

## **Boeing Receives HyFly Award for Hypersonic Missile Demonstrator**

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Phantom Works, the advanced research and development unit of Boeing [NYSE:BA], has received a \$92.4 million award from the Defense Advanced Research Projects Agency, or DARPA, to design, develop and test-fly a hypersonic strike missile demonstrator vehicle.

DARPA and the Office of Naval Research, or ONR, jointly fund the HyFly program. During the four-year HyFly program, Boeing and its principal subcontractor, Aerojet, in Sacramento, Calif., will test-fly 11 air vehicles. The last eight will be powered by a dual combustion ramjet engine at speeds up to Mach 6. In addition to Boeing and Aerojet, the HyFly program team includes the Johns Hopkins University Applied Physics Laboratory or JHU/APL and the Naval Air Warfare Center Weapons Division in China Lake, Calif.

"HyFly's objective is to mature the dual combustion, ramjet-based, hypersonic strike missile concept. We'll accomplish this through flight demonstration, in a weapon configuration that's compatible with launch from surface ships and submarines as well as U.S. Navy and Air Force aircraft," said Preston Carter, DARPA's program manager for HyFly.

On May 30, the first-ever successful test of a full-scale, fully integrated, liquid hydrocarbon fueled DCR engine was accomplished at the NASA Langley Research Center in Hampton, Va.

"This is the first time a full-scale scramjet missile engine has been tested with conventional, liquid hydrocarbon fuel where the complete engine flow path is fully installed in a missile configuration," stated Mike White, the JHU/APL program manager for advanced vehicle technologies. "This has enabled us to measure for the first time, net positive thrust for an installed hydrocarbon fueled scramjet engine. This is a major milestone for the hypersonic community and it is the product of a real team effort involving DARPA, ONR, JHU/APL, Boeing, Aerojet and NASA."

The test, conducted at simulated hypersonic flight conditions of Mach 6.5 at 90,000 feet, is the first in a series that will characterize the DCR engine performance in key operating Mach/altitude regions. Additional tests are planned later this year at the Arnold Engineering Development Center, Arnold Air Force Base, Tenn., to verify operation at Mach 3.5 and 4.1 flight conditions. These tests will simulate the hypersonic engine taking over following a rocket boost.

Flight testing starts in 2003 with the separation of an un-powered, controlled vehicle from the launch aircraft. Dispense of a surrogate submunition in the terminal phase of flight will be demonstrated in 2004..

The first DCR powered flight is also planned for 2004, with the full series of tests planned for completion in 2006.

John Fox, HyFly program manager for Phantom Works, says further development to operational status would result in a weapon that "could revolutionize strike capability against both time-critical and deeply-buried targets."

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