Capabilities and Limitations Report for the Integrated Visual Augmentation System Capability Set 3

ATEC Project No: 2021-CE-SED-HUD30-H9832

(b) (6)

January 2021

Report Produced By
The United States Army
Test and Evaluation Command

Approved: (b) (6) **Date:** 27 March, 2021

Commanding
U.S. Army Test and Evaluation Command

Controlled by: ATEC
Controlled by: AEC, SED
CUI Category: Controlled Technical Information
Distribution Statement: B
POC: (b) (6)

Executive Summary

The Integrated Visual Augmentation System (IVAS) is a single platform for Soldiers to fight, rehearse, and train. The Soldier-Centered Design process involves Soldiers early and often in the development and prototyping efforts. This report provides an assessment of IVAS through Capability Set (CS) 3, which represents the first militarized version of the system.

The CS 3 development cycle culminated with Soldier Touch Point (STP) 3 in October 2020. The objective of STP 3 was to support system development by conducting individual and collective tasks with Soldiers and Marines to gather feedback on system design and functionality across the Warfighter functions. STP 3 was intended to demonstrate the CS 3 capabilities and assess progress towards meeting requirements.

Findings and observations were made for CS 3 on the progress towards meeting Capability Matrix requirements. The Program Manager is implementing a number of changes to improve system performance and Soldier acceptance prior to STP 4 and the Initial Operational Test.

Lethality. During unit missions, Soldiers utilized Rapid Target Acquisition (RTA) modes (full screen, picture-in-picture, and bubble) and Family of Weapons Sights-Individual (FWS-I) to engage targets in multiple light and weather conditions. (b) (4) [redacted].

Situational Awareness (SA). IVAS provided Warfighters with low-light and thermal imaging capabilities for conducting individual and unit tasks. (b) (4) [redacted]

Mobility. IVAS provided Warfighters with improved maneuver capabilities through route planning and coordinated land navigation. (b) (4) [redacted]

Mission Planning. (b) (4) [redacted].

Communication. IVAS provided a Platoon level network, (b) (4) [redacted]

(b) (4) [redacted]

Sustainment. (b) (4) [redacted]

Squad-Immersive Virtual Trainer (SiVT). The SiVT provided the capability for up to nine Soldier Infantry Squads to perform collective indoor training (Battle Drill 6). (b) (4) [redacted]

Safety and Health Hazards. (b) (4) [redacted]

Protection. (b) (4) [redacted]

Pre-planned Future Testing. Future events will assess the following aspects of IVAS:

- The operational and support unit logistics footprint associated with transport and storage of IVAS components, spares, and power supply/recharging requirements.
- Cyber electro-magnetic activity testing.
- Ballistic eye protection against three impacts to a system in accordance with Military Preference-32432A.
- Interoperability with the Integrated Tactical Network.

Introduction

Purpose. This report documents demonstrated Integrated Visual Augmentation System (IVAS) capabilities and limitations through the Capability Set (CS) 3 developmental cycle.

Operational Environment. The operational environment ranges from major theater warfare and close combat in urban and complex terrain to regional instabilities, coalition support, unconventional warfare, foreign internal defense, and humanitarian relief efforts.

Operational Need. The 2018 National Defense Strategy identified that peer and near-peer threats have capabilities that match, and in some cases, exceed the capabilities of U.S. forces. These potential adversaries can detect, target, and lethally engage before U.S. forces become aware of their presence. Foreign militaries and commercial industries continue to develop systems supporting SA (image intensifiers, thermal sensors, lasers); communication; and intelligence, surveillance, and reconnaissance.

Maneuver forces must have unrivaled lethality, mental toughness, physical toughness, training, mobility, protection, cross-domain capability, and awareness to maintain overmatch against any adversary in any operational environment. U.S. forces must be capable of employing the capabilities in all five domains – land, maritime, air, space, and cyberspace.

The operational need requires regaining overmatch capabilities in lethality, mobility, communications, SA, protection, and training against peer and near-peer threats. The desired system should provide the Warfighter with the ability to fight, rehearse, and train with the same equipment utilized in actual combat operations.

