



Fueling efficiency

Boeing test pilots find new ways to save fuel—and cut costs

By Sandy Angers

The idea was simple enough: Save money by eliminating dead weight.

In this case, that weight was extra fuel carried on flight tests of newly produced Boeing aircraft such as the C-17 military transport and Next-Generation 737 commercial jetliner. A heavier airplane burns more fuel.

"We used to carry more fuel than you'd ever use, and we never questioned it until the price of fuel went up," said chief C-17 test pilot Fred Austin, whose team has reduced the nominal fuel load by about 20,000 pounds (9,070 kilograms) per flight.

"We weren't going to burn the fuel anyway; it was just going to sit in the fuel tanks and be dead weight," Austin explained.

Like Austin, Boeing test pilots around the company aren't waiting for a revolutionary leap in engine technology or biofuels to reduce fuel burn and emissions. Today, Boeing Test & Evaluation pilots are creating savings through a series of fuel-efficient measures they began implementing incrementally this year.

"Our job is to deliver safe and reliable airplanes. By increasing efficiency and saving fuel, we save the company money," said John Frischkorn, the Next-Generation 737 lead production test pilot who helped develop and implement the fuel savings improvements.

When Frischkorn presented his fuel-saving proposal to the Boeing Test & Evaluation's Flight Operations leadership team earlier this year, chief pilot Chuck Killberg challenged the rest of his team to implement similar improvements.

"The beauty of being an integrated, enterprisewide organization like ours is that these types of efficiency improvements can be more easily shared across the company," Killberg said.

Frischkorn proposed reducing the amount of fuel carried during flight tests of new-production aircraft, an idea adopted



by C-17 test pilots. The C-17 program also worked with its customers and used engineering analysis to prove that maximum-fuel flight tests were no longer necessary.

Another fuel savings idea from Boeing's test pilots involves re-sequencing flight-test profiles, or flight plans, for maximum efficiency.

For example, test pilots perform checks during climb, cruise and descent, as well as approach and landing. By changing the sequence when low-altitude and high-altitude phases are completed based on weather, airplane options and other items that affect the flight, the crew can maximize efficiency and reduce time wasted between each phase.

Re-sequencing flight profiles has saved about 30 minutes per flight for the 737 and about 90 minutes per flight for the C-17. And the time savings adds up to significant fuel savings. The C-17, for example, can burn about 20,000 pounds of fuel an hour, depending on the maneuvers.

Boeing pilots who perform flight tests of new 737s have also increased utilization of nearby Paine Field in Everett, Wash., for "touch-and-go" approaches and landings used to check performance of autopilot and navigation equipment. Traditionally, pilots used Eastern Washington airports at Moses Lake or Yakima for these tests. The single-aisle 737 is built in Renton, Wash., outside of Seattle.

The distance between Moses Lake and the Seattle area is about 120 miles (190 kilometers). But Paine Field is only about 25 miles (40 kilometers) from Seattle. "If we complete all of our testing after the approaches at Moses Lake, the time and fuel it takes to return to Boeing Field is wasted," Frischkorn said. "Now we save up to 30 minutes per flight by using Paine Field" whenever possible.

With streamlined flight profiles and increased use of Paine Field, 737 test pilots are saving an hour of flight time on every airplane. Frischkorn estimates that translates to a savings of about \$700,000 per year on the 737 program, and even more for the Everett-based twin-aisle 777 program.

The fuel efficiency initiatives by Boeing Test & Evaluation also have an additional benefit—reducing the impact on the environment.

"We're saving fuel and that means we're reducing hydrocarbon emissions as well," Austin said. "It's nice to be part of the solution and it contributes to the overall success of the company, which is good for everybody." ■

sandra.l.angers@boeing.com

PHOTO: Fred Austin, C-17 test pilot.
MICHAEL GAIL/BOEING

PHOTO: John Frischkorn, Next-Generation 737 lead production test pilot. ED TURNER/BOEING