National Transportation Safety Board
Aviation Accident Final Report

Location:	Moorhead, MN	**Accident Number:**	CEN17LA043
Date & Time:	11/23/2016, 1759 CST	**Registration:**	N80RT
Aircraft:	BEECH 200	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	3 Minor, 4 None
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

The commercial pilot was conducting an on-demand passenger flight at night in instrument meteorological conditions that were at/near straight-in approach minimums for the runway. The pilot flew the approach as a nonprecision LNAV approach, and he reported that the approach was stabilized and that he did not notice anything unusual. A few seconds after leveling the airplane at the missed approach altitude, he saw the runway end lights, the strobe lights, and the precision approach path indicator. He then disconnected the autopilot and took his hand off the throttles to turn on the landing lights. However, before he could turn on the landing lights, the runway became obscured by clouds. The pilot immediately decided to conduct a missed approach and applied engine power, but the airplane subsequently impacted terrain short of the runway in a nose-up level attitude. The pilot reported that there were no mechanical anomalies with the airplane that would have precluded normal operation. It is likely the pilot lost sight of the runway due to the visibility being at/near the straight-in approach minimums and that the airplane got too low for a missed approach, which resulted in controlled flight into terrain.

A passenger stated that he and the pilot were not wearing available shoulder harnesses. The passenger said that he was not informed that the airplane was equipped with shoulder harnesses or told how to adjust the seats. The pilot sustained injuries to his face in the accident.

Probable Cause and Findings

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

The pilot's failure to attain a positive climb rate during an attempted missed approach in night instrument meteorological conditions that were at/near approach minimums, which resulted in controlled flight into terrain.

Findings

Aircraft	Climb rate - Not attained/maintained (Cause) Emergency equipment - Not used/operated
Personnel issues	Aircraft control - Pilot (Cause) Issuing instructions - Pilot
Environmental issues	Ceiling/visibility/precip - Effect on operation (Cause)

Factual Information

On November 23, 2016, at 1759 central standard time, a Beech 200, N80RT, impacted terrain during a missed approach from runway 30 at Moorhead Municipal Airport (JKJ), Moorhead, Minnesota. The pilot initiated a missed approach after losing visual reference of the runway environment during the final segment of a GPS instrument approach. The pilot and two passengers sustained minor injuries and four passengers were uninjured. The airplane received substantial damage. The airplane was operated by Flight Development, LLC under the provisions of 14 Code of Federal Regulations Part 135 as a single-pilot on-demand passenger flight. The flight was operating on an instrument rules flight plan. Night instrument meteorological conditions prevailed at the time of the accident. The flight departed from Baudette International Airport (BDE), Baudette, Minnesota, at 1714 and was destined to JKJ.

A passenger stated that he and his work crew had been flying between Baudette and Moorhead on a weekly basis for the past 5-6 weeks to build agricultural storage facilities. The passenger stated that the pilot had flown the work crew on one of the previous flights, and the remainder of the flights were flown by the company chief pilot and the company director of operations.

The passenger stated that the accident flight was the first flight in which he was seated in the copilot seat. The passenger stated that he and the pilot were not wearing a shoulder harness. The passenger stated that he was not informed that the airplane was equipped with shoulder harnesses, how to use them, and how to adjust the seats. The passenger stated that he would have adjusted the seat if he would have known that was an option and used his shoulder harness, as he is a safety conscious person.

The pilot stated that before he was handed off from Minneapolis Center to Fargo Approach, he listened to the automated weather observing system (AWOS) at JKJ, which reported that light north winds, a ceiling of 300 feet above ground level, and 1.25 statute mile visibility. He checked in with Fargo Approach and informed them that he had the weather at JKJ and requested the area navigation (RNAV) approach to runway 30 starting at IVEJE, the initial approach fix (IAF). N80RT was not equipped with a wide area augmentation system (WAAS) GPS so he flew the approach as a non-precision lateral navigation (LNAV) approach (straight-in approach minima were: 300 feet above ground level and 1 statute mile visibility). He told Fargo Approach that he realized the weather was deteriorating and would make one attempt at JKJ and then divert to Hector International Airport (FAR), Fargo, North Dakota. Fargo Approach issued a clearance to the IAF, and initial approach altitude, and provided missed approach instructions. The pilot stated that he had flown this approach numerous times and briefed the approach. He stated that the approach was stabilized with the appropriate altitudes and airspeeds throughout and did not notice anything unusual. Upon leveling off at the missed approach altitude of 1,300 feet mean sea level, he looked for the runway. After what seemed like just a few seconds he saw the runway end lights, the strobe lights, and the precision approach path indicator. He disconnected the autopilot and took his hand off the throttles to turn on the landing lights for landing. Before he could even turn on the landing lights, the runway disappeared from sight due to the clouds. He immediately decided to perform a missed approach and applied engine power. He said that he referenced the flight director, but did not recall what it was indicating. He did not feel any sinking feeling indicating that he was losing

altitude. He said that It seemed like just a few seconds before the airplane impacted the ground. The airplane struck the ground in somewhat of a nose-up, level bank attitude. The airplane slid along the ground and turned slightly to the right before coming to rest.

The passenger stated that prior to departure, the pilot said they needed to get going because the weather was getting bad in Fargo. While en route, the passenger heard Fargo Air Traffic Control Tower advise weather was not good, and the pilot stated he would try to fly to JKJ first and then fly to FAR, if that did not work. The passenger said the pilot asked him to be on the lookout for the runway and about 3,600 feet the airplane banked to line up for the approach. The passenger said he heard an audible "too low" warning three times, saw some runway lights at eye level, and then the airplane impacted the ground. The passenger said he did not think the pilot initiated a go-around, and he did not see him adjust engine power settings or move the control yoke. The passenger stated that he received facial injuries that required stitches.

