

## Large Aircraft Infrared Countermeasures (LAIRCM)

### Executive Summary

- The Large Aircraft Infrared Countermeasures (LAIRCM) Phase I system is fielded, is in full-rate production, and, as stated in DOT&E's FY05 Report to Congress, is operationally effective and suitable.
- DOT&E assessed LAIRCM Phase II (Guardian) testing and demonstrated capabilities as adequate to support a low-rate initial production (LRIP) decision, which was based on the Air Force's Operational Assessment (OA) of Guardian completed in FY07.
- The Air Force changed the Guardian acquisition strategy from development of a new capability to an engineering change proposal in FY07.
- This new Air Force Acquisition strategy for Guardian eliminated the Air Force's milestone decisions for the Guardian upgrade allowing entry into full production without milestone decision points.
- Based on testing to date, which was designed to support a LRIP decision, the Air Force's Milestone Decision Authority (MDA) is accepting high risk if Guardian production continues above previously planned LRIP quantities (up to 20 percent of total production) before the Air Force conducts the FY09 LAIRCM Phase II IOT&E.
- DOT&E concurs with the Air Force Operational Test and Evaluation Center's (AFOTEC) OA report that the Next Generation Missile Warning Sensors (NexGen MWS) testing supports the scheduled 2QFY08 LRIP decision, and that demonstrated capabilities are maturing as expected.

### System

- LAIRCM is a defensive system for large transport and rotary wing aircraft that combines the Air Force's newest Missile Warning Sensor (MWS) and infrared laser jammer countermeasure systems.
- LAIRCM Phase I is fielded.
  - It delivers a system of proven and available subsystems.
  - Key components include ultra-violet MWS, countermeasures processor, and infrared laser jammer.
  - The infrared laser jammer is the Small Laser Transmitter Assembly.
  - Platforms with LAIRCM Phase I include C-17, C-130, and MH-53.



- Integration on C-5, CV-22, and C-40 began in FY06-07.
- LAIRCM Phase II is a spiral upgrade in development and incorporates:
  - A new infrared MWS called the NexGen MWS
  - A Miniaturized Laser Jammer Turret Assembly (also known as Guardian)
- The Phase II NexGen MWS is designed to provide higher performance warning compared to Phase I MWS through:
  - Earlier threat warning
  - Improved detection in challenging urban and natural environments
  - Enhanced capability against emerging threats
- Phase II Guardian Laser Jamming Turret Assembly reduces life-cycle costs through:
  - Smaller and lighter packaging
  - Reliability improvements

### Mission

Combatant commanders use LAIRCM to provide automatic protection to crews and large transport or rotary wing aircraft against shoulder-fired, vehicle-launched, and other infrared-guided missiles. Such protection is needed during normal take-off and landing, assault landings, tactical descents, air drops, low-level flight, and aerial refueling.

### Activity

#### LAIRCM Phase I

- The Air Force fielded LAIRCM Phase I in FY05.
- This phase of the LAIRCM system did not undergo significant testing in FY07.

- In FY07, the Navy began plans to test LAIRCM Phase 1 MWS integrated on Marine Corps CH-53E helicopters.

## LAIRCM Phase II

- LAIRCM Phase II is in the System Development and Demonstration phase.
- In FY07, AFOTEC completed OAs for both the Guardian and the NexGen MWS.
- The Air Force's OAs supported the scheduled Guardian LRIP decision in 3QFY07 and a separate NexGen MWS LRIP in 1QFY08.
- USD (AT&L) nominated LAIRCM for transition to Acquisition Category IC in FY07 driven by increased production quantities and a rising research and development budget which supports the incremental upgrades.
- The Air Force changed the Guardian acquisition strategy from development of a new capability to an engineering change proposal in FY07.
- In coordination with DOT&E, the Air Force finalized plans to test the integration of the LAIRCM on the C-5 transport aircraft in early FY08. The LAIRCM system configuration includes the Phase I ultra-violet MWS and the Phase II Guardian.
- DOT&E approved updates to the LAIRCM Test and Evaluation Master Plan (TEMP) in January 2007 for testing through the FY09 IOT&E.
- LAIRCM testing in FY07 was conducted in accordance with the DOT&E-approved TEMP and test plans.
- In FY07, the Navy began plans to test LAIRCM Phase II Guardian integrated on Marine Corps CH-53E.

## Assessment

### LAIRCM Phase I

- The LAIRCM Phase I system is operationally effective at enhancing aircraft survivability, and is much less susceptible to degradation under certain conditions compared to the system initially fielded.

### LAIRCM Phase II

- DOT&E provided a Guardian report to the MDA in support of the scheduled 3QFY07 Guardian LRIP decision. DOT&E

assessed that the OA testing was adequate to support the LRIP decision, and that the demonstrated effectiveness and suitability were at expected maturity levels for this stage of development. Some limitations were identified which should be addressed prior to IOT&E.

- The Air Force's OA testing on the Guardian was adequate for the LRIP decision, but did not fully characterize the system capabilities for a full-rate production decision.
- This new Guardian acquisition strategy eliminated the Air Force's milestone decisions for the Guardian upgrade allowing entry into full production without milestone decision points.
- Based on testing to date, which was designed to support a LRIP decision, the MDA is accepting high risk if Guardian production continues above previously planned LRIP quantities (up to 20 percent of total production) before the Air Force conducts the FY09 LAIRCM Phase II IOT&E.
- Based on the AFOTEC NexGen OA Report, DOT&E anticipates a timely NexGen LRIP decision in 2QFY08. DOT&E concurs with the AFOTEC report that testing is adequate to support a NexGen LRIP decision, and that the system's capabilities are maturing as expected.
- DOT&E plans to provide an Early Fielding Report to Congress early in FY08 that will clarify the risks related to the Air Force fielding Guardian on the C-5 transport aircraft, which is well prior to the planned IOT&E in FY09.

## Recommendations

- Status of Previous Recommendations. The Air Force has addressed all previous DOT&E recommendations.
- FY07 Recommendations.
  1. LAIRCM Phase I: None
  2. LAIRCM Phase II: The Air Force should provide a revised TEMP by October 1, 2008, that incorporates changes to the LAIRCM Acquisition Strategy and clearly defines the Guardian reliability testing to support planning of the FY09 LAIRCM Phase II IOT&E.