

## Advanced Threat Infrared Countermeasures / Common Missile Warning System (ATIRCM/CMWS)

### Executive Summary

- The Army must determine if the two major program elements, Common Missile Warning System (CMWS) and Advanced Threat Infrared Countermeasures (ATIRCM) should be decoupled or not. ATIRCM program element uncertainties are complicating and confusing the management and execution of the CMWS program element.

### Common Missile Warning System (CMWS)

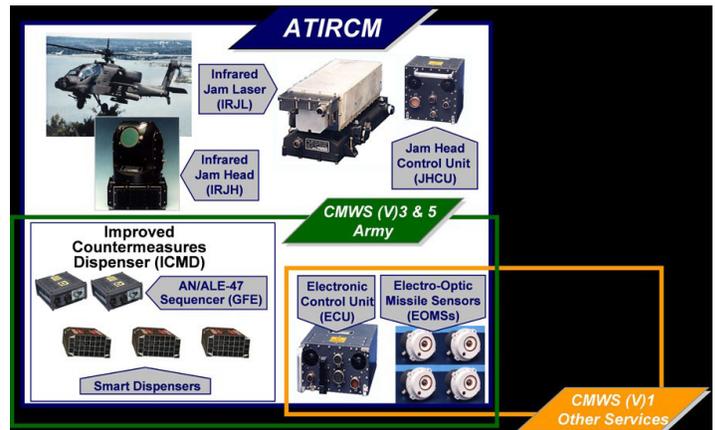
- Following submission of the classified Beyond Low-Rate Initial Production Report to Congress on CMWS, the Army continued to field an interim CMWS designed to support immediate warfighter needs, while deferring development of a full threat capable CMWS. The Army plans to conduct operational tests on the full threat CMWS capability that supports worldwide operations in FY11.
- Based on the FY08 operational reports, the Army should re-evaluate the effectiveness of CMWS in the Operation Iraqi Freedom (OIF) / Operation Enduring Freedom (OEF) threat environments to determine if any effectiveness limitations exist.
- The fielded version of CMWS offers significant advantages in the OIF/OEF environments over the legacy MWS it replaced, but substantial CMWS effectiveness limitations outside the current OIF/OEF environments remain.
- The Army should further improve the CMWS and conduct T&E for combat operations outside the OIF/OEF environments. The Army has initiated both software (Tier 1 update) and hardware (GEN 3 Electronic Control Unit (ECU)) improvements. The testing of these improvements must realistically reflect both the OIF/OEF and non-OIF/OEF threat environments.

### Advanced Threat Infrared Countermeasures (ATIRCM)

- The Army stopped testing of the ATIRCM laser jammer in FY05 due to significant reliability problems identified while testing.
- The Army has initiated a Quick Reaction Capability (QRC) program to equip 70 CH-47D/F model aircraft with ATIRCM. The Army has also revised its test and evaluation strategy for the ATIRCM program of record. The test process culminates in a QRC fielding in FY10 and IOT&E in FY11 to support a planned full-rate production decision in FY11.
- DOT&E is unable to assess the ATIRCM performance until the Army conducts adequate government effectiveness and suitability testing.

### System

CMWS is the newest Army aircraft missile warning system designed to detect incoming surface-to-air infrared missiles, to



warn pilots of the threat, and to command automatic employment of Infrared Countermeasures (IRCM). The current CMWS does not include integration of an infrared laser jammer. It only cues expendable flares.

- The Army will use CMWS as the first missile-warning sensor (MWS) on some aircraft, while augmenting the legacy ALQ-144 passive infrared jammer and replacing the legacy AN/AAR-47 or AN/ALQ-156 missile warning sensors.
- Production CMWS are currently fielded on approximately 950 Army CH-47, UH-60, AH-64, C-12 series, UC-35, and C-23 aircraft. The Army is purchasing 1,742 CMWS systems.
- ATIRCM incorporates an active infrared laser jammer to provide Army helicopters with improved infrared defensive countermeasures. In summer 2008, the Army decided to test and field the existing ATIRCM hardware on the CH-47 Chinook helicopters as a QRC. The Army plans to complete fielding in FY10.
- The Army plans to develop another jammer subsystem for the ATIRCM program of record for installation on all platforms by the end of FY11. This jammer will replace the ATIRCM systems fielded on the CH-47s.

### Mission

- Combatant Commanders intend to use the integrated ATIRCM/CMWS suite to enhance threat warning and improve defensive countermeasures for helicopters and some fixed-wing aircraft. The system is also used to protect aircraft and crews during normal take-off and landing, assault, attack, re-supply, rescue, forward arming, and refueling missions against shoulder-fired, vehicle-launched, and other infrared guided missile threats.

# ARMY PROGRAMS

- Combatant Commanders currently use the fielded version of CMWS-only to warn pilots and support limited infrared countermeasures.

