



Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-384



Air and Missile Defense Radar (AMDR)

As of FY 2016 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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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)

Program Information

Program Name

Air and Missile Defense Radar (AMDR)

DoD Component

Navy

Responsible Office

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Date

Assigned: October 23, 2010

References

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated October 03, 2013

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated October 3, 2013

Mission and Description

Mission: The Air and Missile Defense Radar (AMDR) suite will support maritime missions for Joint Air and Missile Defense and Joint Control Operations.

- Ballistic Missile Defense (BMD)
- Air Defense (AD)
- Surface Warfare (SuW)

Description: The AMDR suite will include:

- AMDR-S: S-band radar providing sensitivity for long range detection and engagement of advanced threats
- X-Band: X-band radar is a horizon-search radar based on existing technology
- Radar Suite Controller (RSC): RSC providing (S and X) band radar resource management, coordination and interface to combat system

Executive Summary

AMDR is the Navy's next generation radar system that will address Ballistic Missile Defense and Air Defense capability gaps identified in the Maritime Air and Missile Defense of Joint Forces (MAMDJF) Initial Capabilities Document. The AMDR suite consists of an S-band radar (AMDR-S), X-band radar, and a Radar Suite Controller (RSC). AMDR-S is a new development Integrated Air and Missile Defense radar providing sensitivity for long range detection and engagement of advanced threats. The X-band radar is a horizon-search radar based on existing technology. The RSC provides S and X band radar resource management, coordination, and interface to the combat system. AMDR will be deployed on the Guided Missile Destroyer (DDG) 51 Flight III. The timeline for AMDR-S/RSC development is designed to meet the in yard need date of the first DDG 51 Flight III planned to be authorized in FY 2016.

The AMDR suite will be delivered through three separate acquisition programs. The AMDR-S/RSC portion received Milestone B approval in October 2013 and was designated an Acquisition Category ID program. For the first 12 ship sets, the X-band radar will be delivered via the AN/SPQ-9B program. For ship sets 13-22, the program office will establish a separately executed program to develop, integrate and test, and procure future X-Band radar sets.

In June of 2009, the Navy awarded three AMDR-S/RSC Concept Studies (CS) contracts to Lockheed Martin, Raytheon, and Northrop Grumman. Under these contracts, each contractor: reviewed and provided feedback on the Government's requirements documents; conducted system engineering trade studies; developed an initial system concept; and developed a draft technology prototype and demonstration plan to achieve Technology Readiness Level 6.

The Government used the results of the CS phase to refine performance requirements and identify technical risks in preparation for transition to the Technology Development (TD) phase. In September 2010, the Navy awarded TD phase contracts to Lockheed Martin, Northrop Grumman and Raytheon. Under these contracts, each contractor: demonstrated maturity of AMDR-S critical technologies; conducted system engineering efforts, including studies and analyses, to develop an initial system design to a level sufficient to conduct a Preliminary Design Review (PDR); conducted Technology Demonstration Review to present its test data and analysis of their demonstrations; conducted a Systems Requirements Review (SRR), System Functional Review (SFR), Test Readiness Review; and provided a TD prototype.

The AMDR program achieved Milestone B in September 2013 and received a signed an ADM on October 4, 2013. After a full and open competition, an EMD phase contract was awarded to Raytheon on October 10, 2013. Shortly after contract award, one of the unsuccessful offerors filed a bid protest with the Government Accountability Office that was subsequently withdrawn on January 9, 2014. The program is currently executing a 48-month EMD contract with Raytheon. The EMD phase is focusing on the design of the system and development of an affordable and executable manufacturing process leading to a Production Readiness Review. Additional activities during the EMD phase will include a hardware and a system Critical Design Review (CDR) to assess the completeness of the detailed design and how it supports the performance requirements. EMD will include integration and test of a single-faced AMDR-S/RSC Engineering Development Model with an AN/SPQ-9B asset at the land-based test site at the Pacific Missile Range Facility in Kauai, HI. The EMD phase will conclude in an AMDR Milestone C decision.

