Selected Acquisition Report (SAR)

Integrated Air and Missile Defense (IAMD)

FY 2024 President's Budget

Defense Acquisition Visibility Environment (DAVE)

Table of Contents

Acronyms and Abbreviations 3
Program Information 5
Responsible Office 5
Mission and Description 6
Executive Summary 7
Schedule 8
Performance 9
Acquisition Budget Estimate 18
Unit Cost 20
Risks 21
Low Rate Initial Production 22
Contracts 23
Deliveries and Expenditures 28
Operating and Support Costs 29

Common Acronyms and Abbreviations

$B - Billions of Dollars
$K - Thousands of Dollars
$M - Millions of Dollars
ACAT - Acquisition Category
Acq O&M - Acquisition-Related Operations and Maintenance
ADM - Acquisition Decision Memorandum
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
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
FMS - Foreign Military Sales
FOC - Full Operational Capability
FRP - Full Rate Production
FY - Fiscal Year
FYDP - Future Years Defense Program
ICE - Independent Cost Estimate
Inc - Increment
IOC - Initial Operational Capability
JROC - Joint Requirements Oversight Council
KPP - Key Performance Parameter
LRIP - Low Rate Initial Production
MDA - Milestone Decision Authority
MDAP - Major Defense Acquisition Program
MILCON - Military Construction
N/A - Not Applicable
O&M - Operations and Maintenance
O&S - Operating and Support
ORD - Operational Requirements Document
OSD - Office of the Secretary of Defense
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
U.S. - United States
UCR - Unit Cost Reporting
USD(A&S) - Under Secretary of Defense (Acquisition and Sustainment)
USD(AT&L) - Under Secretary of Defense (Acquisition, Technology and Logistics)

Program Information

Program Name

Integrated Air and Missile Defense

DoD Component

Army

Responsible Office

Program Manager

Name: COL Christopher Hill, Sr.
Phone: +1 (256) 313-3576
Email: christopher.m.hill36.mil@army.mil

Mission and Description

Program Mission & Description:
The Army Integrated Air and Missile Defense (IAMD) program is a direct response to the U.S. Army Air and Missile Defense (AMD) Concept and Operational and Organizational Plan for the Future Force, the Army IAMD System of Systems (SoS) Capability Development Document (CDD) and the AMD Task Force Concept of Operations. The IAMD program is uniquely structured to enable the development of an overarching SoS capability with all participating Air Defense Artillery components functioning interdependently to provide total operational capabilities not achievable by the individual element systems. The IAMD program achieves this objective by establishing the IAMD architecture and developing (1) the Integrated Battle Command Systems (IBCS) Engagement Operations Center (EOC) that provides the common mission command capability, (2) the Integrated Fire Control Relay capability for fire control connectivity and distributed operations, and (3) the common Plug and Fight (P&F) Kits that network enable multiple sensor components, weapon components, and the IBCS EOC. The IAMD program will provide advanced capabilities to the Army and the Soldier by allowing transformation to a network-centric SoS capability that integrates AMD sensors and weapons with the IBCS EOC. The IAMD SoS architecture will enable extended range and non-line-of-sight engagements, to include joint kill chain engagements across the full spectrum of aerial threats, providing fire control quality data to the most appropriate weapon to complete the mission successfully. Further, it will mitigate the coverage gaps and the single points of failure that plagued AMD design in the past. The IAMD program will provide the user with the ability to train on a single IBCS that will result in overall training savings. The IAMD program will provide the Army with the ability to procure components that interface with the Integrated Fire Control Network, alleviating the cost of procuring total system capabilities in the future.

Executive Summary

IAMD

Program Highlights Since Last Report

The IAMD requirement is stable, and funding is adequate to meet cost, schedule, and performance baselines. Risk did not increase since the last SAR.

The Defense Acquisition Executive (DAE) approved Milestone C for IAMD on January 11, 2021. The Army IAMD Production Acquisition Program Baseline (APB) was approved by the DAE on April 20, 2021.

IAMD conducted Initial Operating Test and Evaluation (IOT&E) in two phases. Phase 1 was conducted from January - March 2022 with Program Increment (PI) 7 software. It consisted of Missile Flight Tests (MFT) 1 and 2, which were completed at White Sands Missile Range (WSMR) on March 12 and 16, 2022, respectively. IOT&E Operational Test Readiness Review (OTRR) 3b was completed August 19, 2022. Phase 2 was conducted August - October 2022 with PI 10. Phase 2 included Software/Hardware in the Loop, MFT-3, and Live Air phases. Emerging results of IOT&E indicate MFT-3 met test objectives; however, target anomalies and network issues prevented engagements. The results of IOT&E will inform the FRP decision and IOC in 2023.

The IBCS Agile Software Development contract was awarded on April 14, 2022, which provides Agile software development capability to deliver continued software-based improvements and capability enhancement to its Air and Missile Defense (AMD) integration network that supports various Army systems.

IBCS was granted a three-year Authority to Operate (ATO) through August 9, 2025. This ATO will support ongoing operational testing, fielding, and event support while providing a functional, secure, survivable, resilient solution to the warfighter.
On November 17, 2022, IBCS successfully conducted two flight tests at WSMR, which included the first IBCS Missile Flight Test with no Patriot Radar providing tracking or missile updates.

