Limited Interim Missile Warning System (LIMWS)

The Army's Limited Interim Missile Warning System (LIMWS) Quick Reaction Capability (QRC) testing demonstrated sufficient system effectiveness to support operations. Due to limited test data, suitability results are inconclusive. Based on the limited data thus far, the system is reliable, assuming mission durations based upon the Army's rotary wing operational mode/summary mission profile. Testing demonstrated LIMWS is survivable in a cyber-contested environment.

SYSTEM DESCRIPTION

LIMWS provides both infrared (IR)-guided missile warning and hostile fire indications for Army rotorcraft. LIMWS can cue the ALE-47 Improved Countermeasure Dispenser and the Common Infrared Countermeasure system to counter incoming IR-guided threats through flare dispenses and IR jamming respectively. LIMWS is a form-fit replacement for the Common Missile Warning System, which operates in the ultraviolet (UV) spectrum. Because LIMWS operates in the IR spectrum, it has performance advantages over a UV missile warning system. This improves missile warning declaration abilities and thus improves countermeasure effectiveness. LIMWS is composed of multiple imaging two-color IR sensors, a system processor, and a removable data module.

MISSION

Commanders employ Army rotorcraft equipped with LIMWS to conduct air assaults, air movements, casualty evacuation, attack, armed escort, reconnaissance, and security operations. During Army missions, LIMWS is intended to provide threat information to the aircrew and threat protection systems for rotary-wing aircraft against shoulder-fired and vehicle-launched IR surface-to-air missiles.

PROGRAM

The Army released a directed requirement for LIMWS. The specific details outlining the requirement are classified. The Army conducted test planning and execution as a QRC.

» MAJOR CONTRACTOR

- BAE Systems Information and Electronic Systems Integration – Nashua, New Hampshire

TEST ADEQUACY

The Army's QRC testing for LIMWS concluded in 3QFY22 and deviated from the original Army-approved test plan. The Army reduced the scope of the test matrices to shorten the duration of the test. DOT&E observed testing that generated test data from hardware-in-the-loop test results based on actual missile-to-warner-to-countermeasure handoff timelines measured during flight, along with performance data generated from flight tests in an operationally representative environment. In both cases, data supported assessing timely detection, countermeasure response, accurate reporting to aircrew of threats, and the false alarm rate. Testers coupled these data with data collected from free-flight missile tests using real missiles to evaluate system-of-system performance.

Testing to date has not generated adequate data to support a suitability assessment. Most of the suitability data are associated with reliability that came from flight hours on UH-60 and HH-60 platforms providing a single reliability measurement with limited confidence due to the limited number of flight hours.

The Army Test and Evaluation Command conducted cooperative vulnerability and penetration assessment testing, in collaboration with the Combat Capabilities Development Command Data and Analysis Center, in 2QFY21. Additionally, Army Test and Evaluation Command, supported by the Threat Systems Management Office, conducted an adversarial assessment in 2QFY21at Redstone Test Center, Alabama. Cyber survivability testing for LIMWS followed the DOT&E-approved test plans and included both Ethernet-based and Military Standard 1553 bus testing.

PERFORMANCE

» EFFECTIVENESS

LIMWS effectiveness was sufficient to support operations. Specific details are documented in DOT&E's classified LIMWS Interim Report of May 2022.

» SUITABILITY

Due to limited data, suitability results are inconclusive. The Army will need to continue to collect suitability data to assess the suitability of the system with confidence. Most suitability data

are associated with reliability in which the system is reliable, assuming mission durations based upon the Army's rotary wing Operational Mode/Summary Mission Profiles. There were no reported safety issues for LIMWS during testing.

» SURVIVABILITY

Testing demonstrated LIMWS is survivable in a cyber-contested environment.

RECOMMENDATIONS

The Army should:

1. Continue collecting data to evaluate system suitability and make system and/or training modifications as necessary.
2. Address the recommendations documented in the classified DOT&E Interim Report.