ARMY INTEGRATED AIR AND MISSLE DEFENSE (IAMD)

December 2021 Selected Acquisition Report (SAR)

December 31, 2021

Department of the Army

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Executive Summary

Program Highlights Since Last Report (Congress): 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, which authorized entry into Production & Deployment, execution of Low Rate Initial Production (LRIP), established the exit criteria necessary to complete LRIP, and approved entry into the Software Acquisition Pathway (SWP) planning phase. The Army IAMD Production APB was approved by the DAE on April 20, 2021.

The Army IAMD Acquisition Decision Memorandum (ADM) requesting authorization to obligate up to $24.67M procurement funds in advance of Milestone C was signed by Under Secretary of Defense for Acquisition and Sustainment (USD (A&S)) on March 12, 2020, and subsequently increased to $35.56M per the Army IAMD ADM signed by USD(A&S) on August 31, 2020. This funding was used to provide materiel, equipment, installation services to refresh production representative hardware for LRIP Lot 1, LRIP modification kits, and services to support production readiness and programmatic requirements.

A five-year competitive, best value contract for the LRIP/Full Rate Production (FRP) of the Integrated Battle Command System (IBCS) was awarded December 23, 2021, which will deliver up to 160 systems to the Army and foreign partners.

IBCS successfully completed Limited User Test (LUT) Flight Tests 1 and 2 in August 2020, and completed LUT on September 2020.

The Operational Test Readiness Review 2 for the IAMD Initial Operational Test & Evaluation (IOT&E) was conducted by Operational Test Command on July 1, 2021. Authority was granted to proceed with Test Planning to support IOT&E at White Sands Missile Range (WSMR), which is set to begin in January 2022. IOT&E will be conducted using production representative equipment while executing Air and Missile Defense operations in Software/Hardware-in-the Loop and Live Air configurations, and will serve as the culminating/capstone event for the LRIP.

On July 15, 2021, the Integrated Fires Mission Command Project Office (IFMC PO) successfully conducted Flight Test-6 at WSMR. Operating in a contested environment, IBCS detected, tracked, and engaged a surrogate cruise missile target with support from multiple Army sensors, as well as joint sensors from the Air Force and Marine Corps. Preliminary indications are that the test met its objectives and achieved successful target intercept. This test served as the final developmental flight test prior to entering the program's IOT&E.

The DAE approved the IAMD SWP and LRIP Re-Characterization ADM on September 21, 2021. The ADM authorizes entry into the SWP Execution Phase and re-characterizes the IBCS FY 2022 quantity (26 IBCS EOCs) as LRIP versus FRP,

increasing the total LRIP procurement from 19 to 45. This does not exceed 10% of the total Army Acquisition Objective and supports an FY 2022 contract award.

The Adversarial Assessment portion of IOT&E was conducted in October 2021 and the Live Air, Hardware-in-the-Loop, and flight test phases will be conducted January - April 2022.

In November 2021, IBCS executed a Project Convergence 21 engagement. Air Defense Artillery soldiers operating the IBCS commanded launch of Missile Segment Enhanced missiles and IBCS engagement over satellite communications, rather than over Integrated Fire Control Network, resulting in a successful intercept and defeat of the target.

The IAMD Project Office name was changed to the Integrated Fires Mission Command (IFMC) Project Office on June 19, 2020.

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

History of Significant Developments Since Program Initiation:

Date	Description
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.
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.
Nov-2012	DAE approved the Army IAMD program restructure APB.
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.
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.
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.
Apr-2021	The DAE approved the Army IAMD Production APB.
Sep-2021	DAE approved the IAMD Software Pathway Execution and Low Rate Initial Production Re-Characterization 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.

