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ADVANCED ANTI-RADIATION GUIDED MISSILE – EXTENDED RANGE (AARGM-ER)

December 2021 Selected Acquisition Report (SAR)

**CLEARED AS AMENDED
For Open Publication**

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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**Name:** CAPT Alexander Dutko**Date Assigned:** June 17, 2021**Address:**

47123 Buse Road

Bldg 2272, Rm 252

Patuxent River, MD 20670-1547

Phone: 301-757-7422**Email:** alexander.c.dutko.mil@us.navy.mil**Mission and Description**

The AGM-88G Advanced Anti-Radiation Guided Missile-Extended Range (AARGM-ER) is an air-launched missile with the capability to rapidly engage air-defense threats. The AARGM-ER configuration will leverage previous investments on the AGM-88E AARGM and incorporate a new solid rocket motor for increased range. AARGM-ER will be integrated on the F/A-18E/F Super Hornet and EA-18G Growler aircraft and configured for internal carriage on the F-35 Lightning II. AARGM-ER requirements are documented in the AARGM-ER CDD that was approved via Joint Requirements Oversight Committee Memorandum (JROCM) serial number 052-16, dated June 16, 2016 and was updated and approved on 20 October 2021.

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Executive Summary

Significant Accomplishments:

The first Developmental Test flight was successfully conducted on July 19, 2021. On August 17, 2021, the Department of Navy Test and Evaluation Executive concurred to the assessment that developmental testing completed to date was sufficient to support the milestone approval.

The Knowledge Point #4 (Milestone C equivalent) ADM was issued on September 3, 2021 that approved entry into the Production and Deployment phase and award of the LRIP 1 & 2 contract.

The LRIP 1 contract was awarded to Northrop Grumman on September 14, 2021. The LRIP 2 option was exercised on December 13, 2021.

The second Developmental Test flight was successfully conducted on January 21, 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
March 2019	Program initiation at Milestone B.
March 2019	Engineering and Manufacturing Development (EMD) contract award.
February 2020	Critical Design Review conducted.
July 2021	First Developmental Test flight conducted.
September 2021	Approved entry into Production and Deployment phase.
September 2021	Low Rate Initial Production (LRIP) 1 Contract award.
December 2021	LRIP 2 contract award.
January 2022	Second Developmental Test flight conducted.

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Schedule

Schedule Events

Schedule Events					
Events	Development APB Objective	Current APB Production Objective/Threshold		Current Estimate/Actual	Deviation
Knowledge Point 2	Jan 2019	Jan 2019	Jan 2019	Jan 2019	
Knowledge Point 4	Mar 2021	Sep 2021	Sep 2021	Sep 2021 (Ch-1)	
IOC	Sep 2023	Sep 2023	Jul 2024	Sep 2023	
FRP	Mar 2024	Nov 2024	May 2025	Nov 2024 (Ch-2)	

Schedule Notes:

Change 1: The Knowledge Point #4 current estimate changed from Jun 2021 to Sep 2021 as a result of the Milestone Decision Authority's approved entrance into the Production and Deployment (P&D) phase.

Change 2: The FRP current estimate changed from Mar 2024 to Nov 2024 due to the update of the APB for production and the addition of an LRIP lot 4.

Significant Schedule Risks

Significant Schedule Risks	
Current Estimate (December 2021)	
1.	Delay of awarding LRIP 3 and 4 at the required quantities due to a Continuing Resolution may result in a production gap.

Performance

Performance Characteristics				
Development APB Objective	Current APB Development Objective/Threshold	Demonstrated Performance (include Date of Demonstration)	Current Estimate/Actual	Deviation
Availability Ao				
(T=O) >=0.9	(T=O) >=0.9 >=0.9	TBD	(T=O) >=0.9	
Availability Am				
(T=O) >=0.8	(T=O) >=0.8 >=0.8	TBD	(T=O) >=0.8	

Performance Notes:

Classified Performance is available in the Classified Annex. There are no changes since the last report.

Requirements Source:

CDD dated 20 October 2021

Acquisition Budget Estimate

Total Acquisition Cost

Category	Base Year	Development APB (02/27/2019)	Production APB (Current) (09/03/2021)		Budget Estimate PB 2023		Deviation
		Objective (BY\$)	Objective (BY\$)	Threshold (BY\$)	BY\$	TY\$	
RDT&E	2019	748.6	751.4	826.5	749.6	803.5	
Procurement	2019	2693.5	2661.9	2928.0	2548.1	3261.9	
MILCON	2019	0.0	0.0	0.0	0	0	
Acq. O&M	2019	0.0	0.0	0.0	0	0	
Total		3442.1	3413.3	N/A	3297.1	4065.4	
PAUC	2019	1.641	1.628	1.790	1.573		
APUC	2019	1.295	1.280	1.407	1.225		

Total End Item Quantity

Quantity Category	Current APB Quantity	Current Estimate Quantity
Development	17	17
Procurement	2080	2080

Budget Notes:

Total Acquisition Cost reflects BY 2019 to remain consistent with the original APB reported in BY 2019. The PB 2023 Budget estimate utilizes 2022 escalation indices.

