Report No. DODIG-2022-085

~~CUI~~

INSPECTOR GENERAL

U.S. Department of Defense

APRIL 20, 2022

(U) Audit of the Army's Integrated Visual Augmentation System

~~Controlled by: DoD OIG~~
~~Controlled by: Audit~~
~~CUI Category: General Procurement and Acquisition~~
~~LDC: FED ONLY~~
~~POC: Deputy Assistant Inspector General for Audit; Acquisition, Sustainment, and Contracting;~~ [redacted]

INTEGRITY ★ INDEPENDENCE★ EXCELLENCE

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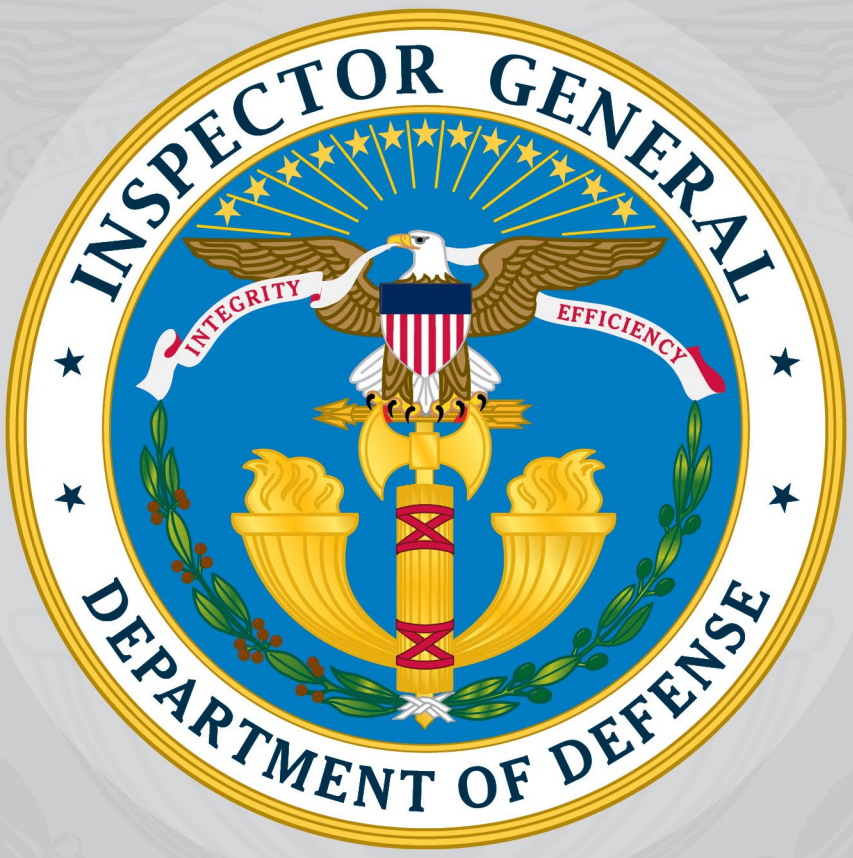
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(U) Results in Brief

(U) Audit of the Army's Integrated Visual Augmentation System

(U) April 20, 2022

(U) Objective

(U) The objective of this audit was to determine whether Army officials effectively managed the Integrated Visual Augmentation System (IVAS) program to meet user needs.

(U) Background

(U) IVAS is a military goggle that overlays tactically relevant information in a Soldier's line of sight to increase lethality, mobility, and situational awareness. The Soldier lethality cross functional team identified seven requirements that enhance the Soldier's decisions and capabilities to execute combat tasks with speed and precision: communication, lethality, mobility, protection, situational awareness, survivability, and training and human performance. These requirements serve as the source for developing technologies to meet IVAS user needs and serve as the basis for the IVAS prototyping effort.

(U) Project Manager IVAS officials (program officials) used Soldier Centered Design during multiple testing events, in the IVAS rapid prototyping phase.[1] This design process places the Soldiers, who will ultimately use a system, in the center of the process to ensure that their needs are considered when making design tradeoffs and production decisions. User acceptance

[1] (U) Rapid prototyping provides for the use of innovative technologies to quickly develop fieldable products that demonstrate new capabilities and meet emerging military needs.

(U) Background (cont'd)

(U) is a core metric for the project, and program officials used surveys to evaluate user acceptance of IVAS with the intent of measuring Soldier experience and tracking progress through the development of the system.

(U) Finding

(~~CUI~~) Army testing officials assessed user acceptance from Soldiers that used IVAS during various operational tests and used the results of those surveys to make changes to the system. However, IVAS program officials did not define minimum user acceptance levels to determine whether IVAS would meet user needs. This occurred because Army policy did not require program officials to define suitable user acceptance levels. Procuring IVAS without attaining user acceptance could result in wasting up to $21.88 billion in taxpayer funds to field a system that Soldiers may not want to use, or use as intended, because [redacted]

(U) Recommendations

(U) We recommend that the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) develop Army-wide policy requiring program officials to define suitable user acceptance measurements for testing and evaluation.

(U) We recommend that the Program Executive Officer Soldier define clear measures of user acceptance levels to meet user needs before Soldier Touch Point-5 testing of IVAS.[2]

[2] (U) Throughout this report, when referring to the senior officer responsible for Program Executive Office Soldier, we use "the Program Executive Officer Soldier" because this is his proper title. In references to the program itself, we use "Program Executive Office Soldier." Soldier Touch Points are testing events designed to demonstrate, measure, and validate capabilities in operational environments.

(U) Results in Brief

(U) Audit of the Army's Integrated Visual Augmentation System

(U) Recommendations (cont'd)

(U) In addition, we recommend that the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), as the decision authority for IVAS, verify whether the Program Executive Office Soldier meets established user acceptance measures and addresses Soldier-identified issues before IVAS production.

(U) Management Comments and Our Response

(U) The Assistant Secretary of the Army (Acquisition, Logistics, and Technology) commented on the three recommendations to the Assistant Secretary and the Program Executive Officer Soldier.

(U) The Assistant Secretary of the Army (Acquisition, Logistics, and Technology) disagreed with our recommendation to issue policy, stating that policy governing measurement of user acceptance input for test and evaluation already exists under current Army regulations as measures of effectiveness and measures of suitability. However, for the IVAS program, user acceptance is a measure of effectiveness, but thresholds and objectives are not clearly specified due to lack of Army policy. Therefore, the recommendation is unresolved. We request that the Assistant Secretary reconsider his position on the recommendation and provide comments on the final report.

