

Department of the Navy Large Aircraft Infrared Countermeasures (DoN LAIRCM)

Executive Summary

- The Navy conducted FOT&E on the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) Advanced Threat Warning (ATW) upgrade installed on the CH-53E from December 2014 through July 2015.
- DoN LAIRCM ATW, as installed on the CH-53E, provides new capabilities integrated into the fielded DoN LAIRCM system, and is operationally effective in most environments, but not operationally suitable because of poor reliability and logistical supportability issues.
- The Navy began developmental tests and operational test planning for installation of DoN LAIRCM on the MV-22, KC-130J, and CH-53K platforms.

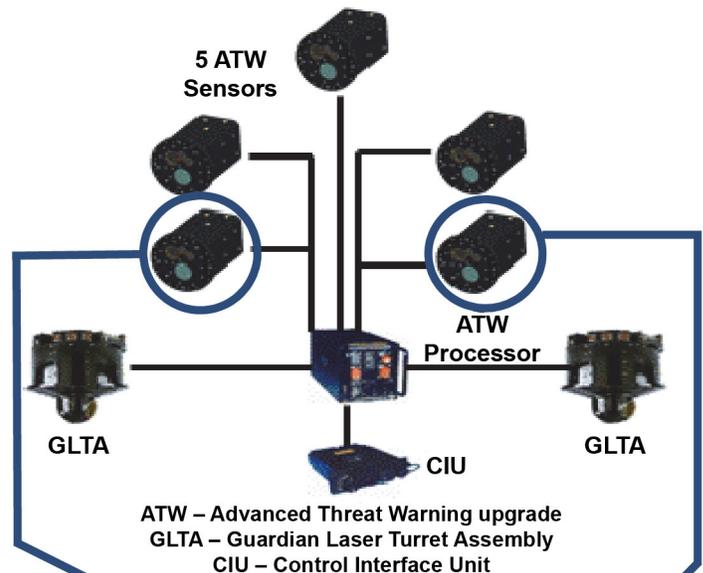
System

- The DoN LAIRCM system, a variant of the Air Force LAIRCM system, is a defensive system for Marine Corps helicopters designed to defend against surface-to-air infrared missile threats.
- DoN LAIRCM combines two-color, infrared Missile Warning Sensors with the Guardian Laser Transmitter Assembly (GLTA).
- The GLTA is equipped with a four-axis, stabilized gimbal system, an AN/AAR-24 Fine Track Sensor, and a Viper™ laser. The Missile Warning Sensor detects an oncoming missile threat and sends the information to the system processor, which, in turn, notifies the crew through the control interface unit and simultaneously directs the GLTA to slew to and begin jamming the threat.
- The ATW capability upgrades the processor and missile warning sensors to provide improved missile detection and adds hostile fire and laser warning capability and visual/audio alerts to the aircrew.
- The Navy plans to upgrade CH-53E DoN LAIRCM systems with ATW and install complete systems on the MV-22, KC-130J, and CH-53K platforms.

Mission

Combatant Commanders, while conducting normal take-off and landing, assault landing, tactical descents, re-supply, rescue, forward arming and refueling, low-level flight, and aerial refueling, will use DoN LAIRCM and its new capabilities to:

- Provide automatic protection of rotary-wing aircraft against shoulder fired, vehicle-launched, and other infrared-guided missiles



- Provide automatic hostile fire and laser warning capability for illuminators, beam riders, laser range finders, small arms, rocket-propelled grenades, unguided rockets, and anti-aircraft artillery

Major Contractor

Northrop Grumman, Electronic Systems, Defensive Systems Division – Rolling Meadows, Illinois

Activity

- The Navy completed the ATW engineering and manufacturing development phase in October 2014 with a CH-53E flight test that verified software fixes to failures that were identified during earlier developmental tests.
- The Navy conducted FOT&E on the DoN LAIRCM ATW upgrade installed on the CH-53E from December 2014 through July 2015 to support a fielding decision for ATW.
- During FOT&E, the Commander, Operational Test and Evaluation Force collected effectiveness and suitability data from the following tests:
 - Shipboard compatibility tests near and onboard the USS *Bataan*
 - Flight tests at Eglin AFB, Florida, and Marine Corps Air Station (MCAS) New River, North Carolina
 - False alert tests during a deployment to/from Yuma, Arizona
 - A maintenance demonstration at MCAS New River
 - A cybersecurity test at MCAS New River
- The Navy began developmental tests and operational test planning for installation of DoN LAIRCM on the MV-22, KC-130J, and CH-53K platforms.
- In early 2016, DOT&E is expected to submit an FOT&E report on DoN LAIRCM detailing the results of testing the system on the CH-53E platform.
 - Technical documentation and training regarding the operational employment aspects of in-flight power cycles need updating to avoid inadvertent loss of system availability during flight.
 - Obsolescence of the smart card utility software and the smart cards themselves will likely cause current/future maintenance and reprogramming challenges for the DoN LAIRCM system.

Assessment

- DoN LAIRCM ATW, as installed on the CH-53E, provides new capabilities integrated into the fielded DoN LAIRCM system, and is operationally effective in most environments, but it is not operationally suitable because of reliability and logistical supportability issues.
 - The operational effectiveness for hostile fire indication and laser warning exceeded the classified threshold requirements, while the missile warning and infrared countermeasures capabilities were not degraded by the ATW upgrade.
 - The ATW system's Mean Time Between Operational Mission Failure was 26 hours with an 80 percent confidence, which is well below the threshold requirement of 130 hours.
 - Logistic supportability shortfalls are as follow:
 - The location of the control interface unit is poorly situated and not useful during combat maneuvering since its current location requires the pilot to look inside the cockpit during critical flight regimes.

Recommendations

- Status of Previous Recommendations. The Navy satisfactorily addressed all previous recommendations on the legacy DoN LAIRCM program. This is the first annual report on the ATW upgrade.
- FY15 Recommendations. The Navy should:
 1. Continue to improve reliability of the ATW sensors, and monitor and report reliability growth to DOT&E.
 2. Resolve the logistic supportability obsolescence problems with the smart cards used to operate, maintain, and reprogram the DoN LAIRCM system.
 3. Resolve the logistic supportability and human factors problem with the location of the control indicator unit.
 4. Resolve the logistic supportability shortfall in the technical documentation and training regarding operational employment aspects of in-flight power cycles.
 5. Collect effectiveness data in a denied-GPS or GPS-jammed environment during FOT&E on either the MV-22 or KC-130J installations on DoN LAIRCM.