

# A tale goes on as another ends

Recent wind-tunnel tests of the X-48C blended wing body demonstrator were noteworthy for more than just the data that will help prepare this research aircraft for its first flight

By Junu Kim

**A** Boeing Research & Technology team working at a NASA wind tunnel recently finished a series of aerodynamic tests that were significant for more than just the results.

This effort generated data that will help the Boeing-NASA X-48 team prepare for flight tests of the X-48C blended wing body (BWB) research aircraft, designed to burn less fuel and make less noise than not only conventional airplanes but also its predecessor—the X-48B. It also marked the last tests conducted in the historic wind tunnel at NASA's Langley Research Center in Virginia.

"Our tests in the wind tunnel at NASA Langley were aimed at helping us better understand and quantify the aerodynamics of the new vehicle," said Dharmendra Patel, X-48C project manager with BR&T. "That is a crucial step in order to safely and efficiently conduct the flight-test program next year."

The X-48C is a modified version of the Boeing X-48B demonstrator, which Boeing and NASA have flown more than 60 times since 2007 to demonstrate the flight qualities offered by the larger lifting surface of the BWB compared to traditional airplane designs. The top- and rear-mounted engines of the BWB are also designed to reduce noise, although that has not been part of the X-48B testing.

But reduced noise and fuel consumption will be part of X-48C testing, which is why Boeing and NASA have replaced the winglets and three engines mounted on the rear of the X-48B with only two engines mounted slightly forward of the rear and flanked by twin canted fins.

"Our goal with the X-48C is to investigate the low-noise properties of the BWB concept while retaining the flight qualities that have been demonstrated with the X-48B," Patel said.

X-48C flight testing is expected to begin next year at NASA's Dryden Flight Research Center in California.

The X-48 airplanes, which have a 21-foot (6.4-meter) wingspan and weigh 500 pounds (227 kilograms), are 8.5 percent scale models of a heavy-lift, subsonic airplane with a 240-foot (73-meter) wingspan that the Phantom Works organization of Integrated Defense Systems believes could be developed in the next 15 to 20 years for military cargo applications.

The X-48C test program also represented the final tests to take place at NASA Langley, a fabled site in aerospace history. Built in 1930, the 30-foot-by-60-foot (9.1-by-18.3-meter) tunnel has hosted tests of vehicles including World War II fighters, submarines, the Mercury space capsule and concepts for a supersonic transport.

"For those of us on the test, it is a bittersweet moment," Patel wrote in a note to colleagues as the test program drew to a close. "After the aircraft has been removed from the test section, we will measure the wind-on-strut effects. This will be the last piece of data recorded at the Langley Full Scale Tunnel. It has been a great privilege for us to be a part of its 78-year history of service in advancing aviation." ■

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**PHOTO:** Boeing employees Dharmendra Patel (left) and Jonathan Vass prepare the X-48C blended wing body demonstrator aircraft for wind-tunnel tests at the NASA Langley Research Center in Virginia.

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