(U) The Assistant Secretary of the Army (Acquisition, Logistics, and Technology), responding for the Program Executive Officer Soldier, partially agreed with our recommendation to define clear measures of user acceptance and requested we revise the recommendation to state to "explain" the clear measures of user acceptance levels to meet user needs before the operational demonstration of IVAS. However, in addition to explaining, officials must define specific and measurable user acceptance requirements. Therefore, we did not change the recommendation and it is unresolved. We request that the Assistant Secretary reconsider his position on the recommendation and provide comments on the final report.

(U) Although the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) agreed with the recommendation to verify whether the Program Executive Office Soldier meets established user acceptance measures, he did not agree with Recommendation 2. Because Army officials must define clear measures of user acceptance levels to implement this recommendation, the recommendation is unresolved pending the revised response to Recommendation 2.

(U) Please see the Recommendations Table on the next page for the status of recommendations.

(U) Recommendations Table

Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology)	1, 3	None	None
(U) The Program Executive Officer Soldier	2	None	None

(U) Please provide Management Comments by May 19, 2022.

(U) Note: The following categories are used to describe agency management's comments to individual recommendations.

- **(U) Unresolved** – Management has not agreed to implement the recommendation or has not proposed actions that will address the recommendation.
- **(U) Resolved** – Management agreed to implement the recommendation or has proposed actions that will address the underlying finding that generated the recommendation.
- **(U) Closed** – The DoD OIG verified that the agreed upon corrective actions were implemented.

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
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April 20, 2022

(U) MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (ACQUISITION, LOGISTICS, AND TECHNOLOGY)
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

(U) SUBJECT: Audit of the Army's Integrated Visual Augmentation System (Report No. DODIG-2022-085)

(U) This final report provides the results of the DoD Office of Inspector General's audit. We previously provided copies of the draft report and requested written comments on the recommendations. We considered management's comments on the draft report when preparing the final report.

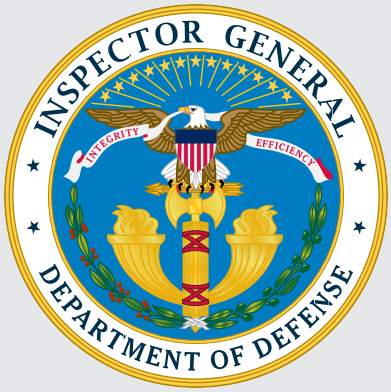
(U) This report contains recommendations that are considered unresolved because the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) and the Program Executive Officer Soldier did not agree with or did not fully address the recommendations presented in the report.

(U) Therefore, as discussed in the Recommendations, Management Comments, and Our Response section of this report, the recommendations remain open. We will track these recommendations until an agreement is reached on the actions that you will take to address the recommendations, and you have submitted adequate documentation showing that all agreed-upon actions are completed.

(U) DoD Instruction 7650.03 requires that recommendations be resolved promptly. Therefore, please provide us within 30 days your response concerning specific actions in process or alternative corrective actions proposed on the recommendations. Send your response to either followup@dodig.mil if unclassified or rfunet@dodig.smil.mil if classified SECRET.

(U) If you have any questions, please contact me at [redacted].

Timothy M. Wimette
Deputy Assistant Inspector General for Audit
Acquisition, Contracting, and Sustainment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(U) Contents

(U) Introduction

(U) Objective

(U) The objective of this audit was to determine whether Army officials effectively managed the Integrated Visual Augmentation System (IVAS) program to meet user needs. See Appendix A for the scope, methodology, and prior audit coverage.

(U) Background

(U) The Integrated Visual Augmentation System

(U) IVAS is a military goggle that overlays tactically relevant holographic information in a Soldier's line of sight to increase lethality, mobility, and situational awareness. The system is currently under development. IVAS integrates next generation 24/7 situational awareness tools and high resolution digital sensors in a single platform designed to improve Soldier sensing, decision making, target acquisition, and target engagement. Project Manager IVAS officials (program officials) stated that Soldiers would use the first version of IVAS primarily at night, though original development was for day and night use. Figure 1 shows a Soldier wearing IVAS. Figure 2 shows the individual components of IVAS.

(U) Figure 1. Army Soldier Wearing IVAS

(U) Source: Program Executive Office Soldier.

(~~CUI~~) Figure 2. [redacted]

(U) Source: The DoD OIG.

(~~CUI~~) [redacted]

(~~CUI~~) [redacted]

[3] (~~CUI~~) [redacted]

(U) IVAS Program Management

(~~CUI~~) Project Manager IVAS, under Program Executive Office Soldier, is responsible for IVAS program management activities.[4] The Acquisition Decision Authority is the Army Acquisition Executive. [redacted][5] [redacted]

(U) Soldier Lethality and IVAS User Needs

(U) The Soldier Lethality capability document states that our potential adversaries have capabilities that match and, in some cases, exceed those of American units. The capability document further states that these potential adversaries can detect, target, and lethally engage before U.S. forces are aware of their presence. To maintain dominance in the close combat fight against potential adversaries, U.S. forces require the development of Soldier lethality capabilities to dominate the battlespace and decrease Soldier risk.

(U) The Soldier lethality cross functional team identified seven requirements for technologies to enhance the Soldier's decisions and capabilities to execute combat tasks with speed and precision. These requirements - communications, lethality, mobility, protection, situational awareness, survivability, and training and human performance - serve as the basis for developing technologies to meet IVAS user needs and for the IVAS prototyping effort.

(U) Communications. The network must provide connectivity and access for forces and enable shared mission planning and situational awareness across Soldiers.

(U) Lethality. Current and future Armed Forces must be capable of defending themselves and projecting lethal dominance over adversaries.

(U) Mobility. Technologies must allow Soldiers to move rapidly, independently, and within the joint force in all operational environments.

(U) Protection. Equipment must provide light, ballistic, and directed energy protection. The equipment must also provide extremities protection; improved eye, hearing, and head protection; and blast protection.

[4] (U) Program Executive Office Soldier's mission is to rapidly deliver agile, adaptive, leading edge Soldier capabilities to provide combat overmatch today and be more lethal tomorrow.

[5] (U) Section 2430, title 10, United States Code (2020) states, in relevant part, that major defense acquisition programs require an eventual total expenditure for research, development, test, and evaluation of more than $300 million or an eventual total expenditure for procurement of more than $1.8 billion.

(U) Situational Awareness. Situational Awareness ensures Soldiers receive tactical information during forced entry operations, restrictive terrain, no light or low-light conditions, and military operations in urban areas.

(U) Survivability. Technology must be predictable and reliable for Soldiers to take action against threats quickly and with minimal risk to friendly forces. Equipment must allow maximum movement and visualization to maintain situational awareness in all environments.