On November 28, 2022, a contract modification was executed on the IBCS LRIP/FRP contract. The modification added additional LRIP Major End Item Quantities, added Logistics training and fielding efforts associated with the additional LRIP quantities and extended the period of performance overall services through December 2025.

History of Significant Developments Since Program Initiation

History of Significant Developments Since Program Initiation	
Date	**Significant Development Description**
Sep - 2021	DAE approved the IAMD Software Pathway Execution and Low Rate Initial Production Re-Characterization Acquisition Decision Memorandum (ADM). The ADM authorizes entry into the Software Acquisition Pathway Execution Phase and re-characterizes the IBCS FY 2022 quantity (26 IBCS EOCs) as LRIP versus FRP.
Apr - 2021	The DAE approved the Army IAMD Production APB.
Jan - 2021	The DAE approved Milestone C for IAMD on January 11, 2021, which authorized entry into P&D, execution of an LRIP quantity of 19 Engagement Operations Centers (EOCs), established the exit criteria necessary to complete LRIP, and approved entry into the Software Acquisition pathway planning phase for Army IAMD software related efforts while the remainder of the IAMD program continues to follow the Major Capability Acquisition pathway.
Dec - 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 validated the Army Acquisition Objective of 454, approved the program to update the APB cost and schedule at Milestone C, and approved the revision of the EMD reliability exit criteria.
Oct - 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.
Nov - 2012	DAE approved the Army IAMD program restructure APB.

Feb - 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.
Dec - 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.

Schedule

IAMD

Events	Milestone Baseline Objective	Current Baseline Objective/Threshold		Current Estimate/Actual	Deviation
MS B Complete	Dec 2009	Dec 2009	Dec 2009	Dec 2009	
CDR Complete	May 2012	May 2012	May 2012	May 2012	
MS C Complete	Jan 2021	Jan 2021	Jan 2021	Jan 2021	
IOT&E-Start	Mar 2021	Mar 2021	Mar 2022	Mar 2021	
IOT&E-Complete	Mar 2022	Mar 2022	Mar 2023	Oct 2022	
IOC Complete	Apr 2022	Apr 2022	Apr 2023	Apr 2023	
FRP Complete	Dec 2022	Dec 2022	Dec 2023	Apr 2023	

Notes

None.

Deviation Explanation

Performance

IAMD

Performance Attributes					
Current Objective	**Current Threshold**	**Current Estimate**	**Deviation (Y/N)**	**Demonstrated Performance**	**Date**
Attribute Title:				KPP	
Net Ready (NR)	Army IAMD SoS shall meet the requirements for supporting military operations, entering, and being managed on networks, and effectively exchanging information as specified in the NR Attributes Table 5.2.3. Army IAMD developed systems/sub-systems shall enter and exit the networks without interrupting, disrupting nor degrading overall network capability or interrupting nor disrupting AMD operations.	Meets objective with limitations until full Joint Interoperability Testing (JIT) certification is received. Army IAMD demonstrated significant high-level Link 16 (L16) capabilities within Program Increment (PI)-7.4e and PI-10.4, which will be used to request an Interim Certificate to Operate (ICTO) on Joint networks. The Agile development cycle supports continued L16 maturation in subsequent Program Increments to ensure Service Level and Joint certification. Army IAMD SoS shall meet the requirements for supporting military operations, entering, and being managed on networks, and effectively exchanging information as specified in the AIAMD Increment 2 CDD-U NR Attributes Table 5.2.3. Army IAMD developed systems/sub-systems shall enter and exit the networks without interrupting, disrupting nor degrading overall network capability or interrupting nor disrupting Air and Missile Defense operations.		IAMD has demonstrated capabilities to exchange Integrated Broadcast System (IBS), Blue Force Tracker (BFT), US Message Text Format (USMTF), and L16 data; however, limitations exist. Most limitations are related to standards non-compliance for reporting on the specific interfaces rather than operational capability. Integration of IBS data within the system was demonstrated during Phase 1 of IOT&E. Initial Service Level Testing (SLT) is complete and limitations identified. Efforts are ongoing to coordinate the SLT results to receive the interim JIT certification. SLT results were: Joint Interoperability Test Command (JITC) testing will continue in 2nd Quarter FY 2023. Army IAMD demonstrated high-level USMTF receipt processing capabilities, as described below. - Upon an external Air and Missile Defense Workstation (AMDWS) transmitting the ADA-05 USMTF Air Tasking Order and USMTF Airspace Control Order to the	10/21/2022

