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## Turbulence injuries, McDonnell Douglas DC-9-80, February 8, 1999

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**Micro-summary:** This McDonnell Douglas DC-9-80 encountered turbulence during descent, injuring several flight attendants.

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**Event Date:** 1999-02-08 at 1841 EST


**Investigative Body:** National Transportation Safety Board (NTSB), USA


**Investigative Body's Web Site:** <http://www.nts.gov/>


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1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).
  2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. ***Your company's flight operations manual is the final authority as to the safe operation of your aircraft!***
  3. Reports may or may not represent reality. Many many non-scientific factors go into an investigation, including the magnitude of the event, the experience of the investigator, the political climate, relationship with the regulatory authority, technological and recovery capabilities, etc. It is recommended that the reader review all reports analytically. Even a "bad" report can be a very useful launching point for learning.
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		NTSB ID: ATL99LA049		Aircraft Registration Number: N433AA	
		Occurrence Date: 02/08/1999		Most Critical Injury: Serious	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place RALEIGH		State NC	Zip Code 27611	Local Time 1841	Time Zone EST
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer McDonnell Douglas		Model/Series MD-80		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>On February 8, 1999, at 1841 eastern standard time, a McDonnell Douglas, MD-80, N433AA, encountered severe turbulence, 10 miles southwest of the South Boston VOR during let down into Raleigh, North Carolina. Flight 1754, a scheduled domestic passenger flight, was operated by American Airlines under the provisions of Title 14 CFR Part 121 with an instrument flight plan filed. Visual weather conditions prevailed at the time of the accident. The airplane was not damaged; the pilot, the first officer, and 131 passengers were not injured. Three flight attendants received minor injuries, and one flight attendant was seriously injured. The flight departed Chicago, Illinois, at 1718.</p> <p>According to the pilot, the airplane was descending through 17,000 feet for an approach into Raleigh, North Carolina when severe turbulence was encountered. The flight attendants were securing the passenger cabin and galley for landing at the time of the occurrence. The pilot reported that the fasten seat belt sign was on. According to the flight crew, clear air turbulence was not forecasted.</p> <p>The examination of the Digital Flight Data Recorder (DFDR), a Sundstrand model UFDR, showed that the turbulence was encountered at an altitude of approximately 17,462 feet on a magnetic heading of approximately 144 degrees. The DFDR also revealed that during the turbulence, vertical acceleration reached a maximum of 2.05 G's and a minimum of -.49 G's. Lateral acceleration reached a maximum of .21 G's and a minimum of -.11 G's. Longitudinal acceleration reached a maximum of .1 G's and a minimum of -.02 G's. According to the data, the autopilot was turned off approximately six seconds after the turbulence began. The autopilot was turned on about seven seconds after it was turned off (see attached Flight Data Recorder Readout Report).</p> <p>The seriously injured flight attendant sustained an L-1 compression fracture.</p>					
FACTUAL REPORT - AVIATION					

		NTSB ID: ATL99LA049			
		Occurrence Date: 02/08/1999			
		Occurrence Type: Accident			
<b>Landing Facility/Approach Information</b>					
Airport Name RALEIGH DURHAM INTER	Airport ID: RDU	Airport Elevation 436 Ft. MSL	Runway Used 23R	Runway Length 10000	Runway Width 150
Runway Surface Type: Concrete					
Runway Surface Condition: Dry					
Type Instrument Approach: VOR/DME; Visual					
VFR Approach/Landing: Traffic Pattern					
<b>Aircraft Information</b>					
Aircraft Manufacturer McDonnell Douglas		Model/Series MD-80		Serial Number 49451	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 138	Certified Max Gross Wt. 160000 LBS	Number of Engines: 2		
Engine Type: Turbo Jet	Engine Manufacturer: P&W	Model/Series: JT8D-919	Rated Power: 21700 LBS		
<b>- Aircraft Inspection Information</b>					
Type of Last Inspection Continuous Airworthiness	Date of Last Inspection	Time Since Last Inspection Hours	Airframe Total Time Hours		
<b>- Emergency Locator Transmitter (ELT) Information</b>					
ELT Installed? Yes	ELT Operated? No	ELT Aided in Locating Accident Site? No			
<b>Owner/Operator Information</b>					
Registered Aircraft Owner AMERICAN AIRLINES		Street Address 4333 AMON CARTER BLVD			
		City FORT WORTH	State TX	Zip Code 76155	
Operator of Aircraft Same as Reg'd Aircraft Owner		Street Address Same as Reg'd Aircraft Owner			
		City	State	Zip Code	
Operator Does Business As:			Operator Designator Code: AALA		
<b>- Type of U.S. Certificate(s) Held:</b>					
Air Carrier Operating Certificate(s): Flag Carrier/Domestic					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 121: Air Carrier					
Type of Flight Operation Conducted: Scheduled; Domestic; Passenger Only					

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: ATL99LA049
	Occurrence Date: 02/08/1999
	Occurrence Type: Accident

**First Pilot Information**

Name On File	City On File	State On File	Date of Birth On File	Age 55
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Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number: On File
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Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land

Rotorcraft/Glider/LTA:

Instrument Rating(s): Airplane

Instructor Rating(s): None

Type Rating/Endorsement for Accident/Incident Aircraft? Yes	Current Biennial Flight Review?
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Medical Cert.: Class 1	Medical Cert. Status: Unknown	Date of Last Medical Exam: 08/1998
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	14800	1264								
Pilot In Command(PIC)										
Instructor										
Last 90 Days	132									
Last 30 Days	69									
Last 24 Hours	7									

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? No	Second Pilot? Yes
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**Flight Plan/Itinerary**

Type of Flight Plan Filed: IFR

Departure Point CHIGAGO	State IL	Airport Identifier ORD	Departure Time 1618	Time Zone CDT
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Destination RALEIGH	State NC	Airport Identifier RDU	
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Type of Clearance: IFR

Type of Airspace: Class A

**Weather Information**

Source of Briefing:  
Company

Method of Briefing:

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: ATL99LA049
	Occurrence Date: 02/08/1999
	Occurrence Type: Accident

<b>Weather Information</b>					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
ROA	1853	CDT	1176 Ft. MSL	80 NM	315 Deg. Mag.
Sky/Lowest Cloud Condition: Thin Overcast			5500 Ft. AGL	Condition of Light: Night/Dark	
Lowest Ceiling: Unknown			0 Ft. AGL	Visibility: 4 SM	Altimeter: 29.00 "Hg
Temperature: 7 °C	Dew Point: 6 °C	Wind Direction: 130		Density Altitude: 600 Ft.	
Wind Speed: 9	Gusts:	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): 0 Ft.	Visibility (RVV) 0 SM	Intensity of Precipitation: Light			
Restrictions to Visibility: None					
Type of Precipitation: Rain					

<b>Accident Information</b>		
Aircraft Damage: None	Aircraft Fire: None	Aircraft Explosion: None

Classification: U.S. Registered/U.S. Soil					
<b>- Injury Summary Matrix</b>	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants		1	4		5
Other Crew					
Passengers				131	131
- TOTAL ABOARD -		1	4	133	138
Other Ground	0	0	0		0
- GRAND TOTAL -	0	1	4	133	138

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National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**



NTSB ID: ATL99LA049

Occurrence Date: 02/08/1999

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

PHILLIP POWELL

Additional Persons Participating in This Accident/Incident Investigation:

DOUG BADGETT

WINSTON SALEM FSDO