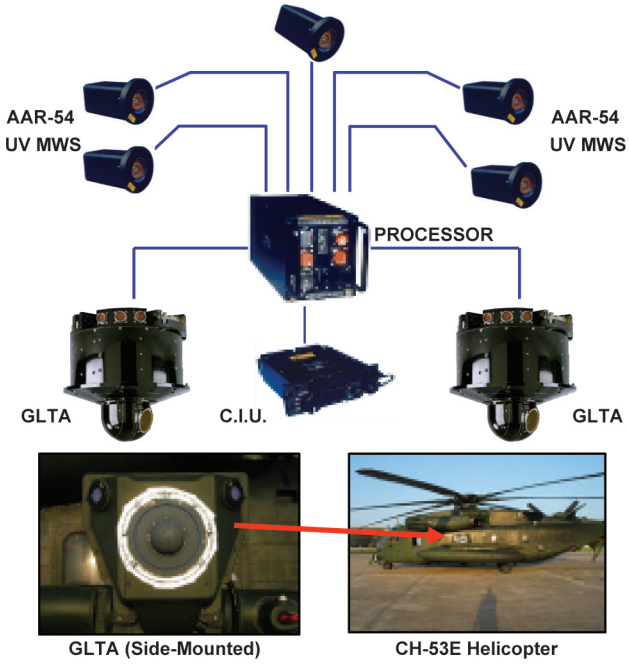
Department of the Navy Large Aircraft Infrared Countermeasures (DoN LAIRCM)

Executive Summary

- The Marine Corps intends to equip operational CH-53E aircraft by January 2009 and CH-46E aircraft by May 2009 with a directional, laser-based self-protection system. For the CH-53E, the Marine Corps chose to use a derivative of the latest variant of the Air Force's Large Infrared Countermeasures (LAIRCM) System, which is based on newer infrared warning sensors and an upgraded laser jammer (the Guardian Laser Transmitter Assembly (GLTA)) as opposed to the ultraviolet warning sensors and the small laser transmitter assembly (SLTA) used on earlier versions of LAIRCM.
- The Department of the Navy (DoN) LAIRCM completed an ambitious, accelerated test program in August 2008. Testing consisted of live fire missile shots against the system at the White Sands Missile Range, New Mexico, and Tonopah Test Range, Nevada; an integrated developmental and operational test (DT/OT) flight test program; and a Quick Reaction Assessment (QRA) by the Navy's Operational Test and Evaluation Force (COTF) on both the CH-53E and CH-46. The results of these tests will inform an Early Operational Capability Decision by October 2008 and initial aircraft installations in January 2009. Because of the accelerated test schedule, the Navy completed only minimal suitability testing and evaluation. The Navy conducted a maintenance demonstration in September 2008.
- The Navy/Marine Corps plan to continue the test and evaluation of the system in the CH-53E and the CH-46 in order to obtain a full-rate production (FRP) decision. The IOT&E will emphasize suitability and additional effectiveness testing. The Service plans to conduct an operational assessment in December 2008 to support the February 2009 Milestone C decision and an IOT&E for the CH-53E in March to April 2009 to support the June 2009 FRP decision. The test plan calls for FOT&E on the CH-46 and the CH-53D in July and September 2009, respectively.

System

- DoN LAIRCM is a defensive system for Marine Corps helicopters against surface-to-air infrared missile threats that combines an ultraviolet or two-color infrared Missile Warning Sensor (MWS) with the GLTA.
- This system is a spin-off of the Air Force's LAIRCM program, which is a defensive system for large transport and rotary wing aircraft that combines AAR-54 MWS and infrared laser jammers.
- The CH-53E is the lead platform, followed by the CH-46.
- The Navy intends to field an Early Operational Capability (EOC) DoN LAIRCM in the fall of 2008 with one squadron to U.S. Central Command.