				Army IAMD participant, the Army IAMD Fire Control workstation provided an indication that the USMTF files arrived. - The Army IAMD Fire Control workstation alert Graphical User Interface (GUI) indicated: - Arrival of USMTF Air Tasking Order (ATO) - Arrival of USMTF Air Combat Order (ACO) - The Army IAMD Fire Control Workstation Integrated Defense Design (IDD) File Manager indicated ACO file present and ATO file present.	
Attribute Title:				KPP	
Integrated Defense Effectiveness	(1) To support attainment of a commander's defense effectiveness objectives, which would normally range from 0.5 to 0.99, shall provide flexible interceptor selection and firing doctrine within the Task Force. (2) 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 utilizing fused and/or composite organic and non-organic sensor data from multiple sensors to execute engagements (e.g., single/multiple/simultaneous) up to the operationally effective range of selected missile	Meets objective with limitations. (1) To support attainment of a commander's defense effectiveness objectives, which would normally range from 0.5 to 0.99, shall provide flexible interceptor selection and firing doctrine within the Task Force. (2) 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 utilizing fused and/or composite organic and non- organic sensor data from multiple sensors to execute engagements (e.g., single/multiple/simultaneous) up to the operationally effective range of selected missile kinematics. (3) Shall be capable of allowing greater defense effectiveness for high-		IAMD provides flexible interceptor selection and fire doctrine via the Integrated Defense Designer. There are a few limitations with the firing doctrine, not being able to change the "Computed Method of Fire (MOF)" during execution, and not being able to define a separate MOF for pop-up targets. IAMD defeats non-ballistic and ballistic platforms at times and locations not otherwise available to the commander with some limitations. IBCS is able to perform engage-on-net for non-ballistic targets. Longer than desired reaction times occur when sensor track disclosure to IBCS is later in time for a target resulting in engagements falling below/inside keep-out. IBCS continues to improve classification and sub-	10/21/2022

	kinematics. (3) 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. (4) ASoS Defense effectiveness levels shall not degrade and will remain equal to or greater than the effectiveness levels of fielded BM and CM/ABT defense systems.	priority assets while increasing defense effectiveness to full 360-degree coverage against attacking non-ballistic threats. (4) ASoS Defense effectiveness levels shall not degrade and will remain equal to or greater than the effectiveness levels of fielded BM and CM/ABT defense systems.		classification of targets (Air to Surface Missile especially) which is a cause for some failed engagements. IBCS does not use non-organic sensor track data for PAC-2 Tactical Ballistic Missiles (TBMs) engagements. This capability is being demonstrated in prototypes with Joint Track Management Capability with Navy and Marine Corps sensors. IAMD is capable of increasing defense effectiveness to full 360-degree coverage against attacking non-ballistic threats. During the 2022 IOT&E event, IBCS demonstrated that it had the capability to defend a near 360-degree coverage against attacking non-ballistic threats to the extent of given sensor and weapon abilities. Defense effectiveness is degraded for selected threats when compared to non-IAMD enabled legacy performance. This degradation is primarily driven by increased reaction time for high-speed threats. IBCS effectiveness against Non-Separating TBMs and ABTs is consistent with legacy systems. However, IBCS engages Separating TBMs at lower altitudes than legacy systems, and occasionally engages the booster of these targets because of restrictions in redirecting Interceptors within the legacy capabilities. During	

				IOT&E, the following defects were identified that contributed to the IDE limitations: engagement planning, erroneous Identification Friend or Foe, ARM classification, TBM Outs/Booster, and Common Warfighter Machine Interface useability. ATEC supports the PM Get-well Plan, which will be verified in Follow On Test and Evaluation (FOT&E) with a future PI.	
Attribute Title:				KPP	
Force Protection	(1) Shall be designed to be operated by Soldiers wearing body armor and equipped with appropriate weapons. (2) Shall have situational awareness and understanding commensurate with the supported force. (3) Shall report the position and ID of all IAMD assets into the COP and JBC-P/BFT2 nets. (4) Shall be operable by Soldiers in MOPP 4. (5) Vehicle cabs shall be capable of adding up-armor protection in accordance with (IAW) the approved Family of Medium Tactical Vehicles CPD.	Will meet threshold with limitations. (1) Shall be designed to be operated by Soldiers wearing body armor and equipped with appropriate weapons. (2) Shall have situational awareness and understanding commensurate with the supported force. (3) Shall report the position and ID of all IAMD assets into the COP and JBC-P/BFT2 nets. (4) Shall be operable by Soldiers in MOPP 4. (5) Vehicle cabs shall be capable of adding up-armor protection IAW the approved Family of Medium Tactical Vehicles CPD.		Tank-automotive and Armaments Command (TACOM) Memorandum for Record confirming Up Armor cabs support small arms protection. System contains BFT radios to support BFT Nets. Human Systems Integration (HSI) assessment during LUT and IOT&E showed system could be operated by the soldiers wearing body armor. System does not support manned rigid wall shelters; therefore, requirement is not applicable.	10/21/2022
Attribute Title:				KPP	
System Survivability: Cyber Survivability	(1) Army IAMD Inc 2 systems shall be capable of operations in MT-3, Operational Tactical - 72 hours. (2) Reference System Survivability KPP in Table 5.3	Meets threshold with limitations. (1) Army IAMD Inc 2 systems shall be capable of operations in MT-3, Operational Tactical - 72 hours. (2) Reference System Survivability		Multiple cyber-test events have been performed and proven several findings from the 2021 Cooperative Vulnerability and Penetration Assessment	10/21/2022

