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## Turbulence injury, Airbus A320-232, April 19, 2001

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**Micro-summary:** This Airbus A320-232 experienced turbulence in cruise, resulting in injury to a flight attendant.

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**Event Date:** 2001-04-19 at 0948 PDT


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

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

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  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!***
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		NTSB ID: LAX01LA136		Aircraft Registration Number: N654AW	
		Occurrence Date: 04/19/2001		Most Critical Injury: Serious	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Las Vegas		State NV	Zip Code 89119	Local Time 0948	Time Zone PDT
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Airbus Industrie		Model/Series A320-232		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 April 19, 2001, at 0948 hours Pacific daylight time (PDT), an Airbus Industrie A320-232, N654AW, encountered turbulence while in cruise flight at 31,000 feet msl near Raton, New Mexico. The flight, which departed New York, New York, at 0858 eastern daylight time, was destined for Las Vegas, Nevada, and landed there at 1113 PDT. One flight attendant was seriously injured; one other flight attendant and 3 passengers received minor injuries; and the airline transport certificated pilot, the second pilot, and the remaining flight attendant and 118 passengers were not injured. The airplane was not damaged. The flight was operated by America West Airlines, Inc., under 14 CFR Part 121, as flight 7, a regularly scheduled domestic passenger flight. The flight was operating on a instrument flight plan and visual meteorological conditions prevailed.</p> <p>The company flight dispatcher reported that he advised the flight crew of a recently issued significant meteorological notice (SIGMET) via company communications radio about 30 minutes before the accident. The SIGMET was for forecast and reported occasional severe turbulence over southern Colorado and northern New Mexico between 31,000 feet and 39,000 feet. The dispatcher recommended that the flight descend below the area of forecast turbulence or alter course around it. The crew advised they would "discuss the situation and get back with me;" however, the next communication from the flight was about 30 minutes later when they reported the encounter with moderate to severe turbulence over the Cimarron (New Mexico) navigational aide at 31,000 feet and the injury to one flight attendant.</p> <p>In their report to the Safety Board, the company Director, Operations Safety, reported "At approximately 0915 PDT, the dispatcher communicated to the captain that the flight was approaching an area of forecast moderate to severe turbulence associated with mountain wave activity. The forecast (SIGMET Papal) covered an area of the front range of the Rocky Mountains, between flight Level 310 (FL310) and FL390. The dispatcher recommended that the flight alter course (to return to the original flight plan in lieu of the direct routing the flight was on) and descend to FL280. The captain queried air traffic control, and upon receiving reports of smooth air at FL310, he descended from FL350 to FL310 and remained on the direct routing. Approaching the area of forecast turbulence, he illuminated the seat belt sign and advised the passengers of the potential for turbulence. He also advised the flight attendants to stow the galley equipment. Approximately 3 to 4 minutes later, the flight encountered Severe Clear Air Turbulence. Once it was determined that there were injured crewmembers and passengers aboard (and that they were receiving medical attention), the captain coordinated with dispatch and the flight landed in Las Vegas with[out] further incident."</p> <p>The pilot reported he recalled dispatch issued the SIGMET for severe turbulence from 33,000 feet to 37,000 feet and they were cruising at 31,000 feet. There also had been a pilot report of severe turbulence in "that" area. Pilots of other aircraft were telling air traffic controllers that they were experiencing mountain wave activity at higher altitudes (than they were at). The pilot notified the flight attendants, turned on the "fasten seat belt" sign, and made a cabin</p>					
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National Transportation Safety Board

## FACTUAL REPORT

AVIATION

NTSB ID: LAX01LA136

Occurrence Date: 04/19/2001

Occurrence Type: Accident


## Narrative (Continued)


announcement telling the passengers to remain in their seats as a precautionary measure. "Approximately three to four minutes later, we went from smooth air to a light mountain wave indication followed by an abrupt encounter with severe turbulence which lasted about seven to eight seconds. This encounter caused us to drop 400 feet of altitude immediately, the autopilot disconnected and the aircraft attitude was upset to a pitch down followed by a momentary TCAS [Traffic Collision Avoidance System] warning. Items loose in the cockpit became airborne. It was the first officer's leg so he continued to fly the aircraft back to our clearance altitude of FL310. We notified ATC [Air Traffic Control] and requested FL280 to find smoother air."

The airplane's digital flight data recorder was read out by the manufacturer, Honeywell Commercial Electronics Systems. The altitude parameter showed the airplane cruised at flight level 350 (FL350, approximately 35,000 feet, msl) until 0909:30, at which time it descended to flight level 310 (FL310, approximately 31,000 feet, msl), arriving there at 0911:30. The airplane remained at FL310 until the turbulence encounter at 0948. Prior to 0948:37, the normal acceleration parameter remained near 1.0. In the 16-second period between 0948:37 and 0948:53 the normal acceleration parameter first increased to 1.441, then dropped abruptly to -0.379, then increased to 1.449, then dropped to 0.105, then increased to 1.348, then dropped abruptly to 0.215 followed by an abrupt increase to 1.371, before returning to approximately 1.0. At 0950:23, the altitude parameter showed the airplane started a descent from FL310 until it leveled at flight level 280 (approximately 28,000 feet, msl) at 0951:55.

