



Aviation Investigation Final Report

Location:	San Marcos, Texas	Accident Number:	CEN24LA085
Date & Time:	January 2, 2024, 17:10 Local	Registration:	N46MF
Aircraft:	Learjet 35	Aircraft Damage:	Substantial
Defining Event:	Runway excursion	Injuries:	5 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled - Air Medical (Discretionary)		

Analysis

While in cruise flight approaching the descent for landing, the crew received automated weather information that was about an hour old that reported wind from the northeast. The crew selected the precision approach to the airport, which landed toward the southeast. Unknown to the crew, the wind had shifted from the northeast to a tailwind from the northwest and had increased in velocity with gusts. They did not request current weather during the descent, and no weather information was provided by the tower controller.

Recorded data for the approach revealed that the airplane had a 15-knot tailwind and a steep descent rate before the landing, which exceeded the company's general operation manual's criteria for a stabilized approach. Data showed the airplane touched down at 124 knots about halfway down runway 13, which was wet, with about 2,600 ft remaining. The captain applied the brakes and reported that they were unresponsive. The airplane overran the runway and traveled into a grass field. The nose landing gear separated from the airplane, resulting in substantial damage to the fuselage. The first officer (FO) stated that he perceived that the airplane had hydroplaned on landing.

A performance study conducted for the accident flight using available airplane and weather information revealed the landing distance for the airplane on a wet/contaminated runway was 4,550 ft; runway 13 was 5,601 ft. The calculated landing reference speed to included "half the gust factor" was 125 knots. The manufacturer's flight manual lists the maximum tailwind component as 10 knots. The landing data for the flight could not be calculated since the actual tailwind component at the time of the landing exceeded 10 knots.

Probable Cause and Findings

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

The captain's failure to perform a go-around following an unstable approach while landing with a gusty tailwind, which resulted in the airplane touching down long on the wet runway with insufficient distance to stop. Contributing to the accident was the crew's unawareness of the prevailing winds and first officer's decision to not call a go-around.

Findings

Personnel issues	Knowledge of meteorologic cond - Flight crew
Environmental issues	Tailwind - Awareness of condition
Environmental issues	Tailwind - Effect on operation
Personnel issues	Decision making/judgment - Pilot
Personnel issues	Decision making/judgment - Copilot

Factual Information

History of Flight

Landing-landing roll	Runway excursion (Defining event)
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On January 2, 2024, about 1710 central standard time, a Learjet 35A, N45MF, was substantially damaged when it was involved in an accident near San Marcos, Texas. The two pilots and three passengers were not injured. The airplane was operated under the provisions of Title 14 *Code of Federal Regulations* Part 135 as an air medical transport flight.

The airplane departed Albuquerque International Sunport Airport (ABQ), Albuquerque, New Mexico, about 1448 mountain standard time with the captain flying, and flew to San Marcos Regional Airport (HYI), Austin, Texas.

A review of air traffic control radio transmissions, ADS-B data, pilot statements, and weather information revealed that while the airplane was en route to its destination, the crew checked the weather with the airplane's Garmin 750 system. The crew also listened to the airport's Automatic Terminal Information Service, which reported wind from 310° at 12 knots, gusts to 24 knots, visibility 9 miles, lightning in the vicinity, and an overcast ceiling at 900 ft. The pilot briefed the ILS 13 instrument approach and was informed by the approach controller that they were using the RNAV GPS approach to runway 8 or 35. Thinking they heard someone make a missed approach, the captain requested to use the ILS approach to runway 13. After receiving vectors, the captain intercepted the approach course and began to fly the approach. When the crew checked in with HYI tower, the tower acknowledged them and later cleared them to land on runway 13. No updated weather was provided to the flight crew by the tower controller over the radio and the flight crew did not request a wind check.

The captain reported that the airplane broke out of the clouds about 500 ft above the ground and that the visibility was poor. The first officer (FO) called out that the runway end identifier lights were in sight, which the captain then also saw along with the runway. The captain flew the airplane to the runway, touched down, applied the brakes, and deployed the spoilers. After he applied normal pressure to the brakes, the airplane showed no signs of deceleration on the wet runway. The captain pushed harder on the brakes with no improvement to the braking action. He called to the FO that the airplane had "no brakes" and seeing the airplane was going to overrun the end of the runway, veered left to avoid damaging the localizer antenna. The airplane departed the end of the runway and traveled into a grass field. The nose landing gear separated from the airplane, resulting in substantial damage to the fuselage.

The FO reported that during the approach, the captain had difficulty maintaining course alignment due to the autopilot "not working the way it was supposed to." The FO advised the

captain to hand fly the approach and not continue attempting to configure the autopilot. Later on the approach, the FO called out having the airport and the precision approach path indicators in sight at the airplane's "12 o'clock" and stated that the landing was assured. The captain did not respond, so the FO asked if the captain could see the runway, to which the captain responded no. He informed the captain the runway was "down" and the captain saw the runway. The captain then "abruptly chopped power and descended to land at a rapid pace." After the airplane touched down the FO perceived that they were hydroplaning, and the airplane ran off the end of the runway. The FO stated that a go-around should have been initiated before the landing.

A review of weather information for the airport found that at 1600 CST, about 70 minutes before the accident, the automated weather reporting facility at the airport recorded wind from 070° at 8 knots, visibility 10 miles, thunderstorms in the vicinity, and light rain. About an hour later at 1706 CST, the automated weather observation facility at the airport reported a wind from 310° at 12 knots gusting to 24 knots, visibility 9 miles, and an overcast ceiling at 900 ft.