The FY 2014 budget included a \$115M reduction due to delay in the EMD contract award and the FY 2015 budget included a \$15M reduction for program execution. There are currently no schedule or technical issues for the program.

The program required two waivers to Section 2366b criteria. The provision requiring that a program "... has received a preliminary design review (PDR) and conducted a formal post-PDR assessment," was deferred until the EMD phase. An initial PDR was conducted prior to Milestone B with each of the three TD phase solutions. However, to avoid the cost burden of completing three PDRs for the full AMDR system in a full radar suite design, the program requested and received a waiver to conduct a delta-PDR for hardware and a delta-PDR for software for the EMD phase contractor only. The delta hardware PDR was completed on May 21, 2014 and the system delta PDR was completed on August 27, 2014. The post-PDR assessment is currently in development. The AMDR hardware CDR was completed on December 3, 2014 with the system CDR scheduled for April 29, 2015.

In addition to the PDR waiver, USD(AT&L) approved proceeding into EMD without Director, Operational Test & Evaluation approval of the AMDR Test and Evaluation Master Plan, "... because of an unresolved issue regarding the need for an unmanned test asset for close-in Aegis ship self defense engagement testing." USD AT&L determined this is not an AMDR issue per se and concluded "AMDR is a high priority program and the EMD phase will not be fundamentally affected by the resolution of this issue."

On October 24, 2014 the AMDR system was designated a Joint Army/Navy Nomenclature of AN/SPY-6(V).

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

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 Development Estimate	Current APB Development Objective/Threshold		Current Estimate
Milestone B	Jul 2013	Jul 2013	Jan 2014	Sep 2013
System CDR	Jan 2015	Jan 2015	Jul 2015	Apr 2015
DT-3 Complete	Apr 2017	Apr 2017	Oct 2017	Sep 2017
Milestone C	Jul 2017	Jul 2017	Jan 2018	Sep 2017
IYND	Sep 2019	Sep 2019	Mar 2020	Jan 2020
IOT&E Complete	Jun 2023	Jun 2023	Dec 2023	Jun 2023
IOC	Sep 2023	Sep 2023	Mar 2024	Sep 2023

(Ch-1)

Change Explanations

(Ch-1) The current estimate for DT-3 Complete has changed from June 2017 to September 2017 due to an approximately three-month slip associated with EMD contract award protest.

Notes

Initial Operational Test and Evaluation (IOT&E) Complete dates reflect the planned completion date for IOT&E/Combat System Ship Qualification Test (CSSQT) for the Guided Missile Destroyer (DDG) 51 Flight III.

IOC date based on the AMDR Capability Development Document. Requirements to reach IOC include: (1) successful completion of IOT&E; (2) all maintenance and training materials, including embedded maintenance training and embedded technical manuals, are available to ship's crew; and (3) logistics support is in place, including onboard spares, supply support and shore-based distance support.

