



National Transportation Safety Board Aviation Accident Final Report

Location:	SPEARFISH, SD	Accident Number:	MIA98FA219
Date & Time:	08/04/1998, 1345 MDT	Registration:	N69BS
Aircraft:	Socata TBM-700	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	4 Fatal

Flight Conducted Under: Part 91: General Aviation - Personal

Analysis

Witnesses observed the flight enter downwind for runway 30, after it had completed a published approach to runway 12, with a circle to land on runway 30. The witnesses, one of which was a commercial pilot said that there were jagged ceilings at the time about 400 to 500 feet above the ground. He and two other men with him saw the airplane below the clouds. As the airplane proceeded downwind, it momentarily entered a cloud. As the airplane came out of the cloud, it turned left in about a 30 degree turn. The angle of bank increased to about 70 to 80 degrees, the tail of the airplane came up, and the airplane impacted the ground nose first. Several pilots at the airport heard someone from N69BS make a radio transmission on the UNICOM frequency. What was heard by several people was that N69BS had broken out at 2200 feet. They then heard, 'N69BS turning base,' immediately followed by 'lookout' and 'oh ...' All of the eye witnesses agreed that at no time did they see or hear any problems with the engine. They all said that the sounds coming from the engine never changed. The published approach in use at the time of the accident was the GPS (global positioning system) runway 12. The pilot made his initial approach to runway 12, broke off the approach to the right, entered a right downwind for a landing on runway 30. The published circling minimums for the approach were MDA (minimum descent altitude) 4,800 feet, HAT (height above terrain) 869 feet. Using an approach speed of 90 knots, the minimum visibility was 1 mile. Using an approach speed of 120 knots, the minimum visibility was 1 1/4 miles. The field elevation was 3,931 feet. The profile for the GPS runway 12 approach showed that after the IAF (Jessee way point), the course was 204 degrees, at 7,000 feet, to the Dezzi way point, from Dezzi the course was 114 degrees, descend to 5,600, to Sophi way point, after Sophi descend to 4,800 feet to the missed approach point at the Ruste way point. The distance from Dezzi to Ruste was 10 miles.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain control of the airplane while turning to base leg. Contributing factors were low ceilings, clouds, and the pilot's failure to adhere to both the published approach procedures and the published minimum decent altitude.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: APPROACH - VFR PATTERN - BASE TURN

Findings

1. (F) WEATHER CONDITION - LOW CEILING
2. (F) WEATHER CONDITION - CLOUDS
3. (F) IFR PROCEDURE - NOT FOLLOWED - PILOT IN COMMAND
4. (F) MINIMUM DESCENT ALTITUDE - NOT COMPLIED WITH - PILOT IN COMMAND
5. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On August 4, 1998, about 1345 mountain daylight time, a Socata TBM-700, N69BS, registered to a private individual, crashed while turning from downwind to base leg at the Spearfish/Black Hills Airport (SPF) near Spearfish, South Dakota, while on a Title 14 CFR Part 91 personal flight. Marginal visual meteorological conditions were reported, and an IFR flight plan was filed. The airplane was destroyed. The private-rated pilot-in-command, a commercial-rated pilot/passenger, a private-rated pilot/passenger, and one passenger were fatally injured. The flight had originated at an unknown time, the same day, from Lawrence, Massachusetts, en route to Spearfish, and had made a refueling stop at Madison, Wisconsin. The flight departed Madison at 1146 CDT [1046 MST].

Witnesses observed the flight enter downwind for runway 30, after it had completed a published approach to runway 12, with a circle to land on runway 30. The witnesses, one of which was a commercial pilot said that there were jagged ceilings at the time about 400 to 500 feet above the ground. The same witness, and two other men with him saw the airplane below the clouds. As the airplane proceeded downwind, it momentarily entered a cloud. As the airplane came out of the cloud, it turned left in about a 30-degree turn. The angle of bank increased to about 70 to 80 degrees, the tail of the airplane came up, and the airplane impacted the ground nose first.

Several pilots at the airport heard someone from N69BS make a radio transmission on the UNICOM frequency. What was heard by several people was that N69BS had broken out at 2200 feet. They then heard, "N69BS turning base," immediately followed by "lookout" and "oh ...". All of the eyewitnesses agreed that at no time did they see or hear any problems with the engine. They all said that the sounds coming from the engine never changed.

The accident occurred during the hours of daylight approximately 44 degrees, 29 minutes north, and 103 degrees, 47 minutes west.

PERSONNEL INFORMATION

Information on the pilot is contained in this report on page 3, under First Pilot Information. The pilot's personal log book listing his flight hours was not recovered.

