Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-205

Integrated Air and Missile Defense (IAMD)

As of FY 2019 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

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Sensitivity Originator

No originator info Available at this time.

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
Integrated Air and Missile Defense (IAMD)

DoD Component
Army

Responsible Office

Mr. Michael Chandler
5250 Martin Road
Redstone Arsenal, AL 35898-8000

michael.r.chandler10.civ@mail.mil

Phone: 256-313-3576
Fax: 256-313-3460
DSN Phone: 897-3576
DSN Fax: 897-3460
Date Assigned: November 17, 2014

References

SAR Baseline (Development Estimate)

FY 2011 President's Budget dated February 1, 2010

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated October 8, 2014

Mission and Description

The mission of the Army Integrated Air and Missile Defense (IAMD) Project Office (PO) is to define, develop, acquire, field and sustain the Army's portion of the Joint IAMD System of Systems capability to be deployed as integrated components in Army, Joint, Interagency, Inter-Governmental and Multi-National net-centric architectures. Additionally, the IAMD PO will develop, acquire, field and sustain the IAMD Battle Command System (IBCS) component of the architecture and integrate externally developed sensors and shooters to provide an effective IAMD capability.

The IAMD program will allow transformation to a network-centric system of systems capability, also referred to as "Plug and Fight", that integrates all Air and Missile Defense (AMD) sensors, weapons and mission control. The IAMD program will integrate the Patriot and Improved Sentinel components to support the engagement of air breathing targets, cruise missiles, unmanned aerial vehicles and the tactical ballistic missiles threat. Each sensor and weapon platform will have a "Plug and Fight" interface module which supplies distributed battle management functionality to enable network-centric operations. The IBCS functionality will be incorporated into Air Defense Airspace Management Cells, Air Defense Artillery Brigade Headquarters and Army Air and Missile Defense Command Headquarters.

The common IBCS provides the functional capabilities to control and manage the IAMD sensors and weapons via the Integrated Fire Control Network capability for fire control connectivity and enabling distributed operations. Central to the IAMD program is the IBCS Development Program consisting of the IBCS Major End Items (MEI): the Engagement Operations Center and "Plug and Fight" modules. The development of these MEIs is essential to achieving Army transformation imperatives, connectivity to the Global Interface Grid for Joint operations, obtaining a Joint Single Integrated Air Picture, establishing Engage on Network capabilities, enabling Net-Ready operations for Army AMD components and providing a common Integrated Fire Control capability. This innovative approach at modernization will reduce O&S costs and will enhance training.

Executive Summary

Program Highlights Since Last Report

An IAMD program re-plan was approved by OSD in December 2017 and the program is executing against the revised plan. The IAMD requirements are stable and funding is adequate to meet cost, schedule and performance objectives for the revised program as approved by the DAE on December 13, 2017. In accordance with the ADM, the APB will be updated at Milestone C. The Army continues to monitor the progress and development of IAMD in order to meet the revised performance baseline.

The IAMD Battle Command System (IBCS) EMD Bridge contract was awarded on April 3, 2017. This is an extension of the previous Northrop Grumman IBCS contract.

Soldier Check-Out Event (SCOE) Phase I: On August 25, 2017, soldiers successfully completed the SCOE 3.1 Phase 1, culminating in a 72-hour endurance run at the Tactical System Integration Lab at Tobin Wells, Fort Bliss, Texas. Phase 1 results demonstrated that the software is mature and stable to perform and sustain air battle operations.

SCOE Phase II: On October 21, 2017, the Army IAMD Project Office concluded execution of the SCOE 3.1 Phase II participation in the U.S. Marine Corps (USMC) Weapons and Tactics Instructor live air event at Yuma, Arizona. Army IAMD deployed to a remote and austere new environment and conducted realistic Joint operations for the first time, operating the Integrated Fire Control Network in a congested spectrum under realistic field conditions. The test detachment soldiers were able to conduct Army IAMD Joint Link-16 network participation with the USMC Tactical Air Operations Center. Surveillance operations were conducted in a robust, operationally realistic environment with large red air and blue air contingents, including electronic attack. The IBCS network maintained strong connectivity and tracking in the electronic warfare environment.

The IAMD program re-plan was approved by the DAE on December 13, 2017. The ADM directed the program to update the APB cost and schedule at Milestone C and approved the revision of EMD exit criteria.

There are no significant software-related issues with this program at this time based on the successful SCOE results after the 2016 LUT.

History of Significant Developments Since Program Initiation

History of Significant Developments Since Program Initiation	
Date	**Significant Development Description**
December 2009	Army IAMD Milestone B ADM approved entry into EMD and program initiation. The Milestone B decision resulted in down-select to an IAMD Battle Command System prime contractor award to Northrop Grumman.
February 2012	Army IAMD program restructure ADM was approved. The ADM approved an Army Acquisition Objective increase from 285 to 431. The Army IAMD architecture was expanded to incorporate the brigade combat team's: Air Defense Airspace Management Cell, Air Defense Artillery Brigade, Army Air and Missile Defense Command Headquarters, Indirect Fire Protections Capability / Avenger Battalions and Componentized Patriot system. The ADM approved the program as a designated system for the Defense Exportability Feature pilot program.
November 2012	DAE approved the Army IAMD program restructure APB.
October 2014	DAE approved Army IAMD Change 2 APB. The schedule breach occurred as a result of resourcing priorities in the FY 2015 PB affecting only schedule.
December 2017	In response to a Program Deviation Report submitted for Army IAMD, the DAE approved the program re-plan in an ADM, dated December 13, 2017. The ADM approved the program to update the APB cost and schedule at Milestone C and the revision of the EMD reliability exit criteria.