Employment Concept of Operations. Dismounted close combat forces within the Brigade Combat Teams will employ IVAS as they engage in offensive, defensive, stability, and security operations against unconventional enemy forces in all operational environments and terrains. The dismounted conventional and close combat forces operate in a framework of decisive action. Their actions take place at the point where all of the plans from higher headquarters meet the enemy in close combat. This role requires Leaders at all levels to quickly understand the situation, make decisions, and fight the enemy to accomplish the mission. Close combat forces will close with the enemy by means of fire and maneuver in order to destroy or capture them, or to repel their assault with fire, close combat, and counterattack. Every member of the Squad will employ IVAS.

Threats. The primary threat to IVAS equipped-dismounted forces is threat-dismounted forces using small arms, night vision devices, and lasers. The enemy will optimize their forces and capabilities to the physical/cultural environment and/or circumstances. Enemy forces are likely to be hybrid threats, consisting of a diverse and dynamic combination of regular forces, irregular forces, and/or criminal elements, all operating in an integrated manner to achieve mutually benefitting effects. Easy access to new technology allows enemies the potential to achieve parity with U.S. technology, or possibly a niche technological advantage. Close combat forces can expect to face increased threats from armed Unmanned Aerial Systems, and the enemy's ability to jam Global Positional System (GPS) signals will limit the use of precision munitions. Enemy tactics, equipment, and capabilities vary greatly. They may use kinetic or non-kinetic means to attack or degrade both U.S. and related mission partners' ability to conduct operations. Chemical, biological, radiological contamination and initial nuclear effects could also threaten Soldier Lethality technologies. The non-kinetic techniques that adversaries may employ include electromagnetic, cyber, and directed-energy systems for detecting, jamming, intercepting, spoofing, exploiting, tampering, or interfering with military communication links and signals. While currently unlikely, directed energy or radio frequency weapons could be used to disrupt or damage electronics. Enemies will incorporate lessons learned from ongoing operations against U.S. Forces, seeking knowledge regarding tactics, techniques, and procedures.

The existential challenge of near-peer threats requires the rapid procurement of IVAS by U.S. close combat forces. The leap-ahead nature of the system mitigates that challenge and favorably widens the battlefield capabilities gap. IVAS returns tactical overmatch to American forces as part of an integrated system. The IVAS versatility gained allows the Warfighter and units to fight, rehearse, and train with a single system, providing consistency to units invaluable to lethality in combat.

System. IVAS is a head-borne, mixed-reality vision system that consists of a heads-up display (HUD) and End User Computing Device, or EUD, commonly referred to as the 'puck'. The HUD incorporates digital thermal and low-light sensors, and displays information from Tactical Assault Kit (TAK) and Family of Weapon Sights – Individual

(FWS-I) and virtual objects from the Squad Immersive Virtual Trainer (SiVT). The SiVT component provides the mixed-reality training environment for Soldiers to rehearse battle drills and collective tasks. The puck is a body-borne computing device for both the HUD and SiVT experiences with HUD system controls, integrated computer/data storage, device and power connection interfaces/ports, commercial GPS receiver, internal battery enabling hot swap of external battery, and it provides wireless linkage to FWS-I for rapid target acquisition (RTA). The HUD connects to the puck by the typhoon cable. The squad radio, when connected to the puck by a cable, provides the individual Soldier the ability to transmit digital data. The radio enhances TAK functionalities on the HUD and allows data transfer between the Soldier and the Tactical Cloud Package (TCP) for additional computing capabilities. Figure 1 shows the components and interfaces of IVAS.

Interfaces. IVAS interfaces with several systems listed below:

- FWS-I to provide the RTA capability.
- TAK.
- Integrated Tactical Network.
- TCP (Mobile Computing Platform).
- Conformal Wearable Battery (CWB).

