



National Transportation Safety Board Aviation Accident Final Report

Location:	Sioux City, Iowa	Accident Number:	CEN10LA105
Date & Time:	January 19, 2010, 07:15 Local	Registration:	N586BC
Aircraft:	Beech B200	Aircraft Damage:	Substantial
Defining Event:	Collision with terr/obj (non-CFIT)	Injuries:	4 None
Flight Conducted Under:	Part 91: General aviation		

Analysis

The pilot of the Part 91 business flight filed an instrument-flight-rules (IFR) flight plan with the destination and alternate airports, both of which were below weather minimums. The pilot and copilot departed from the departure airport in weather minimums that were below the approach minimums for the departure airport. While en route, the destination airport's automated observing system continued to report weather below approach minimums, but the flight crew continued the flight. The flight crew then requested and were cleared for the instrument landing system (ILS) 31 approach and while on that approach were issued visibilities of 1,800 feet runway visual range after changing to tower frequency. During landing, the copilot told the pilot that he was not lined up with the runway. The pilot reportedly said, "those are edge lights," and then realized that he was not properly lined up with the runway. The airplane then touched down beyond a normal touchdown point, about 2,800 feet down the runway, and off the left side of the runway surface. The airplane veered to the left, collapsing the nose landing gear. Both flight crewmembers had previous experience in Part 135 operations, which have more stringent weather requirements than operations conducted under Part 91. Under Part 135, IFR flights to an airport cannot be conducted and an approach cannot begin unless weather minimums are above approach minimums. The accident flight's departure in weather below approach minimums would have precluded a return to the airport had an emergency been encountered by the flight crew, leaving few options and little time to reach a takeoff alternate airport. The company's flight procedures allow for a takeoff to be performed as long as there is a takeoff alternate airport within one hour at normal cruise speed and a minimum takeoff visibility that was based upon the pilot being able to maintain runway alignment during takeoff. The company's procedures did not allow flight crew to depart to an airport that was below minimums but did allow for the flight crew, at their discretion, to perform a "look-see" approach to approach minimums if the weather was below minimums. The allowance of a "look see" approach essentially negates the procedural risk mitigation afforded by requiring approaches to be conducted only when weather was above approach minimums.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flight crew's decision to attempt a flight that was below takeoff, landing, and alternate airport weather minimums, which led to a touchdown off the runway surface by the pilot-in-command.

Findings

Personnel issues	Decision making/judgment - Flight crew
Environmental issues	Below approach minima - Effect on operation
Organizational issues	(general) - Operator

Factual Information

HISTORY OF FLIGHT

On January 19, 2010, at 0715 central standard time, a Hawker Beechcraft Corp. B200, N586BC, operated by Blue Cross and Blue Shield of Iowa (BCBS) received substantial damage on impact with terrain during landing on runway 31 at Sioux Gateway Airport/Col. Bud Day Field (SUX), Sioux City, Iowa. Instrument meteorological conditions prevailed at the time of the accident. The pilot, copilot, and two passengers were uninjured. The 14 CFR Part 91 business flight was operating on an instrument flight rules flight (IFR) plan. The flight originated from Des Moines International Airport (DSM), Des Moines, Iowa, at 0636, and was en route to SUX.

The right seat pilot said that for the first leg of a flight the flying pilot is the pilot-in-command (PIC) The PIC obtains weather and files the flight plan. On the day of the accident, there were four legs scheduled; the left seat pilot was to fly the first two legs, and the right seat pilot was to fly the remaining two legs. Both pilots obtained weather information and discussed the weather displayed on the WSI screen for SUX and Rapid City Regional Airport (RAP), Rapid City, South Dakota. They both discussed the weather and that there was a “good chance” that they may not be able to land at SUX. RAP was chosen as the alternate airport because it was their second destination. The right seat pilot said the weather in RAP was “good.” The right seat pilot later stated that he didn’t know what alternate airports were filed by the left seat pilot, whether it was RAP or Joe Foss Field Airport (FSD), Sioux Falls, South Dakota.