(U) Training and Human Performance. Systems must provide a training environment for Soldiers to fight, rehearse, and train using the same equipment.[6]

(U) IVAS Testing Methodology

(U) Program officials used Soldier Centered Design during testing events in the IVAS rapid prototyping phase.[7] Soldier Centered Design intended to place the Soldiers, who will ultimately use a system, in the center of the design process and ensure that their needs are the foremost consideration when making design tradeoffs and decisions. This design process is a significant shift from the traditional acquisition process where program officials approve a requirements document and provide it to a material developer for a small quantity development and operational assessment upon completion. With Soldier Centered Design, the goal is to directly tie program success to user acceptance of the system.

(U) The Soldier Centered Design process used frequent Soldier feedback to develop and mature IVAS. In addition to conducting user studies and user juries, the program office plans to develop IVAS through five distinct increments of expanding functionality, known as Capability Sets and corresponding Soldier Touch Points (STPs).[8] The STPs are testing events designed to demonstrate, measure, and validate capability sets in operational environments. The STPs should inform future capability sets.

(U) The five Capability Sets, objectives, and corresponding STPs for IVAS are:

- **(~~CUI~~) Capability Set 1** – Demonstrate proof of concept using commercial products with an integrated commercial thermal sensor. Program officials conducted STP-1 at [redacted]

[6] (U) We did not review training for this audit because the Army needs to finish developing IVAS before Soldiers use it for training.

[7] (U) Rapid prototyping provides for the use of innovative technologies to quickly develop fieldable products that demonstrate new capabilities and meet emerging military needs.

[8] (U) User studies are rapid, iterative research and design activities that bring end users, designers, and engineers together. User juries are structured events to gain insight and feedback on features and interfaces as they are modified throughout the design process.

- **(~~CUI~~) Capability Set 2** – Demonstrate technology integrated with thermal and low light sensors. Program officials conducted STP-2 at [redacted]
- **(~~CUI~~) Capability Set 3** – Demonstrate production representative prototype in an operational environment. Program officials conducted STP-3 at [redacted]
- **(~~CUI~~) Capability Set 4** – [redacted]
- **(~~CUI~~) Capability Set 5** – [redacted]

(U) Human Factors and User Acceptance

(~~CUI~~) [redacted]

(U) IVAS Funding

(~~CUI~~) [redacted] The Army planned to procure 121,500 IVAS units; [redacted][9] [redacted]

[9] (U) Public Law 117-81, "National Defense Authorization Act for Fiscal Year 2022," December 27, 2021.

(U) Congressional Interest

(U) The FY 2022 National Defense Authorization Act requires the Secretary of the Army to report on system reliability, network adequacy, power duration, terrain data sufficiency, and plans for iterative improvements to IVAS. The Act also directs the removal of procurement funds until the Secretary of the Army submits the required report to the congressional defense committees. The Secretary of the Army's report on IVAS is due 60 days after completion of the initial test and evaluation event. Currently the Army scheduled the event for June 2022; therefore, the report is due in August 2022. In addition, the Act stated that the Director of Operational Test and Evaluation shall assess the validity, reliability, and objectivity of the report submitted by the Secretary of the Army.

(U) Furthermore, the Joint Explanatory Statement to accompany the Consolidated Appropriations Act, 2022 places FY 2022 IVAS procurement funding, in the amount of $350 million, on hold until the program completes initial operation test and evaluation and the Program Executive Office Soldier provides a brief to the House and Senate Appropriations Committees.[10]

(U) Review of Internal Controls

(U) DoD Instruction 5010.40 requires DoD organizations to implement a comprehensive system of internal controls that provides reasonable assurance that programs are operating as intended and to evaluate the effectiveness of the controls.[11] We identified an internal control weakness related to policy on acceptable user levels for weapon systems. Army officials have not identified user acceptance levels to define the likelihood of meeting user needs because Army policy did not require program officials to define suitable user acceptance levels. We will provide a copy of the final report to the senior official responsible for internal controls in the Department of the Army.

[10] (U) House Report 2471, "Joint Explanatory Statement of the Committee of Conference on H.R. 2471 – Division C: Consolidated Appropriations Act, 2022," March 9, 2022.

[11] (U) DoD Instruction 5010.40, "Managers' Internal Control Program Procedures," May 30, 2013, (Incorporating Change 1, June 30, 2020).

(U) Finding

(U) Army Policy Did Not Address User Acceptance Levels When Developing Systems

(~~CUI~~) Army testing officials assessed user acceptance from Soldiers that used IVAS during various tests and used the results of those surveys to make changes to the system. However, program officials did not define clear measures of user acceptance levels to determine whether IVAS would meet user needs. This occurred because Army policy did not require program officials to define suitable user acceptance levels. Procuring IVAS without attaining user acceptance could result in wasting up to $21.88 billion in taxpayer funds to field a system that Soldiers may not want to use or use as intended, because [redacted]

(U) Program Officials Did Not Define Clear Measures of User Acceptance Levels

(U) IVAS program officials did not define clear measures of user acceptance levels to determine whether IVAS will meet user needs. The purpose of user acceptance testing is to consistently monitor the likelihood of meeting user needs. The more prototype testing with Soldiers and incorporating changes based on Soldier feedback, the higher likelihood of their acceptance of IVAS. DoD Instruction 5000.89 states that operational testing of middle tier acquisition programs offers a unique opportunity to "fly before you buy" by involving the operational user early in the acquisition process, before the initial production decision is made, to incorporate user input into the system and to maintain acceptable risk to the Soldier.[12]

(U) IVAS program officials did not define clear measures of user acceptance levels to determine whether IVAS will meet user needs.

[12] (U) DOD Instruction 5000.89, "Test and Evaluation," November 19, 2020.

(~~CUI~~) [redacted] During the IVAS rapid prototyping phase, program officials conducted multiple testing events with users. The testing events culminated in the STP-4 [redacted] to demonstrate, measure, and validate IVAS with users in an operational environment.

(U) Army Assessed IVAS User Acceptance

(~~CUI~~) Army testing officials assessed Soldier acceptance of IVAS using surveys. After the Soldiers performed individual and collective tasks in operational tests, the office of the Director, Operational Testing and Evaluations and Army testing officials assessed user experiences across communications, lethality, mobility, protection, situational awareness, and survivability. We evaluated the survey responses from STP-4 to understand user acceptance as it related to user needs.[13] To determine the level of Soldier satisfaction with the system, the survey included questions on a Soldier's experiences with IVAS during testing and whether the Soldiers that tested the system would recommend IVAS. See Appendix B for the 56 survey questions we reviewed from STP-4 and how the [redacted] responded to the questions.