Risk and Sensitivity Analysis

Risks and Sensitivity Analysis	
Current Procurement Cost (December 2021)	
1.	The current estimate is aligned with the PB 2023 budget submission.
2.	The production estimate continues to be sensitive to the annual quantities assumed. PB 2023 includes USMC procurement phasing changes and assumes inclusion of 300 United States Air Force AARGM-ER Installation Kits in FY 2023 to FY 2026.
Original Baseline Estimate (February 2019)	
1.	After review of the programmatic and technical baseline at KP-2, the MDA directed AARGM-ER to utilize the Component Cost Position as the funding requirement. The OSD CAPE performed an ICE which independently validated the procurement estimate, however they identified risk to the development associated with schedule. The production estimate is sensitive to the annual quantities assumed. The Baseline Estimate includes United States Air Force quantities through FY 2023.
Revised Original Estimate (Month YYYY)	
None.	
Current Baseline Estimate (September 2021)	
1.	After review of the programmatic and technical baseline at KP-4, the MDA directed AARGM-ER to utilize the Component Cost Position as the funding requirement. The OSD CAPE estimate was 6% higher than the Component Cost Position

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Unit Cost

Current Baseline Compared with Current Estimate

Category (\$M)	Current APB	Current Estimate	% Change	NMC Breach
PAUC				
Cost	3413.3	3296.0	-3.4%	-
Quantity	2097	2097	0.0%	-
Unit Cost	1.628	1.572	-3.4%	
APUC				
Cost	2661.9	2548.1	-4.3%	-
Quantity	2080	2080	0.0%	-
Unit Cost	1.280	1.225	-4.3%	

Original Baseline Compared with Current Estimate

Category (\$M)	Original APB	Current Estimate	% Change	NMC Breach
PAUC				
Cost	3442.1	3296.0	-4.2%	-
Quantity	2097	2097	0.0%	-
Unit Cost	1.641	1.572	-4.2%	
APUC				
Cost	2693.5	2548.1	-5.4%	-
Quantity	2080	2080	0.0%	-
Unit Cost	1.295	1.225	-5.4%	

Unit Cost Notes:

Unit Cost tables reflect BY 2019 to remain consistent with the original APB reported in BY 2019.

Contracts

Contract Data (\$TYM)		
Contract Number	N0001919C0050	
Effort Number		
Modification Number	P00026	
Modification Date	February 3, 2022	
Award Date	March 07, 2019	
Definitization Date	March 07, 2019	
Order Number		
CAGE Code/CAGE Legal Name	3EFM9	
Contract Title	AARGM-ER Engineering and Manufacturing Development (EMD)	
Contract Address	9401 Corbin Avenue Northridge, CA 91324	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price: 317.1	Current Target Price: 396.83	
Initial Ceiling Price N/A	Current Ceiling Price: 396.83	
Contract's EAC: 410.31	PM's EAC: 410.98	
Initial Quantity: 17	Current Quantity: 17	Delivered Quantity: 2
BAC: 353.61	BCWP: 230.08	ACWP: 266.06
BCWS: 249.51	Cost Variance: (\$34.8M)	Schedule Variance: (\$20.0M)

Contract Notes:

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to an EMD contract modification, issued in September 1, 2021, which increased the target price of a contract line item number for Systems Engineering and Development for Electronic Safe Arm Device and Warhead.

Cost Variance:

The unfavorable net change in the cost variance is due to rework caused by anomalies discovered during integration testing, investigation efforts, and additional resources required to complete planned efforts.

Schedule Variance:

The unfavorable net change in the schedule variance is due to ongoing design modifications and material hardware delays, in some cases caused by supplier shutdowns due to the COVID pandemic.

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Contract Data (\$TYM)		
Contract Number	N00019-21-C-0044	
Effort Number		
Modification Number	P00002	
Modification Date	January 24, 2022	
Award Date	September 14, 2021	
Definitization Date		
Order Number		
CAGE Code/CAGE Legal Name	3EFM9	
Contract Title	AARGM-ER Low-Rate Initial Production (LRIP) 1 & 2	
Contract Address	9401 Corbin Avenue Northridge, CA 91324	
Contracts/Effort Price, Quantity, and Performance (\$M)		
Initial Target Price: 41.23	Current Target Price: 86.89	
Initial Ceiling Price: N/A	Current Ceiling Price: N/A	
Contract's EAC:	PM's EAC:	
Initial Quantity: 16	Current Quantity: 32	Delivered Quantity 0
BAC: N/A	BCWP: N/A	ACWP: N/A
BCWS: N/A	Cost Variance: N/A	Schedule Variance: N/A

Contract Notes:

This is the first time reporting on this contract.