The right seat pilot stated that they departed from DSM and were en route to SUX where they were going to pick up two additional passengers. The right seat pilot said that he and the left seat pilot felt no pressure in completing the accident flight, and that the company would not question them if they didn’t complete a flight.

The right seat pilot stated that while en route to SUX, the cloud tops were at 16,000 feet. He said that the left seat pilot never told him that he didn’t want to perform the approach. He thought they were in visual meteorological conditions when they began the approach and guessed that the cloud tops were 3,500 feet. They obtained the SUX automatic terminal information service (ATIS) prior to the beginning the approach and also obtained a new ATIS report “shortly” before they received vectors onto the approach course.

According to a recording of air traffic control communications, N586BC was instructed to change to SUX tower frequency from SUX approach control frequency while the airplane was on the instrument landing system (ILS) runway 31 approach. N586BC contacted the tower and was issued runway 31 touchdown and rollout runway visual ranges (RVRs) of 1,800 feet. (A 2,400 feet RVR equates to 1/2 statute mile (SM) and a 1,600 feet RVR equates to 1/4 SM).

The right seat pilot stated that when they arrived at the approach minimums, they had the runway environment in sight. They saw lights at 250 feet, and saw the runway at decision height. The right seat pilot said there was “no question” that the left seat pilot did not go below minimums. At less than 100 feet, the right seat pilot turned off the yaw dampener, turned on

the landing lights, and called reference (REF) speeds at 100 feet and 50 feet. The left seat pilot used approach flaps and a “little” higher REF speed. At less than 100 feet, the right seat pilot told the left seat pilot that he was not lined up with the runway, to which the left seat pilot responded, “those are edge lights” and “oh yeah, I see what I’m doing.” The left seat pilot added “a little” power to correct, which carried the airplane down the runway. The airplane touched down 3,000 – 3,500 feet down the runway, near the intersection of runway 35, with the left main landing gear off the runway surface. The airplane then veered off the runway.

According to the left seat pilot’s statement, the flight was uneventful from DSM to SUX. The visibility was reported at ½ mile and an indefinite ceiling of 100 feet. He stated that the transition from instrument flying to visual flying was made into a white-on-white landscape. The pilot also stated that this was not a reportable accident.

According to the Federal Aviation Administration (FAA), the airplane touched down about 2,800 feet down runway 31 with the left landing gear off the runway surface. The airplane nose landing gear collapsed, and the nose section and avionics were damaged. The airplane sustained buckling of the underside fuselage skin and damage to the nose section structure.

There had been no arrivals at SUX by other aircraft prior to the accident flight.

PERSONNEL INFORMATION

The left seat pilot, age 55, held an airline transport pilot (ATP) certificate with an airplane multiengine land rating and an airplane single-engine land rating with commercial privileges. He held a Cessna 560XL type rating with a limitation of SIC privileges only. He also held a flight instructor certificate with an airplane single-engine rating, which expired September 30, 1989. He accumulated a total flight time of 6,018 hours, of which 1,831 hours were in the accident airplane make and model.

The left seat pilot had been employed as a pilot since 1987 with three commercial operators and his last employment was with a Part 135 operator based in Ankeny, Iowa. He was then employed as a pilot by Wellmark, Inc. (BCBS aviation department) on April 24, 2002, and served as PIC on the company B200 and as second-in-command on the company’s Cessna 560XL. He received recurrent annual pilot training on the B200 airplanes through CAE SimuFlite located in Dallas, Texas. On June 25, 2009, he completed his last flight review during B200 recurrent training at CAE SimuFlite. He has attended SimuFlite for B200 recurrent training annually since employed by Wellmark, Inc.