Acronyms and Abbreviations

CDR - Critical Design Review

CSSQT - Combat System Ship Qualification Test

DT - Development Test

IOT&E - Initial Operational Test and Evaluation

IYND - In Yard Need Date

Performance

Performance Characteristics				
SAR Baseline Development Estimate	Current APB Development Objective/Threshold	Demonstrated Performance	Current Estimate	
Availability				
Ao ≥0.99	Ao ≥0.99	Ao ≥0.98	TBD	Ao ≥0.99
System Training				
Maintenance technicians correctly perform ≥ 99% of critical tasks and ≥ 99% of non-critical tasks as defined in the TTL.	Maintenance technicians correctly perform ≥ 99% of critical tasks and ≥ 99% of non-critical tasks as defined in the TTL.	Maintenance technicians correctly perform ≥ 99% of critical tasks and ≥ 80% of non-critical tasks as defined in the TTL.	TBD	Maintenance technicians correctly perform ≥ 99% of critical tasks and ≥ 80% of non-critical tasks as defined in the TTL.
Net Ready				
Will satisfy applicable Net Ready KPP elements for all operational activities and information exchanges.	Will satisfy applicable Net Ready KPP elements for all operational activities and information exchanges.	Will satisfy applicable Net Ready KPP elements for joint critical operational activities and information exchanges.	TBD	Will satisfy applicable Net Ready KPP elements for joint critical operational activities and information exchanges.
Energy Efficiency				
Two reduced power states for AMDR-S, when commanded by the platform CMS: State 1 consumes no more than 1100 kW total prime power; State 2 consumes no more than 850 kW total prime power	Two reduced power states for AMDR-S, when commanded by the platform CMS: State 1 consumes no more than 1100 kW total prime power; State 2 consumes no more than 850 kW total prime power	Two reduced power states for AMDR-S, when commanded by the platform CMS: State 1 consumes no more than 1230 kW total prime power; State 2 consumes no more than 950 kW total prime power	TBD	Reduced Power Substate 1 consumes 1110kW total power; Reduced Power Substate 2 consumes 860kW total power
Survivability				
(Objective = Threshold) Exemption - AMDR will be integrated into the DDG 51 hull with no decrease in survivability of the hull based on DDG 51 live fire equivalent testing (DDG 81 shock trial)	(Objective = Threshold) Exemption - AMDR will be integrated into the DDG 51 hull with no decrease in survivability of the hull based on DDG 51 live fire equivalent testing (DDG 81 shock trial)	Exemption - AMDR will be integrated into the DDG 51 hull with no decrease in survivability of the hull based on DDG 51 live fire equivalent testing (DDG 81 shock trial)	TBD	Exemption - AMDR will be integrated into the DDG 51 hull with no decrease in survivability of the hull based on DDG 51 live fire equivalent testing (DDG 81 shock trial)
Force Protection				

(Objective = Threshold) Exemption - Will support host platform requirement	(Objective = Threshold) Exemption - Will support host platform requirement	Exemption - Will support host platform requirement	TBD	Exemption - Will support host platform requirement
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Classified Performance information is provided in the classified annex to this submission.

Requirements Reference

The AMDR Capability Development Document (CDD) was signed by the Chief of Naval Operations on April 20, 2013 (Joint Requirements Oversight Council Memo (JROCM) signed June 27, 2013). Specific Key Performance Parameter (KPP) values have been established in the CDD and those requirements have been flowed down to the Top Level Radar Performance (TLRP) and Top Level Requirements (TLR) documents developed by the program. AMDR capability will be codified in a Capability Production Document (CPD) in support of MS C.

The Pre-EMD DAB's Acquisition Decision Memorandum (ADM), dated May 21, 2012, directed a change to the program structure so that it includes only the AMDR S-band array and the Radar Suite Controller (RSC). This APB represents only the S-band and RSC capabilities from the AMDR CDD. The X-band capabilities in the AMDR CDD will be addressed in a separate future Program of Record.

Change Explanations

None

Acronyms and Abbreviations

Ao - Operational Availability
 BMD - Ballistic Missile Defense
 CMS - Combat Management System
 dBsm - Decibels Relative to a Square Meter
 DDG - Guided Missile Destroyer
 Km - Kilometer
 kW - kilowatt
 MS - Milestone
 RCS - Radar Cross Section
 TTL - Training Task List

Track to Budget

RDT&E

Appn	BA	PE	
Navy	1319	04	0603513N
	Project	Name	
	4019	Shipboard System Component (Shared) (Sunk) Development - Radar Upgrades	
	Notes: Applies to FY 2006 - 2007		
Navy	1319	05	0604307N
	Project	Name	
	3044	AEGIS Combat System (Shared) (Sunk) Engineering - Solid State SPY Radar	
	Notes: Applies to FY 2006 - 2007		
Navy	1319	05	0604501N
	Project	Name	
	3186	Advanced Above Water (Shared) (Sunk) Sensors - Air and Missile Defense Radar	
	Notes: Applies to FY 2008 - 2014		
Navy	1319	05	0604522N
	Project	Name	
	3186	Air and Missile Defense Radar (AMDR) System - Air and Missile Defense Radar	
	Notes: Applies to FY 2015 - 2023 (program transitioned from PE0604501N to PE0604522N in FY 2015).		