Schedule

Schedule Events

Event Title (or Header)	Current Objective	Current Threshold	Current Estimate/Actual Date	Deviation ?
Milestone B	Dec-2009	Dec-2009	Dec-2009	
Critical Design Review	May-2012	May-2012	May-2012	
Milestone C	Jan-2021	Jan-2021	Jan-2021	
Initial Operating Test & Evaluation (IOT&E) Start	Mar-2021	Mar-2022	Mar-2021	
IOT&E Complete	Mar-2022	Mar-2023	Apr-2022	
IOC	Apr-2022	Apr-2023	Apr-2022	
FRP Decision	Dec-2022	Dec-2023	Dec-2022	

Schedule Notes:	*Schedule Deviation Explanations:*
Change Explanations: (Ch-1) Milestone C current estimate changed from September 2020 to January 2021 due to programmatic impacts from COVID-19. The Milestone C Defense Acquisition Board (DAB) for the Army IAMD program was conducted on November 17, 2020. The DAE approved Milestone C for IAMD on January 11, 2021. (Ch-2) The current estimate for IOT&E Start changed from July 2021 to March 2021 based on an expansion of the training phase, with dedicated training by Army 3-43 BN associated with New Equipment Training (NET) and Collective Training. (Ch-3) The current estimate for IOT&E Complete changed from February 2022 to April 2022 to allow for an update by the program team of the IBCS PI7.4 SW. Downstream events like IOC are currently considered unaffected by the testing phase extension. (Ch-4) The FRP Decision Review current estimate changed from June 2022 to December 2022 because LRIP contract award was delayed to December 2021. The LRIP contract award drives key criteria for FRP Materiel Release (MR), including Delta Qualification Testing, aspects of MR, and LRIP Product Line Validation.	

Significant Schedule Risks

Event	Date	Description
MS B	12/31/2009	Schedule Risk to Integrated Test and Evaluation: This risk was assessed as Moderate. Mitigation efforts have focused on defining the test strategy, re-launching the Test and Evaluation Working Integrated Product Team, developing the draft Test and Evaluation Master Plan, and developing an integrated test schedule.

Performance

Performance Attributes					
Current Objective	**Current Threshold**	**Current Estimate**	**Deviation?**	**Demonstrated Performance**	**Date**
Attribute Title:	Net Ready (NR)			KPP	
(T=O) Army IAMD System of Systems (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 Air and Missile Defense (AMD) operations.	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.	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.		IAMD has demonstrated capabilities to exchange Integrated Broadcast System (IBS), Blue Force Tracker (BFT), USMTF, and L16 data; however, significant limitations exist. Most limitations are related to standards non-compliance for reporting on the specific interfaces rather than operational capability.	9/12/2020

Attribute Title:	Integrated Defense Effectiveness			KPP	
(1) (T=O) 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) (T=O) 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) (T=O) Shall be capable of allowing greater defense effectiveness for high-priority assets while increasing defense effectiveness to full 360-degree coverage against	(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-priority assets while increasing defense effectiveness to full 360-degree coverage against attacking non-	(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- priority assets while increasing defense effectiveness to full 360-degree coverage against attacking non-		IAMD provides flexible interceptor selection and firing doctrine 99% of the time. There are a few limitations with the firing doctrine not supporting a SALVO MOF, not being able to change the "Computed Method of Fire" during execution, and not being able to define a 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. Issues with IBCS having longer reaction time occur when sensor track disclosure to IBCS is later in time for a target causing engagements to fall below/inside	9/12/2020

attacking non-ballistic threats. (4) (T=O) Army Integrated Air & Missile Defense System of Systems (ASoS) Defense effectiveness levels shall not degrade and will remain equal to or greater than the effectiveness levels of fielded Ballistic Missile (BM) and Cruise Missile (CM)/Air Breathing Target (ABT) defense systems.	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.	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.		keep-out. IBCS continues to have issues with improper or delayed classification and sub-classification of targets (Air to Surface Missile especially) which leads to failed engagements. IBCS cannot use non-organic sensor track data for engagements. IAMD is capable of increasing defense effectiveness to full 360-degree coverage against attacking non-ballistic threats. During the 2020 LUT 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. Given correct classification and identification for other threats, defense effectiveness is equal to that of legacy systems. IBCS effectiveness against Non-Separating TBMs, Anti-Radiation Missiles, 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.	
Attribute Title:	Force Protection			KPP	
(1) (T=O) Shall be designed to be operated by Soldiers wearing body armor and equipped with appropriate weapons. (2)	(1) Shall be designed to be operated by Soldiers wearing body armor and equipped with appropriate weapons. (2) Shall	(1) Shall be designed to be operated by Soldiers wearing body armor and equipped with appropriate weapons. (2) Shall		Tank-automotive and Armaments Command (TACOM) MRF stating Up Armor	9/12/2020

