Team ABL Successfully Demonstrates First Software Segment of Airborne Laser's Battle Management System

Team ABL the U.S. Air Force, Boeing, Lockheed Martin and TRW for the first time has successfully demonstrated integrated Battle Management hardware and software for the Airborne Laser (ABL) in the Virtual ABL Facility (VAF) at Boeing in Seattle. The demonstration was completed recently, nearly two weeks ahead of schedule.

Labeled "Event 16," the demonstration was the final step in completing "Build 1A," the first of six Battle Management segment software builds. "Build 1A" includes the basic software architecture and operating system upon which all remaining software to be developed will be based.

The ABL weapon system will use a megawatt-class chemical laser mounted on a modified 747-400 Freighter aircraft to shoot down theater ballistic missiles in their boost phase as soon as 2003. It is the Department of Defense's choice for the boost-phase intercept element of its theater ballistic missile defense architecture. ABL will protect civilian and key military assets from attack by missiles such as the Scuds used by Iraq during the Persian Gulf War.

Boeing is responsible for developing the ABL's Battle Management system -- its surveillance, battle management, command, control, communications, computers and intelligence (BMC4I).

"Build 1A" software also controls the six infrared search-and-track (IRST) sensors and provides the capability to display infrared tracks seen by the IRSTs.

"We brought together all of our software elements successfully and now are able to track its functionality in our VAF," said Rich Flanders, Battle Management software design manager for Boeing.

"This is the first time we brought together enough of the functionality to evaluate how we were doing relative to being able to produce a high rate of productivity that we originally proposed."

The software build includes 200,000 lines of software, which was made at a rate of 400 lines of code per man month. That rate, which Flanders calls "astonishing," is four times faster than standard military development programs.

Key to the development of the software system is its affordability. Off-the-shelf components commercial cards and drivers, for example -- are being integrated to prevent cost and schedule delays, and boost productivity.

"This demonstration has proved out our whole approach to developing software," Flanders said. "We integrated commercial products, integrated displays being generated with a code generator tool, and we're now getting real-time performance.

"The building blocks that we need to go forward were successfully demonstrated as part of this product," he said. "We couldn't be more pleased."

Build 1B the next software segment that will include the active ranging system interface built in is to be delivered in late April 2000.

The Battle Management segment of ABL provides surveillance, communication, planning, and the central command and control of the weapon system. It performs the following functions: infrared surveillance, detection and tracking of multiple targets; target typing and prioritization; distributed predictive avoidance, or deconfliction; mission planning; military communications; crew/system interface; and theater interoperability.

The Battle Management suite provides a robust capability to deliver missile launch and impact point prediction information to the rest of the U.S. forces defending against the theater ballistic missile threat.

By providing this information to other elements of the Department of Defense missile defense architecture within moments of a missile launch during battle, the Airborne Laser gives the war-fighters in the field the chance to eliminate the enemy launch site or protect people and assets near the projected impact location -- saving lives and resources.

In recent war games and simulations, the ABL demonstrated its ability to kill missiles carrying germs or nuclear agents seconds after launch and before they can land in allied territory. The robust capability of its surveillance system also provides information about enemy missile launch activities at the earliest possible moment to other defense systems in the battlefield.

Team ABL is in the third year of a $1.3 billion program definition and risk-reduction contract with the Air Force Space & Missile Systems Center, Kirtland Air Force Base, N.M., to design, produce, integrate and flight test the first prototype ABL system. The contract culminates in 2003 with a boost-phase shoot-down of a theater ballistic missile.

Boeing has overall program management and systems integration responsibilities for ABL. In addition to developing the Battle Management system, Boeing is building a 747-400 Freighter in Everett, Wash., and will modify the aircraft for ABL next year in

Wichita, Kan. Lockheed Martin Missiles & Space, of Sunnyvale, Calif., is developing the ABL target acquisition and beam-control systems. TRW, of Redondo Beach, Calif., is building the laser and the related ground-support subsystem.

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