



National Transportation Safety Board Aviation Accident Final Report

Location:	Rangeley, ME	Accident Number:	NYC01FA058
Date & Time:	12/22/2000, 1716 EST	Registration:	N30EM
Aircraft:	Beech B200	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal

Flight Conducted Under: Part 91: General Aviation - Executive/Corporate

Analysis

The pilot and passenger departed on a night IFR flight. Weather en route was a mixture of instrument and visual meteorological conditions. When the airplane was 17 miles southwest of its destination, the pilot was cleared for an instrument approach. At 9 miles, the pilot reported the airport in sight, and canceled his IFR clearance. The airplane continued to descend towards the airport on a modified left base until radar contact was lost at 3,300 feet msl. The pilot was in radio contact with his wife just prior to the accident. He advised her that he was on base for runway 32. Neither the pilot's wife, nor ATC received a distress call from the pilot. The airplane was located the next morning about 100 feet below the top of a mountain. The accident site was 7.9 miles from the airport, and approximately 1,200 feet above the airport elevation. Ground based weather radar recorded light snow showers, in the general vicinity of the accident site about the time of the accident, and satellite imagery showed that the airplane was operating under a solid overcast. A level path was cut through the trees that preceded the main wreckage. Examination of both engines and the airframe revealed no pre impact failures or malfunctions.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot-in-command's failure to maintain sufficient altitude while maneuvering to land, which resulted in a collision with terrain. Factors in the accident were the dark night, mountainous terrain, snow showers, clouds, and the pilot's decision to cancel his IFR clearance.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: APPROACH - VFR PATTERN - BASE TURN

Findings

1. (F) LIGHT CONDITION - DARK NIGHT
2. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY
3. (F) WEATHER CONDITION - SNOW
4. (F) WEATHER CONDITION - CLOUDS
5. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
6. (F) IN-FLIGHT PLANNING/DECISION - INADEQUATE - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On December 22, 2000, at 1716 eastern standard time, a Beech KingAir B200, N30EM, impacted Beaver Mountain 7.9 miles south of the Rangeley Municipal Airport (8B0), Rangeley, Maine. The certificated commercial pilot and passenger were fatally injured. A mixture of night instrument meteorological and visual meteorological conditions prevailed for the personal flight that departed Portland, Maine, destined for Rangeley. An instrument flight rules flight plan was filed, and the flight was conducted under 14 CFR Part 91.

Earlier in the day the airplane departed Rangeley, flew to Boston, Massachusetts, and then to Portland to pickup a passenger before proceeding back to Rangeley. After departing Portland, the airplane climbed to an en route altitude of 11,000 feet msl. Approximately 29 miles to the southwest of Rangeley, the pilot was cleared to 6,000 feet msl. At 17 miles southwest, the pilot was cleared for the GPS "A" approach, and was instructed to cross the Rangeley non directional beacon (NDB) at 5,800 feet msl. At 9 miles, the pilot reported the airport in sight, and canceled his IFR clearance. The pilot was instructed to squawk "VFR", and that a frequency change to "advisory" was approved. According to radar data, the airplane continued to descend towards the airport on a modified left base until radar contact was lost at 3,300 feet msl. Air traffic control facilities did not receive any distress calls or reports of difficulties from the pilot prior to or after the frequency change was approved.

The pilot radioed his wife (who was waiting at the airport), and told her he was on base for runway 32. She did not receive any distress calls or reports of difficulties from the pilot. When the airplane did not arrive, she called some friends and attempted to report the airplane as overdue to Bangor Automated Flight Service Station (AFSS), but could not get through on the direct line. About 20 minutes after the accident, a friend was able to report the airplane as missing to Boston AFSS. An air and ground search was commenced about 45 minutes after the accident, but was later postponed until morning because of weather. The airplane was located the next morning on the southwest side of a 3,125-foot mountain, about 100 feet below the top.

The accident happened during the hours of darkness. The wreckage was located 44 degrees, 53.00 minutes north latitude, 70 degrees, 38.33 minutes west longitude, and an elevation of about 3,025 feet msl.