## Prime Contractor

- BAE Systems

## Activity

### CMWS

- The Army authorized full-rate production of CMWS in FY06, following submission of the classified Beyond Low-Rate Initial Production Report to Congress on CMWS.
- The Army continued to field an interim CMWS designed to support immediate warfighter needs, while deferring development of a full threat capable CMWS. The Army plans to conduct operational tests on the full threat CMWS capability that supports worldwide operations in FY11.
- Scheduled FY08 CMWS software testing, which was intended to partially resolve the shortfalls identified in IOT&E, was repeatedly delayed (current projection for testing is September to November 2008). This was partly the result of technical problems in the design of the update, and partly the result of poor test range resource availability/coordination.
- The CMWS Program Office planned to sponsor CMWS live fire missile testing at Eglin AFB, Florida, in February 2008 in order to provide the prime contractor more data to develop the full threat capable CMWS. The CMWS Program Office cancelled because the contractor was not ready to support the test.
- The Army conducted follow-on testing of the CMWS installation on the Army UH-60, CH-47, and AH-64, as well as the addition of a fifth sensor on select fielded aircraft to improve the CMWS field of view.
- The Navy completed integration testing of CMWS on Marine Corps UC-35D aircraft in November 2007. Integration improvements and insufficient data will require further testing in early FY09.
- The Army has funded a processor hardware upgrade (GEN 3 ECU) in order to increase the capability of the legacy ECU. The Preliminary Design Review was successfully completed in April 2008. The Army plans to conduct the Critical Design Review and first article testing in FY09/10.
- The Army did not conduct the CMWS testing in FY08 in accordance with the DOT&E-approved Test and Evaluation Master Plan (TEMP). The Army needs to update the November 2005 TEMP with current test plans and resources.

### ATIRCM

The Army stopped testing of the ATIRCM laser jammer due to significant reliability problems identified during testing in FY05.

- In FY07, the Army initiated a significant redesign of the ATIRCM laser jammer to address reliability issues and to provide a multi-band laser jamming capability. No operational testing has taken place on the FY08 redesign.
- Testing of the new multi-band laser and jam codes started in 3QFY08 at the Guided Weapons Evaluation Facility at Eglin AFB.

- The Program Office initiated an ATIRCM QRC program in order to equip 70 Army CH-47D/F aircraft with the ATIRCM. An operational assessment conducted by the Army Test and Evaluation Command is planned for 3QFY09.
- The ATIRCM contractor continued a five-phase reliability growth test to assess the reliability of some components of the ATIRCM redesign. The ATIRCM contractor completed Reliability Development Test-3B in 3QFY08.

## Assessment

### CMWS

- The Program Office has proposed the GEN 3 ECU upgrade in order to partially address limitations due to the changing OIF/OEF threat environments.
- In FY06, DOT&E determined that CMWS was operationally effective and suitable for the OIF/OEF combat operations when installed on the CH-47, UH-60, AH-64, and C-12 aircraft. Test results from some of the implemented incremental improvements have not been fully analyzed. Other recommendations have only been partially addressed.
- The fielded version of CMWS offers significant improvements over the legacy MWS it is replacing in the OIF/OEF environment. However, testing has shown substantial system effectiveness limitations for CMWS outside the FY06 OIF/OEF threat environments, as well as limitations caused by specific platform integration problems.
- The Army has not accredited their end-to-end CMWS simulation model, which has the potential to reduce the flight test requirements of follow-on testing.
- The Army has not coordinated test planning with DOT&E for CMWS FOT&E and the integration on new platforms as stated in the approved TEMP.

### ATIRCM

- DOT&E assesses the Army's schedule for a planned full-system (CMWS and ATIRCM) IOT&E in FY10 as optimistic because there are no government test data products available to support the assessment of ATIRCM performance improvements since development of the redesigned ATIRCM began over two years ago.
- The direction of the ATIRCM program element has continued to be a source of uncertainty. Consequently, adequate test planning and resourcing is at risk.

### ATIRCM/CMWS

- The combined ATIRCM/CMWS TEMP does not adequately detail current plans to integrate testing and evaluate a laser-based jamming capability integrated with CMWS.

# ARMY PROGRAMS

- The approved Army Acquisition Strategy for ATIRCM/CMWS does not detail an incremental CMWS capability (Tier 1) to full threat capability, or provide an accurate timeline for planned ATIRCM and CMWS integration. Likewise, the Acquisition Strategy does not reflect the options being considered and pursued by the program manager or the Program Executive Officer.

## Recommendations

- Status of Previous Recommendations. Three DOT&E recommendations from FY06 and FY07 remain valid.
- FY08 Recommendations.
  1. The Army must either establish a program Acquisition Strategy that addresses the combined requirements of the CMWS and ATIRCM and produce a matching TEMP; or formally decouple the acquisition from the ATIRCM component from the CMWS and produce a separate Acquisition Strategy and TEMP documents for ATIRCM and CMWS.
  2. The Army must continue to develop the ECU update program (GEN 3 ECU) to provide additional processing resources to both the CMWS alone and the integrated CMWS/ATIRCM programs.
  3. The Army should conduct an operational assessment of the combined CMWS and ATIRCM system in FY09 in order to assess the current operational effectiveness and suitability of CMWS and ATIRCM.

# ARMY PROGRAMS