

## Early Infantry Brigade Combat Team (E-IBCT) Increment 1 Class I Block 0 Unmanned Aircraft System

### Executive Summary

- The Army plans to acquire systems within the Early Infantry Brigade Combat Team (E-IBCT) program that were originally components of the Future Combat System (FCS) program. In June 2009, the Defense Acquisition Executive cancelled the FCS program and directed the Army to establish the E-IBCT Increment One as a separate acquisition program with a Milestone C decision scheduled for December 2009.
- Class I Block 0 Unmanned Aircraft System (UAS) is one of the planned E-IBCT Increment One capabilities and is the predecessor to the Class 1 UAS threshold capability currently under development.
- Results of FY09 testing will contribute to the DOT&E Operational Assessment of the Class I Block 0 UAS informing the E-IBCT Milestone C decision.

### System

- The Class I Block 0 UAS design comes from the Defense Advanced Research Projects Agency developed gas Micro Air Vehicle.
- The Army intends to employ the E-IBCT Class I Block 0 UAS at the company/platoon level.
  - The system is intended to be man-portable in two custom Modular Lightweight Load-carrying Equipment packs weighing no more than 56 pounds each.
  - The flight time endurance is 40 minutes with a forward airspeed up to 40 knots.
  - The aircraft can be launched in winds up to 15 knots and once airborne, operates in winds up to 20 knots at an altitude of 500 feet above ground level with a range out to 4 km.
- The Class I Block 0 UAS consists of an aircraft with a five horsepower engine, a ground data terminal, an operator control unit, gimballed payloads (electro-optical or infrared), avionics pod, and support equipment.
- The electro-optical pod and infrared pod payloads are interchangeable sensors. The Class I Block 0 Aircraft can carry one sensor at a time.



- The Class I Block 0 UAS takes off and lands vertically and once airborne uses both autonomous and manual flight mode navigation.

### Mission

Companies and platoons employ the Class I Block 0 UAS to conduct reconnaissance, surveillance, target acquisition, and force protection missions in support of operations in open, rolling, and under canopy terrain, and in urban environments.

### Prime Contractor

- Honeywell Aerospace Division, Albuquerque, New Mexico

### Activity

- The Army plans to acquire systems within the E-IBCT program that were originally components of the FCS program. In June 2009, the Defense Acquisition Executive cancelled the FCS program and directed the Army to establish the E-IBCT Increment One as a separate acquisition program with a Milestone C decision scheduled for December 2009.
- The government and contractor jointly conducted developmental flight testing consisting of tethered and off tether reliability tests, software regressions tests, and Electromagnetic Environmental Effects (E3) test. The test team conducted confirmation testing, partial environmental

# ARMY PROGRAMS

qualification testing, E3 radiated susceptibility tests, and payload and aircraft performance testing.

- The Army conducted three Technical Field Tests to assess performance of the Class I Block 0 systems integration by the test unit in a field environment.
- The Training and Doctrine Command conducted a Force Development Test and Evaluation to validate doctrine, organization, training, and leader development products.
- The Army conducted a Limited User Test (LUT) from August 25 through September 12, 2009. During the test a company, augmented by battalion elements, conducted offensive and defensive operations.
- In October 2009, the E-IBCT conducted additional reliability testing for the Class 1 Block 0 UAS in order to provide an additional assessment of system reliability.
- Results of the LUT and the additional reliability testing will provide the basis for the DOT&E Operational Assessment of the Class I Block 0 UAS informing the E-IBCT Milestone C decision. The Army conducted the testing in accordance with the DOT&E-approved Test and Evaluation Master Plan and test plan.

## Assessment

- Class I Block 0 UAS performed well, but is not reliable. The air vehicle flight and sensor performance met most user requirements. Class I Block 0 UAS reliability demonstrated during the LUT is well short of user threshold requirements.
- The incorporation of gimballed sensors has improved the effectiveness of the system.
- During the LUT, the Class 1 Block 0 UAS provided reconnaissance and surveillance support. The unit did not employ the system as a man-portable, “use on the move” system, as the Army requirements document intends. The battalion, to make better use of available resources and better support subordinate company operations, effectively consolidated all UAS resources under battalion control and employed them from “team airport,” a centralized launch and recovery site.
- During the LUT, there were two occasions when the aircraft fuel bladders burst during refuel operations. This is a known suitability issue of the current manual syringe pump refueling

system. To address this issue, the Army has developed an electric fueling system, is competing qualification testing of that system, and intends to deliver this capability to the field as part of the system in FY10.

- Images taken by the Class I Block 0 are truncated to facilitate passage through the “network” via the Network Integration Kit (NIK) and are not usable when received at the battalion tactical operations center. Transmission times for images passing through the NIK are sometimes significant – up to 24 hours – depending on the saturation of the network. Even though this network issue is not a Class I Block 0 system shortcoming, it does hamper the effectiveness of the unit equipped with this UAS capability.
- The Army has not reduced the acoustic signature of the aircraft. The Class 1 Block 0 UAS can be heard and seen from 2 and 4 km away respectively.
- Reliability and durability of the aircraft continues to be poor.

## Recommendations

- Status of Previous Recommendations. The Army addressed two of the four FY08 recommendations.
- FY09 Recommendations. The Army should:
  1. Review manpower, training, resource requirements, and commensurate air vehicle capabilities to ascertain if assigning the Class 1 Block 0 systems as a battalion asset, as demonstrated in the LUT, rather than a company/platoon level asset would be more effective and suitable.
  2. Consider including the One System Remote Video Terminal as part of the system for use by maneuver leaders to receive “real time” and quality images until network passing of the images is satisfactory.
  3. Reduce the acoustic and visual signature of the aircraft to improve aircraft and unit survivability and system effectiveness.
  4. Improve the reliability and durability of the aircraft.
  5. Consider including an expansion valve for the fuel bladder.
  6. Consider reducing the weight of the electric fueling system, currently weighing 20 pounds, so that it may be included in the backpack configuration and replace the syringe refuel system.