(U) Soldier Assessment of Communications

(~~CUI~~) [redacted] See Figure 3 for the Soldiers' responses.

[13] (U) Since program officials used a continuous test and update process, we focused on reviewing the last major test event results, STP-4.

(~~CUI~~) Figure 3. [redacted]

(U) Source: The DoD OIG.

(~~CUI~~) [redacted]

(~~CUI~~) [redacted]

(U) Soldier Assessment of Lethality

(~~CUI~~) [redacted] See Figure 4 for the Soldiers' responses.

(~~CUI~~) Figure 4. [redacted]

(U) Source: The DoD OIG.

(~~CUI~~) [redacted]

(~~CUI~~) [redacted]

(U) Soldier Assessment of Mobility

(~~CUI~~) [redacted] See Figure 5 for the Soldiers' responses.

(~~CUI~~) Figure 5. [redacted]

(U) Source: The DoD OIG.

(~~CUI~~) [redacted]

(~~CUI~~) [redacted]

(U) Soldier Assessment of Protection

(~~CUI~~) [redacted] See Figure 6 for the Soldiers' responses.

(~~CUI~~) Figure 6. [redacted]

[redacted]

(U) Source: The DoD OIG.

(~~CUI~~) [redacted][14] [redacted]

[14] (U) Army Test and Evaluation Command, "Capabilities and Limitations Report for the Integrated Visual Augmentation System Soldier Touch Point 4," June 2021.

(~~CUI~~) [redacted]

(U) Soldier Assessment of Situational Awareness

(~~CUI~~) [redacted] See Figure 7 for the Soldiers' responses.

(~~CUI~~) Figure 7. [redacted]

(U) Source: The DoD OIG.

(~~CUI~~) [redacted]

(~~CUI~~) [redacted]

(~~CUI~~) [redacted]

(U) Soldier Assessment of Survivability

(~~CUI~~) [redacted] See Figure 8 for the Soldiers' responses.

(~~CUI~~) Figure 8. [redacted]

[redacted]

(U) Source: The DoD OIG.

(~~CUI~~) [redacted]

(U) Overall User Acceptance of IVAS

(~~CUI~~) [redacted]

(~~CUI~~) [redacted][16][redacted]

[15] (~~CUI~~) [redacted]

[16] (U) Director, Operational Test and Evaluation, "Integrated Visual Augmentation System Capability Set 4 Operational Assessment," September 2021.

(~~CUI~~) [redacted]

(~~CUI~~) [redacted]

(~~CUI~~) [redacted] Program officials stated that they were very confident STP-5 would demonstrate resolution of most of the IVAS issues and increase user acceptance. However, there will be little time to address issues identified from STP-5. Program officials have scheduled the initial operation test and evaluation for [redacted]

(U) Army Lacked Policy on User Acceptance

(U) Army policy did not require program officials to define suitable user acceptance levels. Results from the surveys show both positive and negative user acceptance. Army officials stated that it was difficult to assess Soldier feedback. Officials also stated that challenges to assessing user acceptance included asking the right questions, Soldiers not liking change, comparing prototype "in process" systems to current capabilities, and lack of Soldier knowledge or training on new systems. Army officials emphasized that they needed to consider user feedback when determining the Army's need to modernize for the next fight with innovative technology.

(~~CUI~~) [redacted][17] [redacted]

(U) Army Futures Command and program officials did not define suitable user acceptance levels for the system. Army Futures Command officials inferred user acceptance as "a Soldier doing their job better and quicker using IVAS." The IVAS Deputy Program Manager stated that user needs and user acceptance were defined and tested in many ways. The program office conducted tests, STPs, user juries, and user studies, all of which were qualitative in nature, to test IVAS and obtain user feedback. He further stated that the product description provided user acceptance requirements. However, we concluded the IVAS product description document did not include a measurement for user acceptance.[18]

(U) The program office compiled data from surveys and asked questions regarding use of the IVAS after test events, but did not determine if user acceptance was at an appropriate level. The IVAS Program Manager stated that Soldier feedback is important for assessing the fixes for problems and Soldiers can provide input on system improvement. However, the Army has not developed any percentage or other measurement of user acceptance to determine whether the system is acceptable. Therefore, we recommend that the Assistant Secretary of the Army (Acquisition, Technology, and Logistics) develop Army wide policy requiring program officials to define suitable user acceptance measurements for testing and evaluation. The Program Executive Officer Soldier should define clear measures of user acceptance levels for IVAS before STP-5 testing. In addition, before IVAS production, the Assistant Secretary, as the decision authority for IVAS, should verify whether Program Executive Officer Soldier met the established user acceptance measures and addressed Soldier identified issues.

[17] (U) IVAS Capability Matrix, December 2021.

[18] (U) Product Description for Integrated Visual Augmentation System, November 2, 2020.

(U) Potential Waste if User Acceptance is Not Considered

(~~CUI~~) Procuring IVAS without attaining user acceptance could result in wasting up to $21.88 billion in taxpayer funds to field a system that Soldiers may not want to use or use as intended, because [redacted] In addition, concerns led congressional officials to place on hold $350 million in procurement funds in the Joint Explanatory Statement to accompany the Consolidated Appropriations Act, 2022, until Army officials complete initial operational test and evaluation and report to the defense and appropriation committees.

(U) Procuring IVAS without attaining user acceptance could result in wasting up to $21.88 billion in taxpayer funds to field a system that Soldiers may not want to use or use as intended.

(U) Defining suitable user acceptance levels to determine whether IVAS meets user needs will help ensure that the Army only procures systems that close combat forces will use and will assist the Army in providing a reliable report to DoD leadership and Congress relating to communications, lethality, mobility, protection, situational awareness, and survivability. According to program officials, IVAS has the potential to change how Soldiers execute missions in close combat. Obtaining Soldier acceptance will help ensure IVAS meets Soldier requirements and optimize the system's operational benefits at the start of the IVAS distribution.

(U) Conclusion

(~~CUI~~) [redacted]

[19] (~~CUI~~) [redacted]

(~~CUI~~) [redacted] Program officials stated that, if Soldiers do not love IVAS and do not find it greatly enhances accomplishing the mission, then Soldiers will not use it. Army officials should establish policy requiring program officials to define suitable user acceptance levels measurements [redacted]

(U) Program officials stated that, if Soldiers do not love IVAS and do not find it greatly enhances accomplishing the mission, then Soldiers will not use it.

(~~CUI~~) [redacted]

(U) Management Comments on the Finding and Our Response

(U) The Assistant Secretary of the Army (Acquisition, Logistics, and Technology) provided comments on the Finding, which included additional information from the Program Executive Office Soldier. For the full text of the Assistant Secretary's and Program Executive Office comments, see the Management Comments section of the report.

