Lockheed Martin Joint Common Missile Seeker And Software Successfully Pass Key Design Reviews

The tri-mode seeker and guidance software that represent the "eyes and brains" of the Lockheed MartinJoint Common Missile (JCM) reached a significant milestone in passing sub-system Preliminary Design Reviews (PDRs) recently.

The reviews were conducted at Lockheed Martin Missiles and Fire Control's Orlando facility in late May and early June.

"The tri-mode seeker is really what distinguishes JCM from the eight missiles it will be replacing," said Rick Edwards, director for Tactical Missiles at Lockheed Martin Missiles and Fire Control. "It gives JCM the ability to zero in on and destroy threat targets even in close proximity to vital urban structures, friendly forces and non-combatants who must be protected."

"The tri-mode seeker and multi-purpose warhead were identified by the customer as crucial risk areas for the JCM program because of their advanced technologies, and because their capabilities had never been achieved before," Edwards continued. "Now that both the seeker and the warhead have been demonstrated against the full range of required targets, this risk has been substantially reduced."

JCM's multi-purpose warhead, which previously passed its sub-system PDR, includes both a tandem-shaped charge for armored targets, and a blast fragmentation capability for other targets, such as reinforced structures in urban areas.

The JCM seeker includes a semi-active laser (SAL), for precision strike and limited collateral damage; an imaging-infrared (I2R) sensor, for passive fire-and-forget and robustness against countermeasures; and a millimeter-wave (MMW) radar, for active fire-and-forget and operation in adverse weather and battlefield obscurants.

The sophisticated seeker -- the first of its kind -- gives JCM both line- of-sight and beyond-line-of-sight targeting capability, as well as the ability to acquire, track and destroy a wide range of stationary and moving land and maritime targets.

The sub-system PDR for JCM's guidance group covered both the seeker and the micro-miniaturized high-speed electronics that process the data the sensors acquire. The sub-system PDR for JCM software and simulations covered the software in the onboard computer that interprets the seeker data, selects a target, sets the warhead mode and generates the electronic commands, which guide the missile to its destination.

"We were confident that we would pass the sub-system PDRs for the seeker and the software," said Steve Barnoske, JCM program director at Lockheed Martin. "The seeker has undergone extensive testing -- including tower testing at the Army's Redstone Arsenal, at our company test range, at Eglin Air Force Base, FL, and at Santa Rosa Island; as well as captive-carry testing at Redstone Arsenal. These tests show JCM can detect, track and engage all required target types -- land and maritime, moving and stationary -- using all three sensor modes in various combinations. We've tracked a T-72 tank, amphibious landing craft and a fast-moving maneuvering Boghammar vessel. Once a target is acquired by the JCM seeker, it is not likely to escape. The multi-purpose warhead takes care of the rest."

Data presented in the PDRs summarized results of tower and captive-carry tests of two prototype tri-mode seekers tracking land and littoral (coastal) targets, as well as extensive computer simulations that have been conducted since 2003.

Passage of the two sub-system PDRs completes the series required in preparation for the system-level PDR on June 29-30, which will determine whether the program has demonstrated the level of maturity for exit from the Phase 1 of its System Design and Development (SDD) contract.

The software-and-simulation PDR confirmed the maturity of the JCM software, including critical target recognition algorithms adapted from the Longbow program, which, with the MMW and I2R sensors, enable JCM to reliably distinguish targets from non-targets.

The Joint Common Missile is the next-generation, multi-purpose, air-to- ground precision missile that will replace

the Hellfire, Longbow and Maverick air-to-ground missiles currently in the arsenal of the U.S. Army and Navy, filling eight critical capability gaps identified in the Joint Capabilities Integration and Development System (JCIDS) process.

Headquartered in Bethesda, MD, Lockheed Martin employs about 130,000 people worldwide and is principally engaged in the research, design, development, manufacture and integration of advanced technology systems, products and services.

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Note to editors:

Lockheed Martin's major suppliers for the JCM sensors and electronics include Remec and EMS on the MMW seeker, for the RF electronics and the antenna, respectively; CMC Electronics, for the focal plane array for the I2R seeker; Honeywell, for the inertial measurement unit; and Mercury Computer Systems, for the signal-processing electronics. The warhead is supplied by General Dynamics Ordnance and Tactical Systems, a business unit of General Dynamics. The majority of the software work is performed at Lockheed Martin.

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