Procurement

Appn	BA	PE	
Navy	1611	02	0204222N
	Line Item	Name	
	2122	DDG 51 (Shared)	

MILCON

Appn	BA	PE	
Navy	1205	01	0805376N
	Project	Name	
	P422	Advanced Radar Detection Laboratory (Sunk)	

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2013 \$M			BY 2013 \$M	TY \$M		
	SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Development Estimate	Current APB Development Objective	Current Estimate
RDT&E	1860.0	1860.0	2046.0	1714.6	1911.1	1911.1	1754.9
Procurement	3846.9	3846.9	4231.6	3259.8	4724.0	4724.0	4016.3
Flyaway	--	--	--	2642.5	--	--	3258.7
Recurring	--	--	--	2624.5	--	--	3238.7
Non Recurring	--	--	--	18.0	--	--	20.0
Support	--	--	--	617.3	--	--	757.6
Other Support	--	--	--	520.7	--	--	638.3
Initial Spares	--	--	--	96.6	--	--	119.3
MILCON	28.8	28.8	31.7	28.6	27.5	27.5	27.5
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	5735.7	5735.7	N/A	5003.0	6662.6	6662.6	5798.7

Confidence Level

Confidence Level of cost estimate for current APB: 50%

Based on the AMDR Independent Cost Estimate (ICE) prepared for the Milestone B Defense Acquisition Board (DAB) review (memo dated May 29, 2013), it is about equally likely that the estimate will prove too low or too high.

Total Quantity			
Quantity	SAR Baseline Development Estimate	Current APB Development	Current Estimate
RDT&E	0	0	0
Procurement	22	22	22
Total	22	22	22

Cost and Funding

Funding Summary

Appropriation Summary									
FY 2016 President's Budget / December 2014 SAR (TY\$ M)									
Appropriation	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
RDT&E	1046.1	129.7	241.8	151.9	32.7	28.9	29.9	93.9	1754.9
Procurement	0.0	0.0	262.3	351.6	340.1	337.8	344.2	2380.3	4016.3
MILCON	27.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.5
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2016 Total	1073.6	129.7	504.1	503.5	372.8	366.7	374.1	2474.2	5798.7
PB 2015 Total	1086.0	144.7	517.5	457.1	388.6	384.6	380.1	2474.1	5832.7
Delta	-12.4	-15.0	-13.4	46.4	-15.8	-17.9	-6.0	0.1	-34.0

Quantity Summary										
FY 2016 President's Budget / December 2014 SAR (TY\$ M)										
Quantity	Undistributed	Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	To Complete	Total
Development	0	0	0	0	0	0	0	0	0	0
Production	0	0	0	1	2	2	2	2	13	22
PB 2016 Total	0	0	0	1	2	2	2	2	13	22
PB 2015 Total	0	0	0	1	2	2	2	2	13	22
Delta	0	0	0	0	0	0	0	0	0	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding							
1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	TY \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2006	--	--	--	--	--	--	10.9
2007	--	--	--	--	--	--	35.3
2008	--	--	--	--	--	--	92.9
2009	--	--	--	--	--	--	92.5
2010	--	--	--	--	--	--	164.9
2011	--	--	--	--	--	--	204.2
2012	--	--	--	--	--	--	138.8
2013	--	--	--	--	--	--	193.9
2014	--	--	--	--	--	--	112.7
2015	--	--	--	--	--	--	129.7
2016	--	--	--	--	--	--	241.8
2017	--	--	--	--	--	--	151.9
2018	--	--	--	--	--	--	32.7
2019	--	--	--	--	--	--	28.9
2020	--	--	--	--	--	--	29.9
2021	--	--	--	--	--	--	30.6
2022	--	--	--	--	--	--	32.9
2023	--	--	--	--	--	--	30.4
Subtotal	--	--	--	--	--	--	1754.9