The pilot reported that there was no mechanical malfunction/failure with the airplane.

The pilot's safety recommendation on how the accident could have been prevented was:

"Stick to my normal personal weather minimums and not attempt a non-precision approach to minimums. It would of been so easy to go to Fargo and do the ILS. I have always lectured to my students on the advantage of having two pilots when things are challenging. This is a prime example of such [an accident]. Over confidence is always something that we have to try to keep in check."

A review of the pilot's training records showed that the pilot completed the company's Federal Aviation Administration (FAA) approved ground and flight training program, dated August 17, 2016. The ground training was conducted by the company director of operations and the company chief pilot. The pilot's flight training, which was 10.8 hours in duration, was conducted by the company chief pilot. The pilot received and passed his most recent Part 135.293 Airman Proficiency Check, dated August 18, 2016, which was conducted by an FAA inspector from the Fargo Flight Standards District Office. The check was performed using a Beech 200 and was 1.7 hours in flight duration. The pilot received a grade of satisfactory for all of the check's maneuvers/procedures.

FAA Advisory Circular 91-65, Use of Shoulder Harnesses in Passenger Seats, states in part:

On December 17, 1985, the National Transportation Safety Board (NTSB) issued safety recommendation A-85-124, recommending issuance of advisory circular to provide information on crash survivability aspects of small aircraft. The recommendation was the result of an NTSB general aviation airplane crashworthiness project. In the project, the safety board examined 500 relatively severe general aviation airplane accident, to determine what proportion of the occupants would have benefited from the use of shoulder harnesses and energy-absorbing seats. The safety board found that 20 percent of the fatally-injured occupants in these accidents could have survived with shoulder harnesses (assuming the seat belt was fastened) and 88 percent of the seriously injured could have had significantly less severe injuries with the use of shoulder harnesses. Energy-absorbing seats could have benefited 34 percent

of the seriously injured. The safety board concluded that shoulder harness use is the most effective way of reducing fatalities and serious injuries in general aviation accidents.

Part 135.117, Briefing of Passengers Before Flight, states that before each takeoff each pilot in command of an aircraft carrying passengers shall ensure that all passengers have been orally briefed on: the use of seat belts, the placement of seat backs in an upright position before takeoff and landing, location and means for opening the passenger entry door and emergency exits, location of survival equipment, if the flight involves extended overwater operation, ditching procedures and the use of required flotation equipment, if the flight involves operations above 12,000 feet MSL, the normal and emergency use of oxygen, and location and operation of fire extinguishers.

History of Flight

Approach-IFR final approach	Loss of visual reference
Approach-IFR missed approach	Controlled flight into terr/obj (CFIT) (Defining event) Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	**Age:**	59, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 None	**Last Medical Exam:**	09/20/2016
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	08/18/2016
Flight Time:	5630 hours (Total, all aircraft), 89 hours (Total, this make and model), 5345 hours (Pilot In Command, all aircraft), 149 hours (Last 90 days, all aircraft), 46 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	BEECH	**Registration:**	N80RT
Model/Series:	200	**Aircraft Category:**	Airplane
Year of Manufacture:	1978	**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	BB-370
Landing Gear Type:	Tricycle	**Seats:**	11
Date/Type of Last Inspection:	100 Hour	**Certified Max Gross Wt.:**	12500 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo Prop
Airframe Total Time:		**Engine Manufacturer:**	Pratt&Whitney
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	PT6A-41
Registered Owner:	SLICE OF THE 406 LLC	**Rated Power:**	1050 hp
Operator:	Flight Development, LLC	**Air Carrier Operating Certificate:**	On-demand Air Taxi (135)
Operator Does Business As:		**Operator Designator Code:**	VOXA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Night
Observation Facility, Elevation:	JKJ, 918 ft msl	**Observation Time:**	1754 CST
Distance from Accident Site:	1 Nautical Miles	**Direction from Accident Site:**	120°
Lowest Cloud Condition:	Clear	**Temperature/Dew Point:**	1°C / 1°C
Lowest Ceiling:	Overcast / 300 ft agl	**Visibility**	0.5 Miles
Wind Speed/Gusts, Direction:	7 knots, 350°	**Visibility (RVR):**	
Altimeter Setting:	30.1 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	Moderate - Fog; No Precipitation		
Departure Point:	Baudette, MN (BDE)	**Type of Flight Plan Filed:**	IFR
Destination:	Moorhead, MN (JKJ)	**Type of Clearance:**	IFR
Departure Time:	1714 CDT	**Type of Airspace:**	

Airport Information

Airport:	Moorhead Municipal Airport (JKJ)	**Runway Surface Type:**	Asphalt
Airport Elevation:	918 ft	**Runway Surface Condition:**	
Runway Used:	30	**IFR Approach:**	Global Positioning System
Runway Length/Width:	4300 ft / 75 ft	**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Minor, 4 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Minor, 4 None	**Latitude, Longitude:**	46.839167, -96.664167 (est)

Administrative Information

Investigator In Charge (IIC):	Mitchell F Gallo	**Adopted Date:**	09/06/2017
Additional Participating Persons:	Perry Ochsner; Federal Aviation Administration; Fargo, ND		
Publish Date:	09/06/2017		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=94427		