Threshold Breaches

APB Breaches		
Schedule		☑
Performance		☐
Cost	RDT&E	☑
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☑
Unit Cost	PAUC	☐
	APUC	☐

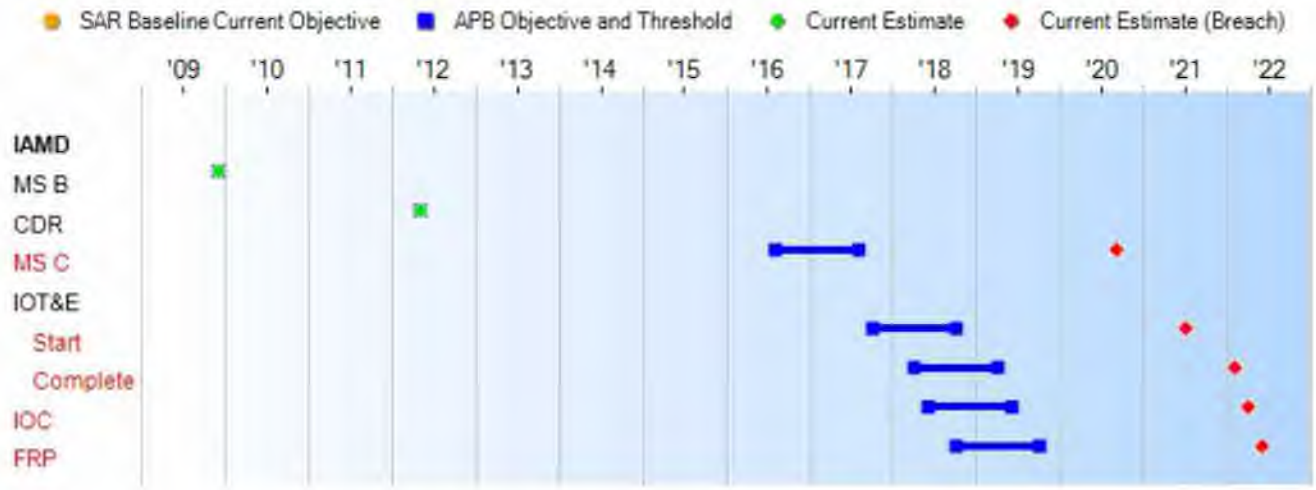
Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

Explanation of Breach

The breaches in this SAR were previously reported in the December 2016 SAR.

Per the December 13, 2017 DAE approved IAMD ADM, the program will update the APB cost and schedule at Milestone C.

Schedule



Schedule Events				
Events	SAR Baseline Development Estimate	Current APB Development Objective/Threshold		Current Estimate
MS B	Dec 2009	Dec 2009	Dec 2009	Dec 2009
CDR	Aug 2011	May 2012	May 2012	May 2012
MS C	Dec 2014	Aug 2016	Aug 2017	Sep 2020[1]
IOT&E				
Start	Jan 2016	Oct 2017	Oct 2018	Jul 2021[1] (Ch-1)
Complete	Jul 2016	Apr 2018	Apr 2019	Feb 2022[1]
IOC	Aug 2016	Jun 2018	Jun 2019	Apr 2022[1]
FRP	May 2017	Oct 2018	Oct 2019	Jun 2022[1]

[1] *APB Breach*

Change Explanations

(Ch-1) The current estimate for the IOT&E Start changed from July 2020 to July 2021 and is an administrative update to the last SAR.

Notes

The IAMD ADM, approved by the DAE on December 13, 2017, directed the program to update the APB at Milestone C. Therefore, the program will continue to report the above breaches until a revised APB is approved.

Acronyms and Abbreviations

CDR - Critical Design Review
IOT&E - Initial Operational Test and Evaluation
MS - Milestone

Performance

Performance Characteristics				
SAR Baseline Development Estimate	**Current APB Development Objective/Threshold**		**Demonstrated Performance**	**Current Estimate**
Net Ready				
The Army IAMD SoS must fully support execution of joint critical operational activities identified in the applicable joint- and system-integrated architectures, and the system must satisfy the technical requirements for transition to Net-Centric military operations to include the following: DISR mandated GIG IT standards and profiles identified in the TV-1 •DISR mandated GIG KIPs identified in the KIP declaration table NCOW RM Enterprise Services •Information assurance requirements including availability, integrity, authenticat-ion, confidential-ity, and non-repudiation, and issuance of an ATO by the DAA •Operationally effective information exchanges •Mission critical performance and information assurance attributes, data correctness, data availability, and consistent data processing specified in the applicable joint- and system-integrated architecture views.	The Army IAMD SoS must fully support execution of all operational activities identified in the applicable joint and system integrated architectures and the system must satisfy the technical requirements for Net-Centric military operations to include the following: DISR mandated GIG IT standards and profiles identified in the TV-1 DISR mandated GIG KIPs identified in the KIP declaration table NCOW RM Enterprise Services IA requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA Operationally effective information exchanges Mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint and system integrated architecture views.	The Army IAMD SoS must fully support execution of joint critical operational activities identified in the applicable joint- and system-integrated architectures, and the system must satisfy the technical requirements for transition to Net-Centric military operations to include the following: DISR mandated GIG IT standards and profiles identified in the TV-1 DISR mandated GIG KIPs identified in the KIP declaration table NCOW RM Enterprise Services IA requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA Operationally effective information exchanges Mission critical performance and IA attributes, data correctness, data availability, and consistent data processing specified in the applicable joint- and system-integrated architecture views.	TBD	The Army IAMD SoS must fully support execution of joint critical operational activities identified in the applicable Joint- and system-integrated architectures, and the system must satisfy the technical requirements for transition to Net-Centric military operations to include the following: DISR mandated GIG IT standards and profiles identified in the TV-1. DISR mandated GIG KIPs identified in the KIP declaration table. NCOW RM Enterprise Services. Information assurance requirements including availability, integrity, authentication, confidentiality, and non-repudiation, and issuance of an ATO by the DAA. Operationally effective information exchanges. Mission critical performance and information assurance attributes, data correctness, data availability, and consistent data