Annual Funding 1319 RDT&E Research, Development, Test, and Evaluation, Navy							
Fiscal Year	Quantity	BY 2013 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2006	--	--	--	--	--	--	12.1
2007	--	--	--	--	--	--	38.4
2008	--	--	--	--	--	--	99.1
2009	--	--	--	--	--	--	97.4
2010	--	--	--	--	--	--	171.2
2011	--	--	--	--	--	--	206.9
2012	--	--	--	--	--	--	138.3
2013	--	--	--	--	--	--	190.3
2014	--	--	--	--	--	--	109.5
2015	--	--	--	--	--	--	124.1
2016	--	--	--	--	--	--	227.4
2017	--	--	--	--	--	--	140.2
2018	--	--	--	--	--	--	29.6
2019	--	--	--	--	--	--	25.6
2020	--	--	--	--	--	--	26.0
2021	--	--	--	--	--	--	26.1
2022	--	--	--	--	--	--	27.5
2023	--	--	--	--	--	--	24.9
Subtotal	--	--	--	--	--	--	1714.6

Annual Funding 1611 Procurement Shipbuilding and Conversion, Navy								
Fiscal Year	Quantity	TY \$M						
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program	
2016	1	178.7	--	20.0	198.7	63.6	262.3	
2017	2	282.5	--	--	282.5	69.1	351.6	
2018	2	273.1	--	--	273.1	67.0	340.1	
2019	2	272.3	--	--	272.3	65.5	337.8	
2020	2	278.7	--	--	278.7	65.5	344.2	
2021	2	287.2	--	--	287.2	65.0	352.2	
2022	2	292.7	--	--	292.7	66.1	358.8	
2023	3	447.3	--	--	447.3	96.6	543.9	
2024	2	303.9	--	--	303.9	67.0	370.9	
2025	3	464.5	--	--	464.5	97.3	561.8	
2026	1	157.8	--	--	157.8	34.9	192.7	
Subtotal	22	3238.7	--	20.0	3258.7	757.6	4016.3	

Annual Funding 1611 Procurement Shipbuilding and Conversion, Navy							
Fiscal Year	Quantity	BY 2013 \$M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	1	160.6	--	18.0	178.6	57.1	235.7
2017	2	249.0	--	--	249.0	60.9	309.9
2018	2	236.0	--	--	236.0	57.9	293.9
2019	2	230.7	--	--	230.7	55.5	286.2
2020	2	231.5	--	--	231.5	54.4	285.9
2021	2	233.9	--	--	233.9	52.9	286.8
2022	2	233.7	--	--	233.7	52.7	286.4
2023	3	350.1	--	--	350.1	75.6	425.7
2024	2	233.2	--	--	233.2	51.4	284.6
2025	3	349.4	--	--	349.4	73.2	422.6
2026	1	116.4	--	--	116.4	25.7	142.1
Subtotal	22	2624.5	--	18.0	2642.5	617.3	3259.8

Annual Funding 1205 MILCON Military Construction, Navy and Marine Corps	
Fiscal Year	TY \$M
	Total Program
2009	27.5
Subtotal	27.5

Annual Funding 1205 MILCON Military Construction, Navy and Marine Corps	
Fiscal Year	BY 2013 \$M
	Total Program
2009	28.6
Subtotal	28.6

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	10/4/2013	10/4/2013
Approved Quantity	16	16
Reference	Milestone B ADM	Milestone B ADM
Start Year	2016	2016
End Year	2023	2023

The Current Total LRIP Quantity is more than 10% of the total production quantity due to timing of Initial Operational Test and Evaluation, IOC, and the need to meet the shipbuilding plan. The Milestone B ADM dated October 4, 2013 included approval for a planned LRIP quantity not to exceed 16 units.