(U) The Assistant Secretary stated that the potential waste of up to $21.88 billion is misleading as it is a contract ceiling over a 10-year period and includes all possible sales to the Services and foreign military sales.

(U) The Assistant Secretary also stated that IVAS must meet a set of performance measures based on entrance criteria before operational testing and that user acceptance is part of data collected to evaluate suitability. He explained that there is inherent tension between user acceptance and opportunity and provided examples where Soldier acceptance was initially low, such as night vision goggles, machine guns, and automated transport replacing horses. The comments stated that Soldier acceptance can be impacted by subjective forces such as fatigue, weather, experience, bias, and familiarity with the legacy system. As such, the Assistant Secretary stated that user acceptance is not a metric that lends itself to objective measures. However, the Assistant Secretary also stated that user acceptance is useful in the requirements development process and prototyping when Soldier-centered design is most impactful. In addition, the Assistant

(U) Secretary stated that Soldier-centered design is used for tradeoffs, not production decisions, and the report inappropriately recommends Soldier acceptance be the key determining factor for production readiness.

(~~CUI~~) The Assistant Secretary further stated that the procurement quantity was based on the funding levels available at the rapid fielding decision in order to comply with the National Defense Authorization Act. Furthermore, [redacted]

(U) Our Response

(~~CUI~~) Army officials awarded a contract for up to $21.88 billion for IVAS. While officials may not exercise the entire amount of the contract, it is possible they may. [redacted] It is entirely possible the system will not be used to its full designed capabilities if Soldiers do not like it, or could not function effectively when wearing the system. [redacted] Army officials should have established user acceptance measurements at the beginning of the program to ensure that user needs were met. While we agree there is inherent tension between user acceptance and opportunity, having an established measurement or goal enables officials to know that close combat forces accept, want to use, and can function effectively with IVAS.

(~~CUI~~) [redacted] However, officials have not set clear guidelines for when that feedback should be measured and considered as part of ensuring the system meets the system requirements and user needs.

(~~CUI~~) [redacted]

(U) Recommendations, Management Comments, and Our Response

(U) Recommendation 1

(U) We recommend that the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) develop Army-wide policy requiring program officials to define suitable user acceptance measurements for testing and evaluation.

(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology) Comments

(U) The Assistant Secretary of the Army (Acquisition, Logistics, and Technology) disagreed with our recommendation, stating that policy governing measurement of user acceptance input for test and evaluation already exists under current Army regulations as measures of effectiveness and measures of suitability. The Assistant Secretary also stated that, because each acquisition program is different, applying specific, quantifiable DoD or Army-level user acceptance measures could impede the Army's ability to tailor programs or remain agile and adaptable. The Assistant Secretary further stated that user input on IVAS is a key component of the test and evaluation approach and the Army uses the results in its risk-based acquisition decision process.

(U) Our Response

(U) Comments from the Assistant Secretary partially addressed the specifics of the recommendation; therefore, the recommendation is unresolved. Army policy does not require program officials to define the levels of user acceptance, or satisfaction, necessary to meet operational effectiveness, operational suitability, or survivability for systems that closely integrate with Soldiers. For the IVAS program, user acceptance is a measure of effectiveness, but thresholds and objectives are not clearly specified due to lack of Army policy. The Army must develop a policy that would require not one predetermined definition or measure but rather would allow program officials to tailor specific and defined levels of user acceptance for each program in terms of thresholds and objectives for testing and evaluation. We request that the Assistant Secretary reconsider his position on the recommendation and provide comments on the final report that address the need for policy on user acceptance measurements.

(U) Recommendation 2

(U) We recommend that the Program Executive Officer Soldier define clear measures of user acceptance levels to meet user needs before Soldier Touch Point-5 testing of the Integrated Visual Augmentation System.

(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology) Comments

(U) The Assistant Secretary of the Army (Acquisition, Logistics, and Technology), responding for the Program Executive Officer Soldier, partially agreed with the recommendation. The Assistant Secretary recommended that we revise the recommendation to have the IVAS requirements community explain the clear measures of user acceptance levels to meet user needs before the operational demonstration of IVAS. In addition, the Assistant Secretary stated that user acceptance contributes to the continuous evaluation process and that Program Executive Officer Soldier will continue to refine user acceptability.

(U) Our Response

(U) Comments from the Assistant Secretary did not address the specifics of the recommendation; therefore, the recommendation is unresolved. In addition to explaining their measures for user acceptance, officials must define specific and measurable user acceptance requirements for IVAS. We request that the Assistant Secretary reconsider his position on the recommendation and provide comments on the final report that address the need to define measures of user acceptance levels, before further decisions are made regarding the development or production of IVAS. Clear measures of user acceptance will enable the Army to determine whether the system meets user needs.

(U) Recommendation 3

(U) We recommend that the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), as the decision authority for the Integrated Visual Augmentation System, verify whether the Program Executive Office Soldier met the established user acceptance measures and addressed Soldier-identified issues before production.

(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology) Comments

(U) The Assistant Secretary of the Army (Acquisition, Logistics, and Technology) agreed with the recommendation, stating that verification is an integral part of the production and fielding decision scheduled for the fourth quarter of FY 2022.

(U) Our Response

(U) Although the Assistant Secretary agreed with the recommendation, he did not agree with Recommendation 2. Because Army officials must define clear measures of user acceptance levels to implement this recommendation, the recommendation is unresolved pending the revised response to Recommendation 2.

(U) Appendix A

(U) Scope and Methodology

(U) We conducted this performance audit from October 2021 through February 2022 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

(U) Review of Documentation and Interviews

(U) To answer our audit objective and determine whether Army officials effectively managed the IVAS program to meet user needs, we reviewed the Soldier Lethality Initial Capabilities Document, Integrated Visual Augmentation System Capability Matrix, Product Description for Integrated Visual Augmentation System, Director Operational Test and Evaluation operational assessment for Soldier Touch Point (STP) 4, Capabilities and Limitations Report for Integrated Visual Augmentation System Soldier Touch Point 4, Final Report for the Human Factors User Assessment and Weapons Compatibility Test of the IVAS Capability Set 4b, FY 2022 National Defense Authorization Act, and the Joint Explanatory Statement to accompany the Consolidated Appropriations Act, 2022.

(U) The audit universe consisted of the feedback sessions from the four completed Soldier touch points. Since the program officials used a continuous test and update process, we focused on reviewing the last major test event results, Capability Set 4, including STP-4. The feedback from the most recent touch point, STP-4, occurred from April 19, 2021, through April 30, 2021. We obtained and reviewed Soldier results of the survey program officials conducted after IVAS STP-4. We reviewed the Soldier survey questions and nonstatistically selected the questions that applied to communications, lethality, mobility, protection, situational awareness, and survivability. The survey questions may have related to more than one of the six capabilities.

