Backgrounder

Integrated Defense Systems
P.O. Box 516
St. Louis, MO 63166
www.boeing.com

Airborne Laser

Description & Purpose: The Airborne Laser (ABL) provides speed-of-light capability to destroy ballistic missiles in their early stages of flight.

Customer: U.S. Missile Defense Agency

General Characteristics: The ABL program places battle management equipment, a beam control/fire control system, and a high-energy Chemical Oxygen Iodine Laser (COIL) on a modified Boeing 747-400F aircraft to detect, track and destroy all classes of ballistic missiles in their boost phase of flight. ABL also can pass information on launch sites, target tracks and predicted impact points to other sensors and shooters in the layered, global Ballistic Missile Defense System.

Boeing provides the aircraft, battle management, overall systems integration and testing. Northrop Grumman supplies the megawatt-class, high-energy laser and one of the low-power illuminator lasers. Lockheed Martin provides the beam control/fire control system.

Background: The Airborne Laser's progress has been especially significant since 2004:

In late 2004, the Airborne Laser team achieved two key milestones: "first light" of the COIL in ground testing, and "first flight" of the first ABL aircraft with the battle management and beam control/fire control systems.

In 2005, two more major goals were accomplished. The program completed passive flight tests that demonstrated the performance of the battle management and beam control/fire control systems. The program also fired the high-energy laser at lethal power and duration in ground tests.

In 2006, the team completed modifications to the ABL aircraft to accept the COIL's six modules, and integrated ABL's two solid-state illuminator lasers into the beam control/fire control system onboard the aircraft. The illuminator lasers are used to track hostile ballistic missiles and measure conditions between the aircraft and the target, allowing the beam control/fire control system to compensate for atmospheric turbulence that the missile-killing COIL would encounter in its path to the target. The team also completed active ground tests of the beam control/fire control system, including numerous firings of

the illuminators on the ground, exercising all elements of the ABL engagement sequence.

In 2007, the program successfully demonstrated in active flight tests that ABL's battle management and beam control/fire control systems can complete the full series of steps required to support a ballistic missile engagement. During these tests, the modified Boeing 747-400F operated from Edwards Air Force Base, Calif., and used its infrared sensors to find an instrumented target board located on a U.S. Air Force "Big Crow" test aircraft. ABL's battle management system then issued engagement and target location instructions to the beam control/fire control system. The beam control/fire control system acquired the target with sensors in the nose-mounted turret and fired its two illuminator lasers to support actively tracking the target, to measure atmospheric conditions and to correct the outgoing laser beam for the measured atmospheric conditions. ABL then fired a low-power surrogate laser at Big Crow, successfully simulating a target engagement.

In 2008, the team completed installation of the high-energy laser in the aircraft and began firing the laser onboard the aircraft in ground testing.

In April 2009, ABL began conducting flight tests with the entire weapon system integrated aboard the aircraft. Additional flight tests will set the stage for an airborne intercept test against a ballistic missile in 2009.

Contacts:

Marc Selinger
Boeing Missile Defense Systems
(703) 414-6138
marc.selinger@boeing.com

Chuck Cadena
Boeing Missile Defense Systems
(703) 872-4503
chuck.cadena@boeing.com

Last Updated: June 2009