Foreign Military Sales

None

Nuclear Costs

None

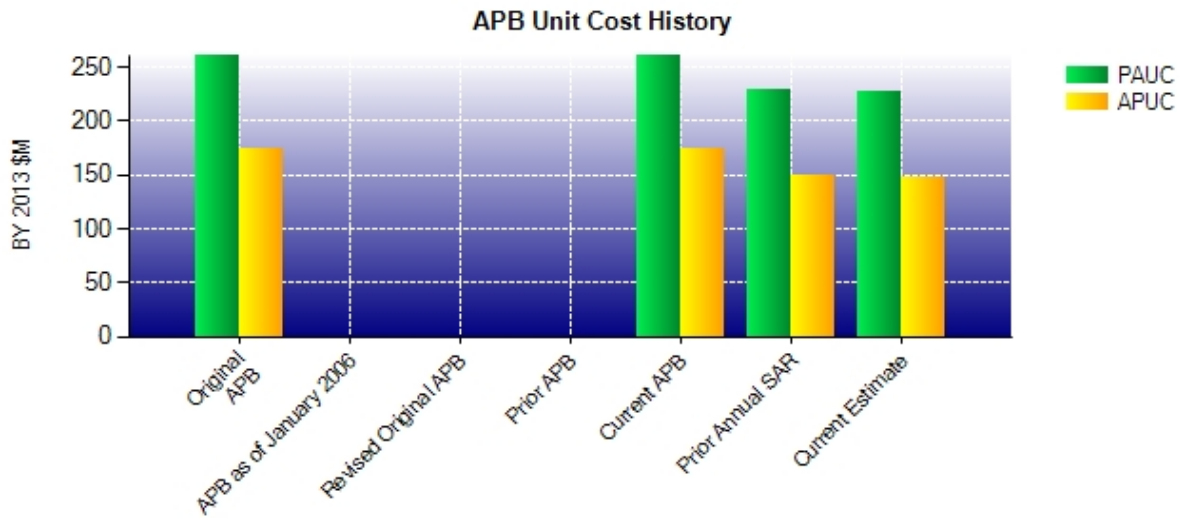
Unit Cost

Unit Cost Report

Item	BY 2013 \$M	BY 2013 \$M	% Change
	Current UCR Baseline (Oct 2013 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	5735.7	5003.0	
Quantity	22	22	
Item	260.714	227.409	-12.77
Average Procurement Unit Cost			
Cost	3846.9	3259.8	
Quantity	22	22	
Unit Cost	174.859	148.173	-15.26

Item	BY 2013 \$M	BY 2013 \$M	% Change
	Original UCR Baseline (Oct 2013 APB)	Current Estimate (Dec 2014 SAR)	
Program Acquisition Unit Cost			
Cost	5735.7	5003.0	
Quantity	22	22	
Unit Cost	260.714	227.409	-12.77
Average Procurement Unit Cost			
Cost	3846.9	3259.8	
Quantity	22	22	
Unit Cost	174.859	148.173	-15.26

Unit Cost History



Item	Date	BY 2013 \$M		TY \$M	
		PAUC	APUC	PAUC	APUC
Original APB	Oct 2013	260.714	174.859	302.845	214.727
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	N/A	N/A	N/A	N/A	N/A
Current APB	Oct 2013	260.714	174.859	302.845	214.727
Prior Annual SAR	Dec 2013	228.664	149.582	265.123	183.809
Current Estimate	Dec 2014	227.409	148.173	263.577	182.559

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY \$M)									
Initial PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
302.845	0.336	0.000	0.000	0.000	-12.355	0.000	-27.249	-39.268	263.577

Current SAR Baseline to Current Estimate (TY \$M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
214.727	0.800	0.000	0.000	0.000	-5.718	0.000	-27.250	-32.168	182.559

SAR Baseline History				
Item	SAR Planning Estimate	SAR Development Estimate	SAR Production Estimate	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	Jul 2013	N/A	Sep 2013
Milestone C	N/A	Jul 2017	N/A	Sep 2017
IOC	N/A	Sep 2023	N/A	Sep 2023
Total Cost (TY \$M)	N/A	6662.6	N/A	5798.7
Total Quantity	N/A	22	N/A	22
PAUC	N/A	302.845	N/A	263.577