PILOT INFORMATION

According to Federal Aviation Administration (FAA) records, the pilot held a commercial pilot certificate with ratings for airplane single-engine land, multi-engine land, single engine-sea, and airplane instrument. In addition, he held a certified flight instructor rating for airplane single-engine land, multi-engine land, and airplane instrument. The pilot's logbook was not recovered, and presumed destroyed in the post-crash fire. On the pilot's last application for a FAA second class medical certificate, dated March 13, 2000, he reported 15,500 hours of total flight experience. On the day of the accident, the pilot completed a 14 CFR Part 135 flight evaluation in a Piper PA-31, which was administered by an FAA inspector.

According to a witness, the pilot would normally fly to the Rangeley NDB when approaching from the south at night and IMC. Once over the lake and in VMC, the pilot would cancel his IFR clearance and descend to 3,500 feet msl. He would then fly a normal traffic pattern at or above 2,800 feet msl, being sure to maintain at least 2,200 feet while over the town of

Rangeley. In addition, the pilot would use the altitude select during the arrival to provide situational awareness and terrain separation. The witness estimated that the accident site corresponded to a left base for runway 32, but was approximately 2 miles wider than normal.

The pilot received refresher training in the accident airplane in June of 1999, and in May of 2000. The training in June consisted of 10 to 15 hours of ground instruction, which included watching Archie Trammell's video on airborne weather radar. The training also included 5 hours of flight time. About 30 to 45 minutes of the flight time was devoted to using the weather radar, with a portion of that covering ground mapping. The witness added that for normal operations, the pilot did not use the weather radar for terrain identification, because he thought it created too much of a workload while flying single pilot.

AIRCRAFT INFORMATION

According to the airplane's Pilot Operating Handbook (POH), the airplane was an all metal, low wing monoplane with fully cantilevered wings, and a T-tail empennage. It was equipped with two Pratt and Whitney PT6A-42 engines, each capable of producing 850 shaft horsepower. The over all length of the airplane was 43 feet 10 inches, with a wingspan of 54 feet 6 inches. Maximum takeoff weight was 12,500 pounds, and the airplane had a maximum usable fuel load of 544 gallons. Maximum speeds for flap and landing gear extension were 200 KIAS for approach flaps, 181 KIAS for the landing gear, and 157 KIAS for full flaps. In addition, performance charts indicated that at maximum gross weight, with an outside air temperature of approximately 14 degrees Fahrenheit, the airplane could climb to 19,000 feet on one engine.

The instrument panel for the pilot side was configured with an attitude indicator, a pressure altimeter, an airspeed indicator, a turn coordinator, a horizontal situation indicator (HSI), a vertical speed indicator (VSI), and a radar altimeter. The copilot side had basically the same configuration as the pilot side, except the copilot's side had a radio magnetic indicator (RMI), and no radar altimeter. In addition, the airplane was equipped with a color weather radar. The airplane was not equipped with a ground proximity warning system (GPWS), nor was it required to be.

AIRPORT INFORMATION

The Rangeley Airport was located approximately 1.5 miles north of Rangeley, Maine, at an elevation of 1,825 feet msl. The airport was comprised of runway 14/32, which was equipped with runway end identifier lights (REIL), and medium intensity runway lights (MIRL). The runway was 3,200 feet long, 75 feet wide, and did not have a visual approach slope indicator (VASI). The up angle from the airport to the accident site was 1.65 degrees.

METEOROLOGICAL INFORMATION

No weather reporting was available for Rangeley, but a witness reported the weather was "clear." The nearest official weather observation from the accident site was approximately 29 miles to the southwest. That facility reported at 1652, wind calm, visibility 9 miles, ceiling 6,000 feet overcast, temperature 15 degrees Fahrenheit, dew point 12 degrees Fahrenheit, and an altimeter setting of 29.81 Hg.

According to a Safety Board Meteorological Factual Report, a Doppler radar image generated by a facility 61 miles to the south of the accident site, revealed very light radar returns, which were consistent with light snow showers, in the general vicinity of the accident site. Examination of a GOES-8 infrared satellite image captured 1 minute before the accident

indicated the cloud tops over the accident site were approximately 10,000 feet msl and 6,200 feet msl over Rangeley. Another GOES-8 image captured 16 minutes after the accident indicated that the cloud tops were 10,000 feet over both locations.

