

Early Infantry Brigade Combat Team (E-IBCT) Increment 1 Unattended Ground Sensors (UGS)

Executive Summary

- In 2009, the contractor conducted three Technical Field Tests (TFTs), an Early Infantry Brigade Combat Team (E-IBCT) Force Development Test and Evaluation (FDT&E), and a Limited User Test (LUT) for the Tactical-Unattended Ground Sensor (T-UGS) and the Urban-UGS (U-UGS).
- Based on lessons from 2008 tests, 2009 improvements included a new form factor (NFF) as well as a Range Extension Repeater for the T-UGS, and a Leader Display and Control Device (LDAC) for the U-UGS.

System

- E-IBCT Increment 1 has two unattended ground sensors, T-UGS and U-UGS, capable of target detection, location, and classification. UGS consist of multiple types of sensors to include acoustic, seismic, magnetic, electro-optical/infrared sensors, and radiological/nuclear sensors.
- Tactical-UGS systems are self-organizing networks of remotely deployed, long-range sensors designed to enhance perimeter defenses of forward operating bases and other facilities. It includes a gateway for transmission of information to the tactical network and fusion of data from its various sensors.
- Tactical-UGS sensors include the intelligence, surveillance, and reconnaissance sensors, radiological and nuclear sensors, and electro-optical/infrared sensors. T-UGS are hand emplaced and hand-retrieved at the end of missions.
- Urban-UGS are small, leave-behind imaging and intrusion detection sensors, similar to commercial burglar alarms that are emplaced in buildings, caves, or tunnels. Information is transmitted to the tactical network via a hand-held gateway.
- The program modified the T-UGS and U-UGS based upon performance in 2008 testing by the addition of a LDAC

Activity

- During the summer of 2009, the contractor conducted a series of three TFTs at White Sands Missile Range, New Mexico. The TFTs were developmental tests executed under field conditions and were designed to assess the level of technical maturity for all E-IBCT systems, including T-UGS and U-UGS. The Army's Training and Doctrine Command conducted an E-IBCT FDT&E in August 2009 at Fort Bliss, Texas. The purpose of the FDT&E was to develop tactics, techniques, and procedures for employment of E-IBCT systems, including T-UGS and U-UGS.



**Tactical-Unattended
Ground Sensor (T-UGS)**

**Urban-Unattended
Ground Sensor (U-UGS)**

- device – a handheld device to display U-UGS images – and a Range Extension Repeater – a radio relay device to extend the communications range from the T-UGS field to the High Mobility Multi-Wheeled Vehicle (HMMWV)-mounted Network Integration Kit.
- A new form-factor T-UGS (NFF T-UGS) was introduced into the last TFT in late July. A limited number of NFF T-UGS were also available for employment during the LUT.

Mission

Infantry companies and platoons use UGS to provide remote perimeter defense, surveillance, target acquisition, situational awareness, and detection of radiological and nuclear contamination.

Prime Contractor

- Textron Defense Systems, Wilmington, Massachusetts

- The Army Test and Evaluation Command executed a LUT, the first operational test of T-UGS and U-UGS, at Fort Bliss, Texas, in August and September 2009. During the LUT, a company-size unit equipped with both current form factor and NFF T-UGS and the U-UGS executed a series of offensive, defensive, and stability missions during four 96-hour scenarios. The results of the LUT will be used to inform the T-UGS and U-UGS Milestone C decision.

ARMY PROGRAMS

- In October 2009, after the LUT, the program conducted additional reliability testing for the NFF T-UGS and the U-UGS with LDAC.

Assessment

- During TFTs, the demonstrated reliability for U-UGS and T-UGS was poor. The Army Test and Evaluation Command-calculated maximum growth potential for T-UGS and U-UGS is below the current threshold reliability requirements. Shortfalls in meeting reliability requirements may adversely affect the U-UGS' and T-UGS' overall operational effectiveness and suitability and increase life-cycle costs.
- Based upon the analyses of the results from the LUT, the T-UGS and U-UGS require further development before IOT&E or fielding. Both systems demonstrated poor communications connectivity, inadequate transmission ranges, poor image quality, and frequent system failures.
- The program plans to implement a number of configuration changes prior to LUT 2, scheduled for the summer of 2010. In particular, operational testing to date has been conducted

with early prototype Joint Tactical Radio System (JTRS) or surrogate radios. This has precluded the ability to conduct an evaluation of the T-UGS and U-UGS operating in a secure tactical network against potential threat information operations, such as electronic warfare. This will be a necessary condition for LUT 2.

- The effectiveness of the T-UGS and U-UGS is dependent upon the availability of production-representative JTRS radios and corresponding waveforms. This is a risk area for the program as the JTRS development and Test and Evaluation schedule currently lags the E-IBCT program by several months.

Recommendations

- Status of Previous Recommendations. The Army addressed the previous recommendations.
- FY09 Recommendations. The Army should:
 1. Execute the planned reliability growth programs for T-UGS and U-UGS.
 2. Continue development and testing to improve UGS reliability and effectiveness.