EA-6B Upgrades / Improved Capability (ICAP) III and Low Band Transmitter (LBT)

Executive Summary

- The Navy's improvement to the EA-6B aircrew's battle-space awareness was demonstrated in the Improved Capability (ICAP) III Block 2 Follow-on Test and Evaluation (FOT&E) conducted in FY06. This included assessment of the ICAP III's digital link/Multi-Function Information Distribution System (MIDS).
- The ICAP III weapons system provides better crew situational awareness and improved electronic threat, identification, and locating capability for the suppression of enemy radar-guided threats compared to the legacy EA-6B ICAP II system.
- The Navy's second operational assessment of a new Low Band Transmitter (LBT) antenna configuration demonstrated a strong path to achieve future operational effectiveness. The demonstrated poor LBT reliability and one safety concern indicate that LBT suitability needs significant improvement prior to the FY07 LBT IOT&E.
- Limited testing during the Navy's Quick Reaction Assessment of the LBT consisted of only two flights. LBT integrated with the aircraft systems demonstrated on one of the two flights that it can be effective for its intended mission. LBT effectiveness was not demonstrated on the other flight due to LBT reliability issues.

System

- The legacy EA-6B ICAP II aircraft is a four seat, carrier/land-based, tactical jet aircraft with an onboard receiver, external jamming pods, a communication jammer, and a High Speed Anti-Radiation Missile (HARM).
- EA-6B ICAP III improvements are designed to provide:
  - Enhanced reliability
  - A new receiver, processor, and antenna system (ALQ-218)
  - New tactical displays/interfaces
  - New joint mission planner
  - Better external communications
- LBT improvements over legacy low band pods are designed to:
  - Expand frequency coverage
  - Provide better reliability - simplified design replaces three low-reliability transmitters

Mission

- Combatant commanders use the EA-6B to support friendly air, ground, and sea operations by suppressing enemy radars and communications.
- Both EA-6B ICAP II and ICAP III capabilities allow suppression of enemy radar-guided threats with HARM and jamming of integrated air defenses, in addition to supporting emerging asymmetric missions.
- EA-6B ICAP III mission improvements include:
  - Counters to emerging threats
  - More flexible and effective protection of strike aircraft
  - More accurate HARM targeting
  - Improved battle management
  - Selective reactive jamming capability to allow automatic detection and jamming of threats as they become active
  - Streamlined mission planning and post flight analysis
- LBT and other EA-6B assets jam radars and communications.

Activity

EA-6B ICAP III

- DOT&E provided a report to Congress in early FY06 that assessed the system as operationally effective and suitable. This supported the Navy's FY06 ICAP III full-rate production decision and initial operational deployments of EA-6B ICAP III squadrons, including the first EA-6Bs equipped with MIDS connectivity.
- The Navy conducted FOT&E of the ICAP III Block 2 configuration in FY06 to assess the integration of the MIDS,

early versions of the new Joint Mission Planning System (JMPS), and other improvements. This testing was conducted as part of the Air Force's Red Flag large force exercise at Nellis AFB, Las Vegas, Nevada; the Naval Air Warfare Center, Patuxent River, Maryland; and the Naval Air Weapons Center, China Lake, California.
- The Navy assessed the functionality of an early version of the JMPS for EA-6B ICAP III as part of the FY06 FOT&E, while separately commencing IOT&E of the production JMPS on EA-6B ICAP II aircraft.
- The Navy initiated planning for the EA-6B's upgraded USQ-113 (V) 4 communications jammer and ICAP III Block 3, which incorporates LBT functionality.
- EA-6B ICAP III testing in FY06 was conducted in accordance with DOT&E-approved TEMP (FY06 REV A) and test plans.

Low Band Transmitter (LBT)
- The LBT is in System Development and Demonstration phase in preparation for separate early operational capability and full-rate production decisions in FY07.
- The Navy conducted a second operational assessment on LBT Phase II in FY06 at the Naval Air Warfare Center, China Lake, California. The purpose of this test was to assess potential effectiveness of the new horizontal high-band antenna for radar jamming, while also continuing suitability evaluations.
- A Quick Reaction Assessment of LBT, designed to support specific operational missions, was conducted late in FY06 on legacy EA-6B ICAP II aircraft that incorporated software upgrades needed to support LBT.
- The Navy continued planning for a LBT IOT&E in FY07.
- LBT testing in FY06 was conducted in accordance with DOT&E-approved TEMP and test plans.

Assessment

EA-6B ICAP III
- The Navy's improvement to the EA-6B aircrew's battle-space awareness was demonstrated in the ICAP III Block 2 FOT&E. This included assessment of the ICAP III's digital link/MIDS. A Navy operational test report is expected early in FY07 after the test completes.
- The tactical employment for EA-6B ICAP III selective reactive jamming is still not mature.
- The ICAP III weapons system combines better crew situational awareness with improved speed and accuracy of electronic threat detection, identification, and locating to enhance the suppression of enemy radar-guided threats compared to legacy EA-6B ICAP II systems.
- The current process of constructing mission intelligence files does not provide EA-6B operators with sufficient confidence in emitter identification accuracy and intercept performance for uncharacterized threats.
- Operational testing revealed that integration of MIDS with the selective reactive jamming capability to achieve autonomous functionality would benefit the warfighter.
- Although the Navy's report is not finalized, functionality of JMPS on the EA-6B ICAP III appears adequate, but usage for ICAP IIII test sorties revealed deficiencies that were not apparent when the simpler legacy EA-6B ICAP II mission planning was conducted.
- The Navy's Advanced Multiple Emitter Environment Simulators (AMES III) has been unable to consistently support assessment of the ICAP III's advanced capabilities for which it was designed. AMES III is a laboratory threat signal simulator whose full capability is also critical to timely testing of the EA-18G.

Low Band Transmitter (LBT)
- The Navy's second operational assessment in FY06 of LBT's horizontally polarized high-band antenna configuration demonstrated a strong path to achieve future operational effectiveness. Navy testing revealed poor LBT reliability and one safety issue. This test indicates LBT suitability needs significant improvement prior to the FY07 LBT IOT&E.
- Limited testing during the Navy's Quick Reaction Assessment of the LBT consisted of only two flights. LBT integrated with the aircraft systems demonstrated on one of the two flights that it can be effective for its intended mission. LBT effectiveness was not demonstrated on the other flight due to LBT reliability issues.

Recommendations
- Status of Previous Recommendations. One of the four issues from previous DOT&E recommendations is unresolved. FY05 #1: The Navy should address the deficiencies found in the process used to develop EA-6B ICAP III mission intelligence files. This recommendation remains valid.
- FY06 Recommendations.

  EA-6B ICAP III. The Navy should**:**
  1. Continue tactics development to operationally employ the ICAP III's selective reactive jamming capability.
  2. Correct Advanced Multiple Environment Simulator III threat simulator deficiencies to adequately support future EA-6B and EA-18G testing.
  3. Although above specified requirements, the Navy should consider integrating MIDS with the selective reactive jamming capability to achieve autonomous functionality.

  Low Band Transmitter (LBT). The Navy should:
  1. Improve LBT reliability to support a LBT early operational capability and entry into IOT&E.
  2. Update the TEMP in FY07 to support planning for the IOT&E.