The right seat pilot, age 36, held an ATP certificate with an airplane multiengine land rating and an airplane single-engine land rating with commercial privileges. He held a Cessna 560XL type rating with no limitations. He also held a flight instructor certificate with an airplane single-engine rating, multiengine, and instrument airplane ratings. He held a ground instructor certificate with an advanced rating. He accumulated a total flight time of 6,892 hours, of which 2,186 hours were in the accident airplane make and model.

The right seat pilot, age 36, was employed as a pilot since 2001 at the Part 135 operator where the left seat pilot had been employed. The right seat pilot provided ground and flight

instruction for private, commercial, and instrument ratings at the Part 135 operator's Part 61 flight school and also instruction for the operator's Part 135 flight department. He was then employed as a pilot by Wellmark, Inc. on January 3, 2005, and served as PIC on the company's B200 and Citation Excel. He received recurrent annual pilot training on B200 airplanes through CAE SimuFlite located in Dallas, Texas. On August 31, 2009, he completed his last flight review during B200 recurrent training at CAE SimuFlite. He has attended SimuFlite for B200 recurrent training annually since employed by Wellmark, Inc.

METEOROLOGICAL INFORMATION

The DSM automated surface observing system (ASOS) recorded the following observations:

At 0554, wind - 120 at 5 knots, visibility - 1/4 statute mile (SM), runway 31 runway visual range (RVR) - 2,600 feet variable 3,000 feet, weather phenomena - moderate freezing fog (FZFG), sky condition - overcast 100 feet above ground level (AGL), temperature - -4 degrees Celsius (C), dew point - -6 degrees C, altimeter - 29.96 inches of mercury (Hg), remarks: ...surface visibility - 1/2 SM...

At 0654, wind - 140 degrees at 6 knots, visibility - 1/4 SM, RVR runway 31 - 2,000 feet variable 2,600 feet, weather phenomena - moderate FZFG, sky condition - overcast 100 feet AGL, temperature - -4 degrees C, dew point - -6 degrees C, altimeter - 29.97 inches of mercury (Hg), remarks: ...surface visibility - 1/2 SM...

The SUX ASOS recorded the following observations:

At 0552, wind - 130 degrees at 5 knots, visibility - 1/2 SM, weather phenomena - moderate FZFG, sky condition - vertical visibility (VV) 100 feet AGL, temperature - -4 degrees C, dew point - -6 degrees C, altimeter 29.92 inches Hg...

At 0652, wind - 120 degrees at 6 knots, visibility - 1/2 SM, weather phenomena - moderate FZFG, sky condition - VV 100 feet AGL, temperature - -4 degrees C, dew point 6 degrees C, altimeter 29.91 inches Hg...

At 0725, wind - 120 degrees at 8 knots, visibility - 1/4 SM, weather phenomena - moderate FZFG, sky condition - VV 100 feet AGL, temperature - -4 degrees C, dew point - -7 degrees, altimeter 29.91 inches Hg...

The FSD ASOS recorded the following observations:

At 0540, wind - 160 degrees at 6 knots, visibility - 1/2 SM, weather phenomena - moderate FZFG, sky condition - overcast 100 feet AGL, temperature - -8 degrees C, dew point - -9 degrees, altimeter 29.89 inches Hg...

At 0736, wind - 140 degrees at 6 knots, visibility - 1/2 SM, weather phenomena - moderate FZFG, sky condition - overcast 300 feet AGL, temperature - -8 degrees C, dew point - -9 degrees, altimeter 29.87 inches Hg...

FSD ASOS recorded observations continued to report visibility – 1/2 SM and sky condition – overcast 300 feet AGL until 0806 when visibility became 1/4 SM and sky condition became broken 100 feet AGL.

The Pierre Regional Airport (PIR), Pierre, South Dakota, ASOS recorded the following observations:

At 0553, wind – 130 at 12 knots, visibility – 1/2 SM, weather phenomena – moderate FZFG, sky condition – VV 100 feet AGL, temperature - -4 degrees C, dew point - -4 degrees C, altimeter 29.71 inches of mercury...