(U) We calculated the sum of total participants and the percentage of:

- (U) negative responses – dissatisfied, would not recommend, disagree, or unlikely;
- (U) neutral responses – neither dissatisfied or satisfied, might or might not recommend, unsure, neither agree nor disagree, neither likely nor unlikely;

- (U) positive responses – satisfied, would recommend, agree, or likely; and
- (U) not applicable responses (if applicable).

(U) We reviewed the following guidance.

- (U) DoD Instruction 5000.80, "Operation of the Middle Tier of Acquisition," December 30, 2019
- (U) DoD Instruction 5000.89, "Test and Evaluation," November 19, 2020
- (U) Army Regulation 73-1, "Test and Evaluation Policy," June 8, 2018
- (U) Department of the Army Pamphlet 73-1, "Test and Evaluation in Support of Systems Acquisition," May 30, 2003

(U) We conducted a site visit to the IVAS program office at Fort Belvoir, Virginia. We met and interviewed the IVAS program management officials to understand IVAS, risk areas, and risk mitigations strategies. We also interviewed officials from the:

- (U) Office of the Director, Operational Test and Evaluation;
- (U) Assistant Secretary of the Army (Acquisition, Technology, and Logistics);
- (U) Army Test and Evaluation Command; and
- (U) Army Futures Command.

(U) We did not review the Enhanced Training and Human Performance user need. We did not review training for this audit because the Army needs to complete development of IVAS before Soldiers use it for training.

(U) This report was reviewed by the DoD Component associated with this audit to identify whether any of their reported information, including legacy FOUO information, should be safeguarded and marked in accordance with the DoD CUI Program. In preparing and marking this report, we considered any comments submitted by the DoD Component about the CUI treatment of their information. If the DoD Component failed to provide sufficient comments about the CUI treatment of their information, we marked the report based on our assessment of the available information.

(U) Internal Control Assessment and Compliance

(U) We assessed internal controls and compliance with laws and regulations necessary to satisfy the audit objective. In particular, we assessed control activities related to whether Army officials are effectively managing the IVAS program to meet user needs. We identified an internal control weakness related to policy on acceptable user levels for weapon systems because Army

(U) policy did not require program officials to define suitable user acceptance levels. However, because our review was limited to these internal control components and underlying principles, it may not have disclosed all internal control deficiencies that may have existed at the time of this audit.

(U) Use of Computer-Processed Data

(U) We used computer-processed data to analyze the STP-4 survey results. We obtained the STP-4 survey questions and data from the IVAS program officials to determine the questions related to the user needs identified as part of the audit. We mitigated risks associated with data completeness by comparing the participant count in the surveys raw data to the survey response count identified in the Director, Operational Test and Evaluation STP-4 operational assessment. We mitigated risks associated with the accuracy of the data by searching for any records in the data that were incomplete. We used the survey data and results to provide context and feedback to the DoD about its user acceptance policies. We determined that the data we obtained from the STP-4 survey results were sufficiently reliable for the purpose of this report.

(U) Prior Coverage

(U) During the last 5 years, the Government Accountability Office (GAO) issued three reports and has one current report discussing or related to whether Army officials are producing and fielding Integrated Visual Augmentation System units that meet user needs. Unrestricted GAO reports can be accessed at http://www.gao.gov. Unrestricted DoD OIG reports can be accessed at http://www.dodig.mil/reports.html/.

(U) GAO

(U) Report No. GAO-21-222, "Weapon Systems Annual Assessment: Updated Program Oversight Approach Needed," issued June 2021

> (U) The GAO concluded that the program intends to deliver a total of 2,550 prototypes in four capability sets, each to provide increasing capabilities. The program updated its completion date from November 2020, to September 2023, and increased total estimated costs by $26.4 million from the previous year. Program officials explained the change was an error in reporting. The GAO recommended the DoD develop a reporting strategy to improve oversight of those weapon systems developed using multiple efforts or pathways, but the recommendation did not specifically relate to IVAS.

(U) Report No. GAO-20-439, "Defense Acquisitions Annual Assessment: Drive to Deliver Capabilities Faster Increases Importance of Program Knowledge and Consistent Data for Oversight," issued June 2020

(U) The GAO concluded that the initial 24-month schedule was aggressive and the program may not be able to deliver the full capability as planned. The report stated that the Army will likely have to tradeoff performance to meet the schedule, but that the program expects to deliver a capability in the timeframe. The GAO reported that IVAS relies on the successful development and integration of 15 critical technologies. Army Research, Development & Engineering Command stated that the technology risk was at maturity. However, the Office of the Under Secretary of Defense (Research & Engineering) stated the technology risk was high. The GAO made no recommendations for the IVAS program in the annual assessment.

(U) Report No. GAO-19-132, "Army Modernization: Steps Needed to Ensure Army Futures Command Fully Applies Leading Practices," issued January 2019

(U) The GAO concluded that the Army has generally applied leading practices identified by GAO to its modernization efforts, but proceeding into weapon systems development at earlier stages of technology maturity raises the risk that the resulting systems could experience cost increases, delivery delays, or failure to deliver desired capabilities. The Army's intent to transition technologies to weapon system before maturing the technologies is inconsistent with its leading practices. The GAO recommended that the Commanding General of Army Futures Command demonstrate technology in an operational environment before stating system development, take steps to incorporate the experiences of cross-functional teams, execute a process for identifying and incorporating lessons learned from cross-functional team pilots, and fully apply leading practices for mergers and organizations transformations.

(U) Appendix B

(U) Soldier Touch Point - 4 Survey Questions

(~~CUI~~) Program officials administered surveys to [redacted], to capture user acceptance and performance data on the Soldier Touch Point event. Program officials executed STP-4 at [redacted]

(~~CUI~~) [redacted]	[redacted]	[redacted]	[redacted]	[redacted]
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[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted] (~~CUI~~)

(U) Soldier Touch Point - 4 Survey Questions (cont'd)

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(U) Soldier Touch Point - 4 Survey Questions (cont'd)

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(U) Soldier Touch Point - 4 Survey Questions (cont'd)

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[redacted]				(~~CUI~~)

*(~~CUI~~) [redacted]

(U) Source: The DoD OIG.