	KPP/KSA/Other Attributes Rollup for Cyber Survivability Attribute identification.	KPP in Table 5.3 KPP/KSA/Other Attributes Rollup for Cyber Survivability Attribute identification.		(CVPA)/Adversarial Assessment (AA) have been remediated or mitigated. A Cyber-Risk Reduction test event was held in April 2022 on PI-10 to conduct an initial review of fixes of vulnerabilities listed in the 2021 CVPA and AA reports, find additional vulnerabilities, and provide a preview of the cyber posture of the system going into IOT&E Phase 2. A Verification of Fixes (VoF) was held in September 2022 at the start of IOT&E Phase 2. The VoF successfully demonstrated the reduction of risk to the system through cybersecurity solution implementation in each PI. Ongoing cyber testing is planned after each PI to ensure improvements are implemented, verified, and new vulnerabilities are found early in the development processes. Continued development of PEO Missiles and Space (MS) Cybersecurity Resiliency System (CRS) integrated tool suite with a targeted integration into the IBCS baseline after IOC. The CRS tool suite, which will include a Commercial Off-the-Shelf (COTS) Security Information Event Manager (SIEM) solution, is	

				expected to increase cyber visibility and analytic capabilities into the system. Newly formed IBCS cyber agile teams are expected to continue prioritizing vulnerabilities, mitigations, and fixes while providing a cyber-focal point to the system development process. The critical enabler for the AIAMD Program is IBCS software development and qualification testing. The 2018 National Defense Authorization Act (NDAA) Section 873 selected the IFMC PO to implement an Agile or Iterative Development Methods Pilot Program and OSD designated AIAMD as the Army's only DevSecOps Pathfinder program. AIAMD employs the Scaled Agile Framework (SAFe), which is a knowledge base of proven, integrated principles, practices, and competencies for Lean, Agile and DevOps. SAFe uses multiple Program Increments for release of new capabilities. SAFe is a scalable and configurable framework that helps organizations deliver new products, services, and solutions in the shortest sustainable lead-time. SAFe guides the roles,	

				responsibilities, and activities necessary to achieve a sustained, competitive technological advantage. The IFMC PO leverages Agile processes to prioritize and implement cybersecurity engineering, testing, and fixes for the IBCS system.	
Attribute Title:				KPP	
System Survivability: Electronic Protection, CBRN, and Assured Positioning, Navigation and Timing (PNT)	(1) Electronic protect solutions shall reduce/eliminate the effects of enemy electronic attack to preserve the ability to pass data within requisite timelines to support EO and FO requirements. (2) Shall return to full mission capability within 30 minutes of decontamination procedures after a CBRN attack. (3) Shall survive five cycles of contamination/decontamination within a 30-day period with no more than 20% degradation in function. (4) Shall be capable of decontamination to negligible risk levels; the thorough decontamination process will take no longer than 75 minutes. (5) Shall survive and meet performance after exposure to electromagnetic environmental effects (E3) (e.g., direct/indirect	(1) Meets with limitations (T=O) Electronic protect solutions shall reduce/eliminate the effects of enemy electronic attack to preserve the ability to pass data within requisite timelines to support EO and FO requirements. (2) (T=O) Shall return to full mission capability within 30 minutes of decontamination procedures after a CBRN attack. (3) (T=O) Shall survive five cycles of contamination/decontamination within a 30-day period with no more than 20% degradation in function. (4) (T=O) Shall be capable of decontamination to negligible risk levels; the thorough decontamination process will take no longer than 75 minutes. (5) (T=O) Shall survive and meet performance after exposure to electromagnetic environmental effects (E3) (e.g., direct/indirect lighting strike, HEMP, etc.) as addressed in MIL-STD-464C/MIL-		Assured PNT M-code integration scheduled for LRIP. Electronic Protection (EP) capabilities have been demonstrated to have capability against specific threats during PEO MS dedicated Cyber and Electromagnetic Activities (CEMA) Events, during the Limited User Test, IOT&E, and during Developmental and Flight Tests. Improvements to EP are addressed in future builds through updates to tracking software, sensor capabilities, and through the integration of improved Integrated Fire Control Network (IFCN) radio hardware. As the threat evolves, system enhancements will be allocated to address the threat. IBCS incorporates active overpressure in EOC shelters for CBRN contamination minimization. IBCS Environmental Qualification Testing showed the system has shortfalls on the	10/21/2022

	lighting strike, HEMP, etc.) as addressed in MIL-STD-464C/MIL-STD2169. (6) No threshold (7) No Threshold (8) The PNT capabilities employed by the system must maintain tactical resiliency and continue to provide trusted PNT information at the level of accuracy required by the mission in the expected physical, electromagnetic environments.	STD2169. (6) Manned rigid wall shelter shall withstand the initial nuclear weapons effects of blast, thermal radiation, and initial nuclear radiation to the same level where critical task operators remain combat-effective long enough to execute the mission and IAW prescribed criteria levels in NATO STANAG 4145. (7) Assured PNT shall be capable of operating in level 2 conditions. (8) The PNT capabilities employed by the system must maintain tactical resiliency and continue to provide trusted PNT information at the level of accuracy required by the mission in the expected physical, electromagnetic environments.		decontamination process - issue to be addressed in future Engineering Change Proposals.	
Attribute Title:				KPP	
Sustainment: Operational Availability	Army IAMD developed systems/sub-systems shall achieve an Ao of at least 95%.	Will exceed objective. Program meets threshold of Army IAMD developed systems/sub-systems shall achieve an Ao of at least 95%		IAMD performance demonstrated during IOT&E Phase 2 Reliability is estimated at 88% and Operational Availability (Ao) is estimated at 98%.	10/21/2022
Attribute Title:				KPP	
Sustainment: Material Availability	Army IAMD developed systems/sub-systems shall achieve an Am greater than 90%.	Army IAMD developed systems/sub-systems shall achieve an Am greater than 90%.		Materiel Availability (Am) has not been estimated to date. It is expected to be completed by 2/28/2023.	
Attribute Title:				KPP	
Common AMD Command and Control	(1) IBCS subsystems (AAMDC and Below) shall incorporate common functionality (EO/FO), that includes: track management, engagement	Meets threshold with limitations. (1) IBCS subsystems (AAMDC and Below) shall incorporate common functionality (EO/FO), that includes track management, engagement planning,		IAMD includes common functionality across IBCS components within a Task Force. Hardware and software are common throughout all IBCS MEIs; however, some views are only available at	10/21/2022