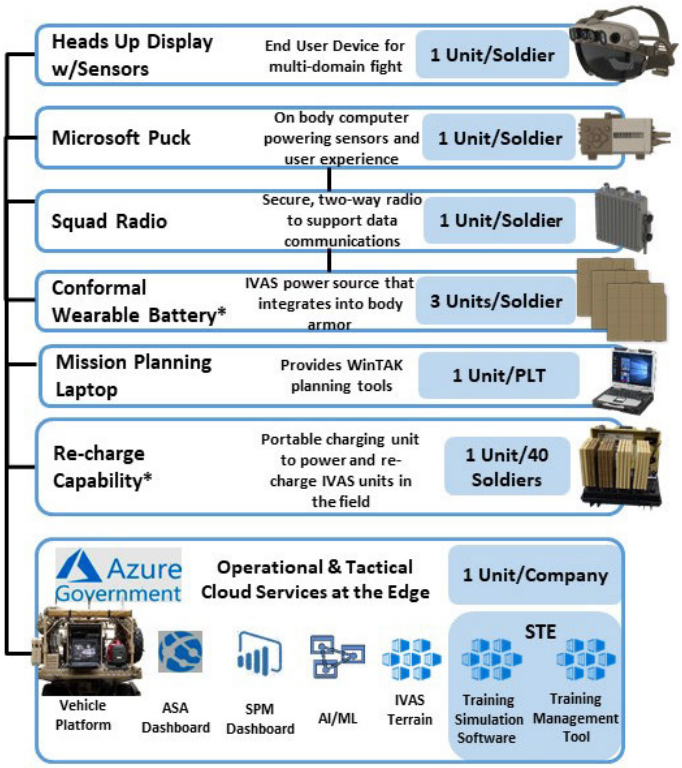


Figure 1. IVAS Components.

Program Overview. During the Close Combat Lethality Technology Day on 25 May 2018, the Secretary of Defense (SECDEF) directed that the Soldier Lethality and Synthetic Training Environment Cross Functional Teams analyze the resources required and the feasibility of expediting the development of a HUD and Squad training capability for close combat fighting forces. The SECDEF specifically focused the team's efforts on program acceleration with a delivery of systems by 2020.

Acquisition Approach. The IVAS project is one of the U.S. Army's first Section 804 Middle Tier of acquisition (MTA) projects, and utilizes the Other Transaction Authority contract vehicle. IVAS is utilizing a rapid prototyping track that encompasses collaborative iterative design and development with constant Warfighter feedback. The approach is composed of four CSs with each CS culminating in a Soldier Touch Point (STP). Each CS involves contractor developmental testing, government developmental testing, User Studies, User Juries, and an STP. Each CS adds more enhancements. The first two CSs utilized a modified commercial system. CS 1 and CS 2 focused on technology maturation and demonstration. CS 3 and CS 4 will utilize the military system, and testing will focus on military utility.

Soldier-Centered Design. IVAS is using a Soldier-Centered Design process, a hybrid of traditional acquisition methods, and Human Centered Design. Soldier-Centered

Design is an approach to solving military problems by involving Soldiers and Marines in all steps of the problem-solving process. Soldier-Centered Design, backed by statistical research, concludes the more iterations conducted with the Soldier, the greater the chance of Soldier acceptance of the system. The process uses frequent feedback from Soldiers and Marines to inform developers on desired functionality. This process is a significant shift from the traditional acquisition process where an approved requirement document is provided to a material developer for a small quantity development and operational assessment upon completion.

The IVAS program had 26 three-week agile software development sprints planned through CS 3. The hardware developed uses Microsoft's integrated end-to-end hardware development process with key deliverables through each CS. Prior to STP 3, 203 Soldiers and Marines have supported the Soldier-Centered Design process.

Data Sources

Sensor Performance Modeling. The Night Vision and Electronics Sensors Directorate estimated target recognition performance using the Night Vision Thermal and Image Process and Night Vision Integrated Performance Model models. Performance was estimated in various obscured conditions.

Developmental Testing. The contractor conducted ballistic fragment assessments at the U.S. Army Aberdeen Test Center (ATC).

STP 3. STP 3 was executed at Fort Pickett, VA, from 19 October 2020 through 01 November 2020. Four Platoons from the 82nd Airborne Division and U.S. Marines supported the event. STP 3 focused on lethality, mobility, communication, sustainment, and training. STP 3 scope involved New Equipment Training (NET), Squad Live-fire Exercise (react to contact and Squad assault), and Platoon Situational Training Exercises (react to contact, enter and clear a room, enter and clear a trench, attack a bunker) that focused on individual and collective tasks such as flat-range marksmanship, land navigation, mission planning, and Squad reconnaissance. STP 3 deliberately increased the level of difficulty and stress for the Soldiers' throughout the events culminating in a company level 72-hour operation in numerous weather conditions. SiVT conducted indoor and outdoor synthetic training. Indoor training demonstrated enter and clear a room (Battle Drill 6). Outdoor training was a technology feasibility Soldier enablement and demonstration.

