

Denver Post Article

Tests take look at flying blind

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Monday, September 03, 2001 - It's clear weather above the Continental Divide, which is not exactly what United Airlines captain Rick Shay wants as he prepares his approach into Eagle County Regional Airport.

So, he blocks his view out the cockpit windshield with a piece of cardboard.

The point is to test a new technology that NASA hopes will let pilots avoid crashes when visibility is at its worst.

Over two days, Shay will fly the approach into Eagle 18 times using "synthetic vision," which allows pilots to see everything in front of the aircraft on computer-enhanced displays in the cockpit - even in low visibility conditions.

If the Gulfstream jet that crashed on approach to Aspen last March had had such a device, the pilots might have seen the hill in their way and taken evasive action, said John Koelling, a NASA research engineer involved in the ongoing test of synthetic vision at Eagle.

"Controlled flight into terrain" is one of the biggest killers in commercial aviation. About 200 people a year have died in such accidents over the past decade.

"The aim is to eliminate low-visibility-induced incidents and accidents," Koelling said.

NASA has brought its 757 "flying laboratory" to Colorado to test various synthetic-vision technologies on the flights to Eagle.

Synthetic vision combines data from airport and terrain mapping with global positioning satellite information to give a precise representation of the flight on cockpit displays.

On Saturday, Shay and NASA research pilot Les Kagey made 10 approaches to Eagle's runway, five from the east and five from the west.

NASA has chosen Eagle for the testing because it's one of the most "terrain-challenged" airports in the country.

Nothing illustrates the challenges better than a procedure called "circle-to-land" on Eagle's runway 7.

Shay and other commercial pilots get special training to land at mountain airports like Eagle. He's landed many times at Eagle, but until the NASA tests had never made the circle-to-land, which puts the jet very close to the surrounding terrain.

Published navigational charts require that the landing be flown with a visual approach. Yet this day, Shay makes the circle-to-land looking at the computerized representation of the terrain and the approach to runway 7.

Kagey is the safety pilot in the right seat, with a clear view out the windshield and the ability to correct for any fault in the synthetic vision.

The technology works perfectly.

Shay manipulates the controls to guide the aircraft down a symbolic pathway in the sky represented on the computer screen.

With red rock cliffs looming to the west, the huge plane makes a final sharp right turn and levels out for final approach.

It's extremely quiet in the plane's cabin.

"Don't try this at home," says Dejan Damjanovic, with some relief as the plane completes the turn and approaches the runway.

"This is why we came to Eagle," adds Mike Norman, the Boeing Co.'s flight test coordinator for synthetic vision.

Damjanovic, a visitor on the flight, is director of advanced technology for Jeppesen, the Denver-based developer of aviation charts, maps and electronic terrain databases.

Boeing, Jeppesen and other contractors such as Rockwell Collins are partners with NASA on the synthetic vision project.

Aboard the plane, Shay has perfectly lined up the 757 with runway 7's centerline. When the plane is 100 feet above the runway, Kagey takes the controls and applies power for a "go-round" procedure to make another approach for landing.

Shay is impressed. "To be able to display the terrain and maneuver the airplane in relation to it without any reference to the outside world is way cool," he said.