Boeing Hot-Fires Pocket-size Missile Defense Systems Thruster

Boeing [NYSE:BA] has successfully tested a new rocket thruster, just eight inches in length, that is now the most powerful engine of its type in the propulsion industry.

Developed by Boeing Rocketdyne in Canoga Park, Calif., the Divert and Attitude Control System (DACS) engine generated 1,100 pounds of thrust in hot-fire tests conducted recently at White Sands Test Facility, N.M. The tests follow a design and development schedule that moved from a clean sheet of paper to working hardware in only five months.

Creation of the DACS engine is aimed at meeting high-performance propulsion needs of the Kinetic Energy Interceptor (KEI), the next-generation missile defense concept.

"The engine met all of the test objectives, while demonstrating efficient combustion performance," said Bill Burns, director, Missile Defense Propulsion Systems, for Boeing. "Our goal was to hit 1,100 pounds of thrust. Rocketdyne stands alone in achieving that performance level with a thruster of this size."

The team ran two series of hot-fire tests. The first was conducted with a "workhorse" thrust chamber, and demonstrated short pulse firings. Then, a second series put the near-flight configuration engine through its paces, ultimately reaching 115-percent of rated thrust.

"When we reached 1,150 pounds, we knew we'd really accomplished something unique," added Bill Brown, lead project engineer, for Boeing. "The importance of attaining that goal is that the engine has multiple applications, including its use in kinetic energy weapon (KEW) divert propulsion systems.

"There are four to eight engines per system," continued Brown. "It could also anchor a third-stage boost motor, or "kick stage" engine for the final stage of a multi-stage missile. And there is the potential for the engine to be employed as part of a propulsion system for NASA's Orbital Space Plane, now in development, along with other space platforms and strategic missiles."

Characteristics of the new DACS rocket thruster include the ability to be turned on and off in any sequence to meet mission requirements, as commanded by the targeting, guidance, navigation and control system; very high specific impulse and thrust-to-weight-ratios; and highly reliable operation and low production costs.

A key advantage of the engine is its use of storable liquid propellants, which are fully-characterized with well-documented technical, performance, operational, safety and handling data. Successfully used in various U.S. space and weapon systems for decades, liquid propellant performance in rocket propulsion systems is highly predictable and repeatable.

Based on extensive experience in developing and producing missile defense attitude control systems over the past 20 years, Boeing Rocketdyne has continuously demonstrated that storable liquid systems can effectively achieve or exceed propulsion requirements for the high-performance maneuvering portion of missile defense weapons.

Boeing Rocketdyne has developed and flight-tested over 70 different liquid attitude control system designs for national defense programs, at thrust levels ranging from one to 1,100 pounds, and has produced over 200 systems. The sophistication of these programs ranges from advanced concept technology development to system design and development, to transition into production.

A unit of The Boeing Company, Integrated Defense Systems is one the world's largest space and defense businesses. Headquartered in St. Louis, Boeing Integrated Defense Systems is a $25 billion business. It provides systems solutions to its global military, government and commercial customers. It is a leading provider of intelligence, surveillance and reconnaissance; the world's largest military aircraft manufacturer; the world's largest satellite manufacturer and a leading provider of space-based communications; the primary systems integrator for U.S. missile defense; NASA's largest contractor; and a global leader in launch services.

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