CS 3 Objectives

CS 3 culminated with delivery of the first military form factor IVAS employed during STP 3. Below were the overarching objectives for CS 3:

- CS 3 focus was on the initial military form factor (prototype).
- Six hundred (prototype) systems delivered for CS 3, per the contract.
- CS 3 culminated with STP 3; systems not intended for fielding.
- Feedback from CS 3 and STP 3 inform ongoing CS 4 designs.
- STP 3 was at Company level (Note: STP 2 was at Platoon level and STP 1 was at Squad level).
- CS 3 IVAS configuration assessed during STP 3 included the HUD (low-light/thermal sensors), puck, cables, IVAS radios, TCP, CWB, and SiVT equipment.

STP 3 conduct:

- STP 3 had participation from 119 enlisted and six officers.
- Eighty-six percent (108 Soldiers) had experience with low light devices (PVS-14, PVS-31), while 51.6 percent (65 Soldiers) had experience with thermal devices (PSQ-20B, PAS-13).
- Soldiers' length of service varied from seven months to 16 years five months. The figure below shows length of service for STP 3 participants.

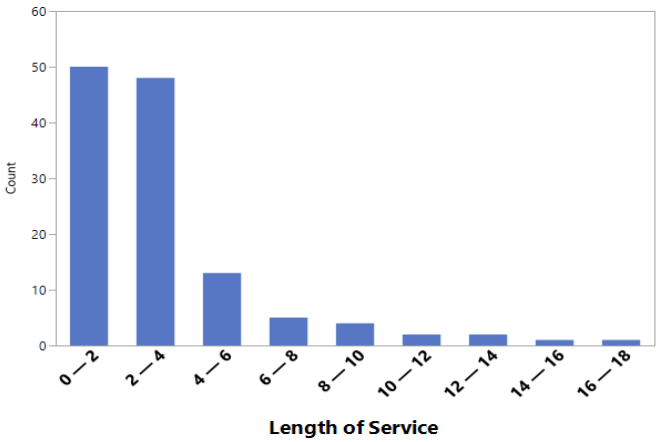


Figure 2. Length of Service for STP 3 Participants.

- Soldiers completed Familiarization Training (six days of classroom instruction and practical exercises), SiVT Soldier enablement scenarios, multiple tactical Platoon missions, and a rigorous 72-hour Company level culminating exercise (CULEX).

- The first time IVAS was tested for an extended period by Soldiers was the 72-hour CULEX.

- STP 3 environmental conditions varied from heavy rain, hot and humid, to cold temperatures with various illuminations throughout.

Performance data, Test Incident Reports (TIRs), surveys, focus group data, network data, and on-board system telemetry data were collected from ongoing technical testing and STP 3. Concurrent design of software, hardware, display, and human factors will be assessed at cold and tropic regions, and evaluated during the Initial Operational Test (IOT).

Capability Matrix Review

At this stage of development, not all Capability Matrix requirements were expected to be achieved. The table below summarizes what has been demonstrated through CS 3.

Table 1. Capability Matrix Summary

	Tier	Description	Threshold	Objective	Observation
Effectiveness	1	Weight	(b) (4)	(b) (4)	(b) (4)
	1	Detection and Recognition (Thermal)	(b) (4)	(b) (4)	(b) (4)
	1	Detection and Recognition (Low-Light)	(b) (4)	(b) (4)	(b) (4)
	1	View of Immediate Environment	(b) (4)	(b) (4)	(b) (4) (b) (4)
	1	Intra Soldier Wireless (ISW)	(b) (4)	(b) (4)	(b) (4)
	1	Operational Networking	(b) (4)	(b) (4)	(b) (4)
Suitability	2	System Availability	(b) (4)	(b) (4)	(b) (4)
	2	Training	(b) (4)	(b) (4)	(b) (4)
	3	System Input Options	(b) (4)	(b) (4)	(b) (4)

Notes: All other Capability Matrix requirements will be addressed in CS 4. (b) (4) [redacted]

Lethality

Warfighters equipped with IVAS CS 3 and FWS-I demonstrated the ability to use RTA. Warfighters utilized the three RTA modes (full screen, picture-in-picture, and bubble) to engage targets from 50 to 300 meters. Warfighters feel RTA is a useful capability of the IVAS.