Cost Variance

Summary TY \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Development Estimate)	1911.1	4724.0	27.5	6662.6
Previous Changes				
Economic	+0.5	+8.9	+0.2	+9.6
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-150.2	-91.0	-0.2	-241.4
Other	--	--	--	--
Support	--	-598.1	--	-598.1
Subtotal	-149.7	-680.2	--	-829.9
Current Changes				
Economic	-10.9	+8.7	--	-2.2
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+4.4	-34.8	--	-30.4
Other	--	--	--	--
Support	--	-1.4	--	-1.4
Subtotal	-6.5	-27.5	--	-34.0
Total Changes	-156.2	-707.7	--	-863.9
CE - Cost Variance	1754.9	4016.3	27.5	5798.7
CE - Cost & Funding	1754.9	4016.3	27.5	5798.7

Summary BY 2013 \$M				
Item	RDT&E	Procurement	MILCON	Total
SAR Baseline (Development Estimate)	1860.0	3846.9	28.8	5735.7
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	-148.8	-73.7	-0.2	-222.7
Other	--	--	--	--
Support	--	-482.4	--	-482.4
Subtotal	-148.8	-556.1	-0.2	-705.1
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+3.4	-29.5	--	-26.1
Other	--	--	--	--
Support	--	-1.5	--	-1.5
Subtotal	+3.4	-31.0	--	-27.6
Total Changes	-145.4	-587.1	-0.2	-732.7
CE - Cost Variance	1714.6	3259.8	28.6	5003.0
CE - Cost & Funding	1714.6	3259.8	28.6	5003.0

Previous Estimate: December 2013

RDT&E	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-10.9
Adjustment for current and prior escalation. (Estimating)	+2.8	+2.9
Re-phasing of funds to match current program schedule and implementation of cost reduction initiatives. (Estimating)	-6.5	-6.5
Revised estimate to reflect the application of new outyear escalation indices. (Estimating)	+7.1	+8.0
RDT&E Subtotal	+3.4	-6.5

Procurement	\$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	+8.7
Revised estimate based on contract pricing for LRIP units. (Estimating)	-23.7	-27.5
Adjustment for current and prior escalation (Estimating)	-5.8	-7.3
Decrease in Other Support. (Support)	-1.2	-1.4
Decrease in Initial Spares. (Support)	-0.3	0.0
Procurement Subtotal	-31.0	-27.5

Contracts

Contract Identification

Appropriation: RDT&E
Contract Name: AMDR Engineering and Manufacturing Development
Contractor: Raytheon Company
Contractor Location: 528 Boston Post Road
 Sudbury, MA 01776
Contract Number: N00024-14-C-5315
Contract Type: Cost Plus Incentive Fee (CPIF)
Award Date: October 10, 2013
Definitization Date: October 10, 2013

Contract Price							
Initial Contract Price (\$M)			Current Contract Price (\$M)			Estimated Price At Completion (\$M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
385.7	N/A	0	388.5	N/A	0	394.6	395.5

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to a Request for Equitable Adjustment (REA) contract modification that addressed the delay due to a bid protest. The bid protest was subsequently withdrawn.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2014)	-9.2	-2.9
Previous Cumulative Variances	0.0	0.0
Net Change	-9.2	-2.9

Cost and Schedule Variance Explanations

The unfavorable cumulative cost variance is due to multiple factors, but is primarily due to additional unplanned effort required to complete design and begin manufacturing of the digital receiver/exciter components for the Engineering Development Model (EDM) array. This is partially offset by various tasks underrunning and material efficiencies experienced in multiple control accounts.

The unfavorable cumulative schedule variance is due to delayed completion of digital receiver/exciter design and the temporary suspension of Transmit/Receive Integrated Microwave Module (T/RIMM) manufacturing for the EDM array. T/RIMM manufacturing has since re-started, and the program successfully completed Hardware CDR, experiencing significant schedule recovery in recent months.