At 0653, wind – 130 degrees at 14 knots, visibility – 1/2 SM, weather phenomena – moderate FZFG, sky condition – VV 100 feet AGL, temperature – 4 degrees C, dew point - - 4 degrees C, altimeter 29.70 inches of mercury...

The PIR ASOS recorded from 0710 – 1153, visibility – 1/4 SM and sky condition – VV 100 feet AGL.

RAP ASOS reported on the day of the accident, visibility – 10 SM and sky condition – clear.

AIDS TO NAVIGATION

The SUX ILS 31 standard instrument approach procedure had straight-in approach minimums 1,296 feet mean sea level and 2,400 foot visibility (200 feet above runway threshold and 1/2 SM visibility).

AIRPORT INFORMATION

SUX has the following runways: 13/31 (9,002 feet by 150 feet, grooved concrete) and 17/35 (6,600 feet by 150 feet, asphalt/porous friction courses).

The SUX ILS 31 instrument approach chart depicts runway 31 as having medium intensity approach light system with runway alignment indicator lights (MALSR) and high intensity runway lights (HIRLs). The chart did not indicate nor was the runway equipped with in-runway lighting (runway center line lighting or touchdown zone lighting).

FLIGHT RECORDERS

The airplane was not equipped with a flight data recorder or cockpit voice recorder nor was it required under operations conducted under Part 91.

TESTS AND RESEARCH

According to the company's Aviation Department Flight Operations Manual (December 2009), Takeoff Considerations and Landing Considerations states in part:

Takeoff Weather Minimums - Should a departure be planned at a point where weather

conditions are below published landing minimums, a takeoff will not be made unless a suitable alternate airport is available within one hour at normal cruise speed with one engine inoperative. This is to ensure a landing capability in the event of an emergency shortly after takeoff. The weather at such alternate airport should be forecast to be at or above landing minimums for at least one hour before and after the anticipated arrival time.

Minimum Visibility Takeoff – For all takeoffs, the visibility shall not be lower than that required to maintain runway alignment solely by outside visual reference to cockpit instrumentation.

Landing – Weather Minimums – FAR 91 rules for instrument approaches shall apply. The corporation authorized the PIC, at his discretion, to initial a ‘look-see’ approach to MDA or DH when reported weather is below published weather minimums. In this case, the flight crew should be prepared to immediately initiate the prescribed missed approach procedure if the airport is not in sight of the MAP. However, a flight may not be initiated to a destination that is below published landing minimums unless trends indicate that weather will be at or above landing minimums prior to the arrival at the destination.

The Instrument Flying Handbook (FAA-H-8083-15A), Chapter 2, Takeoffs and Departures, Takeoff Minimums, states in part:

While mechanical failure is potentially hazardous during any phase of flight, a failure during takeoff under instrument conditions is extremely critical. In the event of an emergency, a decision must be made to either return to the departure airport or fly directly to a takeoff alternate. If the departure weather were below the landing minimums for the departure airport, the flight would be unable to return for landing, leaving few options and little time to reach a takeoff alternate.

The FAA established takeoff minimums for every airport that has published Standard Instrument Approaches. These minimums are used by commercially operated aircraft, namely Part 121 and 135 operators. At airports where minimums are not established, these same carriers are required to use FAA designated standard minimums (1 statute mile [SM] visibility for single- and twin- engine aircraft, and 1/2 SM for helicopters and aircraft with more than two engines).

Aircraft operating under Part 91 are not required to comply with established takeoff minimums. Legally, a zero/zero departure may be made, but it is never advisable. If commercial pilots who fly passengers on a daily basis must comply with takeoff minimums, then good judgment and common sense would tell all instrument pilots to follow the established minimums as well.

