Boeing X-31A VECTOR Resumes Flight Testing Under International Program

The Boeing Company [NYSE: BA] announced today that the X-31A aircraft has begun flight testing in Phase II of the VECTOR program. VECTOR is a multinational program focused on demonstrating how thrust vectoring can be used to help aircraft achieve extremely short takeoffs and landings (ESTOL).

"ESTOL operations can provide significant operational and cost benefits to our military customers," said Gary Jennings, VECTOR program manager for Boeing Phantom Works. "Our team is eager to demonstrate how thrust vectoring can help reap these benefits."

The VECTOR team comprises the U.S. Navy, Germany's defence procurement agency, the European Aeronautic Defence and Space (EADS) Company, and the Boeing Phantom Works advanced R&D division, which serves as lead systems integrator. The team represents the only multinational collaborative R&D X-Plane effort of its kind.

By adding thrust vectoring to traditional flight control systems, the team is demonstrating how pilots can perform significantly shorter takeoffs and landings at much lower speeds. This capability would provide greater operational and basing flexibility for fighter aircraft, reduce aircraft wear-and-tear and maintenance costs, and allow aircraft to be built with lighter, more affordable structures and materials.

For aircraft carrier operations, ESTOL capability would also reduce wind-over-deck requirements for takeoffs and landings, eliminate the need to jettison unused fuel and ordnance before landings, and reduce maintenance on catapults and arresting gear.

The X-31, the world's first international X-Plane, is equipped with three paddle-like tail vanes that allow the flight control system to redirect the engine's exhaust to retain control and lift at dramatically higher angles-of-attack and slower speeds than traditional aircraft. The VECTOR program hopes to achieve landing approaches at up to 25 degrees angle-of-attack (versus the more typical 12 degree AOA) at only about 110 knots (versus the more typical 175 knots representative of most other aircraft).

The X-31 was originally developed and flown under the Enhanced Fighter Maneuverability (EFM) program, conducted from 1990 to 1995 as a joint venture by the U.S. Navy, DARPA (Defense Advanced Research Projects Agency), NASA and Germany. That program demonstrated how thrust vectoring could be used to enhance performance in air-to-air fighter engagements.

Capitalizing on this previous EFM investment, the $53 million VECTOR program started in January 2000 with Boeing restoring the X-31 to flight status after nearly five years in storage. Phase I flight testing, conducted from February 2001 to April 2001, focused on pilot familiarization and validating systems.

The remainder of 2001 involved developing new flight control software and major modifications to the vehicle. These modifications included an auto-throttle system, a belly-mounted video camera, components for an Integrity Beacon Landing System (IBLS), triple redundant INS/GPS, a Flush Air Data System (FADS) that provides extremely accurate readings at all angles-of-attack, a new flight test instrumentation system, and moving the flight test noseboom to the top of the radome.

The current Phase II flight testing, which began May 17 at Patuxent River Naval Air Station, will fly ESTOL approaches to a virtual runway in the sky to ensure that the IBLS system provides the extreme accuracy required for ESTOL landings. Three successful checkout flights have been conducted so far. Actual ESTOL runway landings will be conducted in Phase III, scheduled to begin this fall.

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