Synthetic Training Environment Live Training Systems (STE-LTS)



In February 2024, the Army conducted the Synthetic Training Environment Live Training System Increment 1 (STE-LTS Inc. 1) Operational Demonstration (Ops Demo). The STE-LTS Inc. 1 Ops Demo will support a Middle Tier of Acquisition (MTA) rapid prototyping (RP) to rapid fielding (RF) transition decision in 1QFY25. DOT&E published an Ops Demo report in August 2024.

SYSTEM DESCRIPTION

STE is the Army's next generation, holistic combined arms collective training capability, intended to enable leaders, soldiers, and units from squad through the Army Service Component Command to train in complex operational environments at the point of need. The STE-LTS program is one of five main signature efforts of the STE and focuses on the development of a next generation live training architecture to enable the realistic exercise of unit combat weapons up to brigade level. STE-LTS seeks to address the brigade combat team weapon types and effects not currently simulated by the Army's legacy live training system, the Instrumented - Multiple Integrated Laser Engagement System (I-MILES). STE-LTS encompasses 12 engagement types and 5 instrumentation enablers that make up the live training capability framework that supports Army combined arms maneuver training. The engagement types include direct fire, counter-defilade fire, indirect fire, dropped, placed, or thrown objects, guided and autonomous weapons, directed and radiant energy weapons, plumes (i.e., chemical, biological, and nuclear), and connections (i.e., information warfare). The training instrumentation enablers include calculations, network, sensors, terrain, and transmitters.

STE-LTS Inc.1 is the first increment of the STE-LTS program. It consists of five training device types intended to replicate employment and simulate the battlefield effects of weapon systems during force-on-force training: (1) hand grenades, (2) Claymore mines, (3) 60mm mortars, (4) 81mm mortars, and (5) Stinger antiaircraft missiles. Legacy Stinger training devices have reached the end of their life cycle, and the Army does not currently have force-onforce training devices for the other weapon types.

Future planned upgrades will include the following:

- Replacement of the direct fire weapon simulation capabilities of the legacy I-MILES.
- Additional weapon types such as counter defilade and guided weapon systems.
- Next generation weapon systems such as directed energy and cyber weapons.

MISSION

Unit commanders, along with the Army's combat training centers and home station training staff, will use the STE-LTS training technologies to improve individual soldier lethality and survivability, and to improve, accelerate, and sustain unit-level combined arms maneuver proficiency through repetition in a realistic combat environment. STE-LTS next generation systems are intended to replicate more engagement types, improve sensory feedback, increase realism of direct fire engagement, increase realism of battle damage assessments, and improve after action reviews and instrumentation at the combat training centers and home stations.

PROGRAM

The STE-LTS is an MTA RP program comprised of three planned increments of training capability development that will transition to an MTA RF or Major Capability Acquisition (MCA) pathway for product maturation, production, and fielding.

 STE-LTS Inc.1 capabilities will transition to an MTA RF program, pending an outcome determination decision in 1QFY25. DOT&E published an operational demonstration (Ops Demo) report in August 2024 to inform the Army's transition decision. The program office is planning to begin a limited fielding to the Joint Readiness Training Center (JRTC), Fort Johnson, Louisiana, and the National Training Center (NTC), Fort Irwin, California in 3QFY26. A follow-on MCA program of record will continue development and extend the fielding to home stations training facilities.

- STE-LTS Inc. 2 capabilities are intended to replace the direct fire weapon simulation capabilities of the legacy I-MILES while adding additional weapon types such as counter defilade and guided weapon systems. The Army is planning an Ops Demo in 2QFY26 supporting an outcome determination to transition to an MCA program in 3QFY26.
- STE-LTS Inc. 3 capabilities include next generation weapon systems such as directed energy and cyber weapons. An Ops Demo and outcome determination date has not yet been established for inc. 3 capabilities.

The STE-LTS TES covering increments 1 and 2 is in development and should be submitted to DOT&E in 1QFY25 for approval.

» MAJOR CONTRACTORS

- Cubic Corporation Orlando, Florida (60mm and 81mm mortar training devices)
- Cole Engineering Services, Inc. (CESI) – Orlando, Florida (stinger anti-aircraft missile training devices)
- Serious Simulations, LLC Oviedo, Florida (hand grenade)

and Claymore mine training devices)

TEST ADEQUACY

In February 2024, the Army conducted the STE-LTS Inc. 1 Ops Demo at the JRTC, Fort Johnson, Louisiana, in accordance with a DOT&E-approved test plan. The Ops Demo was observed by DOT&E and adequate to inform a preliminary assessment of system performance and inform an MTA RP to RF transition decision in 1QFY25. DOT&E published an Ops Demo report in August 2024.

PERFORMANCE

» EFFECTIVENESS

Data from the Ops Demo indicate that the STE-LTS Inc. 1 training devices have potential to improve individual soldier and unit collective training through the enhanced realism of having the five additional weapon types in the live force-on-force training environment. Soldier lethality and survivability may be improved as soldiers are exposed to the weapons effects in real time during close combat training.

The Ops Demo report identified several minor issues with weapon employment and effects characteristics that impact the operational realism of force-onforce training. Of particular interest is ensuring that the lethal effects of these weapons are accurately simulated in real time so that soldiers develop an appropriate sense of the effectiveness when employing those weapons, as well as the danger posed when they are employed by the enemy. Additional details can be found in the August 2024 Ops Demo report.

» SUITABILITY

Data from the STE-LTS Inc.1 Ops Demo indicate that improvements in the reliability of training devices and their integration with the JRTC network are needed prior to fielding and widescale use supporting JRTC and NTC training rotations. Each of the training device types had unique reliability and integration failures that when combined, resulted in reduced combat realism during the training evolutions. If corrected, the STE-LTS inc. 1 training devices will enhance combat realism and provided needed individual and unit collective training. Additional details can be found in the August 2024 Ops Demo report.

The STE-LTS Inc. 1 Program Office has acknowledged many of the suitability findings in the DOT&E Ops Demo report and has begun pursuing technical solutions with the device vendors. A follow-on test to validate training device improvements while demonstrating successful network integration was conducted in August 2024 at the NTC. Additional system improvements and testing are being planned for FY25 prior to fielding to the JRTC and NTC.

» SURVIVABILITY

The Army showed through analysis that the STE-LTS Inc. 1

training devices do not present a cybersecurity risk to the JRTC or NTC networks. DOT&E concurred with the Army analysis, and therefore cyber survivability was not assessed. STE-LTS increments 2 and 3 will require a system specific review to determine what cyber survivability testing is required. There are no other survivability requirements for the STE-LTS Inc. 1 training devices.

RECOMMENDATIONS

The Army should:

- Continue to refine STE-LTS Inc.1 training device employment characteristics to minimize the differences between the training devices and the real weapon systems.
- 2. Determine and address the cause of inconsistent integration with the JRTC network.
- 3. Determine and address the cause of identified reliability issues.
- 4. Verify integration and reliability fixes through integrated testing prior to beginning production.