

Early Infantry Brigade Combat Team (E-IBCT) Increment 1 Non-Line-of-Sight Launch System (NLOS-LS)

Executive Summary

- The program shifted their low-rate initial production (LRIP) decision from December 2009 to April 2010 in order to correct deficiencies identified in early flight tests and due to hardware production delays.
- The program has conducted nine of 18 Army government developmental Precision Attack Missile flight tests. Five flights revealed failures that the program manager is addressing.
- The Container Launch Unit (CLU) is meeting its Early Infantry Brigade Combat Team (E-IBCT) Increment 1 reliability requirements. The Precision Attack Missile (PAM) is below its E-IBCT Increment 1 reliability requirements.
- The E-IBCT Increment 1 Limited User Test (LUT) demonstrated that the Non-Line-of-Sight Launch System (NLOS-LS) requires further testing in order to meet Army requirements before fielding to units employed in combat. NLOS-LS cannot be fully assessed until completion of the Flight LUT in 2QFY10.
- The program is making progress, but continues to be schedule driven leading up the NLOS-LS Flight LUT in 2QFY10 and the LRIP decision in 3QFY10.

System

- The XM501 NLOS-LS is an E-IBCT, Increment 1 program the Army intends to field to Infantry Brigade Combat Teams.
- The NLOS-LS consists of a CLU with self-contained electronics and software for remote and unmanned operations. The CLU can be fired from the ground or from a variety of vehicles.
- Each CLU contains a computer, communications system, and 15 PAMs.
- The PAM is a modular guided missile that receives target information prior to launch and can respond to target location updates during flight.
- PAMs are designed to defeat high-payoff light and heavy armored, moving, or stationary targets at ranges up to 40 km.
- The PAM supports four targeting modes:
 - Laser-designation: the PAM follows the laser beam from the forward observer to the target.
 - Laser-anointed: the PAM is initially guided by the laser then uses its infrared seeker and algorithms to select the aimpoint to the target.



- Autonomous operation mode: the PAM finds targets autonomously using its infrared seeker and computer algorithms.
- GPS mode: the PAM flies to a specific aimpoint using GPS and inertial guidance.
- In the E-IBCT Increment 1, Soldiers communicate with the missile, through the CLU, using the Advanced Field Artillery Tactical Data System. When the full network is complete for the IOT&E, Soldiers will communicate directly with the missile from a variety of nodes.

Mission

The E-IBCTs will use NLOS-LS sections, composed of six CLUs, transported on three Family of Medium Tactical Vehicles, and a Control Cell located within the E-IBCT Cannon battalions, to provide a precision-guided munitions launch capability to attack moving and stationary point targets such as tanks, armored troop carriers, and artillery.

Prime Contractors

- Lockheed Martin NetFires LLC, Dallas, Texas
- Raytheon Missile Systems, Tucson, Arizona

ARMY PROGRAMS

Activity

- In May 2009, the program shifted their LRIP decision from December 2009 to April 2010 in order to correct deficiencies identified in early flight tests and due to hardware production delays.
 - The program manager has conducted nine of 18 Army government developmental PAM flight tests and one Navy government developmental PAM flight test at White Sands Missile Range (WSMR), New Mexico, between November 2008 and November 2009. The flights demonstrated the PAM's capability to launch, fly a pre-designated route, track moving and stationary targets with its seeker, receive In-Flight Target Updates, and impact a target. The flights revealed a number of deficiencies. All deficiencies have been addressed, except for a launch failure during the Navy test, caused by a short in a cable coupling. The project office has a short-term fix to allow flight testing to continue, but has not developed a long-term solution.
 - The program intends to complete the remaining government developmental PAM flight tests by December 2009. The program will fire six PAMs at WSMR and three PAMs at the Cold Region Test Center, Fort Greely, Alaska. These remaining flight tests will include PAMs with warheads, moving targets, and an engagement close to the maximum range of 40 km.
 - Soldiers from the Army Evaluation Task Force tested the NLOS-LS during the E-IBCT Increment 1 LUT in September 2009 at WSMR. NLOS-LS tactics, techniques, and procedures and CLU reliability were the focus of the test.
 - The program will execute a Flight LUT at WSMR, beginning in January 2010, to examine a unit's ability to employ the NLOS-LS and execute their doctrinal mission under realistic operational conditions. Six fully tactical rounds will be fired against threat targets. The test results will be used to support the LRIP decision scheduled for April 2010.
- for reliability growth should the program discover additional deficiencies in the remaining developmental flight tests.
- The E-IBCT Increment 1 LUT demonstrated that the NLOS-LS requires further testing in order to meet Army requirements before fielding to units employed in combat. NLOS-LS cannot be fully assessed until completion of the Flight LUT in 2QFY10.
 - The CLU is currently meeting its E-IBCT Increment 1 reliability requirements. As of September 2009, the CLU has demonstrated it can operate 259 hours before a system abort exceeding the Increment 1 requirement of 125 hours.
 - The PAM is below its planned reliability growth curve that is designed to meet its requirement after the IOT&E. As of September 2009, there have been eight successes in 13 flights (62 percent success). The Increment 1 requirement following the IOT&E is 85 percent.
 - Based on demonstrated performance in developmental testing, completion of the planned Flight LUT and the ongoing developmental test flight series and modeling is needed to evaluate the operational performance of the PAM infrared seeker.
 - Developmental testing and modeling conducted to date indicates PAM is meeting its lethality requirements against armored targets. More testing is needed to determine PAM effectiveness against non-armored targets.
 - The Army incorporated Soldier feedback in the design of the CLU and is applying their input to the production representative NLOS-LS systems for easier use in a combat environment.

Recommendations

- Status of Previous Recommendations. The Army addressed DOT&E's FY08 recommendation to increase the developmental test flight test window by delaying tests when known problems were not fixed. The Army also included countermeasured targets in two additional flight tests.
- FY09 Recommendations. The Army should:
 1. Implement the Lessons Learned from the E-IBCT LUT and NLOS-LS Flight LUT. Apply the corrective actions before fielding the NLOS-LS to combat.
 2. Continue the test-analyze-fix strategy to the PAM flight test program.

Assessment

- The program is making progress, but continues to be schedule driven leading up the NLOS-LS Flight LUT in 2QFY10 and LRIP decision in 3QFY10. The recent successes indicate the program manager appears to have fixed the deficiencies discovered early, but more complicated flight tests with sensors and warheads as well as environmental conditioning remain. The schedule driven flight tests leave little chance