METEOROLOGICAL INFORMATION

Meteorological information is contained in this report on page 3, under Weather Information. At the time of the accident the winds were reported to be calm, and the lowest ceiling was broken at 2,200 feet. Witnesses reported a jagged ceiling, mist and fog in the area.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot, on August 5, 1998, at the Medical Examiner's Office, Clinical Laboratory of the Black Hills, Rapid City, South Dakota, by Dr. Donald M. Habbe.

Toxicological tests were conducted at the Federal Aviation Administration, Research Laboratory, Oklahoma City, Oklahoma, and revealed, "No ethanol or drugs detected in Blood."

COMMUNICATIONS

All communication with the flight were routine. At 1311:36, the pilot of N69BS made radio contact with the controller at Ellsworth Approach Control (APCH), Ellsworth Air Force Base, Rapid City, South Dakota. The flight reported in on frequency at an altitude of 17,900 feet descending to 17,000 feet.

At 1312:03, the APCH controller said, "...[N69BS] no weather or traffic advisory available for the Spearfish airport...you can get Spearfish weather on one eight point three two five." The pilot said he was getting the frequency "intermittently now" and thanked the controller.

The controller asked the pilot, what his intentions were at Spearfish, and the pilot answered, "...we'll do the visual in there if we can."

At 1313:00, the controller said, "...we've had traffic trying to get in there all day, we just had a Mooney trying to get in there...V-F-R and could not get into the airfield V-F-R." The pilot said, "...we'll do the N-D-B [non-directional beacon] or the G-P-S (difficult to read) A [global positioning system] to it."

The controller told the pilot that the "Rapid City N-D-B" was out, and pilot said, "(laugh), looking good today huh? Down here. OK we'll find Jese [way point, initial approach fix/IAF] hang on a minute."

At 1313:32, the APCH controller said, "...correction, the Spearfish N-D-B is out." The pilot of N69BS answered "affirmative."

The pilot was given a clearance to "descend at pilots discretion, maintain one zero thousand [10,000 feet]...fly heading two nine five [295 degrees], Spearfish."

At 1326:06, the APCH controller said, "...attention all aircraft, attention all aircraft, Ellsworth RADAR is out of service. I say again, Ellsworth RADAR is out of service."

At 1333:00, the controller asked the pilot of N69BS to "say position." The pilot replied, "...sixteen and a half south east of Jesse." The controller said, "...verify six miles North East of Spearfish airport, level at one zero thousand."

The pilot said, "...OK give you call six east of Spearfish airport at one zero thousand."

At 1333:20, the APCH controller said, "Sir, verify that is your position now. I show you six northeast of Spearfish level at one zero thousand, code [transponder] one zero seven, ident." The pilot acknowledged the "ident," and said, "...position again for you is one four point six east of Jese." The controller then said to the pilot "...roger, Jese is not depicted on my RADAR sir, I need your position off Spearfish."

At 1333:55, the control said to the pilot of N69BS, "...disregard, turn right three zero degrees for RADAR identification." The pilot acknowledges the controller request, and at 1335:50, the pilot said, "...right now [the flight] is seven point four north of Spearfish."

The controller told the pilot to report Jese for G-P-S runway one two Spearfish airport, and the pilot acknowledged the clearance.

At 1340:30, there was a change of controllers at Ellsworth APCH, and the pilot of N69BS said his position was "two and one half [miles] from Jese at one zero thousand looking for lower."

The pilot was given the following clearance at 1340:35, "...cross the initial approach fix

[Jesee] at or above one zero thousand, cleared G-P-S approach into Spearfish airport, report procedure turn inbound."

At 1342:50, the pilot said, "...k, give you a call at Jesee...and...coming up on Sophi [final approach fix, FAF]." The controller said, "...roger report procedure turn inbound." The pilot said, "...we are inbound."

At 1343:13, the controller said, "...RADAR service terminated, change to advisory, report your down time this frequency or with Huron Flight Service Station." The pilot said "will do," and that was the last transmission from N69BS.

AERODROME AND GROUND FACILITIES

The published approach in use at the time of the accident was the GPS runway 12. The pilot made his initial approach to runway 12, broke off the approach to the right, entered a right downwind for a landing on runway 30. The published circling minimums for the approach were MDA (minimum descent altitude) 4,800 feet, HAT (height above terrain) 869 feet. Using an approach speed of 90 knots, the minimum visibility was 1 mile. Using an approach speed of 120 knots, the minimum visibility was 1 1/4 miles. The field elevation was 3,931 feet.

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WRECKAGE INFORMATION

The airplane impacted in a open field, on the right downwind leg for runway 30, about 1 1/2 miles southeast of the airport. Impact craters from the landing gear, the engine, and the left wing were found about 30 feet south of the wreckage. The crater attributed to the engine was about 1 foot deep, and one of the propeller blades was found in the crater. The crater was oriented south to north and on the west side of the crater was an impact mark consistent with the left wing. The airplane traveled about 30 feet from the crater, in a northerly direction, coming to rest with the nose of the airplane heading 278 degrees.