	planning, engagement decision, engagement monitoring, defense planning, defense design, warfighter-machine interface, battle monitor and control, network interface and management, and staff functions. (2) Shall provide interoperability via Link 16, enabling integration, which provides situational awareness for non-Army IAMD enabled systems. (3) No Threshold (4) Shall provide playback/recoverable data of operator's functions (e.g., display configuration) used during engagement execution. (5) Shall provide interoperability through Link 16 with current upper tier level system(s).	engagement decision, engagement monitoring, defense planning, defense design, warfighter-machine interface, battle monitor and control, network interface and management, and staff functions. (2) Shall provide interoperability via Link- 16, enabling integration, which provides situational awareness for non-Army IAMD enabled systems. (3) No Threshold (4) Shall provide playback/recoverable data of operator's functions (e.g., display configuration) used during engagement execution. (5) Shall provide interoperability through Link-16 with current upper tier level system(s).		specific workstations (i.e., the Fires Gateway). IBCS uses a common IFCN to maintain common air pictures. However, there are issues with inconsistent track pictures between IBCS components, especially during disrupted or heavily loaded network conditions. Improvements to track picture consistency will continue through the Agile Software process as there were some Common Warfighter Machine Interface useability defects identified during IOT&E. IAMD provides backward compatibility to legacy systems through the use of Link16 networks. IAMD provides limited operator playback/recoverable data of operator functions via offline processing.	

Requirement Source(s)

Note: Army IAMD System of Systems Increment 2 CDD Update dated, December 14, 2020

Program Deviation Explanation

No deviations for this program/subprogram.

Notes

None

Acquisition Budget Estimate
IAMD

Total Acquisition Cost
Budget Position: President Budget
Budget Year: 2024 Base Year: 2020

		Current Baseline		Budget Estimate PB 2024		
Category	**Base Year**	**Objective (BY$M)**	**Threshold (BY$M)**	**BY$M**	**TY$M**	**Deviation**
RDT&E	2020	4,602.6	5,062.9	5,270.1	5,461	**Yes**
Procurement	2020	3,787.5	4,166.3	4,537.2	5,493.4	**Yes**
MILCON	2020	0	0	0	0	
Acq. O&M	2020	80.7	88.8	78.8	90.7	
Total		8,470.8		9,886.1	11,045.1	
PAUC	2020	17.684	19.452	19.347	21.615	
APUC	2020	8.343	9.177	9.336	11.303	**Yes**

Acquisition Cost Deviation Explanations

Total RDT&E, Procurement, and Acquisition O&M APB deviations have occurred as compared to the Current APB. The Army will establish an updated baseline to incorporate the changes below, following the Full Rate Production decision this year.

RDT&E The RDT&E APB deviation occurred due to PDI funding, an increase to the Remote Interceptor Guidance - 360 funding, additional integrated fires test requirements, Army Futures Command integration priorities (1- N) approved requirements, and updated cost estimating methodologies.

Procurement The Procurement APB deviation occurred due to an increase of 32 additional EOCs and ancillary equipment (16th Patriot Battalion, PDI, Ukraine supplemental requirements, and AMD elements) and updated hardware costs.

PAUC Deviation Explanation

APUC Deviation Explanation

The Average Procurement Unit Cost APB deviation occurred due to Hardware cost increases to include Contractor Furnished Equipment (CFE), Government Furnished Equipment (GFE) and Associated Support Items of Equipment (ASIOE).

Budget Notes

Defense Acquisition Executive approved Current APB, April 20, 2021.

Total End Item Quantity

Quantity Category	Current APB Quantity	Current Estimate Quantity
Development	25	25
Procurement	454	486
O&M-Acquired		

Quantity Notes

The Army IAMD unit of measure is the EOC. The development quantity is 25 fully configured prototype RDT&E EOCs, and the procurement quantity is 486 EOCs, which enable system of systems operation of Army Air and Missile Defense Units. The current estimate Procurement Quantity increase from the 454 Army Acquisition Objective (AAO) to 486 is due to the addition of 32 EOCs to support: the addition of the 16th Patriot Battalion, Ukraine supplemental requirements, the Pacific Deterrence Initiative (PDI), and increases to other AMD elements in the FY 2024 President's Budget.