(U) Management Comments

(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology)

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY
ACQUISITION LOGISTICS AND TECHNOLOGY
103 ARMY PENTAGON
WASHINGTON DC 20310

SAAL-ZA 15 March 2022

MEMORANDUM FOR DEPARTMENT OF DEFENSE INSPECTOR GENERAL

SUBJECT: Audit of the Army's Integrated Visual Augmentation System (Project No. D2022-D000AU-0013.000)

1. Pursuant to the Department of Defense Inspector General's (DoDIG) proposed report, dated 28 Feb 22, the following information is provided to DoDIG's request for comments to their subject draft report.

2. The DoDIG Recommendation A.1. "We recommend that the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) develop Army wide policy requiring program officials to define suitable user acceptance measurements for testing and evaluation."

U.S. Army Comment: We non-concur. Our disagreement is based on the existence of Army-wide policy governing measurement of user acceptance input for Test and Evaluation already exists. Army Regulation 73-1 and Department of the Army Pamphlet 73-1 require the development of measures of effectiveness (MOEs) and measures of suitability (MOSs) to support the evaluation of approved Critical Operational Issues and Criteria (COIC).

Each program is unique and DoD and Army policy provide the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (ASA(ALT)) the authority to employ acquisition strategies and processes to match the characteristics of the capability being acquired. Specific, quantifiable DoD or Army-level user acceptance measures could impede the ability of the ASA(ALT) to tailor programs or remain agile and adaptable. Any Army-wide policy changes would also first need to be recognized by the Director, Army Test and Evaluation and analyzed for impact.

In accordance with Army regulation and guidance, the evaluation approach for Integrated Visual Augmentation System (IVAS) includes operational and technical statistics to measure user acceptance as part of the overall IVAS evaluation. User input is a key component of the Soldier-centric design approach and the Army Test and Evaluation Command's (ATEC) evaluation strategy. The User Acceptance Rating Scale is one tool used to summarize Soldier sentiment towards IVAS form, fit, function, and contribution to mission success. ATEC collects feedback on user acceptance via approved survey and Soldier focus groups. The results of all technical and operational

(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (cont'd)

SAAL-ZA
SUBJECT: Audit of the Army's Integrated Visual Augmentation System (Project No. D2022-D000AU-0013.000)

testing, of which User Acceptance is one component, are used in ATEC's evaluation of operational effectiveness, suitability, and survivability. The evaluations and associated recommendations are provided to the Milestone Decision Authority (MDA) as part of their risk-based acquisition decision process.

3. The DoDIG Recommendation A.2. "We recommend that the Program Executive Officer Soldier define clear measures of user acceptance levels to meet user needs before Soldier Touch Point-5 testing of IVAS."

U.S. Army Comment: We concur with the intent of the comment, but recommend that the verbiage be refined to read "We recommend that the IVAS requirements community explain the clear measures of user acceptance levels to meet user needs before the Operational Demonstration of IVAS."

User Acceptance measures fall within established and agreed upon operational effectiveness, suitability, and survivability evaluation strategies. ATEC uses operational and technical statistics to measure user acceptance as part of the overall IVAS evaluation. User acceptance input is one of the many credible data sources that contribute to the continuous evaluation process and readiness determination prior to the Operational Demonstration. Additional comments from the Program Executive Office Soldier (PEO, Soldier) are included in the Enclosure to assist in providing greater accuracy and clarity for the final report. The PEO, Soldier will continue to work with the user community to better refine user acceptability

4. The DoDIG Recommendation A.3. "In addition, we recommend the Assistant Secretary of the Army (Acquisition, Logistics, and Technology), as the decision authority for IVAS, verify whether the Program Executive Officer Soldier met the established user acceptance measures and addressed Soldier identified issues, before IVAS production."

U.S. Army Comment: We concur with this recommendation. This verification is an integral part of the Production and Fielding Decision, currently scheduled to occur in the fourth quarter of Fiscal Year 2022, that the ASA(ALT) will make, which precedes any IVAS production. The independent ATEC evaluation report will inform the ASA(ALT) of system performance, to include the operational effectiveness, operational suitability, survivability, and will be based on all credible data, to include user acceptability. This coupled with input from AFC on whether this system is acceptable for operational use, affords the ASA(ALT) has the ability to make a risk-based decision on whether or not the program should proceed into production.

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(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (cont'd)

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SUBJECT: Audit of the Army's Integrated Visual Augmentation System (Project No. D2022-D000AU-0013.000)

5. The point of contact for this memorandum is [redacted] or [redacted].

Sincerely,

Douglas R. Bush
Assistant Secretary of the Army
(Acquisition, Logistics and Technology)

Encl
1. PEO, Soldier Official Comments and Security Marking Review

3

(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (cont'd)

Department of Defense – Department of the Army
Project Executive Office Soldier – Audit Engagement and Compliance

Draft Audit Report – Comments' Tracker

Auditor	Department of Defense Inspector General (DoD IG)
Audit Number	Project No. D2022-D000AU-0013.000
Audit Description	Audit of the Army's Integrated Visual Augmentation System
Project Manager(s)/ Director	PM IVAS

No.	Comment	Reference	Source/Reviewer
1	"Procuring IVAS without attaining user acceptance could result in wasting up to $21.88 billion in taxpayer funds to field a system that Soldiers may not want to use, or use as intended, [redacted] This is fundamentally flawed and inflammatory, and must be removed or rewritten. If re-written, the word "wasting" must be removed. It is a biased word, intended to illicit an emotionally negative belief in a fictional outcome, without fact or proof. $21.88B is part of the narrative to illicit an emotional response. However, it is an impossible outcome for the Army. This is a contract ceiling that includes all possible hardware, components, and services over a 10 year period at the worst possible pricing structure. Less than half of this total is possible for the U.S. Army. This total includes all possible sales to all sister services, Foreign Military Sales and all maximized service contracts.	Page i. Finding	[redacted]
2	The recommendation that the IVAS uniquely requires clear measures of user acceptance levels prior to entering into a Soldier Touch Point or an Operational Test (OT) suggests that all testing since Goldwater Nichols is insufficient. IVAS is no different from any other weapon system the Army develops. IVAS must meet a set of performance measures based on entrance criteria prior to OT. Subsequently, IVAS OT results will verify that the system meets Army requirements and is suitable, survivable, and effective. As part of the planning for the IVAS OT, the Army Test and Evaluation Command, with oversight from the Director of Operational Test and Evaluation, will document a detailed data collection plan and a System Evaluation Plan which delineate the specific data to be collected and how it will be used to evaluate suitability, survivability, and effectiveness. User acceptance is part of the data that is collected to evaluate suitability.	Page i. Recommendations A.2 and A.3	[redacted]
3	The premise that user acceptance is essential to IVAS program viability is flawed. There is an inherent tension between user acceptance and opportunity. For example, when the Army introduced Night Vision goggles to the force in the 1970's, Soldier acceptance was low despite the fact that this technology provided the ability to see at night. Over time, as Soldiers became more experienced with them, and developed new tactics,	Page i. Recommendations A.2 and A.3	[redacted]