				processing specified in the applicable Joint - and system-integrated architecture views.
Integrated Defense Effectiveness				
To support attainment of a command-er's defense effectiveness objectives, which would normally range from 0.50% to 0.99%, the Army IAMD SoS shall provide flexible interceptor selection and firing doctrine within the Task Force. The Army IAMD SoS-integrated defenses shall enable defeat of non-ballistic and ballistic platforms at times and locations not otherwise available to the commander without an integrated operations capability by exploiting fused organic and non-organic sensor data to execute engage-ments up to the operationally effective range of selected missile kinematics. The Army IAMD SoS shall be capable of allowing greater defense effectiveness for high-priority assets while increasing defense effectiveness to full 360-degree coverage against attacking non-ballistic threats. The Army IAMD SoS defense effectiveness levels shall not degrade and be equal to or greater than the effectiveness levels of fielded TBM and CM/ABT defense systems.	To support attainment of a commander's defense effectiveness objectives, which would normally range from 0.5 to 0.99, the Army IAMD SoS shall provide flexible interceptor selection and firing doctrine within the Task Force. The Army IAMD SoS-integrated defenses shall enable defeat of non-ballistic and ballistic platforms at times and locations not otherwise available to the commander without an integrated operations capability by exploiting fused organic and non-organic sensor data to execute engagements up to the operationally effective range of selected missile kinematics. The Army IAMD SoS shall be capable of allowing greater defense effectiveness for high-priority assets while increasing defense effectiveness to full 360 -degree coverage against attacking non-ballistic threats. The Army IAMD SoS defense effectiveness levels shall not degrade and be equal to or greater than the effectiveness levels of fielded TBM and CM/ABT defense systems.	To support attainment of a commander's defense effectiveness objectives, which would normally range from 0.5 to 0.99, the Army IAMD SoS shall provide flexible interceptor selection and firing doctrine within the Task Force. The Army IAMD SoS-integrated defenses shall enable defeat of non-ballistic and ballistic platforms at times and locations not otherwise available to the commander without an integrated operations capability by exploiting fused organic and non-organic sensor data to execute engagements up to the operationally effective range of selected missile kinematics. The Army IAMD SoS shall be capable of allowing greater defense effectiveness for high-priority assets while increasing defense effectiveness to full 360 -degree coverage against attacking non-ballistic threats. The Army IAMD SoS defense effectiveness levels shall not degrade and be equal to or greater than the effectiveness levels of fielded TBM and CM/ABT defense systems.	TBD	To support attainment of a commander's defense effectiveness objectives, which would normally range from 0.50% to 0.99%, the Army IAMD SoS shall provide flexible interceptor selection and firing doctrine within the Task Force. The Army IAMD SoS-integrated defenses shall enable defeat of non-ballistic and ballistic platforms at times and locations not otherwise available to the commander without an integrated operations capability by exploiting fused organic and non-organic sensor data to execute engagements up to the operationally effective range of selected missile kinematics. The Army IAMD SoS shall be capable of allowing greater defense effectiveness for high -priority assets while increasing defense effectiveness to full 360-degree coverage against attacking non -ballistic threats. The Army IAMD SoS defense effectiveness levels

				shall not degrade and be equal to or greater than the effectiveness levels of fielded TBM and CM/ABT defense systems.
Common Command and Control				
The Army IAMD SoS common C2 components (Battalion and below) shall incorporate common functionality that includes: defense planning, defense design, warfighter-machine interface, battle monitor and control, network interface and manage-ment, track manage-ment, engagement planning, engagement decision, engagement monitoring, and staff functions. The Army IAMD SoS shall provide backward compatibility to enable integration and common functionality (as defined above) of a current force Patriot Battery/SLAMRAAM Platoon with the Increment 2 equipped Task Force.	The Army IAMD SoS common C2 components (Battalion and below) shall incorporate common functionality that includes: defense planning, defense design, warfighter-machine interface, battle monitor and control, network interface and management, track management, engagement planning, engagement decision, engagement monitoring, and staff functions. The Army IAMD SoS shall provide backward compatibility to enable integration and common functionality (as defined above) of a current force Patriot Battery/SLAMRAAM Platoon with the Increment 2 equipped Task Force.	The Army IAMD SoS common C2 components (Battalion and below) shall incorporate common functionality that includes: defense planning, defense design, warfighter-machine interface, battle monitor and control, network interface and management, track management, engagement planning, engagement decision, engagement monitoring, and staff functions. The Army IAMD SoS shall provide backward compatibility to enable integration and common functionality (as defined above) of a current force Patriot Battery/SLAMRAAM Platoon with the Increment 2 equipped Task Force.	TBD	The Army IAMD SoS common C2 components (Battalion and below) shall incorporate common functionality that includes: defense planning, defense design, warfighter-machine interface, battle monitor and control, network interface and management, track management, engagement planning, engagement decision, engagement monitoring, and staff functions. The Army IAMD SoS shall provide backward compatibility to enable integration and common functionality (as defined above) of a current force PATRIOT Battery/ SLAMRAAM Platoon with the Increment 2 equipped Task Force.
Material Availability				
The Army IAMD SoS C2 shall achieve an Operational Availability (Ao) of at least 95%.	The Army IAMD SoS common C2 shall achieve an Ao 99%.	The Army IAMD SoS common C2 shall achieve an Ao of at least 95%.	TBD	The Army IAMD SoS C2 shall achieve an Ao of at least 95%.
Force Protection and Survivability				
The Army IAMD SoS common C2 equipment shall be designed to be	All Army IAMD SoS common C2 vehicle cabs and manned	The Army IAMD SoS common C2 equipment shall be designed to be	TBD	The Army IAMD SoS common C2 equipment shall be