Unit Cost
IAMD

Current UCR Baseline and Current Estimate (Base-Year Dollars)			
Category ($M) Base Year:2020	**Current UCR Baseline**	**Current Estimate**	**% Change**
Program Acquisition Unit Cost			
Cost	8,470.8	9,886.1	
Quantity	479	511	
Unit Cost	17.684	19.341	9.40%
Average Procurement Unit Cost			
Cost	3,787.5	4,537.2	
Quantity	454	486	
Unit Cost	8.343	9.336	11.90%

Original UCR Baseline and Current Estimate (Base-Year Dollars)			
Category ($M) Base Year:2009	**Original UCR Baseline**	**Current Estimate**	**% Change**
Program Acquisition Unit Cost			
Cost	4,806.8	8,352.5	
Quantity	296	511	
Unit Cost	16.239	16.345	0.65%
Average Procurement Unit Cost			
Cost	3,316.0	3,833.2	
Quantity	285	486	
Unit Cost	11.635	7.887	-32.21%

Cost Growth Details

Current Baseline PAUC Breach Explanation

Current Baseline APUC Breach Explanation

Original Baseline PAUC Breach Explanation

Original Baseline APUC Breach Explanation

Impacts of Schedule Changes on Unit Cost

Impacts of Performance Changes on Unit Cost

Actions Taken or Proposed to Control Future Cost Growth

Unit Cost Notes

PB 24 funds the AIAMD program to procure 486 EOCs.

Risk and Sensitivity Analysis

IAMD

Risk and Sensitivity Analysis	
Current Procurement Cost (November - 2020)	
1.	The hardware production configurations are largely assemblages of commercial computer processing, networking, and communications off-the-shelf commercial products (COTS). These COTS products have a short system lifecycle, creating a continual requirement to replace system components to mitigate obsolescence.
2.	The Army identified a 1-N list of systems for future integration into the AIAMD architecture. The timeline for integration of these systems is evolving based on changing priorities to meet real-world threats, maturity of the systems, and availability of funding.

Original Baseline Estimate (June - 2010)
The risk confidence level for this program is difficult to quantify. Since the IAMD program is still in the source selection process the program office developed a “generic” Government program description in the CARD. It is “generic” in the sense that it is not based on the content of the proposals submitted by the bidding contractors. The SCP is, therefore, based on the CARD and not on the specific programs the contractors plan to execute. Through the Cost Review Board (CRB) process, the Army significantly reduced the risk in the Government program described in the CARD. The program office significantly reduced the scope of work they intend to have the winning contractor execute. The system will still provide all required capabilities, however, IAMD will be less integrated than originally planned. The SCP reduces the amount of software development concurrency by increasing the number of software builds from two builds to three builds and extends the development schedule by 20 months. Additionally, the SCP uses software development productivity factors based on analogous systems including systems identified by the bidding contractors.
Current Baseline Estimate (April - 2021)
None

Schedule Risk		
Technical Risks		
Current	December 26, 2022	IBCS Joint Interoperability Certification: This risk is assessed as Moderate. IF Link 16 software issues prevent IBCS from obtaining interoperability certification, THEN the Joint Interoperability KPP requirement will not be met resulting in a slip to IOC.
Current	December 26, 2022	Program Protection: This risk is assessed as Moderate. IF the IBCS design does not adequately provide program protection, THEN significant redesign will have significant cost, schedule, and performance impact.
MS B	December 4, 2009	Track Management (TM): This risk was closed on October 24, 2022. This will be the last time this risk will be reported.

Low Rate Initial Production

IAMD

Item	Initial LRIP Decision	Current Total LRIP
Approval Date	12/23/2009	09/21/2021
Approved Quantity	27	45
Reference	Milestone B ADM	Software Acquisition Pathway Execution and LRIP Re-Characterization ADM
Start Year	2015	2020
End Year	2016	2022

Rationale if quantity exceeds 10% of the total number of articles to be procured:

Notes

The DAE re-plan ADM in December 2017 changed the LRIP start and end years from the initial plan at Milestone B of 2015 and 2016 to the current years of 2020 and 2021, respectively. The Milestone C ADM approved an LRIP quantity of 19. The Software Acquisition Pathway Execution and LRIP Re-Characterization ADM in September 2021 re-characterized the IBCS FY 2022 quantity (26 IBCS EOCs) as LRIP versus FRP, increasing the total LRIP procurement from 19 to 45. The current estimate Procurement Quantity increase from the 454 AAO to 486 is due to the addition of 32 EOCs to support: the addition of the 16th Patriot Battalion, Ukraine supplemental requirements, the PDI, and increases to other AMD elements in the President's Budget 2024.

Contracts & Efforts

Contract Data	
Contract Number	W31P4Q-08-C-0418
Effort Number	
Modification Number	P00226
Award Date	
Definitization Date	03/28/2019
Order Number	
CAGE Code/CAGE Legal Name	9F909/Northrop Grumman Systems Corporation
Contract Title	IBCS EMD Bridge
Contract Address	Huntsville, AL
Contracting Office	ACC - Army Contracting Command
Supported Phase	Development
Contract Strategy	FAR 15 (Negotiated)
Contract Type	Fixed-Price Incentive (Firm Target)
Modification Date	February 04, 2022
Work Start Date	October 31, 2017
Technical Data Rights	Unlimited Rights to Technical Data--Noncommercial Items & Software
Work Completed	100%

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
$76	$496.1	
Initial Ceiling Price	Current Ceiling Price	
	$496.1	
Contractor EAC	PM EAC	
$415.9	$415.9	
Initial Quantity	Current Quantity	Delivered Quantity
11	11	11
BAC	BCWP	ACWP
$439.1	$416.4	$411.5
BCWS	Cost Variance	Schedule Variance
$416.5	$4.9	-$0.1

Contract Notes:

This contract included procurement of hardware and delivery IBCS software integrated on Engagement Operation Centers and Integrated Fire Control Relays, training, engineering, logistics, integration, program management, and test support. It is a hybrid FPIF/CPIF/FFP contract effort with a cost-reimbursable Customer Line Item Number (CLIN) for travel. The period of performance ended April 29, 2022; therefore, this is the last time this contract will be reported.