Soldiers utilized RTA under varied environmental conditions, from heavy rain, hot and humid, to cold temperatures, with various illuminations during Platoon missions and the 72-hour CULEX. Marines conducted RTA live fire events under similar conditions.

(b) (4) [redacted]

(b) (4) [redacted]

Situational Awareness

IVAS CS 3 provides SA using integrated sensors and wireless and digital communications to improve what a user can see, and what information is available to support individual user and unit understanding of their battlespace. (b) (4) [redacted].

The IVAS CS 3 integrated thermal and low-light sensors (b) (4) [redacted]

(b) (4)

(b) (4)

(b) (4)

(b) (4)

(b) (4)

(b) (4)

(b) (4)

(b) (4)

(b) (4)

(b) (4)

Mission Planning

IVAS CS 3 provides unit leaders the ability to create mission plans, distribute plans to unit members (when connected to an IVAS radio), and conduct mission briefs to members on the same frequency/network.

During STP 3, Soldiers demonstrated two ways of mission planning using IVAS: on a Microsoft Windows compatible version of Tactical Assault Kit (TAK) (Windows Tactical Assault Kit (WINTAK)) and in the HUD. Using a laptop, unit leaders can plan using WINTAK software, and then disseminate the plan to other members for mission briefings. From the HUD, a Soldier can initiate a mission planning session where members on the same network can drop graphics and overlays to collaboratively plan a mission.

(b) (4) [redacted]

(b) (4) [redacted]

Communication

The IVAS CS 3 network was designed as a Platoon-centric network. The network provides Soldiers the ability to communicate and share digital data (i.e., mission plans, PLI, graphics, overlays, etc.) with each other for enhanced SA/SU. Soldiers are able to transmit digital data to other members when the puck is in the network (i.e., connected to a radio and within range of another IVAS system or via the TCP connected to a radio and within range). (b) (4) [redacted]

(b) (4) [redacted]

(b) (4) [redacted]

(b) (4) [redacted]

(b) (4) [redacted]

(b) (4) [redacted]

Sustainment

(b) (4) [redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted].

(b) (4) [redacted]:

Table 2. Reliability

(b) (4) [redacted]		
[redacted]	[redacted]	

Note 1: TIRs pending official scoring.

(b) (4) [redacted]

The IVAS CS 3 maintenance approach, primarily consisting of remove-and-replace of defective Soldier-borne IVAS components, was not thoroughly assessed during STP 3, but will be during the IOT and the Logistics Demonstration. The operational and support unit logistics burden associated with transport, storage, and management of IVAS components; transport packaging; spares; and power supply/recharging requirements will be assessed during CS 4.

(b) (4) [redacted]

Squad Immersive Virtual Trainer

Infantry Squads (nine Soldiers) employed SiVT to perform collective indoor training (Battle Drill 6). (b) (4) [redacted]

[redacted]

The training system was able to display various degrees of realism for avatar movement (b) (4)

(b) (4)

(b) (4) .

(b) (4) To date, the following capabilities have not been demonstrated:

- Ability to use outdoors.
- Weapon instrumentation recoil and tracking to support use of M4A1 and M249 Squad individual weapons.
- Virtual employment of thrown or shoulder-fired weapons.
- Weapons instrumentation hardware/software to support all crew-served Platoon weapons.
- Interoperability with external interfaces to share computing and networking demands in training and/or simulated operational environments.

(b) (4)

Safety and Health Hazards

(b) (4)

(b) (4)

(b) (4)

The safety assessment includes the following CS 3 components: the HUD, backup battery pack, CWB, SILVUS Squad radio, SiVT weapons, and SiVT projector.

Three IVAS CS 3 HUD subcomponents emit optical radiation: the display system, the infrared (IR) eye tracker, and the IR projector lamp. Based on U.S. Army Public Health Center (PHC) reviews, the display system, IR eye tracker. and IR projector lamp do not pose an optical radiation hazard.

SiVT has two components that emit optical radiation (IR light): the Bluefire weapons and the optional projector. PHC determined the Bluefire weapons are eye safe Class 1 lasers. The Bluefire weapons and optional projector do not pose an optical radiation hazard.