operated by Soldiers wearing body armor and equipped with appropriate weapons; shall have situational awareness and under-standing commens-urate with the supported force; will report the position and ID of all Army IAMD SoS system into the COP and BFT nets; shall be operable by Soldiers in MOPP 4; and shall survive decontami-nation procedures in such a manner that it can quickly return (within 30 minutes) to full operational capability. All Army IAMD SoS common C2 vehicle cabs shall be capable of adding up-armor protection sufficient to repel enemy small arms as developed by the PM, FMTV. Manned rigid wall shelters incorporated into the Army IAMD SoS shall provide an active overpressure system to prevent contaminat-ion during a CBRNE event that is sustainable through decontami-nation.	shelters shall be capable of adding up-armor protection sufficient to repel enemy small arms as developed by the PM, FMTV. All equipment manned during transport or operations shall mitigate the effects of 7.62mm rounds and below.	operated by Soldiers wearing body armor and equipped with appropriate weapons; shall have situational awareness and understanding commensurate with the supported force; will report the position and ID of all Army IAMD SoS system into the COP and BFT nets; shall be operable by Soldiers in MOPP 4; and shall survive decontamination procedures in such a manner that it can quickly return (within 30 min) to full operational capability. All Army IAMD SoS common C2 vehicle cabs shall be capable of adding up-armor protection sufficient to repel enemy small arms as developed by the PM, FMTV. Manned rigid wall shelters incorporated into the Army IAMD SoS shall provide an active overpressure system to prevent contamination during a CBRNE event that is sustainable through decontamination.		designed to be operated by soldiers wearing body armor and equipped with appropriate weapons; shall have situational awareness and understanding commensurate with the supported force; will report the position and ID of all Army IAMD SoS system into the COP and BFT nets; shall be operable by soldiers in MOPP 4; and shall survive decontamination procedures in such a manner that it can quickly return (within 30 min) to full operational capability. All Army IAMD SoS common C2 vehicle cabs shall be capable of adding up-armor protection sufficient to repel enemy small arms as developed by PM FMTV. Manned rigid wall shelters incorporated into the Army IAMD SoS shall provide an active overpressure system to prevent contamination during a CBRNE event that is sustainable through decontamination.

Requirements Reference

CDD dated May 17, 2010

Change Explanations

None

Notes

The Common Command and Control KPP no longer includes SLAMRAAM backward compatibility. This change will be reflected in the approved CPD supporting Milestone C.

Acronyms and Abbreviations

ABT - Air Breathing Threat
Ao - Operational Availability
ATO - Approval to Operate
BFT - Blue Force Tracking
C2 - Command and Control
CBRNE - Chemical, Biological, Radiological, Nuclear and High Yield Explosives
CM - Cruise Missile
COP - Common Operating Picture
DAA - Designated Approval Authority
DISR - DoD Information Technology Standards Registry
FMTV - Family of Medium Tactical Vehicles
GIG - Global Information Grid
IA - Information Assurance
ID - Identification
IT - Information Technology
KIP - Key Information Profile
min - minute
mm - millimeter
MOPP - Mission Oriented Protective Posture
NCOW RM - Net-Centric Operations and Warfare Reference Model
SLAMRAAM - Surface-Launched Advanced Medium Range Air-to-Air Missile
SoS - System of Systems
TBM - Tactical Ballistic Missile
TV - Technical View, Standards Profile

Track to Budget

RDT&E

Appn	BA	PE
Army	2040 04	0603327A

Project	Name	
S34	AMD System of Systems Engineering and Integration	(Sunk)

Appn	BA	PE
Army	2040 05	0605457A

Project	Name	
DU4	Advanced Electronic Protection Enhancements	(Sunk)
S40	Army Integrated Air and Missile Defense	

Notes: Army IAMD Project Office EMD program funding began in FY 2011.

Procurement

Appn	BA	PE
Army	2035 02	0214400A

Line Item	Name
BZ5075	IAMD Battle Command System

Acq O&M

Appn	BA	PE
Army	2020 04	0702806A

Subactivity Group	Name	
435	Acquisition and Management Support: IAMD	(Shared)

Cost and Funding

Cost Summary

Total Acquisition Cost							
Appropriation	BY 2009 $M			BY 2009 $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	1540.6	2199.5	2419.5	2858.8[1]	1627.5	2402.6	3186.4
Procurement	3316.0	3174.8	3492.3	3340.6	4164.1	3939.2	4532.1
Flyaway	--	--	--	3241.7	--	--	4396.6
Recurring	--	--	--	3237.7	--	--	4392.0
Non Recurring	--	--	--	4.0	--	--	4.6
Support	--	--	--	98.9	--	--	135.5
Other Support	--	--	--	0.0	--	--	0.0
Initial Spares	--	--	--	98.9	--	--	135.5
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	54.2	0.0	0.0	72.4
Total	4856.6	5374.3	N/A	6253.6	5791.6	6341.8	7790.9

[1] *APB Breach*

Current APB Cost Estimate Reference

CAPE ICE dated June 07, 2012

Cost Notes

In accordance with section 842 of the National Defense Authorization Act for FY 2017, which amended title 10 U.S.C. § 2334, the Director of Cost Assessment and Program Evaluation, and the Secretary of the military department concerned or the head of the Defense Agency concerned, must issue guidance requiring a discussion of risk, the potential impacts of risk on program costs, and approaches to mitigate risk in cost estimates for MDAPs and major subprograms. The information required by the guidance is to be reported in each SAR. This guidance is not yet available; therefore, the information on cost risk is not contained in this SAR.

