



National Transportation Safety Board

Aviation Accident Data Summary

Location:	Miami, FL	Accident Number:	DCA11FA004
Date & Time:	10/26/2010, 2130 EDT	Registration:	N626AA
Aircraft:	BOEING 757-223	Injuries:	160 None
Flight Conducted Under:	Part 121: Air Carrier - Scheduled		

Analysis

Flight data recorder data revealed that, after takeoff from Miami International Airport (MIA), Miami, Florida, the airplane climbed for about 16 minutes and was passing through an altitude of approximately 32,000 feet when the rapid decompression occurred. The flight crew declared an emergency (the first officer was the pilot flying) and returned to MIA. Post accident examination of the airplane revealed fatigue cracking of the upper fuselage skin above the forward left passenger (L1) door. The fatigue cracking penetrated the fuselage skin, leading to a rupture and an approximate 18-inch-by-7-inch hole that depressurized the airplane.

NTSB examinations of a section of the fuselage crown skin (from body station 374 to body station 439) where the rupture occurred revealed fatigue cracking along the lower longitudinal step of the chemically milled pocket just above the stringer S-4L (left) lap joint. The fatigue cracking initiated on the interior surface of the skin at multiple locations and propagated through the skin thickness. The skin thickness at the base of the chemically milled step measured 0.035 to 0.037 inch—which is less than the 0.039-inch minimum thickness specified by Boeing. Calculations from an NTSB study of the fatigue striation density and propagation in the fatigue region indicate that it would take an average of 3,709 total cycles for a crack to grow through skin with 0.035-inch thickness and an average interval of 917 cycles for a crack to grow from a minimally detectable size and penetrate a 0.035-inch skin thickness.

The area of cracking and rupture on the accident airplane was not subject to any specific inspections, service bulletins (SB), or airworthiness directives (AD) at the time of the accident. Following the accident, on November 22, 2010, Boeing issued SB 757-53-0097, which called for repetitive external inspections (every 30, 200 cycles, or 300 hours depending on the inspection method) to detect cracks in the fuselage skin along the chemically milled step at stringers S-4L (left) and S 4R (right) between body station 297 and body station 439. On January 10, 2011, the Federal Aviation Administration issued AD 2011-01-15 (effective January 25, 2011) mandating the inspections recommended in SB 757-53-0097.

During its investigation, the NTSB learned of a United Airlines 757 and a second American Airlines 757 that exhibited cracking in the fuselage skin similar to the accident airplane; both had nonconforming thickness at the base of the chemically milled step at the stringer location specified in the SB. Records of manufacture for the skin panels on the accident airplane and the other airplanes with fuselage skin cracking were not retained, and were not required to be retained; therefore, a cause for the manufacturing nonconformance could not be identified.

Flight Events

Enroute - Aircraft structural failure

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Fatigue failure of the fuselage crown skin due to incorrect manufacturing of the crown skin panel that resulted in a skin thickness less than the manufacturer-specified thickness.

Findings

Aircraft-Aircraft structures-Fuselage-Plates/skins (aux fuselage)-Fatigue/wear/corrosion - C
 Organizational issues-Development-Manufacture/production-Equipment manufacture-Manufacturer
 - C

Aircraft and Owner/Operator Information

Aircraft Make:	BOEING	Registration:	N626AA
Model/Series:	757-223	Engines:	2 Turbo Fan
Operator:	AMERICAN AIRLINES INC	Engine Manufacturer:	ROLLS-ROYC
Operating Certificate(s) Held:	Flag carrier (121)	Engine Model/Series:	RB.211 SERIES
Flight Conducted Under:	Part 121: Air Carrier - Scheduled		

Meteorological Information and Flight Plan

Conditions at Accident Site:	Condition of Light:
Observation Facility, Elevation:	Weather Information Source:
Lowest Ceiling:	Wind Speed/Gusts, Direction: / ,
Temperature:	Visibility
Precipitation and Obscuration:	
Departure Point:	Destination:

Wreckage and Impact Information

Crew Injuries:	6 None	Aircraft Damage:	Substantial
Passenger Injuries:	154 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Latitude, Longitude:			

Administrative Information

Investigator In Charge (IIC): Effie Lorenda Ward

Adopted Date: 09/19/2011

Investigation Docket: <http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=77677>

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report.