Budget Estimate PB 2023		Deviation
		Objective (BY 2004 \$M)	Objective (BY 2004 \$M)	Threshold (BY 2004 \$M)	BY \$M	TY \$M	
RDT&E	2004	861.6	834.5	918.0	834.82	933.4	
Procurement	2004	4419.5	6854.1	7539.5	7510.94	11,035.18	
MILCON	2004	0	0	0	0	0	
Acq. O&M	2004	0	0	0	0	0	
Total		5281.1	7688.6		8345.76	11968.58	
PAUC	2004	4.055	4.271		4.637		
APUC	2004	3.291	3.808		4.173		

Total End Item Quantity

Quantity Category	Original APB Quantity	Current APB Quantity	Current Estimate Quantity
Development	0	0	0
Procurement	1200	1800	2345

Budget Notes:

SM-6 Block IA ECP production cut in started in FY 2015.

FY 2023 PB reflects a funding profile for an authorized MYP beginning in FY 2019 and completing in FY 2023. Advance Procurement (AP) is captured in the funding phasing to address economic order quantity material requirements. MYP and AP were approved in the FY 2019 National Defense Authorization Act.

The FY 2023 PB reflects a proposed follow-on five year MYP starting in FY 2024 for SM-6 Block IA.

FY 2023 PB, FY 2027 funding control is lower than the projected AUR Unit Price for a procurement of 150 SM-6 Block IA.

FY 2023 PB includes a requirement to increase the SM-6 Block IA and SM-6 Block IB procurement up to 200 AUR per year starting in FY 2024.

Total Procurement Cost reflected in FY 2028 through FY 2031 represents estimates at the projected AUR Unit Price.

Quantity Notes:

SM-6 received authorization to increase the production profile from 1200 missiles to 1800 missiles as documented in the Navy Electronic Resources and Requirements Review Board (ER3B) memorandum, dated March 18, 2013.

The Current Baseline/Estimate has been updated to reflect a requirement to increase procurement up to 200 SM-6 Block IA and SM-6 Block IB missiles per year starting in FY 2024, and to increase procurement up to 300 SM-6 Block IA and Block IB missiles per year starting in FY 2028, bringing total quantity to 2345 missiles for a 30-year life cycle.

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Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Procurement Cost (December 2021)	
1.	All areas are on track without any major issues. The program continues to monitor obsolescence issues and is currently mitigating the risk by leveraging STANDARD Missile resources to achieve efficiencies. The program continues to execute within the Current Acquisition Program Baseline unit cost metrics.
Original Baseline Estimate (July 2004)	
1.	OSD CAPE ICE Memorandum dated June 2004 shows a comparison of the ICE and Navy Service Cost Position with Development at (\$6M) delta or - 0.7% difference; Procurement at \$527M delta or 14% difference; O&S at \$13M delta or 4% difference; and Total program cost at \$534M delta out of \$5.5B estimate or 11% difference. The 14% difference in the procurement phase cost estimates is driven by differences in the theoretical first unit production costs (T1s), the associated SDD to production step down factors, and learning rates. Schedule Risk: Both the CAPE and the Navy estimates indicate that the current 48-month planned for the SDD phase of the SM-6 program is overly optimistic. Missile programs of this type have an average SDD phase duration of 58-months. The current SM-6 program SDD schedule does not allow for failure during the testing and evaluation phase.
Revised Original Estimate (N/A)	
None.	
Current Baseline Estimate (August 2013)	
1.	OSD CAPE ICE memorandum dated May 2013 shows a comparison of the ICE and Navy Service Cost Position with SDD at \$0 delta; Procurement at \$341M delta or 5.2% difference; O&S at (\$18M) or -3.9% difference; and Total program cost at \$323M delta out of \$8.1B or 4.1% difference. Cost Risk: CAPE suggested that the program's new Acquisition Program Baseline (APB) be established in line with a more realistic maximum SM-6 annual procurement profile reflecting the current budget environment. USD (AT&L) accepted this recommendation. Two programmatic changes have occurred since Milestone B approval: the Navy increased its total production quantity from 1,200 to 1,800, but reduced the maximum annual procurement quantity in every budget cycle, resulting in an SM-6 procurement profile that extends out an additional eight years. Despite these changes, the average procurement unit cost (APUC) has remained within 3.4% of the estimate APUC figure at Milestone C.