(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (cont'd)

No.	Comment	Reference	Source/Reviewer
	techniques, and procedures; Soldier acceptance increased substantially. If the Army had relied on user acceptance in the 1970's, we would have never "Owned the Night." Other examples of military systems with low initial acceptance are the machine gun and automated transport over horses.		
4	User acceptance contains biases that are not understood in a way that can provide statistical relevance to sentiment. Soldier sentiment/acceptance can be impacted by a number of subjective forces such as level of fatigue, weather conditions, professional Soldier experience, soldier bias, familiarity with legacy systems, etc. As such, it is not a metric that lends itself to objective measures that are useful outcomes from OT. However, Soldier feedback is most useful during the requirements development process and early prototyping when Soldier-centered design is most impactful.	Page i. Recommendations A.2 and A.3	[redacted]
5	USD(A&S) approved the RFD for IVAS in [redacted]	Page 3, IVAS Program Management	[redacted]
6	The Army delayed OT for 9 months not 1 year ([redacted]).	Page 15, last paragraph	[redacted]
7	Soldier Centered Design is utilized for design tradeoffs, not for production decisions. A production decision is made by the MDA per AR 70-1 1-7 Procedures h(3)(b)12. The DoDIG report places inappropriate weight on Soldier Centered Design and not enough on how operational testing conducted by ATEC/DOT&E answers system effectiveness.	Page 1	[redacted]
8	Recommend blurring the unit patches on page 1	Page 1	[redacted]
9	Figure 2 doesn't address Cloud.	Page 2	[redacted]
10	Funding paragraph is misleading. The procurement quantity of 68k systems was based on IVAS funding levels available at the time of the RFD in order to be in compliance with pending NDAA statute. The Army reduced the quantity based on available funding. The funding estimate was for all IVAS products (HUD & Puck, TCP, Cloud, Power, and Radios).	Page 6	[redacted]
11	In regards to IVAS Voice Communications – [redacted]	Page 8, Figure 3	[redacted]
12	The Tiered Capability Matrix defines minimum acceptance levels. The Product Description traces to those levels by defining engineering specifications in the Product Description. The awarded contract contains the Product Descriptions and levels of acceptance as agreed to by the Contractor and the Government. [redacted]	Page 16	[redacted]

Final Report Reference

Revised report page 3.

Revised report page 16.

Revised report page 6.

(U) Assistant Secretary of the Army (Acquisition, Logistics, and Technology) (cont'd)

No.	Comment	Reference	Source/Reviewer
	[redacted]The IG report is inappropriately recommending Soldier acceptance to be the key determining factor for Production readiness.		
13	Recommendation #2 – The recommendation should change to read, "... Operational Test" instead of "STP 5". The system will meet form, fit and function per the requirement, verified by the testing community.	Page i	[redacted]
14	Recommendation #3 – The AAE shall take into account the recommendations of ATEC and DOT&E. User acceptance is an important consideration, but not the sole criteria for the decision. The DoDIG places inappropriate weight on Soldier Centered Design and not enough on how Operational testing conducted by ATEC/DOT&E answers system effectiveness.	Page i	[redacted]
15	[redacted]	Page 17, last paragraph	[redacted]

(U) Acronyms and Abbreviations

CUI	Controlled Unclassified Information
GAO	Government Accountability Office
IVAS	Integrated Visual Augmentation System
STP	Soldier Touch Point

(U) Glossary

(U) Battery Pack. A wearable battery that integrates seamlessly into a Soldier's body armor.

(U) Capability Set. A group of testing events including user juries, user studies, and a large-scale, formal evaluation referred to as a Soldier Touch Point, which marks the end of a capability set and serves to drive further planning.

(U) Heads-Up Display. Military transparent goggles with multiple light sensors that present data without requiring Soldiers to look away from their usual field of vision.

(U) Initial Capabilities Document. This document describes the need for a materiel approach to a specific capability gap derived from an initial analysis of materiel approaches executed by the operational user and, as required, an independent analysis of materiel alternatives. It defines the capability gap in terms of the functional area, the relevant range of military operations, desired effects, and time.

(U) Lethality. The ability to effectively detect, identify, and employ lethal effects against appropriate targets throughout the full spectrum of military operations, under all climatic condition, and in all operational environments with minimal collateral effects.

(U) Mobility. The ability to move rapidly, independently and within the joint force in all operational environments.

(U) Puck. A body-mounted computer, connected to the heads-up display that uses a cable to power the sensors and user experience.

(U) Sensor. A device intended to detect and provide perceivable, measurable data.

(U) Situational Awareness. Situational awareness is the ability of Soldiers to receive Command, Control, Communication, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR) information during early or forced entry operations, restrictive terrain, subterranean (zero illumination), low-light conditions, Military Operations in Urban Terrain (MOUT).

(U) Soldier Centered Design. Soldier Centered Design involves iterating on product design for IVAS based on Soldier feedback from embedded Soldier sessions and Soldier Touch Points, with program success directly tied to Soldier acceptance.

(U) Soldier Touch Point. A Soldier Touch Point is a testing event that demonstrates, measures, and validates capability sets in operational environments.

(U) Squad Immersive Virtual Training System. The Squad Immersive Virtual Training System is an immersive training system with advanced scenario generation, artificial intelligence, and after action review capabilities, and the capability to improve Soldier lethality through target engagement, simulated operations, and planning and rehearsals.

(U) Squad Radio. This is a secure, two-way radio to support communications.

(U) Tactical Assault Kit. This kit is a situational awareness software that provides a network for sharing maps, messages, and mission plans.

(U) Tactical Cloud Package. The Tactical Cloud Package is network infrastructure providing advanced computing and Artificial Intelligence/Machine Learning (AI/ML) capabilities at the tactical edge.

(U) Target Acquisition. Target acquisition is the ability to detect, identify, and employ lethal and non-lethal effects against appropriate targets.

(U) Target Engagement. A target engagement is an action taken on a target, such as firing a weapon on an attack.

(U) Three-Dimensional Terrain Model. This is a high fidelity three-dimensional scene including building exteriors, interiors, and surrounding areas.

(U) User Acceptance. The measure of the users' attitude about the system, including their perception of the system's military utility, ease of use, and functionality.

(U) User Jury. User juries are structured events conducted to gain insight and feedback on features and interfaces as they are modified throughout the design process.

(U) User Study. User studies are rapid, iterative research and design activities that bring end-users, designers, and engineers together.

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