



Aviation Investigation Final Report

Location:	Denver, Colorado	Accident Number:	DCA19CA206
Date & Time:	August 27, 2019, 06:50 Local	Registration:	N328FR
Aircraft:	Airbus A320	Aircraft Damage:	None
Defining Event:	Turbulence encounter	Injuries:	1 Serious
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

On August 27, 2019, at 0650 am mountain daylight time, Frontier Airlines as flight 461, an Airbus A320, N328FR, encountered turbulence while on descent to the Denver International Airport (KDEN), Denver, Colorado. As a result of the turbulence, one flight attendant was seriously injured. There were no other injuries to the remainder of the passengers and crew onboard and the airplane was not damaged. The flight was operating under 14 CFR Part 121 as a regularly scheduled passenger flight from the Minneapolis/St. Paul International Airport (KMSP), Minneapolis, Minnesota to KDEN. Visual flight conditions prevailed at the time of the accident.

According to the flight crew, as the flight was approaching 15,000 feet, the captain, who was the pilot monitoring, identified a single cumulus cloud in front of them with the tops at about 15,000 feet, and informed the first officer (FO) of possible turbulence. The FO reduced airspeed to 250 knots in anticipation of the turbulence and the captain advised the flight attendants to take their seats. The airplane then entered moderate turbulence for about 10 seconds.

According to the flight attendants (FA), very shortly after being notified by the captain, the turbulence was encountered. The aft flight attendant was returning to her jumpseat when the turbulence occurred and she was thrown to the floor. After the encounter, she was helped back to her jumpseat by another FA and they informed the flight crew. The flight was met at the gate by medical personnel and the FA was transported to the hospital and diagnosed with a broken left ankle.

An NTSB Weather Study indicated likely mountain wave conditions between 11,000 and 14,000 feet with cloud formation near the accident site and points eastward, and cloud tops near 15,000 ft.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

an encounter with mountain wave turbulence.

Findings

Environmental issues	Terrain induced turbulence - Effect on personnel
-----------------------------	--

Factual Information

History of Flight

Enroute-descent	Turbulence encounter (Defining event)
-----------------	---------------------------------------

Pilot Information

Certificate:	Airline transport	Age:	57
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	5-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	April 5, 2019
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	August 13, 2019
Flight Time:	9639 hours (Total, all aircraft), 110 hours (Last 90 days, all aircraft), 27 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport	Age:	48
Airplane Rating(s):	Single-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	5-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	January 14, 2019
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	August 8, 2018
Flight Time:	6835 hours (Total, all aircraft), 201.5 hours (Last 90 days, all aircraft), 98.5 hours (Last 30 days, all aircraft), 5.2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Airbus	Registration:	N328FR
Model/Series:	A320 251N	Aircraft Category:	Airplane
Year of Manufacture:	2018	Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	8118
Landing Gear Type:	Retractable - Tricycle	Seats:	
Date/Type of Last Inspection:		Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	2 Turbo fan
Airframe Total Time:		Engine Manufacturer:	
ELT:		Engine Model/Series:	
Registered Owner:	Wells Fargo Trust Co Na Trustee	Rated Power:	
Operator:	FRONTIER AIRLINES INC	Operating Certificate(s) Held:	Flag carrier (121)
Operator Does Business As:		Operator Designator Code:	F3LA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Few	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	
Precipitation and Obscuration:			
Departure Point:	Minneapolis, MN (MSP)	Type of Flight Plan Filed:	IFR
Destination:	Denver, CO (DEN)	Type of Clearance:	IFR
Departure Time:	06:00 Local	Type of Airspace:	Class B

Airport Information

Airport:	Denver international Airport KDEN	Runway Surface Type:	Asphalt
Airport Elevation:	5434 ft msl	Runway Surface Condition:	Dry
Runway Used:	16L	IFR Approach:	Visual
Runway Length/Width:	12000 ft / 150 ft	VFR Approach/Landing:	Full stop

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	None
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Serious	Latitude, Longitude:	39.861667,-104.673057(est)

Administrative Information

Investigator In Charge (IIC): English, William

Additional Participating Persons:

Original Publish Date: April 22, 2020

Last Revision Date:

Investigation Class: [Class](#)

Note: This accident report documents the factual circumstances of this accident as described to the NTSB.

Investigation Docket: <https://data.nts.gov/Docket?ProjectID=100174>

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](#).