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

Executive Summary

Common Missile Warning System (CMWS)

- FY07 Army operational reports indicate that the Service should reevaluate the Operation Iraqi Freedom (OIF)/ Operation Enduring Freedom (OEF) threat environments and the impact on CMWS testing or effectiveness limitations.
- The fielded version of CMWS offers significant advantages in the OIF/OEF environments over the legacy MWS it is replacing, 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.

Advanced Threat Infrared Countermeasures (ATIRCM)

- The ATIRCM incorporates an active infrared laser jammer that provides Army helicopters with improved defensive countermeasures. The CMWS cues the ATIRCM.
- The Army stopped testing of the ATIRCM laser jammer in FY05 due to significant reliability problems identified while testing.
- The Army incorporated a redesigned ATIRCM system and began limited ATIRCM government testing in FY07 to provide an assessment through a methodical test process. This test process includes an FY10 ATIRCM IOT&E, to support a planned full-rate production decision in FY10.
- DOT&E is unable to assess the ATIRCM performance until the Army conducts adequate government testing.

System

- CMWS is the newest Army aircraft missile warning system designed to detect incoming surface-to-air infrared missiles, warn pilots of the threat, and to command automatic employment of Infrared Countermeasures (IRCM). The fielded CMWS is not integrated with an infrared laser jammer and 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 760 Army CH-47, UH-60, AH-64, C-12 series, and UC-35 aircraft. The Army is purchasing 1,710 CMWS systems.

- The Army plans to install ATIRCM/CMWS on most H-47 Chinook, H-60 Blackhawk, and H-64 Apache helicopters. CMWS-only is the planned configuration for Army fixed-wing C-12 and UC-35 series aircraft.
- The Navy is installing CMWS-only on a limited number of Marine Corps UC-35 Executive Transports.
- ATIRCM incorporates an active infrared laser jammer to provide Army helicopters with improved infrared defensive countermeasures. The Army plans to conduct the ATIRCM IOT&E as integrated with the full CMWS capability in FY10.

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

Activity

CMWS

- The Army authorized full-rate production of CMWS in FY06, following submission of the classified DOT&E 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 FY10.
- The CMWS Program Office sponsored CMWS live fire missile testing at Eglin AFB, Florida, to provide the prime contractor more data to develop the full threat capable CMWS.
- The Army conducted follow-on testing at Fort Rucker, Alabama, of the CMWS installation on the Army UC-35 jets, integration on the UH-60M, CH-47F, and the addition of sensors on select fielded aircraft to improve the CMWS field of view.
- The U.S. Navy is planning to test CMWS integration on U.S. Marine Corps UC-35 aircraft late in FY07.
- The Army's CMWS testing in FY07 was not conducted in accordance with the DOT&E-approved Test and Evaluation Master Plan (TEMP).

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 fundamental redesign of the ATIRCM laser jammer to address reliability issues and to provide a multi-band laser jamming capability reducing the number of system components.
- The Army began limited ATIRCM government testing in FY07 to provide an assessment of ATIRCM capabilities through a methodical test process. This test process includes a FY10 ATIRCM IOT&E designed to support a planned full-rate production decision in FY10.
- The ATIRCM contractor continued a five-phase reliability growth test to assess the reliability of the ATIRCM redesign.

Assessment

CMWS

- Army operational reports in FY07 indicate that the Service should reevaluate the OIF/OEF threat environments and quickly determine if there are any related CMWS testing or effectiveness limitations.
- 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.
- 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 integrations.
- The Army has incorporated incremental improvements to CMWS that mitigate some of the limitations reported by DOT&E, but the test results have not been fully analyzed.
- 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 integration on new platforms as stated in the approved TEMP. The consequences of this is that DOT&E:
  - Is unable to influence the adequacy of test during planning
  - May not be aware that the testing has been conducted, and subsequently is unable to help other Services apply applicable Army testing results to similar CMWS platform integration efforts

ATIRCM

- DOT&E assesses the Army's schedule for a planned full system (CMWS and ATIRCM) IOT&E in FY10 as being 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.

ATIRCM/CMWS

- The combined ATIRCM/CMWS TEMP does not adequately detail current plans to integrate a laser-based jamming capability with CMWS.
- The approved Army Acquisition Strategy for ATIRCM/CMWS does not detail an incremental CMWS capability (i.e, Interim Threat) or provide an accurate timeline for planned ATIRCM and CMWS integration.

Recommendations

- Status of Previous Recommendations. The three DOT&E recommendations from FY06 remain valid. The Army needs to be more aggressive addressing the following three FY06 recommendations:
  - Test and report on CMWS improvements that support current OIF/OEF environments and worldwide mission environments
  - Provide a revised TEMP that clearly describes the development and test efforts required to support assessment of the full-threat capable CMWS and redesigned ATIRCM
  - Continue to develop the end-to-end simulation model for ATIRCM and CMWS to support the FY10 ATIRCM/CMWS full-rate production decision
- FY07 Recommendation.
  1. The Army must test and report on CMWS capabilities and limitations related to a changing OIF/OEF threat environment.