
Turbulence injuries, Boeing 767-332ER, November 4, 2000

Micro-summary: This Boeing 767-332ER experienced turbulence during cruise, injuring several flight attendants

Event Date: 2000-11-04 at 1115 PST


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

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

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		NTSB ID: SEA01LA014		Aircraft Registration Number: N173DZ	
		Occurrence Date: 11/04/2000		Most Critical Injury: Serious	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place PORTLAND		State OR	Zip Code 97218	Local Time 1115	Time Zone PST
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 767-332ER		Type of Aircraft Airplane	
Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:					
<p>On November 4, 2000, approximately 1115 Pacific standard time, a Boeing 767-332ER, N173DZ, operating as Delta Air Lines flight 1063 on a 14 CFR 121 scheduled domestic passenger/cargo flight from Salt Lake City, Utah, to Portland, Oregon, encountered moderate turbulence during descent at approximately flight level 330 (FL 330) about 90 miles east of the Kimberly, Oregon, VORTAC. In the turbulence encounter, one of the six flight attendants was seriously injured, and three flight attendants received minor injuries. There were no injuries to the other two flight attendants, the airline transport pilot-in-command or first officer, or 176 passengers aboard the aircraft. Following the turbulence encounter, the flight continued to Portland and landed without further incident. The aircraft was not damaged in the occurrence. Visual meteorological conditions were reported at Ontario, Oregon, at 1253 mountain standard time, and the flight was on an instrument flight rules flight plan.</p> <p>The flight's weather package, a copy of which Delta furnished to the NTSB, indicated that light to moderate turbulence was forecast in the area and altitudes where the turbulence encounter actually occurred. A National Weather Service surface analysis chart issued at 1935 Coordinated Universal Time (UTC) also indicated the presence of a generally northwest-southeast oriented cold front across central Oregon. The captain reported that the flight's On-Board Leader (OBL), the lead flight attendant, was briefed before the flight on the possibility of turbulence en route, and that the first officer was the pilot flying on the accident flight. The flight crew reported that after takeoff, they climbed to the flight's cruise altitude of FL 350. They reported that on climbout, the flight attendants called and asked whether it was OK to begin cabin service, and that since they were experiencing "very light chop" at that time, the captain advised them to "use their best judgment regarding whether or not to continue cabin service at that time." The captain reported that at FL 350, about 150 miles east of the Kimberly, Oregon (IMB) VORTAC, the flight began to encounter light to moderate turbulence. He stated that the flight attendants were seated and the seat belt sign was on at that time.</p> <p>The flight crew reported that at this time, ATC was reporting turbulence from FL 230 to FL 390, but at about this time, a Learjet in the area reported that FL 410 was smooth. The crew then requested and received clearance to climb to FL 410. The crew reported that after a couple of minutes of smooth air at FL 410, the flight attendants were advised that it was OK to attempt cabin service. The crew reported that approximately five minutes later, the flight again began to encounter light turbulence. The captain reported that he again seated the flight attendants and made a PA announcement to the passengers that the flight attendants would be taking their seats.</p> <p>The crew then requested and received clearance to descend to FL 310, where it was reported to be smooth. The crew reported that it became smooth when passing approximately FL 370, but that they entered light to moderate turbulence at FL 350. The crew reported that the first officer then extended the speed brakes to increase the rate of descent. The crew reported that the aircraft was flying at its turbulence penetration airspeed of 0.78 Mach at this time. The crew stated that just</p>					
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National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: SEA01LA014

Occurrence Date: 11/04/2000

Occurrence Type: Accident


Narrative (Continued)


above FL 330 (approximately FL 333 according to the first officer), the flight encountered two momentary moderate jolts. The flight subsequently leveled off at FL 310 in smooth air. The crew stated that they were then notified that one or more flight attendants had been injured in the aft galley. The crew reported they then took actions to deal with this situation, and that the remainder of the flight was uneventful.

The flight attendant who received the serious injury (fractured bones in her foot) reported that she was asked to sit in the mid cabin. She reported that after the flight reached 10,000 feet, while the climbout safety video was playing, "the aircraft began to shake a little." She stated that she told another flight attendant seated with her to stay seated, and that she called to the aft galley and informed other flight attendants that she and her partner at mid-cabin would not be walking to the aft galley until she heard from the aft galley attendants that it was smoother. She stated that the aft galley attendants agreed with this plan. The seriously injured flight attendant reported that she then called the cockpit to see how long the turbulence was expected to last, and "was told that it shouldn't last too long and it probably would not get worse than it was right now." She stated that she informed the cockpit crew that the flight attendants would remain seated. She reported that the flight attendants in the aft galley then called and reported that it had smoothed out enough for cabin service to begin. She reported that the flight attendants then began cabin service. She stated that the aircraft started to hit some bumps about 10 minutes after initiation of cabin service. Shortly thereafter, the flight attendants were instructed to take their seats. She and her partner then returned their beverage cart to the aft galley. She reported that they were in the process of attempting to stow the cart in the aft galley when the aircraft encountered turbulence that sent the unseated flight attendants up off the floor. She reported that she hit the ceiling with her head, then came down with the cart in front of her. She stated that the aircraft was then "hit with a violent side movement" and the cart then landed on top of her foot.

