



# Aviation Investigation Final Report

<b>Location:</b>	Pawnee, Nebraska	<b>Accident Number:</b>	WPR12LA119
<b>Date &amp; Time:</b>	February 23, 2012, 14:30 Local	<b>Registration:</b>	N915WN
<b>Aircraft:</b>	Boeing 737-7H4	<b>Aircraft Damage:</b>	None
<b>Defining Event:</b>	Turbulence encounter	<b>Injuries:</b>	1 Serious, 1 Minor, 138 None
<b>Flight Conducted Under:</b>	Part 121: Air carrier - Scheduled		

## Analysis

The airplane had been cruising in smooth air conditions for over 30 minutes when it suddenly encountered 2 to 3 seconds of moderate turbulence. The momentary altitude and roll deviation of the airplane, which was corrected by the autopilot, threw one of the flight attendants against the airplane structure, which resulted in a serious injury to her hand. The flight crew had not been given any turbulence advisories by air route traffic controllers, and the flight crew had not overheard any airplanes in the area reporting moderate turbulence. Immediately after the encounter, the airplane continued in smooth air conditions.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The airplane's encounter with moderate turbulence during cruise flight, which resulted in a serious injury to a flight attendant.

## Findings

<b>Personnel issues</b>	Illness/injury - Cabin crew
<b>Environmental issues</b>	Clear air turbulence - Effect on operation

## Factual Information

### History of Flight

#### Enroute-cruise

Turbulence encounter (Defining event)

On February 23, 2012, about 1430 central standard time, a Southwest Airlines Boeing 737-7H4, N915WN, encountered 2 to 3 seconds of moderate turbulence while in cruise flight between Chicago, Illinois, and Los Angeles, California. The Captain and the First Officer, both of whom were airline transport pilots, were not injured, nor were any of the 135 passengers. One of the three flight attendants received minor injuries, and a second flight attendant received a serious injury to her right hand. The airplane was not damaged. The 14 Code of Federal Regulations Part 121 scheduled domestic passenger flight, which departed Chicago Midway Airport about 55 minutes prior to the turbulence encounter, was en route to Los Angeles International Airport, Los Angeles, California. At the time of the event, the airplane was in visual meteorological conditions on an Instrument Flight Rules flight plan.

According to the flight crew, they were in level cruise flight in smooth air at Flight Level 360, when the airplane experienced the turbulence encounter. Although the airplane had encountered periods of light chop earlier in the flight, it had been in completely smooth air for about 30 minutes prior to the event, and there had been no report of turbulence from the Air Route Traffic Control Center, nor had the flight crew overheard any other aircrew stating that there was anything but smooth air in the area of the encounter. Although the flight attendants were in the process of serving drinks, the passenger seatbelt sign was still on from the earlier period of choppy air. At the moment of the encounter, the airplane experienced both a momentary altitude deviation and a left roll of less than 10 degrees, both of which were corrected by the autopilot, with a slight overshoot past the wings level position. During the encounter sequence, one flight attendant was thrown back against the aft galley door, whereupon her hand hit the recyclable can door. She then immediately felt pain in the hand. At that point in time, the Captain came on the public address system and directed the flight attendants to take their seats immediately, which they did until the flight crew was convinced that they had returned to smooth air conditions. Although the injured flight attendant continued her in-flight duties until the plane landed in Los Angeles, she ultimately went to Urgent Care for treatment. X-rays taken of her hand determined that she had a closed fracture of the carpal bone in her right hand.

According to both flight crew members, the airplane reacted in a manner consistent with it flying through the wake of another preceding or crossing airplane, and after the few seconds of the turbulence encounter, followed by the correction by the autopilot, the airplane returned to straight and level flight in smooth air.

## Pilot Information

<b>Certificate:</b>	Airline transport	<b>Age:</b>	52, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 With waivers/limitations	<b>Last FAA Medical Exam:</b>	February 7, 2012
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	November 2, 2011
<b>Flight Time:</b>	23500 hours (Total, all aircraft), 20550 hours (Total, this make and model), 16000 hours (Pilot In Command, all aircraft), 200 hours (Last 90 days, all aircraft), 75 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

## Co-pilot Information

<b>Certificate:</b>	Airline transport	<b>Age:</b>	44, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	July 18, 2011
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	September 17, 2011
<b>Flight Time:</b>	9887 hours (Total, all aircraft), 6010 hours (Total, this make and model), 1977 hours (Pilot In Command, all aircraft), 208 hours (Last 90 days, all aircraft), 75 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Boeing	<b>Registration:</b>	N915WN
<b>Model/Series:</b>	737-7H4	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Transport	<b>Serial Number:</b>	36888
<b>Landing Gear Type:</b>		<b>Seats:</b>	145
<b>Date/Type of Last Inspection:</b>	February 9, 2012 Continuous airworthiness	<b>Certified Max Gross Wt.:</b>	154500 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo fan
<b>Airframe Total Time:</b>	14201 Hrs as of last inspection	<b>Engine Manufacturer:</b>	CFM INTL
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	CFM56-7B24
<b>Registered Owner:</b>	SOUTHWEST AIRLINES CO	<b>Rated Power:</b>	24200 Lbs thrust
<b>Operator:</b>	SOUTHWEST AIRLINES CO	<b>Operating Certificate(s) Held:</b>	Flag carrier (121)
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	SWA

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>		<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>		<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Scattered / 2700 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Overcast / 3200 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	19 knots / 25 knots	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	300°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.43 inches Hg	<b>Temperature/Dew Point:</b>	8°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Chicago, IL (KMDW)	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Las Angeles, CA (KLAX)	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>	13:35 Local	<b>Type of Airspace:</b>	

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Serious, 1 Minor, 3 None	<b>Aircraft Damage:</b>	None
<b>Passenger Injuries:</b>	135 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Serious, 1 Minor, 138 None	<b>Latitude, Longitude:</b>	40.168888,-96.151947(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Anderson, Orrin
<b>Additional Participating Persons:</b>	Owen Grimm; Lincoln FSDO; Lincoln, NE Dennis Post; Southwest Airlines; Dallas, TX
<b>Original Publish Date:</b>	January 31, 2013
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=82993">https://data.ntsb.gov/Docket?ProjectID=82993</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).