Cost Variance:

No EVM reporting is required for this Firm-Fixed Price contract.

Schedule Variance:

No EVM reporting is required for this Firm-Fixed Price contract.

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Technologies and Systems Engineering

Significant Technical Risks

Significant Technical Risks	
Current Estimate (December 2021)	
1.	Component Energetics Qualification.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	2	2	17	11.76%
Production	0	0	2080	0.00%
Total Program Quantity Delivered	2	2	2097	0.10%

Expended and Appropriated (TY \$M)

Total Acquisition Cost: 4065.4

Expended to Date: 506.9

Percent Expended: 12.5%

Total Funding Years: 19

Years Appropriated: 7

Percent Years Appropriated: 36.8%

Appropriated to Date: 816.1

Percent Appropriated: 20.1%

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

Deliveries and Expenditures Notes:

Expenditures are updated as of March 15, 2022 to reflect RDT&E,N for USN (\$419.20M) and USAF (\$87.18) This amount does not include CLIN 0008, USAF unique F-35A Integration Support and Test Asset Build that is not part of the AARGM-ER Program of Record. Expenditures also include \$0.51M for USN WPN.

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Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	3/4/2019	12/2/2020
Approved Quantity	208	312
Reference	2021	2021
Start Year	2021	2021
End Year	2023	2024

Rationale if Current Total LRIP Quantity exceeds 10% of the total Procurement quantities:

The Current Total LRIP Quantity is more than 10% of the total production quantity due to adding an LRIP lot that increased the LRIP quantity from 10% to 15% to reduce schedule risk to FRP.

LRIP Note:

Knowledge Point 2 (KP-2) ADM approved LRIP quantities of up to 208 All Up Rounds (AURs). The Knowledge Point 4 (KP-4) Acquisition Strategy update approved an additional LRIP contracting year, increasing LRIP quantities up to 312 AURs.

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Operating and Support Costs

Total Program O&S Cost Compared with Baseline

	Current APB Objective (BY\$2019)	Current APB Threshold (BY\$2019)	Current Estimate (BY\$2019)	Current Estimate (TY\$)	Deviation
Total O&S (\$Millions)	261.6	287.8	258.6	391.5	

- Date of Estimate: March 2022

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 (BY\$2019 Million)	AARGM-ER	AARGM (Antecedent)
Unit-Level Manpower	0.000	0.000
Unit Operations	0.012	0.050
Maintenance	3.574	1.536
Sustaining Support	3.691	3.331
Continued System Improvements	2.300	1.546
Other	0.000	0.000
Total O&S	9.577	6.463

Cost Estimate Source: Department of the Navy Component Cost Position from KP 4 updated with PB 2023 quantity profile and 2022 inflation indices

O&S Cost Notes:

The Life Cycle Sustainment Plan, approved April 6, 2021, addresses support activities and requirements required throughout the life cycle of the program. The AARGM-ER system will be supported by both organic and Contractor personnel in the execution of the Integrated Product Support elements. Additionally, the Department of Navy will have three levels of maintenance: Organizational, Intermediate, and Depot. The AARGM-ER maintenance approach is based on existing AARGM/High Speed Anti-Radiation Missile maintenance concepts. The AARGM-ER missile will utilize existing Navy support concepts and supply systems and will remain within current Navy ammunition logistical support channels. The AARGM-ER weapon system requires no major support changes at the field level. The missile will be provided to the users as an All-Up-Round requiring minimal maintenance in the field, with the exception of visual inspections, pre- and post-load checks, loading and unloading services, Built-In-Test, and packaging, storage, and transport.

The Annual O&S Cost above is the Average Annual cost Per TOTAL Quantity of missiles. The estimate concentrates on the costs for the AGM-88G AARGM-ER All Up Round missiles. The 2080 quantity to sustain does not include 17 developmental assets that are not maintained. AARGM-ER and Antecedent (AARGM) are reported in BY\$ 2019, as reflected in the original APB.

AARGM-ER

- Quantity to Sustain: 2080
- First Operational Fiscal Year: FY 2024
- Final Operational Fiscal Year: FY 2050

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- Unit Expected Service Life: 15.00 Years

AARGM

The Antecedent System is the AARGM. Historical O&S costs were collected from the Naval Visibility & Management of Operating and Support Costs database. Antecedent costs are not normalized to the AGM-88G AARGM-ER parameters, Antecedent costs are depicted in BY\$ 2019.

- Quantity to Sustain: 1803
- First Operational Fiscal Year: FY 2012
- Final Operational Fiscal Year: FY 2037
- Unit Expected Service Life: 15.00 Years

AARGM-ER Total costs for disposal is \$2.2M (BY\$19) based on the Knowledge Point #4 Department of the Navy Component Cost Position updated with PB 2023 quantity profile and 2022 inflation indices.

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