EVM data based on Integrated Program Management Report (IPMR) delivered by Raytheon on January 21, 2015 and reflects data through December 31, 2014.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	0	--
Production	0	0	22	0.00%
Total Program Quantity Delivered	0	0	22	0.00%

Expended and Appropriated (TY \$M)			
Total Acquisition Cost	5798.7	Years Appropriated	10
Expended to Date	971.1	Percent Years Appropriated	47.62%
Percent Expended	16.75%	Appropriated to Date	1203.3
Total Funding Years	21	Percent Appropriated	20.75%

The above data is current as of January 30, 2015.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	May 29, 2013
Source of Estimate:	CAPE ICE
Quantity to Sustain:	22
Unit of Measure:	System
Service Life per Unit:	40.00 Years
Fiscal Years in Service:	FY 2021 - FY 2070

Each AMDR System includes four fully populated AMDR-S array faces and a Radar Suite Controller (RSC).

Sustainment Strategy

The planned sustainment strategy for AMDR includes post-delivery routine software maintenance, software updates every two years to address new threats and other emergent capability requirements, Commercial Off The Shelf processing equipment upgrades on an eight year cycle, and a two-level maintenance philosophy (Organization and Depot). AMDR operation and onboard maintenance will be performed by the ship's crew. The ship's operational tempo is assumed to be 180 days on station. Maintenance (preventative and corrective) can occur anytime during the 180 days on station as long as the system is not degraded by the maintenance activity.

Antecedent Information

The antecedent system is AN/SPY-1D(V). AN/SPY-1D(V) has fielded 32 systems, each with a planned service life of 35 years. The source of the cost estimate is the Naval Systems Engineering Directorate - Cost Engineering and Industrial Analysis Division AN/SPY-1D(V) Full Rate Production ICE dated November 14, 2011. The AN/SPY-1D(V) Sustaining Support cost element does not include costs for Operating Equipment Replacement, whereas AMDR does.

Cost Element	Annual O&S Costs BY2013 \$M	
	AMDR Average Annual Cost Per System	AN/SPY-1D(V) (Antecedent) Average Annual Cost Per System
Unit-Level Manpower	--	0.192
Unit Operations	--	--
Maintenance	1.177	2.047
Sustaining Support	2.722	1.047
Continuing System Improvements	0.852	0.204
Indirect Support	--	0.086
Other	--	--
Total	4.751	3.576

Costs above reflect average annual cost per system. For AMDR, Unit-Level Manpower, Unit Operations, and Indirect Support are not reported because they are considered Ship Level Costs. The antecedent column for AN/SPY-1D(V) includes Unit Level Manpower and Indirect Support costs since manpower costs were included in the AN/SPY-1D(V) cost estimate, while for AMDR these costs were captured in the DDG51 costs.

Item	Total O&S Cost \$M			
	AMDR		AN/SPY-1D(V) (Antecedent)	
	Current Development APB Objective/Threshold	Current Estimate		
Base Year	4181.3	4599.4	4181.3	4005.6
Then Year	7857.3	N/A	7857.3	N/A

Objective O&S costs include System Operations and Maintenance, Navy (OMN) (TY \$6,415.1M, BY 2013 \$3,385.7M) and Fleet OMN (TY \$1,442.1M, BY 2013 \$795.6M).

Equation to Translate Annual Cost to Total Cost

Total System O&S [BY 2013 \$4,181.3M] = unitized cost [BY 2013 \$4.751M] * number of systems [22] * service life per system [40].

O&S Cost Variance		
Category	BY 2013 \$M	Change Explanations
Prior SAR Total O&S Estimates - Dec 2013 SAR	4181.3	
Programmatic/Planning Factors	0.0	
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	0.0	
Current Estimate	4181.3	

Disposal Estimate Details

Date of Estimate: May 29, 2013
Source of Estimate: CAPE ICE
Disposal/Demilitarization Total Cost (BY 2013 \$M): Total costs for disposal of all System are 30.2