



High performance

When it comes to the environment, the sky's the limit for Boeing's ecoDemonstrator

By Bret Jensen

Before a new Next-Generation 737-800 is delivered to American Airlines later this year, it will take to the skies loaded with testing equipment, on a mission to find and test significant advances in environmental and fuel efficiencies.

The flights, made in partnership with American Airlines, are part of Boeing's ecoDemonstrator Program. Each year for the next several years, Boeing will fly a demonstrator airplane to test emerging technologies aimed at reducing fuel consumption, reducing noise inside the airplane and in surrounding communities, and testing sustainable materials.

Behind the program is a "One Boeing" team with participation from Boeing Research & Technology, Commercial Airplanes, Boeing Test & Evaluation, Environment, Health and Safety, and many others.

The program is part of the Commercial Airplanes Product Development organization where the Environmental Performance group focuses on innovation for the benefit of the environment.

"The ecoDemonstrator Program is a strong example of how Boeing has chosen to demonstrate our commitment to the environment," said Jeanne Yu, director of Environmental Performance for Commercial Airplanes. "The program accelerates technology through innovation by testing it on aircraft."

This year's platform, the 737-800 destined for American Airlines, will be outfitted after final assembly with some of the latest developmental technology.

"Flying responsibly means being strong stewards for the environment," said David Campbell, vice president of Safety, Security and Environmental for American Airlines. "This is the right step forward to help our overall industry improve our impact on the environment."

After testing is completed, the airplane will be refurbished for delivery to American in November.

"With the use of the American Airlines 737, we have a tremendous opportunity to integrate and validate these technologies on one of the most efficient aircraft flying today," said David Akiyama, ecoDemonstrator program manager.

The first technology suite to be flown in 2012 includes a smorgasbord of

innovations. For example, the wings will be fitted with adaptive trailing edges. While not noticeable to the average passenger, these small, flaplike devices can be optimized over the course of a flight. The adaptive trailing edges tailor the airflow over the wing, reducing fuel burn at takeoff, climb and cruise and reducing community noise at takeoff.

Maturing this technology, along with a portion of the flight-test program, is made possible through funding provided by the U.S. Federal Aviation Administration's Continuous Lower Energy, Emissions and Noise program, known as CLEEN.

"The ecoDemonstrator program is important because we need to provide a platform to test these cutting-edge technologies," said Frederick "Tad" Calkins, an engineer in BR&T's Aerosciences group and principal investigator for the adaptive trailing edge technology development.

The American Airlines airplane is

scheduled to roll out of the Renton factory in late June and then spend one month being outfitted with the technologies, before beginning a one-month flight-test program. The goal is to finish flight testing in late September.

But that won't be the end of it.

The Boeing team already is planning and auditioning innovations for the 2013 ecoDemonstrator. The test-bed airplane will be a 787.

"Each ecoDemonstrator," Akiyama said, "will feature a continuous parade of technology that we'll test for possible incorporation on our future airplane models. Technology is the best path for reducing emissions, lessening noise, and making our current and future airplanes the most environmentally responsible portion of the global air transport industry." ■

bret.r.jensen@boeing.com

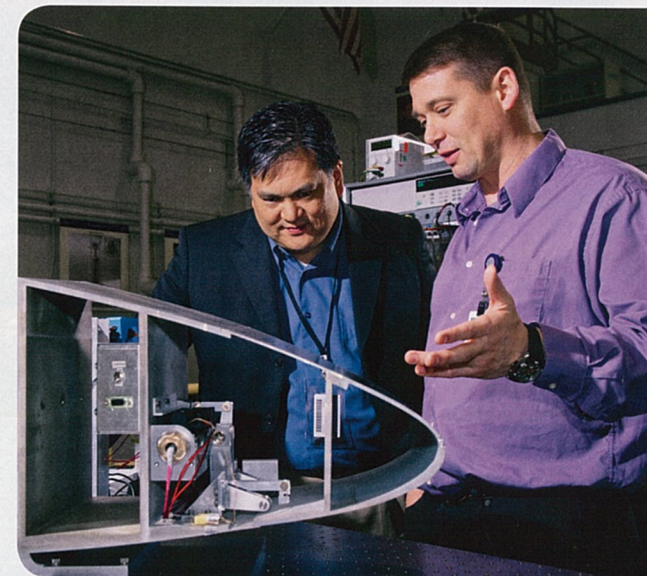


PHOTO: David Akiyama, left, Commercial Airplanes ecoDemonstrator program manager, and Frederick "Tad" Calkins, Boeing Research & Technology Aerosciences engineer, examine a model of wing hardware. **MARIAN LOCKHART/BOEING**

New technology on the ecoDemonstrator

- A variable area fan nozzle where the exhaust area of the engine casing can be changed to reduce community noise and improve engine efficiency
- An active vibration control system developed with supplier Hutchinson Aerospace to reduce noise associated with engine vibration
- A regenerative hydrogen fuel cell developed by Ishikawajima-Harima Heavy Industries that provides an alternative source of power for overall airplane efficiency; the fuel cell efficiently stores and generates power, and it adapts to aircraft electrical systems' demand, potentially reducing weight, fuel burn and carbon emissions