IVAS CS 3 utilizes a backup battery pack, which contains a UL-certified internal rechargeable lithium-ion battery. Lithium batteries are safe under normal conditions, but may become hot or pose a hazard if punctured or damaged.

(b) (1) (A)

(b) (1) (A) [redacted]

The SILVUS Squad radio produces electromagnetic environments that can cause premature initiation of ordnance containing electro-explosive devices (EEDs). The most restrictive Hazard of Electromagnetic Radiation to Ordnance, or HERO, Safe Separation Distance (SSD) for the radio is 10 feet. Not maintaining a proper SSD may cause premature initiation of ordnance containing EEDs, and may result in personal injury/death and equipment damage.

The SILVUS Squad radio presents a Hazard of Electromagnetic Radiation (HERP). Overexposure to radio frequency (RF) radiation can result in injury, and physical contact with transmitting antennas can result in RF shock or burn. The HERP SSD for the SILVUS Squad radio is one inch.

The SILVUS Squad radio produces RF radiation, which can ignite fuel vapors from motor gasoline (MOGAS), aviation gasoline (AVGAS), and Jet Propellant (JP)-8 fuel, resulting in injury and/or equipment damage. A Hazard of Electromagnetic Radiation to Fuel (HERF) SSD of 10 feet must be observed for AVGAS, MOGAS, and JP-8 fueling operations when operating radios. There are no HERF associated with JP-5 and diesel fuels due to the high flashpoint of these fuels.

(b) (4) [redacted]

Protection

Contractor ballistic testing was conducted at ATC. IVAS was not supposed to meet specifications during CS 3. For CS 3, the mission shield is the component intended to provide eye protection. (b) (4) [redacted]

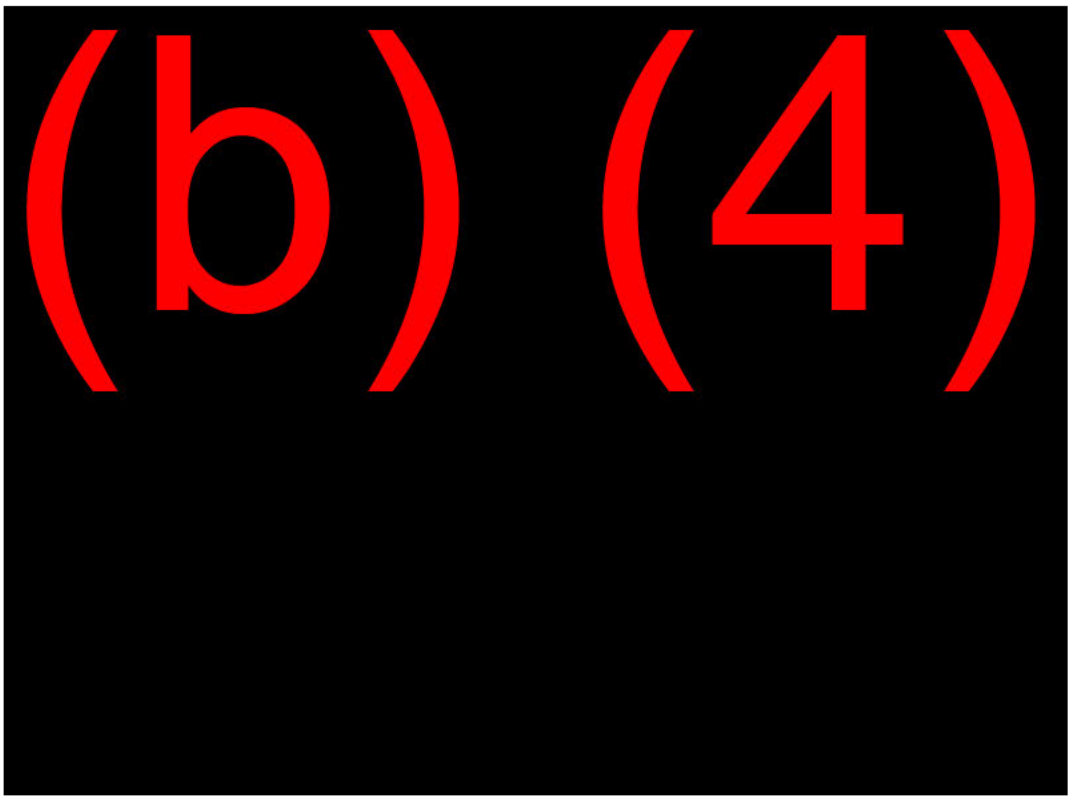
(b) (4) [redacted]

Electronic Warfare and cyber testing has been completed at ATC and the U.S. Army White Sands Missile Range. Data analysis is ongoing.

