



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	40 nm vicinity south of Lake Jackson, Texas	Accident Number:	DCA18CA303
Date & Time:	September 20, 2018, 18:30 UTC	Registration:	N233SW
Aircraft:	Embraer EMB120	Aircraft Damage:	Substantial
Defining Event:	Turbulence encounter	Injuries:	2 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

On September 20, 2018, about 1830 UTC, a Berry Aviation Inc. Embraer EMB-120ER, N233SW, found substantial damage to the cargo area after arriving at Queretaro International Airport (MMQT), Queretaro, Mexico. The two flight crew members were not injured. The flight was being operated as a 14 *Code of Federal Regulations* Part 135 international cargo flight from Shreveport Regional Airport (KSHV), Shreveport, Louisiana, to MMQT.

While in cruise flight in Houston, Texas, airspace, the flight crew noticed a storm cell on the weather radar, however, they continued on their routing since they would stay south of the storm. While passing the storm, they encountered severe turbulence for a short period of time. The flight crew notified ATC of the location of the severe turbulence and continued the flight.

Upon arrival at MMQT, the flight crew entered the cargo area where they noticed several panels had fallen and were hanging from their attachment points. Further maintenance inspection revealed buckling to four fuselage frames and four floor support structures that covered an area several feet long. The damage was classified as substantial as it would adversely affect the structural strength of the fuselage.

The flight crew reported they picked up four pallets of cargo at John C. Munro Hamilton International Airport (CYHM), Hamilton, Ontario, Canada. Two of the pallets were loaded in zone 2 and two were loaded into zone 3. The pallets were secured with vertical cargo nets. The flight crew departed CYHM at 1322 UTC and arrived at KSHV at 1657 to clear US customs and to take on fuel. They departed KSHV at 1727 UTC for MMQT.

After the accident, the operator reminded flight crews to fly 5 or more miles away from thunderstorm cells identified on the weather radar and to secure cargo better to decrease the likelihood that it will shift during turbulence encounters.

Probable Cause and Findings

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

an encounter with severe turbulence, which caused the improperly secured cargo to shift and damage the airplane floor structure.

Findings

Environmental issues	Convective turbulence - Contributed to outcome
Aircraft	(general) - Incorrect use/operation

Factual Information

History of Flight

Enroute	Turbulence encounter (Defining event)
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Pilot Information

Certificate:	Commercial; Private	Age:	33, Male
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:	June 1, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	(Estimated) 2628 hours (Total, all aircraft), 1975 hours (Total, this make and model), 751 hours (Pilot In Command, all aircraft), 188 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:		Age:	46
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-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 2 Without waivers/limitations	Last FAA Medical Exam:	July 6, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	June 2, 2018
Flight Time:	1440 hours (Total, all aircraft), 201 hours (Total, this make and model), 1202 hours (Pilot In Command, all aircraft), 171 hours (Last 90 days, all aircraft), 87 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Embraer	Registration:	N233SW
Model/Series:	EMB120 ER	Aircraft Category:	Airplane
Year of Manufacture:	1995	Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	120307
Landing Gear Type:	Retractable - Tricycle	Seats:	3
Date/Type of Last Inspection:	September 4, 2018	Certified Max Gross Wt.:	26433 lbs
Time Since Last Inspection:		Engines:	2
Airframe Total Time:	44386.7 Hrs as of last inspection	Engine Manufacturer:	Pratt & Whitney Canada
ELT:	C126 installed, not activated	Engine Model/Series:	PW118
Registered Owner:		Rated Power:	
Operator:		Operating Certificate(s) Held:	Commuter air carrier (135)

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:	Clear	Visibility	
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:	Shreveport, LA (KSHV)	Type of Flight Plan Filed:	IFR
Destination:	Queretaro, OF (MMQT)	Type of Clearance:	IFR
Departure Time:	17:27 UTC	Type of Airspace:	Class E

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	29.034444,-95.446388(est)

Administrative Information

Investigator In Charge (IIC):	Ward, Effie Lorenda		
Additional Participating Persons:			
Original Publish Date:	February 24, 2022	Investigation Class:	4
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=98472		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).