Factors Contributing to Cost Variance and Projected Effects on Program Costs
None.

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule
None.

Contract Data	
Contract Number	W31P4Q-19-D-0016
Effort Number	
Modification Number	
Award Date	02/25/2022
Definitization Date	
Order Number	W31P4Q-22-F-0087
CAGE Code/CAGE Legal Name	64059/Lockheed Martin (LM) Missiles and Fire Control
Contract Title	IBCS Adapted Launcher IDIQ TO4
Contract Address	Grand Prairie, TX
Contracting Office	ACC - Army Contracting Command
Supported Phase	Development
Contract Strategy	FAR 15 (Negotiated)
Contract Type	Cost-Plus-Fixed-Fee
Modification Date	
Work Start Date	February 25, 2022
Technical Data Rights	Unlimited Rights to Technical Data--Noncommercial Items & Software
Work Completed	70.74%

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
$21.8	$21.8	
Initial Ceiling Price	Current Ceiling Price	
Contractor EAC	PM EAC	
$19.2	$19.3	
Initial Quantity	Current Quantity	Delivered Quantity
BAC	BCWP	ACWP
$19.9	$14.1	$15.8
BCWS	Cost Variance	Schedule Variance
$15.6	-$1.7	-$1.5

Contract Notes:
This is an IDIQ contract. The overarching contract number is W31P4Q-19-D-0016. The contract number for TO 4 is W31P4Q-22-F-0087. All data in this report reflects TO 4. This TO will provide maintenance and updates of the Launcher Interface Network Kit (LINK) software, engineering, development, prototyping, design reviews, and data collection, HWIL search tracks, and flight test support with the airborne sensor ground station and Remote Interceptor Guidance 360 degrees (RIG-360) for all directed proof of concept efforts; update development of the Software Fire Solution Computer Software Configuration Items; test and range support.

Factors Contributing to Cost Variance and Projected Effects on Program Costs
None.

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule
The negative schedule variance is primarily due to hardware availability delaying the HWIL Integration, higher priority hardware resource allocation, and unexpected software integration issues.

Contract Data	
Contract Number	W31P4Q-22-D-0004
Effort Number	
Modification Number	
Award Date	12/23/2021
Definitization Date	12/23/2021
Order Number	W31P4Q-22-F-0031
CAGE Code/CAGE Legal Name	9F909/NORTHROP GRUMMAN SYSTEMS CORPORATION
Contract Title	IBCS LRIP/FRP DO 1
Contract Address	HUNTSVILLE, AL
Contracting Office	ACC - Army Contracting Command
Supported Phase	Production
Contract Strategy	FAR 16.5 (IDIQ)
Contract Type	Fixed-Price Incentive (Firm Target)
Modification Date	
Work Start Date	December 23, 2021
Technical Data Rights	Unlimited Rights to Technical Data--Noncommercial Items & Software
Work Completed	16.64%

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
$107.7	$804.3	
Initial Ceiling Price	Current Ceiling Price	
Contractor EAC	PM EAC	
$346.6	$346	
Initial Quantity	Current Quantity	Delivered Quantity
13	35	
BAC	BCWP	ACWP
$347.3	$57.8	$52.1
BCWS	Cost Variance	Schedule Variance
$59.3	$5.7	-$1.5

Contract Notes:

Delivery Order (DO) 0001 (W31P4Q-22-F-0031) of the IBCS LRIP/FRP hardware contract provides IBCS hardware end items and associated services (i.e., Engineering Change Proposals) for the Production and Deployment phase of the IAMD program. The overarching IDIQ contract has a Period of Performance of December 23, 2021 to December 22, 2026. All data in this report reflects DO 0001. A modification was awarded November 28, 2022 to add LRIP Major End Item Quantities; logistics training and fielding efforts associated with the additional LRIP quantities and extended the period of performance through December 2025. Delivery quantity of EOCs increased from 13 to 35.

Factors Contributing to Cost Variance and Projected Effects on Program Costs

The EAC reported from contractor's latest IPMR (data through November 25, 2022) does not include 2 recent mods totaling $468M, which is reflected in current target price. Value will be updated in next IPMR data for month end December 2022.

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

The negative schedule variance is primarily due to detailed engineering design schedule extension as a result of updates to the Network Enclosure design implementation; additional Agile start-up activities; and Integrated Fire Control Network (IFCN) Relay material procurement delays pending a significant update to the Technical Data Package.