Additional Capabilities – Artificial Intelligence/Machine Learning

Artificial Intelligence is being developed in two areas: text translations and persons-of-interest. Text translation and persons-of-interest are capabilities that utilize the TCP. For both capabilities, Soldiers took pictures of the text or person's face and sent files via the SILVUS radios to the TCP (when they are within range) for translation and facial matching to the existing database.

Text Translation was demonstrated at STP 3 as Warfighters were able to read/interpret multiple foreign languages. (b) (4) Future capabilities recommend preloading only a select few languages. Warfighters translated seven languages; figure 3 below shows the translation success rate.



Persons-of-Interest (facial recognition) was demonstrated at STP 3 as Warfighters identified persons of interest. (b) (4)

(b) (4) [redacted]

Recommendations

The following are the U.S. Army Test and Evaluation Command (ATEC) recommendations:

Project:

- Develop IOT entrance criteria.
- Include baseline system(s) for future test events to assess IVAS performance improvements.
- Ensure the unit is equipped, and fully trained and experienced with FWS-I prior to test. (Note: Planned FWS-I fielding to 1/82 in January 2021.)

System:

- Conduct additional target recognition assessments to improve Soldier confidence with sensors.
- Establish reliability growth plan.
- Improve Human Factors to improve Warfighter acceptance.
- Demonstrate IVAS communications in denied, contested, and permissive environments.
- Expand communications above the Platoon network.
- Use planned test events with Warfighters to assess system improvements prior to IOT.

Appendix A.
Soldier-Centered Design Events

User Studies are *rapid, iterative* User Experience research and design activities, bringing end users and Microsoft engineering teams together to build empathy, user needs, scenarios, and requirements. The *method, frequency, and location are flexible* and can vary based on the goals and objectives of a specific study. They are *closed, controlled sessions* not intended for external observation or formal demonstration.

- Fast and frequent.
- Focus on Microsoft team learning.
- No demos or Distinguished Visitors.
- Very limited Government participation.

User Juries are *structured evaluations* of prototyped system capabilities by end users in a *relevant environment focused on a specific feature* set. Intended to inform product development, track capability progress, or shape expectations for STPs.

- Deliberately programmed relative to STPs.
- Limited scope and size to remain agile.
- Increased Government participation.
- First true evaluations of CS progress.

STPs are *culminating events* comprised of individual and collective Warfighter tasks that demonstrate, measure, and *validate CSs* in simulated operational environments.

- Holistic reviews of CSs.
- Highly structured events.
- Introduction of collective tasks with either ad hoc or organic unit formations.
- Primary demonstration for Senior Leaders.

Bibliography

1. Initial Capabilities Document for Soldier Lethality, Maneuver Center of Excellence, July 2018.

2. Security Classification Guide for the Integrated Visual Augmented System (IVAS), Project Manager Integrated Visual Augmentation System, January 2019.

3. IVAS Capability Matrix, Army Futures Command, Soldier Lethality Capability Developer, 15 June 2020.

4. Integrated Visual Augmentation System (IVAS) Simplified Acquisition Management Plan (SAMP), Version 1.0, PEO Soldier, 18 April 2019.

5. Memorandum, U.S. Army Evaluation Center, 13 October 2019, subject: Safety Release of Integrated Visual Augmentation System (IVAS) Tactical Cloud Package (TCP) Provided for Soldier Touch Point 3 (STP3).

6. Memorandum, U.S. Army Evaluation Center, 15 October 2019, subject: Safety Release of Integrated Visual Augmentation System (IVAS) Capability Set 3 Provided for Soldier Touch Point 3 (STP3).

7. Section 804 of the National Defense Authorization Act for Fiscal Year 2016, Public Law 114-92, as amended, Title 10, United States Code, Section 2302.

8. Memorandum, U.S. Army Futures Command, 7 June 2019, subject: Army Futures Command Abbreviated Capability Development Document Definition.