WRECKAGE AND IMPACT

A level path of freshly broken tree branches approximately 140 feet long, 60 feet wide, and on a magnetic heading of 050 degrees, preceded the initial ground marks. The actual debris path was approximately 75 feet long and ended at an 80-degree rock covered upslope. At the first point of ground impact was a section of the left wing and left aileron. Next was the left propeller hub, which had separated from the engine. Two of the four propeller blades had separated from the hub, and were located in the debris path. In addition, all four blades displayed "S" bends, leading edge gouges, and chordwise scratches. Next was the left engine. It had separated from the wing, and the engine accessories were partially consumed in the post-crash fire.

The next item in the debris path was the main wreckage. It was comprised of portions of the cockpit, left and right wings, fuselage, and tail section of the airplane, with the tail being the most recognizable. Also located in the main wreckage was the right engine, and right propeller hub. The right engine had separated from the wing, and the engine accessories were consumed in the post-crash fire. The right propeller hub had separated from the engine, and three of the four blades were consumed in the post-crash fire. The remaining blade on the right propeller hub was partially consumed, and displayed chord wise scratches, and leading-edge gouges.

MEDICAL AND PATHOLOGICAL

An autopsy was preformed on the pilot and passenger, by Dr. Michael Ferenc, M.D. on December 26, 2000, at the Medical Examiners Office in Augusta, Maine. Toxicological testing was not preformed on the pilot because of impact and thermal injuries; however, 16 days before the accident, the pilot was administered a random toxicological test. The test was negative, and was administered because the pilot was actively flying on a 14 CFR Part 135 operating certificate.

TESTS AND RESEARCH

On December 29, 2000, the wreckage was removed via helicopter, and loaded onto trucks to be transported to Biddeford, Maine, for further examination. On December 30, 2000, the wreckage was laid out in a hangar. The nose landing gear actuator was consistent with a gear up position, and the left wing flap actuator rod end position corresponded to 7 degrees, half way between full up and approach. The rudder trim actuator was approximately neutral, along with elevator trim. The left aileron trim tab actuator corresponded to approximately 6 degrees of left wing down trim.

The majority of the instrument panel was consumed in the post-crash fire, but some flight instrument information was still extracted. The copilot's RMI was recovered, and indicated a heading of approximately 035 degrees. The copilot's HSI was recovered, and indicated a heading of approximately 045 degrees. The pilot's VSI was also recovered. The needle on the VSI pointed to zero, and the counter weight was bent down approximately 45 degrees. On the face of the VSI, and opposite the VSI needle, was a mark consistent with a needle counter weight impact. In addition, the magnetic compass indicated 048 degrees.

Examination of the left engine turbine sections revealed that the compressor turbine disc

blades were intact. The outer rim on the downstream side of the disc displayed circumferential rubbing and scoring, with frictional heat discoloration. The hub tooling lugs, hub spigot, and hub center displayed circumferential rubbing. The 1st stage power turbine guide vane ring blades were intact. The upstream side inner drum and baffle face displayed circumferential rubbing, and machining, with frictional heat discoloration. The downstream side outer and inner drums displayed circumferential rubbing and scoring, with frictional heat discoloration. The interstage baffle inner cup was circumferentially rubbed and scored completely through the material thickness. The 1st stage power turbine shroud displayed circumferential scoring, and the 1st stage power turbine blades were intact. The tip shrouds displayed circumferential rubbing, and the disc outer rim displayed circumferential rubbing and scoring, with frictional heat discoloration. The hub-retaining nut also displayed circumferential rubbing.