Beginning in FY 2019, the Army realigned direct civilian personnel pay costs from RDT&E and Procurement investment accounts to O&M to provide additional transparency and auditability.

Total Quantity			
Quantity	SAR Baseline Development Estimate	Current APB Development	Current Estimate
RDT&E	11	16	25
Procurement	285	431	454
Total	296	447	479

Quantity Notes

The IAMD Unit of Measure is defined as 25 Fully Configured RDT&E units and 454 IAMD Battle Command Systems Procurement Quantities which enable system of systems operation of Air and Missile Defense units.

Cost and Funding

Funding Summary

Appropriation Summary FY 2019 President's Budget / December 2017 SAR (TY$ M)									
Appropriation	Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	To Complete	Total
RDT&E	2144.3	336.4	277.6	200.3	130.9	63.7	33.2	0.0	3186.4
Procurement	20.9	0.0	0.0	72.3	323.7	428.6	498.0	3188.6	4532.1
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	5.0	5.1	5.2	5.3	5.4	46.4	72.4
PB 2019 Total	2165.2	336.4	282.6	277.7	459.8	497.6	536.6	3235.0	7790.9
PB 2018 Total	2379.7	336.4	290.3	517.5	504.5	578.0	536.3	2558.6	7701.3
Delta	-214.5	0.0	-7.7	-239.8	-44.7	-80.4	0.3	676.4	89.6

Quantity Summary FY 2019 President's Budget / December 2017 SAR (TY$ M)										
Quantity	Undistributed	Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	To Complete	Total
Development	25	0	0	0	0	0	0	0	0	25
Production	0	0	0	0	11	22	45	50	326	454
PB 2019 Total	25	0	0	0	11	22	45	50	326	479
PB 2018 Total	25	12	0	0	27	41	54	53	267	479
Delta	0	-12	0	0	-16	-19	-9	-3	59	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding 2040 | RDT&E | Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2006	--	--	--	--	--	--	23.7
2007	--	--	--	--	--	--	36.3
2008	--	--	--	--	--	--	48.0
2009	--	--	--	--	--	--	114.7
2010	--	--	--	--	--	--	164.7
2011	--	--	--	--	--	--	246.7
2012	--	--	--	--	--	--	262.0
2013	--	--	--	--	--	--	247.4
2014	--	--	--	--	--	--	358.2
2015	--	--	--	--	--	--	147.3
2016	--	--	--	--	--	--	222.1
2017	--	--	--	--	--	--	273.2
2018	--	--	--	--	--	--	336.4
2019	--	--	--	--	--	--	277.6
2020	--	--	--	--	--	--	200.3
2021	--	--	--	--	--	--	130.9
2022	--	--	--	--	--	--	63.7
2023	--	--	--	--	--	--	33.2
Subtotal	25	--	--	--	--	--	3186.4

Annual Funding 2040 | RDT&E | Research, Development, Test, and Evaluation, Army							
Fiscal Year	Quantity	BY 2009 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2006	--	--	--	--	--	--	24.8
2007	--	--	--	--	--	--	37.1
2008	--	--	--	--	--	--	48.1
2009	--	--	--	--	--	--	113.4
2010	--	--	--	--	--	--	160.5
2011	--	--	--	--	--	--	235.7
2012	--	--	--	--	--	--	246.5
2013	--	--	--	--	--	--	228.9
2014	--	--	--	--	--	--	325.2
2015	--	--	--	--	--	--	131.6
2016	--	--	--	--	--	--	196.6
2017	--	--	--	--	--	--	237.9
2018	--	--	--	--	--	--	288.6
2019	--	--	--	--	--	--	234.7
2020	--	--	--	--	--	--	166.1
2021	--	--	--	--	--	--	106.4
2022	--	--	--	--	--	--	50.8
2023	--	--	--	--	--	--	25.9
Subtotal	25	--	--	--	--	--	2858.8

Annual Funding 2035 | Procurement | Other Procurement, Army							
Fiscal Year	Quantity	TY $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	16.3	--	4.6	20.9	--	20.9
2017	--	--	--	--	--	--	--
2018	--	--	--	--	--	--	--
2019	--	--	--	--	--	--	--
2020	11	72.3	--	--	72.3	--	72.3
2021	22	319.8	--	--	319.8	3.9	323.7
2022	45	412.6	--	--	412.6	16.0	428.6
2023	50	484.7	--	--	484.7	13.3	498.0
2024	50	444.7	--	--	444.7	15.0	459.7
2025	43	468.1	--	--	468.1	13.5	481.6
2026	39	479.2	--	--	479.2	13.7	492.9
2027	39	477.7	--	--	477.7	13.9	491.6
2028	66	449.3	--	--	449.3	14.0	463.3
2029	54	468.3	--	--	468.3	13.0	481.3
2030	35	240.2	--	--	240.2	13.6	253.8
2031	--	58.8	--	--	58.8	5.6	64.4
Subtotal	454	4392.0	--	4.6	4396.6	135.5	4532.1

