
Turbulence injuries, Boeing 737-400, December 22, 1996

Micro-summary: This Boeing 737-400 encountered severe clear air turbulence during cruise, seriously injuring two flight attendants and injuring one.


Event Date: 1996-12-22 at 1912 AST

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

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

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		NTSB ID: ANC97LA015		Aircraft Registration Number: N775AS	
		Occurrence Date: 12/22/1996		Most Critical Injury: Serious	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place YAKUTAT		State AK	Zip Code 99689	Local Time 1912	Time Zone AST
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 737-400		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 December 22, 1996, about 1912 Alaska standard time, a Boeing 737-400 airplane, operated under 14 CFR Part 121 by Alaska Airlines as Flight 67, encountered severe turbulence while cruising in visual meteorological flight conditions at Flight Level 350, approximately 30 miles east of Yakutat, Alaska. The airplane was not damaged. The two flight crew members and 37 passengers aboard reported no injuries. All of the three flight attendants aboard were injured. One flight attendant received minor injuries, two flight attendants received serious injuries and were hospitalized. The flight was en route to Anchorage, Alaska, at the time of accident, and the flight continued to Anchorage. The flight departed Juneau, Alaska, about 1820.</p> <p>During a telephone conversation with the NTSB investigator-in-charge, the Captain related the flight had experienced light to moderate turbulence while on the approach to land at Juneau, on the Sitka-Juneau leg preceding the accident flight. He said he spoke with the lead flight attendant, and decided they would delay the meal service after departing Juneau until reaching cruising altitude and evaluating the level of turbulence. After reaching the cruising altitude of Flight Level 350, the Captain said he again conferred with the lead Flight Attendant, and since the level of turbulence was viewed as "light chop", it was decided to begin the service. The Captain also noted he requested "ride reports" from the Anchorage Air Route Traffic Control Center (ARTCC) prior to the meal service, and was advised of light turbulence reported by preceding flights.</p> <p>The Captain said the turbulence suddenly increased from light to moderate, as felt in the cockpit, when the airplane was over Mount Fairweather (a 15,300' mountain). The Captain characterized the turbulence as a fairly rapid pitching up and down of the nose of the airplane, and later reported it to the Anchorage ARTCC as a "good, solid moderate." The fasten seat belt sign was illuminated at the time of the turbulence encounter, and had been so since takeoff.</p> <p>The "A", or Lead Flight Attendant, submitted a statement which says, in part: "About 15 minutes out of JNU, the Capt. came on the PA and informed us that it would probably be bumpy from JNU-ANC. I was just leaving the flight deck (FD) with their meal when all of a sudden a giant jolt, or wave, occurred. I hit my head either on the lav. door or FA bulkhead. Slammed FD door shut and took my jump seat."</p> <p>The lead Flight Attendant waited a few minutes until she felt she was able to walk to the rear of the airplane to check on the passengers and two other flight attendants. She found no injured passengers, but discovered that the other two flight attendants were injured. One flight attendant (Larzalere) was sitting/lying on the aft flight attendant's jump seat, the other (Nielson) was lying on the floor, between the two aft lavatories. The lead flight attendant, two passengers, and an off duty company pilot assisted the lead flight attendant in providing first aid and comfort to the injured flight attendants.</p> <p>The injured flight attendants were interviewed by the NTSB IIC. They related essentially the same</p>					
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National Transportation Safety Board

FACTUAL REPORT

AVIATION

NTSB ID: ANC97LA015

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Occurrence Type: Accident

Narrative (Continued)

information: They were in the rear of the airplane, wheeling out the beverage service cart, when two, massive jolts, or waves, slammed them into the ceiling and floor. Neither recalled any precursors to the severe turbulence. Flight attendant Larzalere reported she had a fractured pelvis and elbow; flight attendant Nielson reported a fractured vertebrae in her back.


A review of the air traffic control communication transcripts provided by the FAA disclosed the flight crew was experiencing turbulence en route and communicated with ARTCC requesting ride reports from preceding aircraft. At 1858, the flight crew radioed: "Anchorage Center, Alaska sixty-seven ah getting ah continuous light in the climb occasional moderate and ah wonder what the ride reports are heading over towards Anchorage." Anchorage Center responded: "...company just came over from Yakutat at ah twenty-nine he didn't give me any reports so I'm not sure what he got south of the route around Laire south of Yakutat and Laire area company just went westbound and he got continuous at both thirty-one and thirty-five." At 1904, the flight crew reported they were over Yakutat, and noted the turbulence was better now that they were away from the hills, and classified the turbulence as "continuous light chop." At 1912, the flight crew reported: "yeah just going over Mount Fairweather there got a ah we'll call it a a good solid moderate turbulence." Anchorage Center responded: "...I assume it's stopped now." The flight crew responded: "well lets see for the time being it came up pretty quick and ah and ah it's we'll call continuous light for now but ah we'll keep you advised if we get into some more of that moderate but it was ah a good solid moderate." At 1920, the flight crew reported to Anchorage Center that they had encountered moderate turbulence, and again requested ride reports and indicated they had two injured flight attendants on board. Additional communications between the flight crew and Anchorage Center is contained in the attached FAA Air Traffic Control Accident Package transcripts.