(T=O) Shall have situational awareness and understanding commensurate with the supported force. (3) (T=O) Shall report the position and ID of all IAMD assets into the COP and JBC-P/BFT2 nets. (4) (T=O) Shall be operable by Soldiers in MOPP 4. (5) (T=O) Vehicle cabs shall be capable of adding up-armor protection IAW the approved Family of Medium Tactical Vehicles CPD. (6) Manned rigid walled shelters incorporated into Army IAMD developed systems/sub-systems shall provide an active overpressure system and air filtration system to prevent contamination during a CBRN event that is sustainable through decontamination. (7) Manned rigid walled shelters shall be capable of adding up-armor protection sufficient to repel enemy small arms as developed by the responsible program manager.	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.	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.		cabs support small arms protection. System contains BFT radios to support BFT Nets. Human Systems Integration (HSI) assessment during LUT showed system could be operated by the soldiers wearing body armor. IBCS EQT showed the system have shortfalls on the decontaminati on process - issue to be addressed in LRIP Engineering Change Proposal (ECP). System does not support manned rigid wall shelters; therefore requirement is not applicable.	

Attribute Title:	System Survivability: Cyber Survivability			KPP	
(1) Army IAMD Inc 2 systems shall be capable of operations in: CSRC 4-High; MT-3, Operational Tactical – 72 hours; CDL 4-Extreme; IL 3-Serious Adverse Effect. (2) Reference System Survivability KPP in Table 5.3 KPP/KSA/Other Attributes Rollup for Cyber Survivability Attribute identification.	(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 KPP/KSA/Other Attributes Rollup for Cyber Survivability Attribute identification.	(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 KPP/KSA/Other Attributes Rollup for Cyber Survivability Attribute identification.		Multiple cyber test events have been performed and proven several findings from CVPA/AA have been remediated. Ongoing cyber testing is planned after each PI to ensure improvements are implemented and verified. Continued development of PEO MS Cybersecurity Resiliency System (CRS) integrated tool suite with a targeted integration into the IBCS baseline prior to IOC. CRS tool suite 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	9/12/2020

				system development process.	
Attribute Title:	System Survivability: Electronic Protection, CBRN, and Assured Position, Navigation and Timing (PNT)			KPP	
(1) (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 Engagement Operations (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	(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 lighting strike, HEMP, etc.) as	(1) (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.,		Assured Positioning, Navigation and Timing (PNT) M-code integration scheduled for LRIP. Electronic Protection capabilities have been demonstrated to have capability against specific threats during PEO MS dedicated CEMA Events and during the Limited User Test. Improvements to these capabilities are addressed in future builds with planned improvements to tracking software and through the integration of improved sensor capabilities. As the threat evolves, system enhancements will be allocated to address the threat. IBCS	9/12/2020

environmental effects (E3) (e.g., direct/indirect lighting strike, HEMP, etc.) as addressed in MIL-STD-464C/MIL-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.	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.	direct/indirect lighting strike, HEMP, etc.) as addressed in MIL-STD-464C/MIL-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.		did not meet the decontaminati on timeline when assessed during Hardware Qualification. However, shortfalls will be addressed in engineering change proposals (ECPs) being implemented by FY 2023. ECPs that are implemented by the OEM will be evaluated during delta testing. Delta testing results will be used to apply necessary changes or complete decontaminati on qualifications of Hardware MEIs.	
Attribute Title:	Sustainment: Operational Availability			KPP	
Army IAMD developed systems/sub-systems shall	Army IAMD developed systems/sub-systems shall	Program meets threshold of Army IAMD developed systems/sub-		IAMD performance demonstrated during the	9/12/2020