C.I.U. - Control Interface Unit
GLTA - Guardian Laser Turret Assembly
MWS - Missile Warning System
UV - Ultraviolet

- Procurement includes quantities for 156 aircraft to include CH-53E, CH-46, and CH53D.
- DoN LAIRCM has an evolutionary incremental Acquisition Strategy:
  - Increment 1 features the AAQ-24 ultraviolet MWS on the CH-46
  - Increment 2 features a two-color infrared MWS upgrade for the CH-53E, CH-46, and the CH-53D, in that order.

Mission

Combatant Commanders will use DoN LAIRCM to provide automatic protection of rotary wing aircraft against shoulder-fired, vehicle-launched, and other infrared-guided missiles. Aircrew need such protection during normal take-off and landing, assault landing, tactical descents, re-supply, rescue, forward arming and refueling, low-level flight, and aerial refueling.

Prime Contractor

- Northrop Grumman

Activity

- The test program from November 2007 through August 2008 consisted of evaluation of the DoN LAIRCM system against live missile shots at the White Sands Missile Range, New Mexico, and Tonopah Test Range, Nevada; and developmental/operational flight tests for both aircraft at Eglin AFB, Florida, from March through August 2008. The Navy evaluated suitability during these tests and during a maintenance demonstration held in September 2008.
- The Navy conducted live fire tests against several infrared missile types in November 2007 and March 2008, primarily to evaluate the performance of the two-color MWS as part of the overall LAIRCM system.
- Subsequent to successful aircraft integration, the Navy/Marine Corps initiated accelerated developmental/operational flight testing in March 2008. The Service conducted more extensive testing on the CH-53E because it used the newer, two color infrared MWS. DoN LAIRCM has conducted 100 flight hours of DT and OT testing at the time of this report.
- The tests on both aircraft encompassed several operationally-representative scenarios which the Navy anticipates in Operation Iraqi Freedom and Operation Enduring Freedom. To expedite the operational assessment of the two systems, the Navy's Operational Test Agency (OTA) participated in the tests throughout. The OTA provided an early assessment of the two configurations, which provided for timely modifications during the tests to improve system performance.
- Subsequent to the completion of the developmental tests in July 2008, the Navy's OTA provided a QRA for both aircraft to support the EOC decision planned for November 2008.

Assessment

- The test team faced a difficult challenge to perform the extensive flight testing in a very short timeframe. DOT&E's initial assessment of the DoN LARICM systems on the CH-53E and the CH-46 indicated that the systems should be operationally effective. A comprehensive analysis and assessment of the DT/OT tests should be complete before the EOC decision in November 2008.
- The live fire tests were useful, and the DoN LAIRCM system performed satisfactorily during these tests. However, the two-color MWS system needs more live fire data to fully characterize performance. The Navy scheduled additional live fire tests for November to December 2008.
- Because of the abbreviated test period, suitability evaluations were minimal. There were two hardware failures during the tests, both with the GLTA. The only substantive suitability test conducted prior to the EOC decision was the Maintenance Demonstration (M-Demo) performed in September 2008. The M-Demo evaluated the logistical support (i.e., technical publications, training) needed to sustain the system in the field and the required maintenance procedures (i.e., remove and replace black boxes, software reloadability, use of diagnostic tools).
- Although the flight tests were adequate for a QRA, more flight testing is required to fully assess the operational effectiveness and suitability of the DoN LAIRCM system on the CH-53E and the CH-46. Additional operational testing planned for the IOT&E in 2009 is required prior to a FRP decision.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY08 Recommendations. The Navy/Marine Corps should:
  1. Ensure that the IOT&E planned for 2009 encompasses a comprehensive suitability evaluation as well as a correction of deficiencies found during the recent QRAs.
  2. Continue to conduct live fire missile shots to obtain a more robust database on the system's capability to counter all types of passive infrared missiles.
  3. Attempt to obtain field data from the deployed units once the EOC aircraft deploy.