Contract Data	
Contract Number	47QTCK-18-D-0011
Effort Number	
Modification Number	
Award Date	
Definitization Date	
Order Number	W31P4Q-22-F-0120
CAGE Code/CAGE Legal Name	0HD54/PERATON INC.
Contract Title	Agile Software Development
Contract Address	Herndon, VA
Contracting Office	ACC - Army Contracting Command
Supported Phase	Development
Contract Strategy	FAR 16.5 (IDIQ)
Contract Type	Firm-Fixed-Price Level of Effort Term
Modification Date	
Work Start Date	April 13, 2022
Technical Data Rights	
Work Completed	

Contracts/Effort Price, Quantity, and Performance (TY$M)		
Initial Target Price	Current Target Price	
Initial Ceiling Price	Current Ceiling Price	
$118.2	$115.3	
Contractor EAC	PM EAC	
Initial Quantity	Current Quantity	Delivered Quantity
BAC	BCWP	ACWP
BCWS	Cost Variance	Schedule Variance

Contract Notes:

This contract provides Agile software development capability to deliver continued software-based improvements and capability enhancement to its AMD integration network that supports various Army systems. The development of this network is being conducted in an Agile methodology using a Scaled Agile Framework (SAFe).

Factors Contributing to Cost Variance and Projected Effects on Program Costs

Factors Contributing to Schedule Variance and Projected Effects on Program Schedule

External Government Activities

Activity Title:	Government Entity	Supported Phase

CAGE:		Work Start Date	
City		State/Province:	
Notes			

Deliveries and Expenditures

IAMD

Deliveries				
Delivered to Date	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	21	21	25	84.00%
Production	6	6	486	1.23%
Total Program Quantity Delivered	27	27	511	5.28%

Expended and Appropriated (TY $M)

Years Appropriated to date: 17

Total Years Appropriated Funding (Current Baseline): 47

Percent Years Appropriated: 36.17%

Then-Year Funding Appropriated as Percentage of Total Acquisition Estimate: 48.95%

Then-Year Funding Expended as Percentage of Total Acquisition Estimate: 32.46%

Total Acquisition Cost: 11,045.1

Deliveries & Expenditures Notes:

The current estimate Procurement Quantity increase from the 454 AAO to 486 is due to the addition of 32 EOCs to support: the addition of the 16th Patriot Battalion, Ukraine supplemental requirements, the PDI, and increases to other AMD elements in the President's Budget 2024. 27 RDT&E EOCs have been delivered to date (12 CPPs + 4 prototypes + 11 S280s); 6 of these RDT&E units were refreshed to become the IOC units and are shifted from RDT&E to production units, included in the 486 total. This brings the total to 21 RDT&E EOCs to date. Four additional EOCs will be delivered in the future to support integration efforts, bringing the total to 25 RDT&E EOCs.

Operating and Support Costs
IAMD

O&S Cost Breakdown:

Category (BY$ Million)	IAMD
Unit-Level Manpower	.0
Unit Operations	256.4
Maintenance	1,481.6
Sustaining Support	1,841.5
Continued System Improvements	801.8
Other	.0
Total	4,381.3

O&S Cost Estimate Note:

Cost Estimate Source – O&S	
Type:	Program Office Estimate
Approval Authority and Date:	Authority: Integrated Fires Mission Command Project Office 12/31/2022
Note:	
Military Pay is not a cost that is borne directly by the Army IAMD program. The Army IAMD program is not increasing Army force structure. Other Army programs have military pay accounted for in their program lines. Therefore, military pay is not included in the Army IAMD O&S costs. This position is consistent with the way the program has reported O&S costs since inception.	

Total Program O&S Cost Compared with Baseline					
	Current Baseline				
	Objective (BY$M)	Threshold (BY$M)	Current Estimate (BY$M)	Current Estimate (TY$M)	Deviation
Total O&S	4,093.2	4,502.5	4,381.3	6,784.3	

Note:

O&S Cost Deviation Explanation

Operating and Support Costs - Disposal and Unitized Costs

IAMD

Annual Unitized O&S Cost Definition and Calculation Relative to Total O&S Cost:

Sustainment Factors	System Name: IAMD	Antecedent System Name:
Quantity to Sustain	486	
Unit of Measure	EOC	
Unit Expected Service Life	20 Years	

Base Year: 2020

Annual Unitized O&S Cost by Category Base Year $ Unit:	System Name: IAMD	Antecedent System Name:
Unit-Level Manpower	0	
Unit Operations	26.4	
Maintenance	152.4	
Sustaining Support	189.5	
Continued System Improvements	82.5	
Other	0	
Total O&S	450.8	0

Disposal/Demilitarization Cost Estimate
(Allocate Disposal estimate by each weapon system (or system variants) acquired by the program. Use BY$M)

Disposal/Demilitarization Cost Estimate

(Base Year $Millions)	System Name: IAMD	Antecedent System Name:	System Name:
Total Disposal	**26.5**		

Cost Estimate Source - Disposal	
Type:	Program Office Estimate
Approval Authority and Date:	Authority: Integrated Fires Mission Command Project Office 12/31/2022

Note:

Military Pay is not a cost that is borne directly by the Army IAMD program. The Army IAMD program is not increasing Army force structure. Other Army programs have military pay accounted for in their program lines. Therefore, military pay is not included in the Army IAMD O&S costs. This position is consistent with the way the program has reported O&S costs since inception.

Disposal Cost Notes:

Disposal Cost is not included in the Operating and Support Cost of the current APB objective and threshold for this program.

Additional O&S Estimate Assumptions:

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) (includes field and sustainment/depot). Under PBL sustainment constructs, IAMD will utilize performance-based sustainment methods and performance metrics, which will include a Public-Private Partnership.

Antecedent Estimate Assumptions:

No antecedent system