achieve an Ao of at least 99%.	achieve an Ao of at least 95%.	systems shall achieve an Ao of at least 95%.		Limited User Test (LUT) exceeded the operational availability (Ao) threshold requirement. ATEC assessed LUT Ao as 96% (with support equipment failures).	
Attribute Title:	Sustainment: Materiel Availability			KPP	
(T=O) 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%.	Army IAMD developed systems/sub-systems shall achieve an Am greater than 90%.		IAMD performance demonstrated to date is on track to meet the requirement. The complex model will be updated in FY 2022 to support an updated assessment.	9/12/2020
Attribute Title:	Common AMD Command and Control			KPP	
(1) IBCS subsystems (AAMDC and Below) shall incorporate common functionality (EO/FO), that includes: track management, engagement planning, engagement decision, engagement monitoring, defense planning, defense design, warfighter-machine interface, battle monitor and control, network interface and	(1) IBCS subsystems (AAMDC and Below) shall incorporate common functionality (EO/FO), that includes: track management, engagement planning, engagement decision, engagement monitoring, defense planning, defense design, warfighter-machine interface, battle monitor and control, network interface and	(1) IBCS subsystems (AAMDC and Below) shall incorporate common functionality (EO/FO), that includes: track management, engagement planning, engagement decision, engagement monitoring, defense planning, defense design, warfighter-machine interface, battle monitor and control, network interface and		IAMD includes common functionality across IBCS components within a Task Force. However, there are issues with inconsistent track pictures between workstations within the same EOC and between EOCs, especially during disrupted network conditions.	9/12/2020

management, and staff functions, executing on the same network. (2) (T=O) Shall provide interoperability via Link-16, enabling integration which provides situational awareness for non-Army IAMD enabled systems. (3) Shall provide Link-16 at enhanced update rates via MIL-STD-3011. (4) (T=O) Shall provide playback/recovera ble data of operator's functions (e.g., display configuration) used during engagement execution. (5) Shall provide interoperability through Link-16, IFCN with current upper tier level system(s).	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/recovera ble 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).	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/recovera ble 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).		IAMD provides backward compatibility through the use of Link16 networks. However, IAMD has limitations in meeting IAMD Net Ready KPP7 requirements, especially in regards to Link16 messaging requirements. IAMD will provide limited operator playback/reco verable data of operator functions. This capability will continue to mature through IOC.	

Performance Notes:	*Performance Deviation Explanations:*
Change Explanations: Performance parameters from the prior SAR were changed or deleted by the Army IAMD System of Systems Increment 2 Capability Development Document (CDD) Update dated, December 14, 2020. The previous Force Protection and Survivability KPP has been separated into a Force Protection KPP and a Survivability KPP. The Common Command and Control KPP has been replaced by the Common AMD Command and Control KPP. Acronyms: AAMDC - Army Air and Missile Defense Command	

ABT - Air Breathing Target Am - Materiel Availability AMD - Air and Missile Defense Ao - Operational Availability ASoS - Army Integrated Air and Missile Defense System of Systems BFT2 - Blue Force Tracking 2 BM - Ballistic Missile CBRN - Chemical, Biological, Radiological, and Nuclear CDL - Cyber Dependency Level CM - Cruise Missile COP - Common Operating Picture CSRC - Cyber Survivability Risk Posture EO - Engagement Operations FO - Force Operations HEMP - High-Altitude Electromagnetic Pulse IAW - In Accordance With IBCS - IAMD Battle Command System ID - Identification IFCN - Integrated Fire Control Network IL - Impact Level JBC-P - Joint Battle Command Platform MIL-STD - Military Standard MOPP - Mission Oriented Protective Posture MT - Mission Type NATO - North Atlantic Treaty Organization nets - networks NR - Net Ready PNT - Position, Navigation and Timing SoS - System of Systems STANAG - Standardization Agreement	