A readout of the aircraft's flight data recorder (FDR), accomplished by Delta, disclosed that at a recorder relative time of 55 hours 16 minutes 9 seconds, the aircraft experienced a vertical acceleration of -0.289 G. According to the FDR data, the aircraft was at an altitude of 32,985 feet and airspeed of 279 knots at the time this reading was recorded. The eight vertical accelerations recorded at relative time 55:16:08, the second immediately preceding the -0.289 G reading, were, sequentially, 0.845, 0.978, 1.044, 1.120, 1.127, 1.001, 0.760, and 0.094 G. The seven vertical acceleration readings at relative time 55:16:09, immediately following the -0.289 G reading, were, sequentially, 0.089, 0.737, 1.019, 1.333, 1.573, 1.422, and 1.262 G.

The NTSB investigator-in-charge calculated the aircraft's Mach number at the time of the -0.289 G vertical acceleration reading using a manual flight computer and handheld scientific calculator. The computation was based on the following: calibrated airspeed of 279 knots and altitude of 32,985 feet (as per the FDR data); compressibility correction factor of 0.94; and temperature of -51 degrees C (approximate standard atmospheric temperature at 33,000 feet.) Based on this data, the aircraft's Mach number was calculated to be 0.78, the figure reported by the captain.

 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: SEA01LA014			
		Occurrence Date: 11/04/2000			
		Occurrence Type: Accident			
Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation Ft. MSL	Runway Used 0	Runway Length	Runway Width
Runway Surface Type:					
Runway Surface Condition:					
Type Instrument Approach:					
VFR Approach/Landing:					
Aircraft Information					
Aircraft Manufacturer Boeing		Model/Series 767-332ER		Serial Number 29692	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 265	Certified Max Gross Wt.	407000 LBS	Number of Engines: 2	
Engine Type: Turbo Fan	Engine Manufacturer: GE	Model/Series: CF6-80C2	Rated Power: 60800 LBS		
- Aircraft Inspection Information					
Type of Last Inspection Continuous Airworthiness	Date of Last Inspection 10/2000	Time Since Last Inspection 153 Hours	Airframe Total Time 6911 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed?	ELT Operated?	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner DELTA AIR LINES INC.		Street Address HARTSFIELD INTL AP DEPT 509			
		City ATLANTA	State GA	Zip Code 30320	
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: DALA		
- Type of U.S. Certificate(s) Held:					
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/Cargo					
FACTUAL REPORT - AVIATION					

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: SEA01LA014
	Occurrence Date: 11/04/2000
	Occurrence Type: Accident

First Pilot Information

Name On File	City On File	State On File	Date of Birth	Age 56
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Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number:
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Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land

Rotorcraft/Glider/LTA: None

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: Valid Medical--no waivers/lim.	Date of Last Medical Exam: 07/2000
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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	13000	5400								
Pilot In Command(PIC)										
Instructor										
Last 90 Days		210								
Last 30 Days										
Last 24 Hours		9								

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed?	Second Pilot? Yes
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Flight Plan/Itinerary

Type of Flight Plan Filed: IFR	
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Departure Point SALT LAKE CITY	State UT	Airport Identifier SLC	Departure Time 1105	Time Zone MST
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Destination Same as Accident/Incident Location	State	Airport Identifier PDX	
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Type of Clearance: IFR

Type of Airspace: Class A

Weather Information

Source of Briefing:
Company

Method of Briefing:

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>	NTSB ID: SEA01LA014
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Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
ONO	1253	MST	2189 Ft. MSL	0 NM	0 Deg. Mag.
Sky/Lowest Cloud Condition: Unknown			0 Ft. AGL	Condition of Light: Day	
Lowest Ceiling: Broken		8000 Ft. AGL		Visibility: 10 SM	Altimeter: 29.00 "Hg
Temperature: 55 °C	Dew Point: 34 °C	Wind Direction: 143		Density Altitude: Ft.	
Wind Speed: 12	Gusts:	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): 0 Ft.	Visibility (RVV) 0 SM	Intensity of Precipitation: Unknown			
Restrictions to Visibility: None					
Type of Precipitation: None					

Accident Information

Aircraft Damage: None	Aircraft Fire: None	Aircraft Explosion: None
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Classification: U.S. Registered/U.S. Soil

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants		1	3	2	6
Other Crew					
Passengers				176	176
- TOTAL ABOARD -		1	3	180	184
Other Ground	0	0	0		0
- GRAND TOTAL -	0	1	3	180	184

National Transportation Safety Board

FACTUAL REPORT

AVIATION



NTSB ID: SEA01LA014

Occurrence Date: 11/04/2000

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

GREGG NESEMEIER

Additional Persons Participating in This Accident/Incident Investigation:

JASON BEECHWOOD

FAA FSDO

HILLSBORO, OR 97124