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A three-week flight-test program recently completed by The Boeing Company [NYSE: BA] and its industry partners has confirmed the effectiveness of several significant airplane noise-reduction technologies that will enable airplanes to be even quieter than they are today.

Known as the Quiet Technology Demonstrator 2 (QTD2), the research and development program is a cooperative commercial aircraft industry project among The Boeing Company, the General Electric Company, Goodrich Corporation and NASA. ANA (All Nippon Airways) of Japan provided one of its new 777 airplanes for the flight-test activities.

The flight-test program provided the opportunity for each company to validate key technologies for incorporation into its own current and future products. NASA joined the effort to acquire data to support its advances in propulsion aeroacoustics, landing gear noise, and computational fluid dynamics research.

The 777-300ER with GE90-115B engines, already the quietest airplane in its class, was fitted with eight different noise-reduction engine inlet and exhaust combinations on the right wing, and the baseline production engine on the left wing. Fan and engine-core chevron exhaust configurations achieved as much as a two-decibel improvement -- a significant community noise reduction. Because jet noise is generated by the jet wake -- extending nearly 50 feet behind the engine -- any reduction is considered a significant achievement. In addition, the low-frequency rumble heard in the aft cabin by passengers during cruise was reduced by up to four to six decibels.

"This is exactly what we wanted to achieve," said Walt Gillette, vice president, 787 Airplane Development. "This makes the new 787 better for the people who will be inside the airplane and better for the people who live in the communities around airports."

Another technology development that proved successful was the manufacture of a sound-absorbing liner on the engine inlet. A new "seamless" construction -- which keeps sound waves from bouncing off joints -- increased the effective treated area by 78 percent over the current version, without increasing the nacelle size. This new acoustic liner resulted in fan tones heard in the front of the aircraft being reduced by up to 15 decibels, making this noise inaudible above other ambient sounds.

These significant noise reductions verify benefits to the 787. "Through these sound enhancements, we will be able to reduce the sidewall acoustical insulation throughout the cabin by several hundred pounds, improving the operating costs for our customers," said Gillette.

In addition to advancing the 787, some of the technologies proven in the QTD2 program will be ready for other future Boeing aircraft.

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