9. Memorandum, Office of the Secretary of Defense, Operational Test and Evaluation, 24 October 2019, subject: Operational and Live-Fire Test and Evaluation Planning Guidelines for Middle Tier of Acquisitions Programs.

10. DOD Instruction 5000.80, Operation of the Middle Tier of Acquisition (MTA), Office of the Under Secretary of Defense for Acquisition and Sustainment, 30 December 2019.

11. DOD Instruction 5000.02, Operation of the Adaptive Acquisition Framework, Office of the Under Secretary of Defense for Acquisition and Sustainment, 23 January 2020.

12. DOD Instruction 5000.89, Test and Evaluation, Office of the Under Secretary of Defense for Research and Engineering, 19 November 2020.

13. Statement of Objectives (SOO) for Prototype Project Agreement (PPA) Integrated Visual Augmentation System (IVAS) System, Project Manager Integrated Visual Augmentation System, November 2018.

14. Battle Drills for the Infantry Rifle Platoon and Squad, Headquarters, Department of the Army, June 2002.

15. Brief, U.S. Army Test and Evaluation Command, 4 December 2020, subject: Integrated Visual Augmentation System Observations Brief – Capability Set #3.

Acronyms

°F	Degrees Fahrenheit
AAR	After-Action Review
AEC	U.S. Army Evaluation Center
ATC	U.S. Army Aberdeen Test Center
ATEC	U.S. Army Test and Evaluation Command
AVGAS	Aviation Gasoline
CS	Capability Set
CULEX	Culminating Exercise
CWB	Conformal Wearable Battery
EED	Electro-Explosive Devices
FOV	Field of View
FWS-I	Family of Weapon Sights - Individual
GPS	Global Positioning System
HERF	Hazard of Electromagnetic Radiation to Fuel
HERP	Hazard of Electromagnetic Radiation to Personnel
HUD	Heads Up Display
IOT	Initial Operational Test
IR	Infrared
ISW	Intra-Soldier Wireless
IVAS	Integrated Visual Augmentation System
JP	Jet Propellant
M&S	Modeling and Simulation
MOGAS	Motor Gasoline
MTA	Middle Tier of Acquisition
MTBEFF	Mean Time Between Essential Function Failure
MTBSA	Mean Time Between System Abort
NET	New Equipment Training
OPFOR	Opposing Forces
PHC	U.S. Army Public Health Center
PLI	Position Location Information
RF	Radio Frequency
RTA	Rapid Target Acquisition
SA	Situational Awareness
SECDEF	Secretary of Defense
SiVT	Squad Immersive Virtual Trainer
SSD	Safe Separation Distance
STP	Soldier Touch Point
SU	Situational Understanding
TAK	Tactical Assault Kit
TCP	Tactical Cloud Package
TIR	Test Incident Report
TTP	Tactics, Techniques, and Procedures
WinTAK	Windows Tactical Assault Kit

Distribution List

Organization	Office Symbol/Recipient	Email
Director, Project Manager Integrated Visual Augmentation System, 10221 Burbeck Road, Fort Belvoir, VA 22060-5806	(b) (6)	(b) (6)
U.S. Army Test and Evaluation Command, 6617 Aberdeen Boulevard, Building 2202 – Third Floor, Aberdeen Proving Ground, MD 21005-5001	(b) (6)	(b) (6)
U.S. Army Evaluation Center, 6617 Aberdeen Boulevard, Building 2202 – Second Floor, Aberdeen Proving Ground, MD 21005-5001	(b) (6)	
U.S. Army Evaluation Center 6617 Aberdeen Boulevard, Building 2202 – Second Floor Aberdeen Proving Ground, MD 21005-5001	(b) (6)	(b) (6)
USAIS CMDT, ATTN: BG David M. Hodne, Suite 6100, 1 Karker Street, Fort Benning, GA 31905	(b) (6)	
Deputy Under Secretary of the Army-Test and Evaluation, Taylor Building, Suite 8000, 2530 Crystal Drive, Arlington, VA 22202-3934	(b) (6)	
Director, Operational Test and Evaluation, 1700 Defense Pentagon, Room 3E1088, Washington, DC 20301-1700	(b) (6)	
Defense Technical Information Center, Enterprise Content Management, 8725 John J. Kingman Road, Fort Belvoir, VA 22060-6218	(b) (6)	