



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Charlotte, North Carolina	Accident Number:	DCA18CA251
Date & Time:	July 23, 2018, 15:38 Local	Registration:	N918DE
Aircraft:	Mcdonnell Douglas MD88	Aircraft Damage:	None
Defining Event:	Turbulence encounter	Injuries:	1 Serious, 1 Minor, 144 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

On July 23, 2018, about 1538 eastern daylight time, Delta Air Lines flight 2133, a McDonnell Douglas MD-88, N918DE, encountered turbulence during descent into Charlotte Douglas International Airport (KCLT), Charlotte, North Carolina. Of the 146 passengers and crew onboard, one flight attendant received serious injuries and one received minor injuries. The airplane was not damaged. The regularly scheduled domestic passenger flight was operated under the provisions of 14 Code of Federal Regulations Part 121 from Atlanta-Hartsfield International Airport (KATL), Atlanta, Georgia, to KCLT.

The captain was the pilot monitoring and first officer was the pilot flying. According to the flight crew, there were thunderstorms along the entire route that required them to deviate around multiple cells. The seat belt sign was on the entire flight and the weather radar was on. As the flight approached KCLT, the captain called the lead flight attendant (FA) and requested that the FAs complete their final walkthrough and be seated for the remainder of the flight, since he expected it to be bumpy during the arrival. As they were deviating around convective weather, the flight entered a cloud and encountered severe turbulence with heavy rain. The autopilot disconnected and the airplane dropped abruptly to the left. The first officer maintained positive manual control throughout the event and the crew estimated the turbulence lasted about 10 seconds. The captain immediately contacted the cabin and was informed that two FAs were injured.

After receiving the captain's call to prepare for landing early, the three FAs immediately began their final walkthroughs. Two FAs were in the aisle when the turbulence occurred. Both FAs were thrown into the air and then onto the floor. One FA had injured her back and was helped into a passenger seat for the remainder of the flight. The other FA injured her knees but was able to continue her duties for the remainder of the flight. The captain declared a medical emergency and requested that emergency personnel meet the airplane at the gate. Upon arrival, both FAs were transported to the hospital where one was diagnosed with a fractured vertebrae.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

An inadvertent encounter with convective turbulence.

Findings

Environmental issues	Convective turbulence - Effect on personnel
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Factual Information

History of Flight

Enroute-descent	Turbulence encounter (Defining event)
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Pilot Information

Certificate:	Airline transport	Age:	42,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	5-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Unknown	Last FAA Medical Exam:	May 22, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	January 9, 2018
Flight Time:	2701 hours (Total, all aircraft), 2701 hours (Total, this make and model), 181 hours (Last 90 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport	Age:	43,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	5-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Unknown	Last FAA Medical Exam:	October 30, 2017
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	March 16, 2018
Flight Time:	230 hours (Total, all aircraft), 230 hours (Total, this make and model), 165 hours (Last 90 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mcdonnell Douglas	Registration:	N918DE
Model/Series:	MD88 88	Aircraft Category:	Airplane
Year of Manufacture:	1993	Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	49959
Landing Gear Type:	Retractable - Tricycle	Seats:	
Date/Type of Last Inspection:	July 7, 2018 Continuous airworthiness	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	Turbo fan
Airframe Total Time:	76668 Hrs at time of accident	Engine Manufacturer:	Pratt & Whitney
ELT:	Installed	Engine Model/Series:	JT8D-219
Registered Owner:		Rated Power:	
Operator:		Operating Certificate(s) Held:	Flag carrier (121)
Operator Does Business As:		Operator Designator Code:	DALA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	CLT	Distance from Accident Site:	
Observation Time:	19:32 Local	Direction from Accident Site:	
Lowest Cloud Condition:		Visibility	9 miles
Lowest Ceiling:	Broken / 3000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.85 inches Hg	Temperature/Dew Point:	28°C / 22°C
Precipitation and Obscuration:			
Departure Point:	Atlanta, GA (KATL)	Type of Flight Plan Filed:	IFR
Destination:	Charlotte, NC (KCLT)	Type of Clearance:	IFR
Departure Time:	14:25 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Serious, 1 Minor, 4 None	Aircraft Damage:	None
Passenger Injuries:	140 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious, 1 Minor, 144 None	Latitude, Longitude:	35.214443,-80.947219

Administrative Information

Investigator In Charge (IIC):	Lovell, John		
Additional Participating Persons:			
Original Publish Date:	June 8, 2021	Investigation Class:	4
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=97877		

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. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).