Acquisition Budget Estimate

Total Acquisition Costs

Budget Year: 2023 Base Year: 2020

Appropriation Category ($Millions)	Objective Base Year (Current APB)	Threshold Base Year (Current APB)	Budget Estimate Base Year	Budget Estimate Then Year	Deviation?
RDT&E	$ 4,602.6	$ 5,062.9	$ 5,038.0	$ 5,141.2	
Procurement	$ 3,787.5	$ 4,166.3	$ 3,817.3	$ 4,616.7	
MILCON	$ 0.00	$ 0.00	$ 0.00	$ 0.00	
Acq O&M	$ 80.7	$ 88.8	$ 80.8	$ 93.8	
Total Acquisition	$ 8,470.8		$ 8,936.1	$ 9,851.7	
PAUC	$ 17.684	$ 19.452	$ 18.425	$ 20.313	
APUC	$ 8.343	$ 9.177	$ 8.299	$ 10.036	

Total End Item Quantity

Quantity	Current APB	Current Estimate
Development Qty	25	25
Procurement Qty	454	460

Budget Notes:
Defense Acquisition Executive approved Current APB, April 20, 2021.

CAPE Cost Risks: The Milestone C Army Cost Position for AIAMD presents a cost profile against which Deputy Assistant Secretary of the Army Cost and Economics judges it equally probable that the program will need more or less funding than depicted. The Increment 2 hardware production configurations are stable and are largely assemblages of commercial computer processing, networking, and communications off-the-shelf commercial products. The substantial Research Development Test and Evaluation-funded costs for software development are (as of Milestone C) input as Level-of-Effort without explicit, critical capabilities defined against those costs. This suggests the Army will have flexibility (via deferring and/or re-prioritizing requirements) to build to these budgets and define success on a range of outcomes.

RDT&E - Current Change Explanations

- Revised escalation indices. (Economic)
- Adjustment for Remote Interceptor Guidance-360 development efforts. (Engineering)
-Adjustment for Key System-Agnostic Enablers development efforts. (Engineering)
- Revised estimate for Agile Software development of additional capability beyond that delivered at IOC.

Procurement - Current Change Explanations
- Revised escalation indices. (Economic)
- Stretch-out of procurement buy profile. (Schedule)
- Revised estimate due to change in program cost estimating assumptions and techniques. (Estimating)
- Decrease in Other Support due to change in program cost estimating assumptions and techniques. (Support)
- Increase in Initial Spares due to change in program cost estimating assumptions and techniques. (Support)

Acq O&M - Current Change Explanations
- Revised escalation indices. (Economic)

- Revised estimate to reflect changes related to core program office staffing assumptions. (Estimating)

Acquisition Cost Deviation Explanations:

Quantity Notes:

The Army IAMD unit of measure is defined as 25 fully-configured prototype RDT&E units and 454 Army IAMD Battle Command System Engagement Operation Center procurement quantities, 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 to 460 is due to the addition of 6 EOCs to support the Pacific Deterrence Initiative in the President's Budget 2023.

Risk and Sensitivity Analysis

Current Procurement Risks:	
1.	The hardware production configurations are stable and are largely assemblages of commercial computer processing, networking, and communications off-the-shelf commercial products.
2.	Compressing the production schedule would reduce program annual fixed costs such as the government program office during production. Modest savings from leveling and shortening the production schedule by a year or two may not warrant the challenges to fielding the system rationally and at a pace that AMD units are ready to receive.