Annual Funding 2035 | Procurement | Other Procurement, Army							
Fiscal Year	Quantity	BY 2009 $M					
		End Item Recurring Flyaway	Non End Item Recurring Flyaway	Non Recurring Flyaway	Total Flyaway	Total Support	Total Program
2016	--	14.4	--	4.0	18.4	--	18.4
2017	--	--	--	--	--	--	--
2018	--	--	--	--	--	--	--
2019	--	--	--	--	--	--	--
2020	11	59.2	--	--	59.2	--	59.2
2021	22	256.8	--	--	256.8	3.2	260.0
2022	45	324.9	--	--	324.9	12.6	337.5
2023	50	374.1	--	--	374.1	10.3	384.4
2024	50	336.5	--	--	336.5	11.4	347.9
2025	43	347.3	--	--	347.3	10.0	357.3
2026	39	348.6	--	--	348.6	9.9	358.5
2027	39	340.7	--	--	340.7	9.9	350.6
2028	66	314.1	--	--	314.1	9.8	323.9
2029	54	321.0	--	--	321.0	8.9	329.9
2030	35	161.4	--	--	161.4	9.2	170.6
2031	--	38.7	--	--	38.7	3.7	42.4
Subtotal	454	3237.7	--	4.0	3241.7	98.9	3340.6

Cost Quantity Information 2035 | Procurement | Other Procurement, Army		
Fiscal Year	**Quantity**	**End Item Recurring Flyaway (Aligned With Quantity) BY 2009 $M**
2016	--	--
2017	--	--
2018	--	--
2019	--	--
2020	11	73.6
2021	22	256.8
2022	45	324.9
2023	50	374.1
2024	50	336.5
2025	43	347.3
2026	39	348.6
2027	39	340.7
2028	66	314.1
2029	54	321.0
2030	35	200.1
2031	--	--
Subtotal	454	3237.7

Annual Funding 2020 | Acq O&M | Operation and Maintenance, Army	
Fiscal Year	TY $M
	Total Program
2019	5.0
2020	5.1
2021	5.2
2022	5.3
2023	5.4
2024	5.6
2025	5.7
2026	5.7
2027	5.8
2028	5.8
2029	5.9
2030	5.9
2031	6.0
Subtotal	72.4

Annual Funding 2020 | Acq O&M | Operation and Maintenance, Army	
Fiscal Year	BY 2009 $M
	Total Program
2019	4.2
2020	4.2
2021	4.2
2022	4.2
2023	4.2
2024	4.3
2025	4.3
2026	4.2
2027	4.2
2028	4.1
2029	4.1
2030	4.0
2031	4.0
Subtotal	54.2

Low Rate Initial Production

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	12/23/2009	12/13/2017
Approved Quantity	27	33
Reference	Milestone B ADM	IAMD ADM
Start Year	2015	2020
End Year	2016	2021

Foreign Military Sales

Notes

The IAMD program office received a Letter of Request (LOR) for Letter of Agreement from Poland for IAMD Battle Command System. A Yockey Waiver was approved for the program such that a response can be provided. The LOR includes a request for Patriot components.

The program also received an LOR for Pricing and Availability from Japan. A Yockey Waiver is in process for this action.

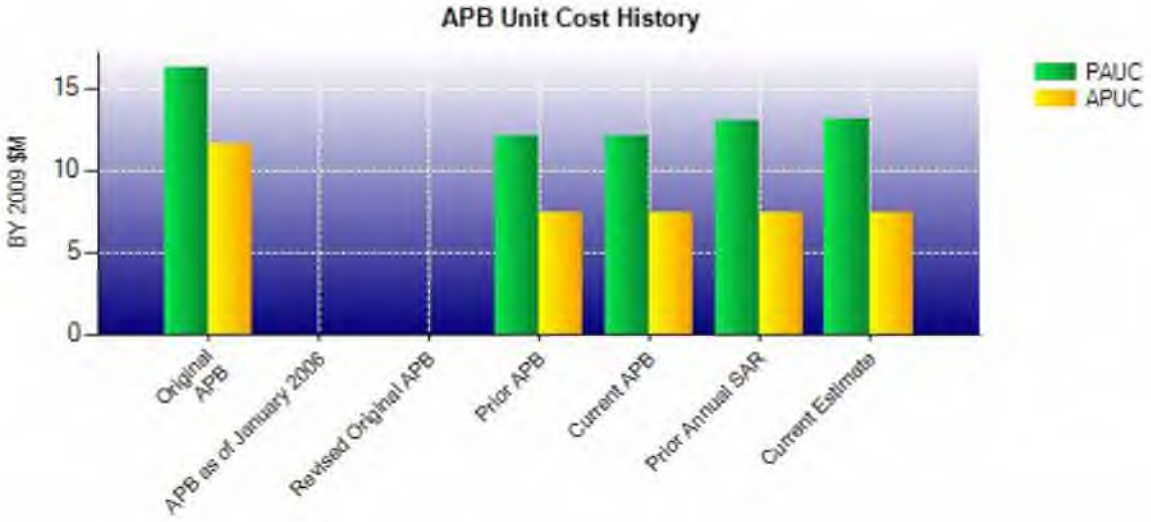
Nuclear Costs

None

Unit Cost

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2009 $M Current UCR Baseline (Oct 2014 APB)	BY 2009 $M Current Estimate (Dec 2017 SAR)	% Change
Program Acquisition Unit Cost			
Cost	5374.3	6253.6	
Quantity	447	479	
Unit Cost	12.023	13.056	+8.59
Average Procurement Unit Cost			
Cost	3174.8	3340.6	
Quantity	431	454	
Unit Cost	7.366	7.358	-0.11

