

## AIRLINE SAFETY

## Experts disagree on danger posed by cracks

**Southwest Airlines says there was no risk to passengers; the FAA disagrees.**

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For nervous travelers, the phrase sounds terrifying: Cracks discovered in an aircraft's fuselage.

It evokes images of holes ripped in the sides of airplanes, explosive decompression of passenger cabins and catastrophic crashes. The frightening connotations have become a serious issue for Southwest Airlines, which has been accused by the Federal Aviation Administration of allowing passengers to fly on Boeing 737 airplanes that hadn't been properly inspected for cracks.

But were passengers ever really in danger on Southwest planes?

Absolutely not, Southwest executives and Boeing say. They say that the cracks discovered on planes weren't large enough to pose a problem



### Sky Talk

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and that cracks routinely develop on airplanes over time.

Some aviation experts agree.

"They're nit-picking over how well Southwest followed the rules, which is probably a good thing," said George Bibel, a professor of mechanical engineering at the University of North Dakota who has extensively studied airplane crashes. "But I don't think there was ever much danger to passengers."

William Waldock, a professor of safety science at Embry-Riddle Aeronautical University in Prescott, Ariz., agrees.

"This is a compliance issue, not a safety-in-flight issue," he said. "At no time was the traveling public in danger."

Others, including the FAA, say allowing planes to fly without inspections was a significant safety risk regardless of whether serious problems were found later.

"There was a total breakdown in the system," said Jim Ballough, director of the FAA's flight-standards service. The rules "should have been complied with 100 percent."

On March 6, the FAA proposed a \$10.2 million fine against Southwest

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for failing to ground 46 jets that hadn't been inspected for exterior cracks.

The case stems from the airline's notification of the FAA on March 15, 2007, that it had discovered that the planes hadn't been inspected. The checks were overdue by 30 months.

Under FAA rules, the planes should have been grounded. Southwest also could have asked the agency to consider a waiver to keep the jets flying until they were inspected.

No waiver was requested, but the planes continued to fly for up to 10 days before being inspected. Documents indicate that a Southwest employee and an FAA official falsified a report that suggested that the planes had been grounded.

When the planes were finally examined, cracks were found and repaired on six planes.

On Tuesday, Southwest suspended three employees involved in the incident and begin reviewing inspection records. One day later, the carrier took 38 planes out of service to reinspect them for fuselage cracks because of confusion over the type of inspection that was needed. The checks turned up cracks on four of

those jets.

The House Transportation and Infrastructure Committee is investigating and will hold a hearing April 3.

#### Risky or routine?

Fuselage cracks develop because of the repeated pressurization and decompression of airplane cabins. The metal is designed to bend as the cabin swells slightly each time the air is pressurized.

Over time, small cracks appear along certain pressure points of an aircraft's exterior.

"Think of bending a paper clip over and over again," said Bibel, who recently authored a book, *Beyond the Black Box*, on airplane crashes. "That's metal fatigue. And it eventually breaks."

Fuselage cracks can be deadly if not repaired. In 1988, the exterior of an Aloha Airlines plane ruptured during a flight, and a flight attendant was sucked out of the cabin.

In 2002, a Boeing 747 flown by China Airlines broke apart in midair and crashed, killing all 225 people aboard. Metal fatigue was the culprit: A crack had developed because of a poor repair job years earlier.

The inevitability of cracks is the reason the inspection guidelines are strict, particularly for older planes.

"There are massive systems in place to find them early and repair them," Bibel said. "Because you do need to be vigilant."

Southwest says that the cracks in its planes were minor and that similar cracks are routinely found and repaired during aircraft inspections.

"All aircraft maintenance is important, but relatively



speaking, this [inspection] addresses a routine, common matter in the world of aircraft maintenance and is not alarming in and of itself," said Ron Ricks, senior vice president of law, airports and public affairs at the Dallas-based airline.

According to documents on the case released by the House committee, the cracks were 1 to 3.5 inches long. That's well within safety limits, according to Gregory Feith, an aviation-safety consultant and former investigator with the National Transportation Safety Board.

Southwest asked Feith to examine the case. He said the inspection rules, issued in 2004, didn't require planes to be initially examined for cracks for as long as a year and a half. That suggests that "the FAA did not regard the skin cracking as an immediate threat to the safety of flight of the airplane," he said.

Data developed by Boeing show that airplanes can fly with skin cracks up to 6 inches long without risk, Feith said.

Boeing also reviewed the case and issued a statement last week that "the safety of the Southwest fleet was not compromised." A Boeing spokeswoman declined a request to be interviewed for this story.

### **Intense scrutiny**

Southwest officials note that all commercial airplanes are under intense scrutiny.

"Planes are inspected on a constant rolling basis," Ricks said. "It's not like your car, that you take in to be checked once a year."

Southwest says planes receive at least 86 inspections annually, not including regular visual inspections that take place daily.

The FAA's inspection re-

quirements are numerous. In addition to regulations already on the books, the agency regularly issues airworthiness directives, which are new inspection requirements inspired by accidents, discoveries of potential problems or trends in flight data.

The Boeing 737-300, for example, has 163 airworthiness directives listed on the FAA's Internet site.

"There is a continuous program of maintenance and inspections," said Waldock, of Embry-Riddle. Inspections are conducted primarily by the airlines, he said, while FAA officials check the paperwork and procedures for compliance.

Brian Alexander, a former military pilot and attorney who specializes in aviation safety for the New York firm Kriendler & Kriendler, said the lapse in inspections at Southwest is worrisome even though serious problems weren't found.

"If you dig deeper, it's clear that their system was either flawed or they knowingly looked the other way," he said. "Either way, that's an extraordinarily important issue."

## **Frequent inspections**

Airplanes have several levels of inspections and are examined continually to detect a variety of problems.

■ Before every flight, pilots and flight crews check equipment and conduct a walk-around review of the aircraft.

■ Every night, mechanics conduct inspections and check for wear and tear on items like tires, usually at an airport maintenance facility.

■ About once each month, a more intensive inspection of the plane and its systems is conducted, generally overnight at the airport.

■ Every 12 to 18 months, the airplane is taken out of service for an extensive inspection and maintenance overhaul.

■ Every four to five years airplanes receive a heavy check, in which mechanics take the entire aircraft apart for inspection and repair.

The good safety record of U.S. commercial aviation is due largely to the extensive requirements imposed by agencies like the FAA, Alexander said.

"If you neglect some of these requirements for inspections, you're taking a huge chance that could result in a plane going down," he said. "That's what is frightening here."

FAA officials agree.

"This is the first time I'm aware of that a carrier continued to operate an aircraft after they identified a breakdown in an inspection requirement, Ballough said. The large fine was caused by Southwest's knowingly allowing the planes to fly after the lapse was discovered, he said.

But airline consultant Mike Boyd of the Boyd Group said: "This is a regulatory issue; it's not about safety. And it's also about the FAA showing [Congress] how tough it can be, and Southwest ended up as the sacrificial lamb."

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### **Airplane cracks**

**How they develop:** Airplane shells bend slightly each time the cabin pressurizes before a flight. Over time, cracks appear in the metal at certain pressure points.

**How they're found:** Inspectors check visually and use instruments like X-rays and magnetic sensors.

**How they're fixed:** The smallest cracks can be polished out, which strengthens the metal. Larger ones can be patched with metal or other material, or panels of the fuselage can be replaced.