A transcript of communications between flight 7 and the Denver Air Route Traffic Control Center was provided by the Federal Aviation Administration (FAA) Northwest Region Quality Assurance Office. At 0930, following a handoff from a different sector, flight 7 checked in and said "[flight] seven at three one zero request a ride report." The controller replied: "expect occasional light chop nothing real bad." At 0935, there were a series of communications, on the same frequency, between United Airlines flight 8146 (at flight level 280) and the controller regarding ride quality. The controller told the United flight that flight level 280 was the "best ride," and that "everything upstairs flight level three five through flight level four one zero is a lot worse it's severe mountain wave and intermittent moderate." The controller then added (to United): "flight level three one zero is occasional light to moderate as well a little worse than flight level two eight zero." At 0946, flight 7 transmitted: "we're just getting a little bit of a nibble here at three one zero but um i'm out looking ahead it looks like two eight zero might be little bit smoother altitude how's it look to you." The controller queried another aircraft at flight level 280, which reported "light ripples," and then told flight 7 that it would be about 3 minutes before he could clear flight 7 to descend to the lower flight level. At 0949:01, flight 7 transmitted: "we just got um a jolt of moderate ah turbulence and we request two eight zero." The controller replied: "traffic twelve oclock and four miles eastbound flight level two niner zero lower when clear." At 0950:02, the controller cleared flight 7 to descend to flight level 280.

The injured flight attendant was one of two in the aft galley when the turbulence was encountered. The other flight attendant, who received minor injuries, reported she had just returned to the aft galley after picking up cabin service items. During her return to the galley, the captain made the announcement about anticipated turbulence. As she reached the aft galley they encountered turbulence. She grasped an assist handle, the other flight attendant grasped one on the opposite side, and they locked forearms in the center. They were "jolted" a couple of times during which she recalled her feet came off the floor and then the turbulence subsided. They "scrambled" toward their jumpseats; however, they encountered additional, more severe, turbulence and it became impossible to hold onto anything. She recalled being thrown about the galley; hitting the ceiling, counters, and doors before being "slammed" to the floor. She landed face down on the floor and thought she had injured her back and both ankles. They were still in turbulence so she crawled on her stomach to the last row of seats and held on to the seat frame. She reported the sounds were deafening and people were screaming. Some overhead bins opened and items fell out. The turbulence subsided and she assisted the injured flight attendant to a seat before helping the remaining flight attendant (in the forward cabin) with passenger and flight duties.

 <b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b>		NTSB ID: LAX01LA136			
		Occurrence Date: 04/19/2001			
		Occurrence Type: Accident			
<b>Landing Facility/Approach Information</b>					
Airport Name	Airport ID:	Airport Elevation Ft. MSL	Runway Used	Runway Length	Runway Width
Runway Surface Type: Unknown					
Runway Surface Condition: Unknown					
Type Instrument Approach: Unknown					
VFR Approach/Landing: Unknown					
<b>Aircraft Information</b>					
Aircraft Manufacturer Airbus Industrie		Model/Series A320-232		Serial Number 1050	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 158	Certified Max Gross Wt.	169754 LBS	Number of Engines: 2	
Engine Type: Turbo Fan	Engine Manufacturer: Int'l Aero En	Model/Series: V2527-A5	Rated Power: 27000 LBS		
- Aircraft Inspection Information					
Type of Last Inspection AAIP	Date of Last Inspection 03/2001	Time Since Last Inspection 333 Hours	Airframe Total Time 7092 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? No	ELT Operated? No	ELT Aided in Locating Accident Site?			
<b>Owner/Operator Information</b>					
Registered Aircraft Owner America West Airlines, Inc.		Street Address 4000 E. Sky Harbor Blvd.			
		City Phoenix	State AZ	Zip Code 85034	
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: AWXE		
- 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 Only					

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: LAX01LA136
	Occurrence Date: 04/19/2001
	Occurrence Type: Accident

**First Pilot Information**

Name On File	City On File	State On File	Date of Birth	Age 48
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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 Instructor

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Multi-engine; Airplane Single-engine

Type Rating/Endorsement for Accident/Incident Aircraft? Yes	Current Biennial Flight Review? 05/2000
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Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--w/ waivers/lim.	Date of Last Medical Exam: 01/2001
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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	15000	5000	500	14500						
Pilot In Command(PIC)	13500									
Instructor										
Last 90 Days	140	140		140						
Last 30 Days	60	60		60						
Last 24 Hours	6	6		6						

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 New York	State NY	Airport Identifier JFK	Departure Time 0858	Time Zone EDT
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Destination Las Vegas	State NV	Airport Identifier LAS	
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Type of Clearance: IFR

Type of Airspace: Class A

**Weather Information**

Source of Briefing: Company

Method of Briefing: Telephone; Teletype

 <b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b>	NTSB ID: LAX01LA136
	Occurrence Date: 04/19/2001
	Occurrence Type: Accident

<b>Weather Information</b>					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
RTN	0953	MST	6352 Ft. MSL	30 NM	45 Deg. Mag.
Sky/Lowest Cloud Condition: Clear			Ft. AGL	Condition of Light: Day	
Lowest Ceiling: None		Ft. AGL	Visibility: 10	SM	Altimeter: 29.91 "Hg
Temperature: 22 °C	Dew Point: -4 °C	Wind Direction: 290		Density Altitude: Ft.	
Wind Speed: 20	Gusts: 29	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): Ft.	Visibility (RVV)	SM	Intensity of Precipitation:		
Restrictions to Visibility: None					
Type of Precipitation: None					

<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	1	1	3
Other Crew					
Passengers			3	118	121
- TOTAL ABOARD -		1	4	121	126
Other Ground					
- GRAND TOTAL -		1	4	121	126

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National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**

NTSB ID: LAX01LA136

Occurrence Date: 04/19/2001

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

RICHARD B. PARKER

Additional Persons Participating in This Accident/Incident Investigation:

TERRI L TACKETT  
FAA Flt Stnds Dist Office  
Las Vegas, NV 89119

JOHN B DRAKE  
America West Airlines  
Phoenix, AZ 85034

MARK A SOLPER  
Air Line Pilot's Association  
Phoenix, AZ 85034