Recorded data for the approach found that the airplane had about 15 knots of tailwind and a descent rate that exceeded 2,000 ft/min about 10 seconds before the landing. The descent rate reduced to 1,000 ft/min about 3 seconds before touchdown. The airplane touched down at 124 knots calibrated airspeed about halfway down the runway, with about 2,600 ft remaining.

A performance study conducted for the accident flight using available airplane and weather information revealed that the landing distance for the airplane on a wet/contaminated runway was 4,550 ft. Of note, runway 13 was 5,601 ft. The calculated base landing reference speed would be 119 knots, which then would have been increased for "half the gust factor" to 125 knots. The manufacturer's flight manual lists the maximum tailwind component as 10 knots, so landing data could not be accurately calculated for the accident flight.

A review of the flight's general operations manual found the criteria for a stabilized approach as "one of the key features of safe approaches and landings. It is characterized by a constant-angle, constant-rate of descent approach profile ending near the touchdown point, where the landing maneuver begins. A stabilized approach is the safest profile in all but special cases, in which another profile may be required by unusual conditions." The manual stated the flight should be stabilized by 1,000 ft above touchdown in instrument meteorological conditions. Also, it states that "[i]f an unexpected, sustained rate of descent greater than 1,000 fpm is encountered during the approach, a missed approach should be performed."

Pilot Information

Certificate:	Airline transport; Flight instructor	Age:	71, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Glider; Helicopter	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Glider; Helicopter; Instrument airplane	Toxicology Performed:	
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	July 11, 2023
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	December 8, 2023
Flight Time:	11000 hours (Total, all aircraft), 2200 hours (Total, this make and model), 7400 hours (Pilot In Command, all aircraft), 65 hours (Last 90 days, all aircraft), 25 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Commercial	Age:	27, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	January 18, 2003
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	September 14, 2023
Flight Time:	789 hours (Total, all aircraft), 165 hours (Total, this make and model), 338 hours (Pilot In Command, all aircraft), 101 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Learjet	Registration:	N46MF
Model/Series:	35 A	Aircraft Category:	Airplane
Year of Manufacture:	1981	Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	377
Landing Gear Type:	Retractable - Tricycle	Seats:	9
Date/Type of Last Inspection:	October 5, 2023 AAIP	Certified Max Gross Wt.:	18300 lbs
Time Since Last Inspection:		Engines:	2 Turbo fan
Airframe Total Time:	14813 Hrs at time of accident	Engine Manufacturer:	Honeywell
ELT:	Installed, not activated	Engine Model/Series:	TFE731-2C-2B
Registered Owner:	MED FLIGHT AIR AMBULANCE INC	Rated Power:	3500 Lbs thrust
Operator:	MED FLIGHT AIR AMBULANCE INC	Operating Certificate(s) Held:	Commuter air carrier (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	Condition of Light:	Day
Observation Facility, Elevation:	KHYI, 597 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	17:06 Local	Direction from Accident Site:	307°
Lowest Cloud Condition:		Visibility	9 miles
Lowest Ceiling:	Overcast / 900 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	12 knots / 24 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	310°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.07 inches Hg	Temperature/Dew Point:	10°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Albuquerque, NM (ABQ)	Type of Flight Plan Filed:	IFR
Destination:	San Marcos, TX	Type of Clearance:	IFR
Departure Time:	14:48 Local	Type of Airspace:	Class D

Airport Information

Airport:	SAN MARCOS RGNL HYI	Runway Surface Type:	Asphalt
Airport Elevation:	594 ft msl	Runway Surface Condition:	Wet
Runway Used:	13	IFR Approach:	ILS
Runway Length/Width:	5601 ft / 100 ft	VFR Approach/Landing:	Full stop

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	5 None	Latitude, Longitude:	29.885406,-97.855343(est)

Preventing Similar Accidents

Stabilized Approaches Lead to Safe Landings (SA-077)

The Problem

Failing to establish and maintain a stabilized approach, or continuing an unstabilized approach, could lead to landing too fast or too far down the runway, potentially resulting in a runway excursion, loss of control, or collision with terrain. Regardless of the type of aircraft, the level of pilot experience, or whether the flight is being conducted under instrument flight rules or visual flight rules, a stabilized approach is key to maintaining control of the aircraft and ensuring a safe landing.

What can you do?

- Follow SOPs and industry best practices for stabilized approach criteria, including a normal glidepath, specified airspeed and descent rate, landing configuration (flaps, gear, etc.), appropriate power setting, landing checklists, and a heading that ensures only small changes are necessary to maintain runway alignment. Guidance and tips (see the “Interested in more information?” section) indicate that, in most cases, the approach should be stabilized by 1,000 ft in instrument conditions or 500 ft in visual conditions. If the approach becomes unstabilized at any time after that, go around.
- Practice go-arounds and missed approaches so that you are comfortable with the procedures when needed. Remember to establish personal minimums for all types of operations, including go-arounds and missed approaches.
- Use effective single-pilot resource management or crew resource management. A stabilized approach begins with an effective approach briefing. Ensure that you understand critical aspects of the approach, such as the minimum safe altitude, hazards, approach conditions, and missed approach procedures.
- Do not allow perceived operational pressures (for example, from air traffic controllers, passengers, etc.), continuation bias, or last-minute runway changes to influence your decision to execute a go-around; if your approach is not stabilized, go around.
- Never attempt to “save” an unstabilized approach. If the approach becomes unstabilized, conduct an immediate go-around. Remember, when two pilots are on duty, either crewmember may call for a go-around at any time.

See <https://www.nts.gov/Advocacy/safety-alerts/Documents/SA-077.pdf> for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Aguilera, Jason
Additional Participating Persons:	Benjamin Huffman; FAA FSDO; San Antonio, TX Andrew Field; Bombardier Aviation; Dorval, OF
Original Publish Date:	February 26, 2025
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=193628

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](#).