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Item	BY 2009 $M Original UCR Baseline (Jun 2010 APB)	BY 2009 $M Current Estimate (Dec 2017 SAR)	% Change
Program Acquisition Unit Cost			
Cost	4806.8	6253.6	
Quantity	296	479	
Unit Cost	16.239	13.056	-19.60
Average Procurement Unit Cost			
Cost	3316.0	3340.6	
Quantity	285	454	
Unit Cost	11.635	7.358	-36.76



APB Unit Cost History					
Item	Date	BY 2009 $M		TY $M	
		PAUC	APUC	PAUC	APUC
Original APB	Jun 2010	16.239	11.635	19.382	14.611
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	Nov 2012	12.023	7.366	14.187	9.140
Current APB	Oct 2014	12.023	7.366	14.187	9.140
Prior Annual SAR	Dec 2016	13.019	7.463	16.078	9.944
Current Estimate	Dec 2017	13.056	7.358	16.265	9.983

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY $M)									
PAUC Development Estimate	Changes								PAUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
19.566	0.074	-2.176	0.369	0.356	0.212	0.000	-2.136	-3.301	16.265

Current SAR Baseline to Current Estimate (TY $M)									
Initial APUC Development Estimate	Changes								APUC Current Estimate
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
14.611	0.104	-0.080	0.389	0.000	-2.787	0.000	-2.254	-4.628	9.983

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	Dec 2009	N/A	Dec 2009
Milestone C	N/A	Dec 2014	N/A	Sep 2020
IOC	N/A	Aug 2016	N/A	Apr 2022
Total Cost (TY $M)	N/A	5791.6	N/A	7790.9
Total Quantity	N/A	296	N/A	479
PAUC	N/A	19.566	N/A	16.265

Cost Variance

Summary TY $M					
Item	RDT&E	Procurement	MILCON	Acq O&M	Total
SAR Baseline (Development Estimate)	1627.5	4164.1	--	--	5791.6
Previous Changes					
Economic	+2.5	+86.5	--	--	+89.0
Quantity	+105.9	+2432.3	--	--	+2538.2
Schedule	--	+73.2	--	--	+73.2
Engineering	+170.6	--	--	--	+170.6
Estimating	+1280.2	-1209.5	--	--	+70.7
Other	--	--	--	--	--
Support	--	-1032.0	--	--	-1032.0
Subtotal	+1559.2	+350.5	--	--	+1909.7
Current Changes					
Economic	-14.5	-39.1	--	--	-53.6
Quantity	--	--	--	--	--
Schedule	--	+103.5	--	--	+103.5
Engineering	--	--	--	--	--
Estimating	+14.2	-55.8	--	+72.4	+30.8
Other	--	--	--	--	--
Support	--	+8.9	--	--	+8.9
Subtotal	-0.3	+17.5	--	+72.4	+89.6
Total Changes	+1558.9	+368.0	--	+72.4	+1999.3
CE - Cost Variance	3186.4	4532.1	--	72.4	7790.9
CE - Cost & Funding	3186.4	4532.1	--	72.4	7790.9

Summary BY 2009 $M					
Item	RDT&E	Procurement	MILCON	Acq O&M	Total
SAR Baseline (Development Estimate)	1540.6	3316.0	--	--	4856.6
Previous Changes					
Economic	--	--	--	--	--
Quantity	+89.1	+1723.6	--	--	+1812.7
Schedule	--	-2.7	--	--	-2.7
Engineering	+148.7	--	--	--	+148.7
Estimating	+1069.4	-849.2	--	--	+220.2
Other	--	--	--	--	--
Support	--	-799.5	--	--	-799.5
Subtotal	+1307.2	+72.2	--	--	+1379.4
Current Changes					
Economic	--	--	--	--	--
Quantity	--	--	--	--	--
Schedule	--	--	--	--	--
Engineering	--	--	--	--	--
Estimating	+11.0	-50.4	--	+54.2	+14.8
Other	--	--	--	--	--
Support	--	+2.8	--	--	+2.8
Subtotal	+11.0	-47.6	--	+54.2	+17.6
Total Changes	+1318.2	+24.6	--	+54.2	+1397.0
CE - Cost Variance	2858.8	3340.6	--	54.2	6253.6
CE - Cost & Funding	2858.8	3340.6	--	54.2	6253.6

Previous Estimate: December 2016

RDT&E	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-14.5
Revised estimate for test and integration efforts resulting from test plan adjustments. (Estimating)	+11.8	+15.4
Adjustment for current and prior escalation. (Estimating)	+4.6	+5.3
Revised estimate to reflect the Army's realignment of direct civilian pay costs from RDT&E investment account to O&M to provide additional transparency and auditability. (Estimating)	-5.4	-6.5
RDT&E Subtotal	+11.0	-0.3

Procurement	$M	
Current Change Explanations	Base Year	Then Year
Revised escalation indices. (Economic)	N/A	-39.1
Stretch-out of procurement buy profile from FY 2030 to FY 2031 to align with fielding synchronization efforts. (Schedule)	0.0	+103.5
Adjustment for current and prior escalation. (Estimating)	+1.0	+1.2
Revised estimate for IAMD Battle Command System components resulting from design maturation. (Estimating)	-3.0	+8.9
Revised estimate to reflect the Army's realignment of direct civilian pay costs from Procurement investment account to O&M to provide additional transparency and auditability. (Estimating)	-48.4	-65.9
Increase in Initial Spares due to design maturation. (Support)	+2.8	+8.9
Procurement Subtotal	-47.6	+17.5

