Integrated Visual Augmentation System (IVAS)

The Integrated Visual Augmentation System (IVAS) prototyping effort demonstrated growth in capabilities with a first militarized design for Capability Set (CS) 3 and CS 4 but a few challenges remain to be addressed to demonstrate the IVAS operational effectiveness, suitability and survivability in combat. The Army should develop an adequate T&E strategy that quantifies improvements to CS 4 deficiencies prior to IOT&E and fielding.

System Description

The Army intends for the IVAS to increase close combat lethality by providing improved communication, mobility, situational awareness, and marksmanship. The IVAS includes a heads-up display (HUD), body-worn computer (puck), networked data radio, and three conformal batteries for each soldier. The IVAS HUD provides a see-through display and augmented reality capability with integrated thermal and low-light imaging sensors, a built-in compass for navigation, and Tactical Assault Kit situational awareness software. The Intra-Soldier Wireless provides Rapid Target Acquisition capabilities connecting the Family of Weapon Sights – Individual mounted on a soldier's weapon to the sight picture in the HUD. The IVAS radio enables all IVAS-equipped soldiers to pass data within the Company.

Program

IVAS is a Middle Tier of Acquisition program in the rapid prototyping and fielding phases intended to equip over 100,000 soldiers with the system, using an iterative approach of four Capability Sets. In December 2020, after the completion of CS 3 testing, the USD(A&S) approved the IVAS program to transition from rapid prototyping to rapid fielding, authorizing the Army to procure up to 10,000 CS 4 systems while also requiring that correction of problems noted during CS 3 testing be verified prior to IOT&E and CS 4 fielding. The Army employs the rapid prototyping effort to continue system development.

The Army split the IVAS CS 4 into two increments (CS 4a and CS 4b) and completed the testing of both increments in July 2021. The IVAS Program Manager has not yet developed an adequate T&E strategy that quantifies improvements to CS 4 deficiencies, a prerequisite for IOT&E and fielding.

Major Contractor

Microsoft – software development in Redmond, Washington and hardware developed in Mountain View, California.

Test Adequacy

Between October 2020 and November 2020, the Army conducted Soldier Touch Point (STP) 3 at Fort Pickett, Virginia with CS 3 to support the rapid fielding decision. Details are provided in the IVAS CS 3 Operational Assessment report published in March 2021. In April 2021, the Army conducted STP 4 at Fort Bragg, North Carolina with CS 4a prototypes. STP 4 included a 48-hour company mission scenario and multiple comparative events to compare performance of soldiers equipped with the IVAS to soldiers equipped with their current equipment. Following additional fixes, the Army demonstrated CS 4b in User Jury 4.3 at Fort Bragg, North Carolina in July 2021. The Army conducted a Cooperative Vulnerability and Penetration Assessment on hardened CS 4 systems at White Sands Missile Range, New Mexico in May 2021, followed by a developmental test with soldiers focused on discovering IVAS CS 4 cyber and electronic warfare vulnerabilities. CS 4 testing informed the Army decision about IVAS readiness for IOT&E.

Performance

Effectiveness and Suitability

To comply with the IVAS Security Classification Guide, the details of the IVAS operational effectiveness and suitability are provided in the Controlled Unclassified Information edition of this report. The report assesses the contribution of the IVAS CS 3 to navigation and mission planning and the ability of the IVAS-equipped units to distinguish enemy from friendly forces and reliably engage the enemy. It provides additional details on IVAS sensors and display, Rapid Target Acquisition integration, reliability, availability, human factors/comfort, field of vision, and user acceptance.

Survivability

The survivability of IVAS in cyber- and electromagnetic spectrum-contested environments will be assessed during the IOT&E.

Recommendations

The Army should:

1. Develop an adequate T&E strategy to quantify improvements to CS 4 deficiencies prior to IOT&E.
2. Continue to mitigate deficiencies identified in test.
3. In coordination with Microsoft, develop a reliability growth plan to continue to correct failure modes.
4. Complete a battery and power management plan to determine how soldiers will charge batteries to ensure adequate power to complete a 72-hour mission scenario.