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Unit Cost

Current Baseline Compared with Current Estimate

Category (\$M)	Current APB (August 2013)	Current Estimate (December 2021)	% Change	NMC Breach
PAUC				
Cost	7688.6	8345.8		
Quantity	1800	2345		
Unit Cost	4.271	3.559	-16.7	
APUC				
Cost	6854.1	7510.9		
Quantity	1800	2345		
Unit Cost	3.808	3.203	-15.9	

Original Baseline Compared with Current Estimate

Category (\$M)	Original APB (July 2004)	Current Estimate (December 2021)	% Change	NMC Breach
PAUC				
Cost	4866.3	8345.9		
Quantity	1200	2345		
Unit Cost	4.055	3.559	-12.2	
APUC				
Cost	3949.6	7510.9		
Quantity	1200	2345		
Unit Cost	3.291	3.203	-2.7	

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Contracts

Contract Data (TY\$M)			
Contract Number	N00024-17-C-5409/1		
Effort Number			
Modification Number	P00004		
Award Date	September 28, 2018		
Definitization Date	September 28, 2018		
Order Number			
CAGE Code/CAGE Legal Name	Raytheon		
Contract Title	SM-6 FRP 17/18		
Contract Address	1151 East Hermans Road Tucson, AZ 85756		
Contracts/Effort Price, Quantity, and Performance (\$M)			
Initial Target Price	Current Target Price		
	564.5		564.5
Initial Ceiling Price	Current Ceiling Price		
	N/A		N/A
Contract's EAC	PM's EAC		
	564.5		564.5
Initial Quantity	Current Quantity	Delivered Quantity	
	250	250	Not reported due to classification
BAC	BCWP	ACWP	
BCWS	Cost Variance	Schedule Variance	

Contract Notes:

The SM-6 FRP Block I and Block IA FY 2017 - FY 2018 Production contract was awarded on September 28, 2018.

Scheduled Quantities and Deliveries to Date are not reported due to classification.

Cost Variance:

Cost Variance reporting is not required on this (FFP) contract.

Schedule Variance:

Schedule Variance reporting is not required on this (FFP) contract.

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Contract Data (\$TYM)		
Contract Number	N00024-20-C-5405	
Effort Number		
Modification Number	P00001	
Award Date	December 20, 2019	
Definitization Date	December 20, 2019	
Order Number		
CAGE Code/CAGE Legal Name	Raytheon Missile Systems	
Contract Title	SM-6 MYP FY19 – FY23	
Contract Address	1151 East Hermans Road Tucson, AZ 85756	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price	Current Target Price	
1049.2	1049.2	
Initial Ceiling Price	Current Ceiling Price	
1098.9	1098.9	
Contract's EAC	PM's EAC	
895.31		895.31
Initial Quantity	Current Quantity	Delivered Quantity
625	625	Not reported due to classification
BAC	BCWP	ACWP
BCWS	Cost Variance	Schedule Variance

Contract Notes:

The SM-6 FRP Block IA MYP ECP FY 2022 contract was awarded April 2022.

The SM-6 FRP Block I/IA MYP FY 2022 Production contract was awarded April 2022.

Cost Variance:

The Integrated Baseline Review was completed on September 14, 2020.

The Integrated Baseline Review was completed on September 14, 2020.

Cost variance (-20.8% ITD) increased due to material accounting adjustments for spare hardware receipts that were unplanned in the baseline, as well as, additional requirements to address technical non-conformance and scrappage.

Schedule Variance:

The Integrated Baseline Review was completed on September 14, 2020.

Schedule variance (+63.24% ITD) decreased due to consumption of hardware towards the MYP contract out of sequence ahead of the FY 2017/FY 2018 contract. This caused a shift in All Up Round delivery sell off than originally planned.

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Technologies and Systems Engineering

Significant Technical Risks

Significant Technical Risks	
Current Estimate (December 2021)	
1.	The program office has been funded to develop an Electronics Unit (EU) upgrade to address a production obsolescence issue.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	0.00%
Production	776	776	2345	33.09%
Total Program Quantity Delivered	776	766	2345	33.09%

Expended and Appropriated (TY \$M)

Total Acquisition Cost (TY \$M):	11968.58
Expended to Date (\$M):	4500
Percent Expended:	37.60
Total Funding Years:	27
Years Appropriated:	18
Percent Years Appropriated:	66.67%
Appropriated to Date:	6068.9
Percent Appropriated:	50.7%

The above data is current as of April 18, 2022.