Acq O&M	$M	
Current Change Explanations	Base Year	Then Year
Revised estimate to reflect the Army's realignment of direct civilian pay costs from RDT&E and Procurement investment accounts to O&M to provide additional transparency and auditability. (Estimating)	+54.2	+72.4
Acq O&M Subtotal	+54.2	+72.4

Contracts

Contract Identification

Appropriation: RDT&E
Contract Name: IBCS EMD Bridge
Contractor: Northrop Grumman
Contractor Location: Huntsville, AL 35806
Contract Number: W31P4Q-08-C-0418/1
Contract Type: Cost Plus Incentive Fee (CPIF)
Award Date: April 03, 2017
Definitization Date: April 03, 2017

Contract Price							
Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price At Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
48.1	N/A	11	92.9	N/A	11	88.6	88.6

Target Price Change Explanation

The difference between the Initial Contract Price Target and the Current Contract Price Target is due to a modification to extend the IAMD Battle Command System Program period of performance from October 2017 to February 2018 and added scope for the remainder of the v4.5 software requirements.

Contract Variance		
Item	Cost Variance	Schedule Variance
Cumulative Variances To Date (12/31/2017)	-1.8	-3.6
Previous Cumulative Variances	--	--
Net Change	-1.8	-3.6

Cost and Schedule Variance Explanations

The unfavorable cumulative cost variance is due to the identification of approximately 19 Field Engineering Changes during the Soldier Checkout Events. These changes were incorporated into the 4.0.2 engineering release.

The unfavorable cumulative schedule variance is due to an updated requirements walkthrough process and recovery plan developed and executed to address technical concerns.

Notes

This is the first time this contract is being reported.

Deliveries and Expenditures

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	16	16	25	64.00%
Production	0	0	454	0.00%
Total Program Quantity Delivered	16	16	479	3.34%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	7790.9	Years Appropriated	13
Expended to Date	2077.5	Percent Years Appropriated	50.00%
Percent Expended	26.67%	Appropriated to Date	2501.6
Total Funding Years	26	Percent Appropriated	32.11%

The above data is current as of February 12, 2018.

Operating and Support Cost

Cost Estimate Details

Date of Estimate:	January 19, 2018
Source of Estimate:	POE
Quantity to Sustain:	454
Unit of Measure:	EOC
Service Life per Unit:	20.00 Years
Fiscal Years in Service:	FY 2021 - FY 2051

The difference in the acquisition quantity of 479 and the sustainment quantity of 454 is due to 25 RDT&E prototypes that will not be sustained.

An IAMD Engagement Operations Center (EOC) provides common mission command through an IAMD Battle Command System with full Engagement Operations/Force Operations capability.

Sustainment Strategy

IAMD will be supported by a combination of Army organic and contractor-provided resources through a Performance Based Logistics (PBL) Product Support Strategy (PSS). Under PBL sustainment constructs, the IAMD Project Office will utilize performance based sustainment methods and performance metrics which will include a Public-Private Partnership. The sustainment decision is the result of a Product Support Business Case Analysis. The IAMD PBL PSS provides a sustainment level product support decision that will provide the human interface, tools and resources needed to sustain the IAMD equipment throughout its life cycle.

Antecedent Information

No Antecedent

Annual O&S Costs BY2009 $K		
Cost Element	**IAMD Average Annual Cost Per EOC**	**No Antecedent System (Antecedent)**
Unit-Level Manpower	0.000	--
Unit Operations	13.055	--
Maintenance	168.266	--
Sustaining Support	8.037	--
Continuing System Improvements	192.442	--
Indirect Support	0.000	--
Other	0.000	--
Total	381.800	--

Item	Total O&S Cost $M			
	IAMD			No Antecedent System (Antecedent)
	Current Development APB Objective/Threshold		Current Estimate	
Base Year	2235.9	2459.5	3467.0[1]	N/A
Then Year	3333.3	N/A	5993.4	N/A

[1] *APB O&S Cost Breach*

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

The O&S cost breach reflects Army IAMD hardware architecture changes, quantity increases to support the Indirect Fire Protection Capability Increment 2 - Intercept Block 1 program and an update of the Army IAMD PSS.

Equation to Translate Annual Cost to Total Cost

Average annual cost per unit is based on 454 units x 20-years of O&S. (Total Cost = Average Annual Cost per unit ($381.8K) x number of units (454) x life per unit (20-years) = $3,467.0M (BY$ 2009)

O&S Cost Variance		
Category	**BY 2009 $M**	**Change Explanations**
Prior SAR Total O&S Estimates - Dec 2016 SAR	3375.9	
Programmatic/Planning Factors	0.0	
Cost Estimating Methodology	9.8	Revised cost estimate for consumables, repair parts and maintenance resulting from design maturation.
Cost Data Update	81.3	Revised cost estimate for unit operations, maintenance, sustaining support and continuing system improvement cost estimating relationships.
Labor Rate	0.0	
Energy Rate	0.0	
Technical Input	0.0	
Other	0.0	
Total Changes	91.1	
Current Estimate	3467.0	

Disposal Estimate Details

Date of Estimate: January 19, 2018

Source of Estimate: POE

Disposal/Demilitarization Total Cost (BY 2009 $M): Total costs for disposal of all EOC are 26.8