According to Federal Aviation Regulation (FAR) 91.169, IFR Flight Plan: Information Required, states that each person filing an IFR flight plan must include an alternate airport if the destination airport does not have a standard instrument approach procedure or appropriate weather reports or weather forecasts, or a combination of them indicate for at least 1 hour before and after the estimated time of arrival, the ceiling will be at least 2,000 feet above the airport and the visibility will be at least 3 SM. The IFR alternate weather minimums are

such that no person may include an alternate airport in an IFR flight plan unless appropriate weather reports of forecasts, or a combination of them, indicate that, at the estimated time of arrival at the alternate airport, the ceiling and visibility at that airport will be at or above the following weather minima for airports with a published instrument approach procedure. For aircraft other than helicopters, the minima specified in that procedure, or if none is specified then a ceiling of 600 feet and visibility of 2 SM for precision approach procedures and a ceiling of 800 feet and visibility of 2 SM for nonprecision approach procedures.

There were two IFR flight plans filed for N586BC on the day of the accident. The first flight plan had a departure from DES at 0620 to SUX with an estimated time en route of 00:39 minutes. The alternate airport listed was Joe Foss Field Airport (FSD), Sioux Falls, South Dakota, located about 73 nautical miles north northwest of SUX. The second flight plan had a departure from SUX at 0725 to RAP with an estimated time en route of 01:26 hours. PIR was listed as the alternate airport.

History of Flight

Approach	Other weather encounter
Landing	Attempted remediation/recovery
Landing-flare/touchdown	Collision with terr/obj (non-CFIT) (Defining event)

Pilot Information

Certificate:	Airline transport	Age:	55, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):		Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	June 12, 2009
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	June 24, 2009
Flight Time:	6018 hours (Total, all aircraft), 1831 hours (Total, this make and model), 3488 hours (Pilot In Command, all aircraft), 61 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:		Age:	36, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	March 12, 2009
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	March 12, 2009
Flight Time:	6892 hours (Total, all aircraft), 2186 hours (Total, this make and model), 5449 hours (Pilot In Command, all aircraft), 103 hours (Last 90 days, all aircraft), 27 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	Registration:	N586BC
Model/Series:	B200	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	BB-1223
Landing Gear Type:	Tricycle	Seats:	10
Date/Type of Last Inspection:	October 15, 2009	Certified Max Gross Wt.:	12500 lbs
Time Since Last Inspection:		Engines:	2 Turbo prop
Airframe Total Time:	10304 Hrs at time of accident	Engine Manufacturer:	Pratt & Whitney
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	PT6-42
Registered Owner:		Rated Power:	850 Horsepower
Operator:		Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	Condition of Light:	Dawn
Observation Facility, Elevation:	SUX, 1098 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	06:52 Local	Direction from Accident Site:	
Lowest Cloud Condition:		Visibility	0.5 miles
Lowest Ceiling:	Indefinite (V V) / 100 ft AGL	Visibility (RVR):	1800 ft
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	120°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.9 inches Hg	Temperature/Dew Point:	-4° C / -6° C
Precipitation and Obscuration:	Moderate - Freezing - Fog		
Departure Point:	Des Moines, IA (DSM)	Type of Flight Plan Filed:	IFR
Destination:	Sioux City, IA (SUX)	Type of Clearance:	IFR
Departure Time:	06:36 Local	Type of Airspace:	

Airport Information

Airport:	Sioux Gateway Airport/Col. Bud SUX	Runway Surface Type:	Concrete
Airport Elevation:	1098 ft msl	Runway Surface Condition:	Dry; Snow
Runway Used:	31	IFR Approach:	ILS
Runway Length/Width:	9002 ft / 150 ft	VFR Approach/Landing:	Full stop

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	2 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 None	Latitude, Longitude:	42.420932, -96.389945(est)

Administrative Information

Investigator In Charge (IIC):	Gallo, Mitchell
Additional Participating Persons:	Daniel Michaelsen; Federal Aviation Administration; Des Moines, IA
Original Publish Date:	October 21, 2010
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=75295

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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](#).