KAI And Lockheed Martin's T-50 Successfully Completes Ultimate Loads Testing

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On Aug. 20, the T-50 Golden Eagle advanced supersonic trainer successfully completed 20 months of static structural testing right on schedule.

The tests were performed by Korea Aerospace Industries (KAI) and Korea Aerospace Research Institute (KARI) in the modern test facility at Daejeon, South Korea. Structural engineers from Lockheed Martin , the principal subcontractor for the program, supported the tests.

"We were very pleased with the results of the T-50 static tests for several reasons," said Jang, Sung Sub, KAI's T-50 chief engineer. "The tests validate our design and analysis methods as KAI builds its first high- performance jet aircraft. The tests indicate the aircraft will meet or exceed every structural design parameter. This should provide us a very safe and durable airframe that has good growth potential for extensive combat training use in the lead-in fighter trainer role. It also means we may not have a lot of redesign for a light-combat variant down the road."

The testing involved loading the structural test aircraft to limit loads for five conditions to support first flight clearance, and ultimate, or 150 percent of limit loads, for 28 conditions. This completes the testing to the total airframe, which will lead to strength certification of the aircraft. Testing of 12 local areas of the aircraft will be completed over the next month. After full analysis of flight test loads data, it is expected that flight test restrictions will be raised from the initial 80 percent to the full 100 percent load envelope.

The test setup involved unique load applications for each condition through the use of hydraulic actuators, synchronously controlled by an automated load-control system. The loads were applied through a combination of 788 tension load pads, 132 metallic straps and fittings, and several simulated components such as landing gear, pylons and engine.

Approximately 2,500 channels of data were recorded while KAI and Lockheed Martin stress engineers monitored the internal state of the aircraft structure to give go/no-go decisions for continuing each test to the next higher load level. During most of the operations, Lockheed Martin engineers in Fort Worth, Texas, were able to monitor the data real time via secure Internet data connections.

"The 14-hour time differential with Korea required our engineers to work nights during the test runs," said Charles W. Smith, T-50 program manager at Lockheed Martin Aeronautics. "But doing the monitoring in a virtual environment provided significant cost savings versus long-term assignments or frequent travel to Korea. This is a practice that will probably become common in the future, such as with international co-development of our F-35 Joint Strike Fighter."

"The T-50 program has stimulated Korea to develop state-of-the-art test facilities," Jang said. "These facilities and the experience our technicians and engineers have gained in this test program are helping us in our quest to develop a world-class aerospace capability in this decade. We appreciate all the help from our American partners toward this goal."

In a related structural program note, durability testing for a second lifetime began on Aug. 12 and is expected to be completed next spring. The first lifetime testing (8,334 flight-hour equivalent) was completed on schedule last April. Durability testing is being conducted at the Agency for Defense Development testing laboratory in Daejeon, South Korea.

BACKGROUND INFORMATION

The T-50 Golden Eagle is being developed by KAI for the Republic of Korea Air Force. Lockheed Martin, as principal subcontractor to KAI, is providing technical expertise for the program and is responsible for developing the T-50 avionics system, flight control system and wings. The two companies are cooperatively marketing the T-50 internationally.

Korea Aerospace Industries Ltd. is the Republic of Korea's national aerospace company established in 1999 with the consolidation of Samsung Aerospace, Daewoo Heavy Industries and Hyundai Space and Aircraft Co. KAI lines of business include fixed-wing aircraft, helicopter aircraft and satellites. Its major products are the KF-16, KT-1 basic trainer, T-50, SB427 helicopters, UAVs, aerostructures and KOMPSAT satellite program.

Lockheed Martin Aeronautics Co., a business area of Lockheed Martin, is a leader in the design, development, systems integration, production and support of advanced military aircraft and related technologies. Its customers include the military services of the United States and allied countries throughout the world. Products include the F-16, F/A-22, F-35 JSF, F-117, T-50, C-5, C-27J, C-130, C-130J, P-3, S-3 and U-2.

Headquartered in Bethesda, Md., Lockheed Martin Corp. employs about 125,000 people worldwide and is principally engaged in the research, design, development, manufacture and integration of advanced technology systems, products and services. The corporation reported 2002 sales of $26.6 billion.

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