Unit Cost

Current Baseline Compared with Current Estimate

Current Baseline Base Year: 2020

Category ($ Millions)	Current Baseline	Current Estimate	% Change	Breach? Significant or Critical
Program Acquisition Unit Cost				
Acquisition Cost	$ 8,470.8	$ 8,936.1		
Program Quantity	479	485		
PAUC	$ 17.684	$ 18.425	4.19%	None
Average Procurement Unit Cost				
Procurement Cost	$ 3,787.5	$ 3,817.3		
Procurement Quantity	454	460		
APUC	$ 8.343	$ 8.299	-0.25%	None

Original Baseline Compared with Current Estimate

Original Baseline Base Year: 2009

Category ($ Millions)	Original Baseline	Current Estimate	% Change	Breach? Significant or Critical
Program Acquisition Unit Cost				
Acquisition Cost	4,806.8	$ 7,548.1		
Program Quantity	296	485		
PAUC	$ 16.239	$ 15.563	-4.16%	None
Average Procurement Unit Cost				
Procurement Cost	$ 3,316.0	$ 3,225.0		
Procurement Quantity	285	460		
APUC	$ 11.635	$ 7.011	-28.68%	None

Unit Cost Notes:
Original Baseline is in Base Year 2009 dollars and was converted here only for comparison to the Current Estimate in Base Year 2020 dollars.

Contracts

Contract Number:	W31P4Q-08-C-0418	**Order Number:**		**Contract Title:**	IBCS EMD Bridge
CAGE Code	9F909	City	Huntsville	Contracting Office	Army Contracting Command - Redstone Arsenal
CAGE Legal Name	Northrop Grumman Systems Corporation (NGSC) Defense Systems (NGDS)	State/Province	AL	Contract Strategy	
Effort Number					
Supportive Phase	Development	Latest Modification Number	221	Definitization Date	3/8/2019
Contract Type	Fixed-Price Incentive (Firm Target)	Latest Modification Date	10/1/2021	Work Start Date	10/31/2017
Technical Data Rights	None	Notes	This contract includes procurement of hardware and delivery of Integrated Battle Command System 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 CLIN for travel.		

Contract/Effort Price, Quantity and Performance ($M)							
Initial Target Price	$ 76.00	Current Target Price	$ 485.44	Contractor's EAC	$ 415.78		
Initial Ceiling Price		Current Ceiling Price	$ 485.44	PM's EAC	$ 415.41		
Initial Quantity	11	BAC	$ 432.30	BCWP	$ 395.19	Work Completed	91.42%
Current Quantity	11	ACWP	$ 394.24	BCWS	$ 395.38	Cost Variance	$ 0.95

Delivered Quantity	11					Schedule Variance	-$ 0.19

Factors Contributing to Cost Variance and Projected Effects on Program Costs:	Factors Contributing to Schedule Variance and Projected Effects on Program Schedule:
Net Change Since last SAR: +$9.41M The favorable net change in the cost variance is due to incorporation of Boeing actuals for Enhanced Plug and Fight Processing Unit being less than planned, cancellation of the SuRe-X test event, and cancellation of a test event at WSMR due to weather. Contractor personnel were utilized to support other program priorities. Portions of the resulting cost underruns were reallocated to other program areas upon execution of a contract period of performance extension mod.	Net Change Since last SAR: +$1.98M The favorable net change in the schedule variance is primarily due to completion of activities associated with LUT.

Contract Number:	W31P4Q-22-D-0004	**Order Number:**	W31P4Q-22-F-0031	**Contract Title:**	W31P4Q-22-F-0031
CAGE Code	9F909	City	Huntsville	Contracting Office	Army Contracting Command - Redstone Arsenal
CAGE Legal Name	Northrop Grumman Systems Corporation (NGSC) Defense Systems (NGDS)	State/Province	AL	Contract Strategy	
Effort Number					
Supportive Phase	Production	Latest Modification Number		Definitization Date	12/23/2021
Contract Type		Latest Modification Date		Work Start Date	
Technical Data Rights	None	Notes	The purpose of the Delivery Order 0001, (W31P4Q-22-F-0031) under Indefinite Delivery/Indefinite Quantity (IDIQ) contract W31P4Q-22-D-0004 is to acquire an Integrated Battle Command System (IBCS) LRIP/FRP in support of the IBCS hardware end item		