The left wing displayed impact damage along the entire length of the wing. The right wing showed very little impact damage. The right wing displayed extensive fire damage inboard around the fuel tank.

The flaps were found extended in the takeoff position. The floating nut was found 4 inches from the rear bearing grove. Control continuity was established to all the flight controls, to include aileron, elevator, and rudder trims.

All three landing gear were found in the down and locked position.

The airplane's cabin area was completely destroyed by the post-impact fire, rendering all the instruments and switch unreadable, and no information was obtained.

TEST AND RESEARCH

Two sections of elevator trim cable were sent to the NTSB Materials Laboratory, Washington, D.C. for examination. For identification the two pieces of cable were marked "a" and "b." The NTSB Materials Laboratory Factual Report is attached to this report.

According to the laboratory factual report the longer piece of cable was marked as "a" and examination revealed that it had sooting and melting along its length, "consistent with fire damage." The cable also showed signs of "corrosion." The splayed end had been damaged by heat and fire, "so no signs of pre-existing damage or cracking could be seen."

The examination of cable "b" revealed that it was oxidized, but showed only minimal sooting at the separated end. The splayed wires revealed that some had a reduced cross section, or necking, at the point of separation. According to the NTSB Materials Laboratory Factual Report, "...the splaying of the cable, along with the necking and shear fractures in the wire, is consistent with an overstress separation."

The engine was removed from the crash site and taken to Pratt & Whitney Canada, Service Investigation Facilities, at St. Hubert, Quebec, Canada. The engine was examined on November 18, 1998, under the supervision of the NTSB investigator-in-charge.

The detailed results of the engine examination can be found in the Pratt & Whitney factual report which is an attachment to this report. All position references are in relation to a view from aft looking forward. Upstream and downstream references are in relation to the gas path flow from the compressor inlet to exhaust. The engine displayed impact damage and some post impact fire damage.

The engine was disassembled and revealed circumferential rubbing and scoring by the compressor turbine vane ring, compressor turbine, first stage power turbine vane ring, first stage power turbine, second stage power turbine vane ring, and the second stage power turbine, due to their making axial contact with their adjacent components under impact loads and external housing distortion. The compressor blades and shroud, compressor turbine blades and shroud, the first and second stage power turbine blades and shroud displayed strong circumferential rubbing and scoring due to their making radial contact under impact loads and external housing distortion. The disassembly of the engine did not reveal any discrepancies. Based on the contact signatures to the internal components of the engine it was determined that the engine was developing power at impact, most likely in the middle to low power range.

ADDITIONAL INFORMATION

The airplane was released to Mr. Will Lantis, the land owner, on August 6, 1998. At the time the airplane was released there was no representative of the owner present. The engine was released to Pratt & Whitney for shipment as per Peter Guy, Claims Adjuster, for the owner's Insurance Company, on November 18, 1998.

Pilot Information

Certificate:	Private	Age:	56, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	03/25/1997
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	3150 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Socata	Registration:	N69BS
Model/Series:	TBM-700 TBM-700	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	10
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	07/29/1997, Annual	Certified Max Gross Wt.:	4000 lbs
Time Since Last Inspection:	275 Hours	Engines:	1 Turbo Prop
Airframe Total Time:	1695 Hours	Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	PT6A-64
Registered Owner:	WILLIAM JAMES GALPIN	Rated Power:	700 hp
Operator:	WILLIAM JAMES GALPIN	Operating Certificate(s) Held:	None
Operator Does Business As:	EAGLE FLIGHT CENTER INC.	Operator Designator Code:	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	SPF, 3931 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	1408 MDT	Direction from Accident Site:	200°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	6 Miles
Lowest Ceiling:	Broken / 2200 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/
Wind Direction:	Variable	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	17° C / 14° C
Precipitation and Obscuration:			
Departure Point:	MADISON, WI (MSN)	Type of Flight Plan Filed:	IFR
Destination:	(SPF)	Type of Clearance:	IFR
Departure Time:	1046 MDT	Type of Airspace:	

Airport Information

Airport:	BLACK HILLS-CLYDE ICE (SPF)	Runway Surface Type:	Asphalt
Airport Elevation:	3931 ft	Runway Surface Condition:	Dry
Runway Used:	30	IFR Approach:	Circling; RNAV
Runway Length/Width:	5498 ft / 75 ft	VFR Approach/Landing:	Full Stop

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	3 Fatal	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 Fatal	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	ALAN J YURMAN	Report Date:	03/30/2000
Additional Participating Persons:	GARY L SOLDWISCH; RAPID CITY, SD LURENT GAY; PEMBROKE PINES, FL ROBERT STEEL; CALGARY, ALBERT, OF		
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. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).