

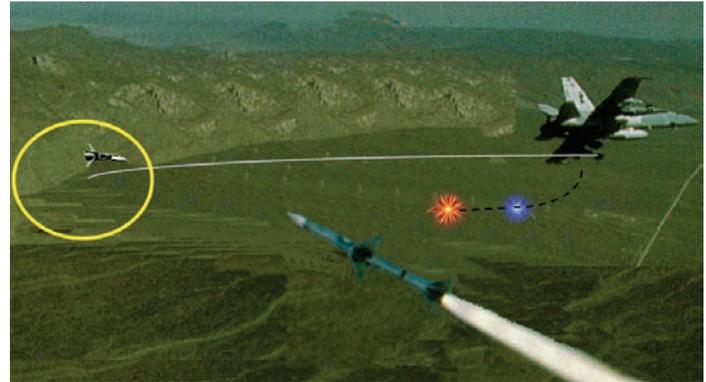
Integrated Defensive Electronic Countermeasures (IDECM)

Executive Summary

- Testers found Integrated Defensive Electronic Countermeasures (IDECM) Block 3 operationally effective during FY08 IOT&E, but not operationally suitable due to several major deficiencies regarding reliability and safety. DOT&E concurred with this assessment.
- IDECM Block 3 Milestone III was moved to 1QFY11 to accommodate the correction of deficiencies identified during IOT&E.
- IDECM Block 4 completed its hardware preliminary design review. A revised Test and Evaluation Master Plan (TEMP) is scheduled to be completed prior to the Critical Design Review planned for November 2009.

System

- The IDECM system is a radio frequency, self-protection electronic countermeasure suite on F/A-18 aircraft. The system is comprised of onboard and off-board components. The onboard components receive and process radar signals and can employ onboard and/or off-board jamming components in response to identified threats.
- There are four IDECM variants: Block I (IB-1), Block II (IB-2), Block III (IB-3), and Block IV (IB-4). All four variants include an onboard radio frequency receiver and jammer. The F/A-18E/F installation includes off-board towed decoys. The F-18C/D installation includes only the onboard receiver/jammer components and not the towed decoy.
 - IB-1 combined the legacy onboard system (ALQ-165) with the legacy (ALE-50) off-board towed decoy (fielded FY02).
 - IB-2 combined the improved onboard system (ALQ 214) with the legacy (ALE-50) off-board towed decoy (fielded FY04).
 - IB-3 combines the improved onboard jammer (ALQ-214) with the new (ALE-55) off-board fiber optic towed decoy that is more integrated with the advanced onboard receiver/jammer (ALQ-214).



- IB-4 replaces the onboard jammer (ALQ-214(V)3) with a lightweight repackaged onboard jammer for the F/A-18E/F and the F/A-18C/D aircraft.

Mission

- Combatant Commanders will use IDECM to improve the survivability of Navy F/A-18 E/F strike aircraft against radio frequency guided threats while on air-to-air and air-to-ground missions.
- The warfighters intend to use IB-3's and IB-4's complex jamming capability to increase survivability against modern radar guided threats.

Prime Contractors

- ALE-55: BAE Systems, Nashua, New Hampshire
- ALQ-214: ITT Electronic Systems, Clifton, New Jersey
- ALE-50 and Improved Multi-purpose Launch Controller (IMPLC): Raytheon Electronic Warfare Systems, Goleta, California

Activity

- Commander, Operational Test and Evaluation Force (COTF) issued their report on the IB-3 IOT&E that was completed in FY08.
- The Navy postponed IB-3 Milestone III to 1QFY11 to allow time to produce modified ALE-55 decoys and correct suitability and safety issues identified during IOT&E.
- The Navy began laboratory testing to confirm the corrections to the IB-3 performance. Flight testing will be conducted in FY10 to verify corrections.
- The Navy modified the IB-4 upgrade acquisition strategy to an engineering change proposal from a conventional milestone acquisition program.
- The IB-4 TEMP update is scheduled to be completed prior to the Critical Design Review planned for 1QFY10.

Assessment

- The IB-3 IOT&E test allowed for a comprehensive evaluation of operational effectiveness and suitability of

the system as installed in the F/A-18E/F while performing representative missions. COTF reported that the IB-3 system was operationally effective, but not operationally suitable, citing several safety concerns and poor reliability. DOT&E concurred with this assessment.

- The IB-3 demonstrated significantly improved operational effectiveness compared to the legacy ALE-50 towed decoy. It provided enhanced aircraft survivability against a broad array of surface-to-air missile threat systems.
- While the safety issues that resulted in a test stoppage in FY06 were resolved, there were three new safety issues uncovered during FY08 IB-3 testing. These included uncommanded decoy deployments, a decoy that partially deployed within its launching canister, and the inability to sever a decoy.
- While the system met many of its suitability requirements, it suffered from poor stowed and deployed reliability and a very high Built-in Test (BIT) false alarm rate. There were multiple instances of decoy magazines that required re-insertion or cleaning for proper function. DOT&E also noted that when a decoy was partially severed (signal line cut but tow line intact), there was no indication to the pilot.
- Inherent to the design of IB-3 are several limitations that could be mitigated by modifications to Navy tactics, techniques, and procedures to maximize the effectiveness of the countermeasures.
- Only two-thirds of key threats were available for realistic testing due to the lack of test resources on open-air ranges and in hardware-in-the-loop facilities. However, the four main categories of threats were adequately represented in developmental and operational testing.

Recommendations

- Status of Previous Recommendations. The Navy is satisfactorily addressing the two FY08 recommendations.

- FY09 Recommendations.

IDECM System

1. The Navy should correct decoy safety, maintenance, and reliability issues, reduce the BIT false alarm rate, and confirm the corrections in laboratory and flight tests.
2. The Navy should develop hardware and/or software changes to provide the pilot with correct indications of the status of a deployed decoy and whether a decoy was successfully severed.
3. The Navy should improve maintenance procedures and training to reduce the incidence of incorrectly installed magazines and contaminated electrical contacts.
4. The Navy should investigate the susceptibility and effects of IDECM on threat missile fuses.
5. The Navy should continue to fund and develop new countermeasure techniques to improve IDECM effectiveness and keep pace with threat advancements.
6. The Navy should explore new tactics, techniques, and procedures to provide optimal aircraft and aircrew survivability when IDECM is employed.

Electronic Warfare Warfighting Improvements

7. In coordination with DoD and other electronic warfare programs, the Navy should develop an enterprise approach to updating and upgrading laboratory and open-air range modeling and simulation capabilities.
8. In coordination with the Defense Intelligence Agency, the Navy should update the threat lethal radii and/or the evaluation processes that are used to determine whether simulated shots are hits or misses.