Large Aircraft Infrared Countermeasures (LAIRCM)

Executive Summary

- The Large Aircraft Infrared Countermeasures (LAIRCM) Phase I system is fielded, and as stated in DOT&E's May 2005 Beyond Low-Rate Initial Report (BLRIP), is operationally effective and suitable. The Air Force began full-rate production in May 2005.
- DOT&E expects the Air Force Operational Test and Evaluation Center (AFOTEC) to complete the ongoing Phase II operational assessment as planned to support low-rate initial production decisions for the Guardian turret and Next Generation (NexGen) Missile Warning Sensor (MWS) in FY06.

System

- LAIRCM combines the Air Force's newest missile warning sensor (MWS) and infrared laser jammer countermeasure systems on large transport aircraft.
- LAIRCM Phase I is fielded.
  - It delivers a system of proven and available subsystems.
  - Key components: ultra-violet MWS, countermeasures processor, and infrared laser jammer.
  - The infrared laser jammer is the Small Laser Transmitter Assembly.
  - Platforms with LAIRCM are C-17, C-130, and MH-53.
  - Future integration on C-5 and C-40 is planned.
- LAIRCM Phase II is in development and incorporates:
  - A new infrared MWS called the NexGen MWS
  - Miniaturized Laser Jammer Turret Assembly (called the 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 more challenging urban and natural environments
  - Enhanced capability against emerging threats
- Phase II Guardian Laser Jamming Turret offers:
  - Smaller and lighter packaging
  - Reduced cost
  - Reliability improvements

Mission

- Combatant commanders use LAIRCM to provide automatic protection to crews and large transport 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

- LAIRCM Phase I IOT&E was completed in 2004. The DOT&E BLRIP, published in May 2005, found LAIRCM Phase I operationally effective and suitable. The Air Force authorized full-rate production for 163 LAIRCM systems in May 2005.
- A follow-on test and evaluation period was conducted in FY05 to assess the correction of deficiencies discovered during the IOT&E and earlier test periods.
- Testing in FY05 was conducted in accordance with the DOT&E-approved Test and Evaluation Master Plan (TEMP) and test plans.

LAIRCM Phase II

- Two contractors are developing competing NexGen MWS designs simultaneously to support a 4QFY06 NexGen source selection. The Guardian turret contractor conducted early development testing. Phase II activities include development and initial tests of the NexGen infrared MWS by both contractors. The NexGen MWS and Guardian turret have different development and delivery schedules. Testing will be aligned when applicable.
- Both NexGen MWS contractors began development of their respective Digital System Models to provide an accurate

assessment of MWS detection performance against various threats and in multiple environments.
- The advanced design of the NexGen MWS requires the development of new test resource capabilities. The Joint Mobile Infrared Countermeasures Test System is being developed under the OSD sponsored Central Test and Evaluation Investment Program. It is a new ground-based missile threat simulator. Additionally, OSD and AFOTEC are developing a Towed Airborne Plume Simulator to support future LAIRCM testing.
- An Operational Assessment (OA) Test Plan was approved by DOT&E to support designated 2005 activities. This plan includes AFOTEC oversight of live missile firing and ground and flight testing in FY05 and FY06. This is the first operational look at Phase II in preparation for the separate Guardian and NexGen MWS IOT&Es, and subsequent full-rate production decisions in FY07. The LAIRCM Program Office revised the TEMP to support LAIRCM Phase II. This is in final service coordination and DOT&E expects to sign it in 1QFY06.
- Testing in FY05 was conducted in accordance with the DOT&E-approved TEMP and test plans.

Assessment

LAIRCM Phase I

- The LAIRCM Phase I system is fielded and is operationally effective at enhancing aircraft survivability. It demonstrated effectiveness in detecting, tracking, and jamming the representative infrared missile threats, yet can degrade under certain conditions.
- The Air Force recently reported on follow-on testing conducted to confirm successful correction of the one effectiveness limitation. DOT&E is currently analyzing this follow-on test. There has been no formal assessment of the suitability concerns identified in the DOT&E BLRIP.

LAIRCM Phase II

- DOT&E expects AFOTEC to complete the ongoing Phase II operational assessment as planned to support low-rate initial production decisions for the Guardian turret and NexGen MWS in FY06.
- The OSD sponsored development of Joint Mobile Infrared Countermeasures Test System is progressing, and should be available to support required LAIRCM tests in FY06 and FY07.

Recommendations

1. LAIRCM Phase I:
   The Air Force should formally report on the results of all corrections made to Phase I system deficiencies as recommended in the DOT&E BLRIP.

2. LAIRCM Phase II:
   As Phase II development and testing continues, the Air Force should ensure that the verification, validation, and accreditation of the contractor generated Digital System Models are adequate to contribute to the overall NexGen MWS effectiveness assessment.