Examination of the right engine turbine section revealed that the compressor turbine disc blades were intact. The outer rim on the downstream side of the disc displayed circumferential rubbing and scoring, with frictional heat discoloration. The hub tooling lugs, hub spigot, and hub center displayed circumferential rubbing. The 1st stage power turbine guide vane ring blades were intact. The upstream side inner drum and baffle face displayed circumferential rubbing and machining, with frictional heat discoloration. The downstream side outer and inner drums displayed circumferential rubbing and scoring, with frictional heat discoloration. The interstage baffle inner cup was circumferentially rubbed, and scored completely through the material thickness. The 1st stage power turbine shroud displayed circumferential scoring. The 1st stage power turbine blades were intact. The tip shrouds displayed circumferential rubbing. The disc outer rim displayed circumferential rubbing and scoring, with frictional heat discoloration. The hub-retaining nut displayed circumferential rubbing.

ADDITIONAL INFORMATION

According to the FAA Aeronautical Information Manual, a VASI is a system of lights that provides visual descent guidance information during the approach to a runway. These lights are visible from 3-5 miles during the day and up to 20 miles or more at night. The visual glide path of a VASI provides safe obstruction clearance within plus or minus 10 degrees of the extended runway centerline and to 4 miles from the runway threshold. Although normal glide path angles are 3 degrees, angles at some locations may be as high as 4.5 degrees to provide obstacle clearance.

According to the Federal Register Preambles for 2000, the FAA commissioned two studies to examine the effectiveness of GPWS and EGPWS in preventing controlled flight into terrain (CFIT) accidents in various airplane categories and operations. The two studies, analyzed CFIT accidents from 1985 to 1995 and found that EGPWS could have prevented 95-100 percent of these accidents. One of the studies concluded that equipping aircraft with GPWS, or EGPWS could be an effective means of preventing CFIT accidents in the general aviation fleet. Likewise, the other study concluded that there was compelling evidence of the potential effectiveness of EGPWS in preventing CFIT accidents.

The airplane wreckage was released on January 2, 2001, to a representative of the owners insurance company.

Pilot Information

Certificate:	Commercial	Age:	48, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
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 2 Valid Medical--w/ waivers/lim.	Last Medical Exam:	03/13/2000
Occupational Pilot:		Last Flight Review or Equivalent:	12/22/2000
Flight Time:	15500 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Beech	Registration:	N30EM
Model/Series:	B200	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	BB-958
Landing Gear Type:	Retractable - Tricycle	Seats:	8
Date/Type of Last Inspection:	12/15/2000, Continuous Airworthiness	Certified Max Gross Wt.:	12500 lbs
Time Since Last Inspection:		Engines:	2 Turbo Prop
Airframe Total Time:	8845.7 Hours	Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	PT6A-42
Registered Owner:	Oquossoc Corporation	Rated Power:	850 hp
Operator:	Mountain Air Service	Air Carrier Operating Certificate:	On-demand Air Taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night/Dark
Observation Facility, Elevation:	BML, 1131 ft msl	Observation Time:	1652 EST
Distance from Accident Site:	29 Nautical Miles	Direction from Accident Site:	231°
Lowest Cloud Condition:	Unknown	Temperature/Dew Point:	-9° C / -11° C
Lowest Ceiling:	Overcast / 6000 ft agl	Visibility	9 Miles
Wind Speed/Gusts, Direction:	Calm	Visibility (RVR):	
Altimeter Setting:	29.81 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:			
Departure Point:	Portland, ME (PWM)	Type of Flight Plan Filed:	IFR
Destination:	Rangeley, ME (8B0)	Type of Clearance:	IFR
Departure Time:	1645 EST	Type of Airspace:	Class G

Airport Information

Airport:	RANGELEY MUNI (8B0)	Runway Surface Type:	Asphalt
Airport Elevation:	1825 ft	Runway Surface Condition:	Unknown
Runway Used:	32	IFR Approach:	None
Runway Length/Width:	3200 ft / 75 ft	VFR Approach/Landing:	Full Stop; Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	44.883333, -70.638889

Administrative Information

Investigator In Charge (IIC):	David S Muzio	Adopted Date:	10/17/2001
Additional Participating Persons:	Eddie Webber; Raytheon; Wichita, KS Thomas Berthe; Pratt & Whitney; Longueuil, UN Glenn Gibbons; FAA/FSDO; Portland, ME George M Dunn; Mountain Air Service; Rangeley, ME		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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.