				production for the Production and Deployment phase of the IBCS Program. The overarching IDIQ contract has a Period of Performance of December 23, 2021 to December 22, 2026. All data in this report reflects Delivery Order 0001.			
Contract/Effort Price, Quantity and Performance ($M)							
Initial Target Price	$ 107.68	Current Target Price	$ 107.68	Contractor's EAC			
Initial Ceiling Price		Current Ceiling Price		PM's EAC			
Initial Quantity		BAC		BCWP		Work Completed	0.00%
Current Quantity		ACWP		BCWS		Cost Variance	
Delivered Quantity						Schedule Variance	
Factors Contributing to Cost Variance and Projected Effects on Program Costs:				Factors Contributing to Schedule Variance and Projected Effects on Program Schedule:			

Technologies and Systems Engineering

Significant Technical Risks

Event	Date	Description
MS B	12/31/2009	Track Management - This risk is assessed as Moderate. IF there is failure to develop the data registration and kinematic fusion IBCS TM components or to provide all required capabilities, THEN there will be degraded performance and/or limited capability, or incur significant program cost and schedule delays to procure an alternate TM solution. This directly impacts the SIAP TPMs.
Current	12/31/2021	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	12/31/2021	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.
Current	12/31/2021	High Software Safety Risk for IOT&E/IOC/CMR: This risk is assessed as High. IF the SW Safety mitigations do not occur prior to IOT&E and through IOC, THEN the program faces potential schedule delays and non-concurrence for future milestones/releases.

Deliveries and Expenditures

Quantities	Planned to Date	Actual to Date	Total Quantity	Percent Delivered
Development	21	21	25	84.00%
Procurement	6	6	460	1.30%
Total	27	27	485	5.57%

Years Appropriated to date	16	Total Years Appropriated Funding (Current Baseline):	47	Percent Years Appropriated:	34.04%

Appropriation Category ($Millions)	Then Year Appropriated Amount	Then Year Expended Amount
RDT&E	3,650.90	3,139.31
Procurement	990.03	89.03
MILCON	0.00	0.00
Acq O&M	23.32	15.71
Total Appropriated/Expended	3,954.91	3,186.97
Percent Appropriated/Expended	47.34%	32.93%

Deliveries & Expenditures Notes:

27 RDT&E Engagement Operation Centers (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 460 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.

Expenditures as of March 31, 2022.

Low-Rate Initial Production

	Initial Decision LRIP	Current Total LRIP
Approval Date	12/23/2009	9/21/2021
Approval LRIP Quantity	27	45
Approval Document Title	Milestone B ADM	Software Acquisition ADM
Start Year	2015	2020
End Year	2016	2021

Rationale if quantity exceeds 10% of the total number of articles to be produced: *CUI: _____*
Quantity Note: *CUI: _____*
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 Engagement Operation Centers) as LRIP versus FRP, increasing the total LRIP procurement from 19 to 45. The current estimate Procurement Quantity increase from the 454 Army Acquisition Objective to 460 is due to the addition of 6 EOCs to support the Pacific Deterrence Initiative in the President's Budget 2023.

Operating and Support (O&S) Cost

Total Program O&S Costs Compared with Baseline

	Current Base Year Objective	Current Base Year Threshold	Current Base Year Estimate	Current Then Year Estimate	Deviation?
Total O&S ($Millions)	$ 4,093.20	$ 4,502.50	$ 4,050.80	$ 6,350.18	

Deviation Explanation:

Operating and Support Cost Breakdown

Category (Base Year $Millions)	System Name: IAMD	System Name:
Unit-Level Manpower	$ 0.00	
Unit Operations	$ 171.5	
Maintenance	$ 977.2	
Sustaining Support	$ 1,797.9	
Continued System Improvements	$ 1,104.2	
Other	$ 0.00	
Total O&S	$ 4,050.8	

Cost Estimate Source

Type: Component Cost Position

Approval Authority and Date: Principal Deputy Assistant Secretary of the Army Financial Management and Comptroller, November 16, 2020

O&S Notes:
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 is not included in the Operating and Support Cost of the current APB objective and threshold for this program.