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Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	July 12, 2004	April 15, 2012
Approved Quantity	120	178
Reference	Milestone B ADM	LRIP Lot 4 ADM
Start Year	2009	2009
End Year	2011	2012

LRIP Note:

The SM-6 program received authorization to enter into a fourth year of LRIP as documented in the ADM dated April 05, 2012. This ADM authorized the increase in the total LRIP quantity from 120 (10 percent) to 178 (15 percent) based on a procurement profile of 1200 missiles, and deferred the FRP decision to FY 2013.

The SM-6 program received authorization to increase the procurement profile from 1200 missiles to 1800 missiles as documented in the Navy Electronic Resources and Requirements Review Board memorandum, dated March 18, 2013.

The SM-6 program built up 25 non-LRIP rounds to be test fired during the System Development and Demonstration phase of the program. All 25 missiles were expended prior to IOC.

Operating and Support Costs

Total Program O&S Cost Compared with Baseline

	Current APB Objective (BY 2004 \$M)	Current APB Threshold (BY 2004 \$M)	Current Estimate (BY\$)	Current Estimate (TY\$)	Deviation
Total O&S (\$Millions)	443.0	487.3	500.5	1017.9	

Deviation Explanation:

The O&S cost breach is due to an updated O&S estimate to adjust for a total quantity from 1,800 to 2,345 missiles and extending the fiscal year retired date from FY 2054 to FY 2058. The annual average cost per missile remains the same.

O&S Cost Breakdown

Allocate O&S estimate by each weapon system (or system variants) acquired by the program) into the CAPE Cost Categories. Add a fresh column for each variant/system.

Category (BY2004\$M)	SM-6
Unit-Level Manpower	0
Unit Operations	3.000
Maintenance	3.200
Sustaining Support	2.100
Continued System Improvements	0.000
Other	0.000
Indirect Support	0.000
Total O&S	8.5000

Cost Estimate Source: POE approved on February 10, 2020

O&S Cost Notes:

Since the SM-6 is a wooden round (a concept that pictures a weapon as being completely reliable and, while deployed on board a ship, having an infinite shelf life while at the same time requiring no special handling, storage, surveillance, or maintenance by ships force personnel), Personnel Costs are unnecessary for missile operation.

The average annual cost per missile assumes 2345 All Up Rounds over a 30 year life cycle. The program received funding for additional tooling and test equipment to procure and assemble up to 200 SM-6 Block IA/IB missiles per year starting in FY 2024, and to procure and assemble up to 300 SM-6 Block IA/IB missiles per year starting in FY 2028. The program expects the average annual cost per missile to remain unchanged with this new requirement.

Unit Level Consumption includes Range and Target Costs, as well as Post Flight Analysis. Intermediate Maintenance consists of Intermediate Level Maintenance facility costs. Depot Maintenance includes Depot Maintenance and Refurbishment.

Sustaining Support includes Sustaining Investment and Software Maintenance. Indirect Costs includes Installation and Personnel Support.

a. Disposal/Demilitarization Cost Estimate and Source of Estimate:

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The Army is responsible for demilitarization of all DoD missile systems at the end of the missile service life, including the STANDARD missile. Disposal costs are not identified at this time.

b. Sustainment Strategy:

SM-6 will leverage the proven and mature STANDARD Missile product support infrastructure. No unique storage, transportation, handling facilities, or launching systems will be required. The All Up Round will be considered a "wooden round" on board ship, with no Operational Level Maintenance (O-Level) required. In the future, a shipboard portable Maintenance Built-In-Test (MBIT) capability will allow a team to come aboard and test or install new software into the SM-6 round.

c. For Each Acquired System or System Variant:

- i. Quantity to Sustain: 2345
- ii. First Operational Fiscal Year: FY 2013
- iii. Final Operational Fiscal Year: FY 2058
- iv. Unit Expected Service Life: 30.00 Years

d. Antecedent System(s) O&S Costs:

For reporting purposes, SM-2 is the antecedent by definition of the closest analogous system to SM-6. The SM-6 program meets a different threat set and demonstrates enhanced capabilities in comparison to the SM-2 program.

SM-2 Cost/Missile/Year based on average quantity serviced in FY 2015, converted to BY 2004\$. SM-2 Block IIIA/IIIB FY 2015 PB is the basis for the SM-2 average annual cost per missile.