Weather at the time of the accident was characterized by the flight crew as clear, and the turbulence was referred to as clear air turbulence. A review of the weather data provided to the flight crew at the time of dispatch indicated the presence of low level winds in excess of 30 knots, and the potential for associated moderate to severe turbulence within 2000 feet of terrain. Company dispatch weather, and weather reports issued by the FAA (attached) disclosed no SIGMETS or pilot reports pertinent to the route of flight. A SIGMET is defined, in part, by the FAA's Airman's Information Manual (AIM) as: " A weather advisory issued concerning weather significant to the safety of all aircraft. SIGMET advisories cover severe and extreme turbulence... ."

The AIM defines moderate turbulence as: "(Reaction Inside Aircraft) Occupants feel definite strains against seat belts or shoulder straps. Unsecured objects are dislodged. Food service and walking are difficult." Severe turbulence is defined: "(Reaction Inside Aircraft) Occupants are forced violently against seat belts or shoulder straps. Unsecured objects are tossed about. Food service and walking are impossible."

The Operator, Alaska Airlines, has similar definitions of turbulence contained in its Flight Attendant and Flight Operations manuals. The Flight Attendant Manual notes that turbulence severity may vary greatly between the flight deck and the cabin. The Flight Operations Manual notes that, when possible, prior to encountering either moderate or severe turbulence, all cabin crew members should have their seat belts fastened.

As a result of this accident, company safety officials at Alaska Airlines have requested that severe turbulence forecasting data generated by another air carrier be shared with Alaska Airlines. This data will reportedly more accurately predict mountain waves and areas of severe turbulence.

 <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p>		NTSB ID: ANC97LA015			
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		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 737-400		Serial Number 25108	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 137	Certified Max Gross Wt.	143500 LBS	Number of Engines: 2	
Engine Type: Turbo Fan	Engine Manufacturer: P&W	Model/Series: CFM-56	Rated Power: 22000 LBS		
- Aircraft Inspection Information					
Type of Last Inspection AAIP	Date of Last Inspection	Time Since Last Inspection Hours	Airframe Total Time Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? No	ELT Operated?	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner ALASKA AIRLINES		Street Address P.O. BOX 68900			
		City SEATTLE	State WA	Zip Code 98168	
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: AS		
- 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					

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	Occurrence Type: Accident

First Pilot Information

Name On File	City On File	State On File	Date of Birth On File	Age 40
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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; Flight Engineer

Airplane Rating(s): Multi-engine Land; Single-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: 12/1996
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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	9576	1037				1000				
Pilot In Command(PIC)	4761	906								
Instructor										
Last 90 Days	46	46								
Last 30 Days	18	18								
Last 24 Hours	11									

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

Type of Flight Plan Filed: IFR

Departure Point JUNEAU	State AK	Airport Identifier JNU	Departure Time 1854	Time Zone AST
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Destination ANCHORAGE	State AK	Airport Identifier ANC		
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Type of Clearance: IFR

Type of Airspace: Class A

Weather Information

Source of Briefing: Company

Method of Briefing:

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Weather Information					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
	0000		0 Ft. MSL	0 NM	0 Deg. Mag.
Sky/Lowest Cloud Condition: Unknown			0 Ft. AGL	Condition of Light: Night/Dark	
Lowest Ceiling: None		0 Ft. AGL	Visibility: 50 SM	Altimeter: 29.00	"Hg
Temperature: °C	Dew Point: °C	Wind Direction:		Density Altitude: Ft.	
Wind Speed:	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

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		2	1		3
Other Crew					
Passengers				37	37
- TOTAL ABOARD -		2	1	39	42
Other Ground	0	0	0		0
- GRAND TOTAL -	0	2	1	39	42

National Transportation Safety Board

FACTUAL REPORT

AVIATION



NTSB ID: ANC97LA015

Occurrence Date: 12/22/1996

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

JAMES D. LABELLE

Additional Persons Participating in This Accident/Incident Investigation:

HARRY C GILSON
FAA, ANCHORAGE FSDO-03
ANCHORAGE, AK 99502

RONDA RUDERMAN
1625 MASSACHUSETTS AVE., N.W.
WASHINGTON, DC 20036

TERRY CLARK
P.O BOX 68900
SEATTLE, WA 98168