

Early Infantry Brigade Combat Team (E-IBCT) Network Interface Kit (NIK)

Executive Summary

- The Army conducted an Early Infantry Brigade Combat Team (E-IBCT) Limited User Test 09 (LUT 09) in 4QFY09 and an E-IBCT Increment 1 LUT 10 in 4QFY10. The Network Interface Kit (NIK) served as the communications means for E-IBCT sensor systems during both events.
- The E-IBCT LUT 09 demonstrated the NIK's ability to send Battle Space Object (BSO) reports to Army battle command systems and to exchange voice and data with the current force network. However, it also revealed NIK deficiencies in operational reliability, message completion rates, transmission range, start-up time, and complexity of operations.
- The December 24, 2009 E-IBCT Acquisition Decision Memorandum (ADM) authorized Low-Rate Initial Production (LRIP) of 81 NIKs for the first brigade. The ADM delayed purchases to equip the remaining two brigades until a scheduled December 2010 Defense Acquisition Board (DAB) In Progress Review (IPR).
- The E-IBCT Increment 1 LUT 10 demonstrated the NIK's capability to send BSO reports to Army battle command systems and to exchange voice and data with the current force network. While the NIK showed performance and reliability improvements over LUT 09, the NIK demonstrated deficiencies in dependability of voice command and control radio, start-up time, operational reliability, complexity of operations, and survivability, as well as demonstrating too much reliance on Field Service Representatives to maintain the system. The NIK did not demonstrate military utility, as its performance did not enhance mission accomplishment and only 5 sensor images out of approximately 4,000 collected were forwarded from the receiving NIK to higher headquarters. The LUT 10 results will support an LRIP decision for Brigades 2 and 3 at the December 2010 DAB IPR.

System

- The E-IBCT NIK consists of vehicle-mounted radios and computers that provide the communications interface between the current force command and control (C2) network and the E-IBCT sensors:
 - Tactical Unattended Ground Sensors (T-UGS)
 - Urban Unattended Ground Sensors (U-UGS)
 - Unmanned Aircraft System (UAS) Class 1 Block 0
 - Small Unmanned Ground Vehicle (SUGV)
- The E-IBCT NIK provides the means for transmission of voice, data, and sensor images from E-IBCT sensor fields to other NIKs within the E-IBCT.
- The E-IBCT NIK supports the update of the Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT) with E-IBCT sensor data.



1 - NIK components, Ground Mobile Radio (GMR) and Integrated Computer System (ICS), rack mounted in the rear of a Mine Resistant Ambush Protected (MRAP) vehicle
 2 - NIK components, GMR and Force XXI Battle Command Brigade and Below (FBCB2), within a MRAP vehicle
 3 - MRAP vehicle equipped with NIK

- The E-IBCT NIK hardware components consist of:
 - Joint Tactical Radio System (JTRS) Ground Mobile Radio (GMR)
 - Integrated Computer System with internal Cross Domain Guard
 - Force XXI Battle Command Brigade and Below/Blue Force Tracking (FBCB2/BFT)
- The JTRS GMR, as a component of the NIK, hosts the following radio waveforms:
 - Wideband Networking Waveform (WNW) v4.0
 - Soldier Radio Waveform (SRW) v1.0c
 - Single Channel Ground and Airborne Radio System (SINCGARS)

Mission

The Army intends the NIK to provide E-IBCT leaders with the means to:

- Rapidly disseminate critical operational/tactical information.
- Exercise remote control of UGS fields.
- Receive and update the Common Operating Picture (COP).
- Interface with the existing command and control communications networks within the E-IBCT.

Major Contractor

The Boeing Company, Integrated Defense Systems – Huntington Beach, California

ARMY PROGRAMS

Activity

- In 4QFY09, the Army conducted the E-IBCT LUT 09. The NIK served as the interface for brigade sensors to transmit data and images to command posts and other NIKs within the Brigade. During LUT 09, the NIK used pre-Engineering Development Model JTRS GMR loaded with early versions of waveforms to receive and transmit images originating from the brigade sensors. The NIK used modified versions of existing FBCB2/BFT to update the unit's situational awareness with sensor reports.
- The December 24, 2009 E-IBCT ADM authorized procurement of Brigade 1 LRIP (81 NIKs) and delayed purchases to equip two additional brigades until a scheduled December 2010 DAB IPR, following the E-IBCT LUT 10.
- In 4QFY10, the Army conducted the E-IBCT LUT 10. The NIK provided communications means for brigade sensor systems similar to the LUT 09, but covered a larger area of operations. During the LUT 10, the NIK used an Engineering Development Model JTRS GMR with more mature versions of waveforms to handle terrestrial transmission of images originating from the brigade sensors. The NIK used newer versions of FBCB2 Joint Capability Requirement (JCR)/BFT to update unit situational awareness using sensor reports.
- The Army conducted LUT 09 and LUT 10 in accordance with DOT&E-approved test plans.
- The NIK is dependent upon the JTRS GMR (as a NIK component) to support SRW connections to sensor fields and WNW connections to other NIKs within the brigade. The JTRS GMR program lags the development of the E-IBCT systems by approximately one year.

Assessment

- The E-IBCT LUT 09 demonstrated the NIK's capability to send BSO reports to Army battle command systems and to exchange voice and data with the current force network. The test revealed NIK deficiencies in operational reliability, message completion rates, transmission range, start-up time, and complexity of operations.
- The E-IBCT Increment 1 LUT 10 demonstrated the NIK's capability to send BSO reports to Army battle command systems and to exchange voice and data with the current force

network. While the NIK showed performance and reliability improvements over E-IBCT LUT 09, the NIK demonstrated the following deficiencies:

- The GMR SINCGARS secure waveform proved un dependable in supporting unit voice command and control of operations. Unit leaders resorted to using legacy SINCGARS radios to accomplish their missions.
 - NIK start-up times ranged from 25 minutes to 10 hours to achieve full mission capability.
 - The NIK did not meet its reliability requirements when assessed from an operational standpoint. The NIK demonstrated 79 hours (with a requirement of 112) for Mean Time Between System Abort (MTBSA) and 31 hours (with a requirement of 37) for Mean Time Between Essential Function Failure (MTBEFF).
 - The NIK is complex to operate and relies too much on Field Service Representatives to maintain the system.
 - The NIK has survivability concerns in the area of Computer Network Operations.
 - The NIK did not demonstrate military utility, as its performance did not enhance mission accomplishment and only 5 sensor images out of approximately 4,000 collected during LUT 10 were forwarded from the receiving NIK to higher headquarters.
- The E-IBCT Increment 1 LUT 10 results will support an LRIP decision for Brigades 2 and 3 at the December 2010 E-IBCT DAB IPR.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY10 Recommendations. The Army should:
 1. Continue its NIK reliability growth program and efforts to correct NIK deficiencies observed during operational testing.
 2. Synchronize JTRS GMR development with the E-IBCT program and conduct independent developmental testing to assure JTRS GMR deficiencies are corrected.