



National Transportation Safety Board Aviation Accident Final Report

Location:	Dillon, MT	Accident Number:	LAX07FA150
Date & Time:	05/03/2007, 1037 MDT	Registration:	N22HP
Aircraft:	CESSNA S550	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

Radar data indicated that the airplane descended on a straight track from flight level (FL) 380 in accordance with the pilot's clearance to descend to 13,000 feet and begin the VOR (very high frequency omni-directional radio range) approach to the destination airport. The last transmission from the pilot was an acknowledgment of the cancellation of radar service and an instruction to switch to the airport advisory frequency. At that time, the airplane was at a mode C reported altitude of 14,000 feet. The airplane maintained a steady descent rate for the next minute and leveled off at 13,000 feet. About 2 1/2 minutes later, the airplane began a turn to the right to head outbound for the procedure turn on the approach and descended to 12,900 feet. The approach procedure specified a minimum altitude of 8,200 feet in the procedure turn. The airplane lost 1,600 feet in the next 10 seconds, and this was the last radar contact. A witness working in his office at the airport heard a loud engine noise, and then a "plop" noise. He said that the engine noise was loud, then softer, and then loud again. He heard it for 3 to 5 seconds. Another witness saw an airplane below the cloud bases that was turning to the right with a nose low pitch attitude of about 75 to 80 degrees. It made six to seven turns before it disappeared from sight behind terrain, and the radius of the turn got tighter as the airplane descended. Examination of the airframe, systems, and engines revealed no anomalies that would have precluded normal operation. Anti-ice fluid was on the leading edges of the wing and tail anti-ice panels. An Airmen's Meteorological Information (AIRMET) in effect for an area that included the accident site noted that the freezing level was from 4,000 to 10,000 feet with the potential for icing from the freezing level to 20,000 feet.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: An in-flight loss of control for undetermined reasons.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: APPROACH - IAF TO FAF/OUTER MARKER (IFR)

Findings

1. (C) REASON FOR OCCURRENCE UNDETERMINED

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

2. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On May 3, 2007, about 1037 mountain daylight time, a Cessna Citation S550, N22HP, collided with terrain during the instrument approach to Dillon, Montana. The pilot/owner was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The airline transport pilot and one passenger were killed; the airplane was destroyed. The cross-country personal flight departed Rockford, Illinois, about 0844 central daylight time, with Dillon as the planned destination. Visual meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan had been filed.

The National Transportation Safety Board investigator-in-charge (IIC) reviewed recorded radio conversations between the pilot and Salt Lake City Air Route Traffic Control Center (ARTCC). The IIC converted the times to mountain daylight time. A controller assigned a discrete beacon code of 6063. At 0952, the pilot indicated that he was level at flight level three eight zero (FL380). At 1010:30, he stated that he was beginning a descent to FL240. At 1030:59, a controller cleared the pilot to descend to 13,000 feet, and then cleared him for the VOR (very high frequency omni-directional radio range) approach to the Dillon Airport. The last transmission from the pilot occurred at 1033:54. He acknowledged cancellation of radar service and an instruction to switch to the airport advisory frequency.

A review of recorded radar data indicated that the target for beacon code 6063 descended on a straight track from flight level (FL) 380. At the time of the pilot's last transmission, the target was at a mode C reported altitude of 14,000 feet. The targets appeared about every 10 seconds. The altitude for each target changed about 200 feet from the last transmission to level off at 13,000 feet, which occurred at 1634:52.

At 1637:26, the target appeared to turn toward the right, and descend to 12,900 feet. About 10 seconds later, the next target, which was also the last target, was at a mode C altitude of 11,300 feet. This was at 45 degrees 15.173 minutes north latitude 112 degrees 32.477 minutes west longitude. The first identified point of contact (FIPC) was at 45 degrees 15.192 minutes north latitude 112 degrees 32.936 west longitude. The coordinates for the VOR were 45 degrees 14.91 minutes north latitude 112 degrees 32.83 minutes west longitude.

A witness was working in his office at the airport. He stated that he heard a loud engine noise, and then a "plop" noise. He said that the engine noise was loud, then softer, and then loud again. He heard it for 3 to 5 seconds. He went to a window in the front of his building, and looked to the east across the runway. He saw a large cloud of black smoke and a fire on the other side of the airport fence.

Another witness stated that a whistling noise got his attention. He looked up, and saw an airplane below the cloud bases that was turning to the right. Its attitude was about 75 to 80 degrees nose low. It made six to seven turns before it disappeared from sight behind terrain, and the radius of the turn got tighter as the airplane descended. He did not see any smoke, and the airplane appeared to be intact.

PERSONNEL INFORMATION

A review of FAA airman records revealed that the 69-year-old pilot held an airline transport pilot certificate with ratings for airplane multiengine land, and a commercial pilot certificate

with ratings for airplane single-engine land and rotorcraft helicopter. He was type rated as an airline transport pilot in the CE-500.

The pilot held a certified flight instructor (CFI) certificate with ratings for airplane single-engine land, instrument airplane, and rotorcraft helicopter. This certificate expired in 1976.

The pilot held a first-class medical certificate issued on April 10, 2007. It had the limitations that the pilot must wear corrective lenses and possess glasses for near and intermediate vision.

An examination of the pilot's logbook indicated that he had a total flight time of 5,057 hours as of the last flight that he logged on March 24, 2007. He logged 26 hours in the last 90 days. He had an estimated 1,200 hours in this make and model, and had flown numerous times to Dillon. His log book indicated over 100 hours of flight time in this airplane in the previous 2 years.

AIRCRAFT INFORMATION

The airplane was a Cessna S550, serial number S550-0103. The airplane was on the Cessna scheduled maintenance program, and phases 1-4 had been completed on December 22, 2006. A review of the airplane's logbooks revealed that the airplane had a total airframe time of 10,526 hours at the last inspection.

The airplane was equipped with a Tecalmit, Kilfrost, and Sheepbridge Stokes (TKS) fluid ice protection system.

The left engine was a Pratt & Whitney Canada JT15D-4B, serial number 102156. Total time recorded on the engine at the last inspection was 10,106 hours. Maintenance personnel installed the engine on this airplane in August 1998, at a total time of 9,481 hours, and with a hot section overhaul.

The right engine was a Pratt & Whitney Canada JT15D-4B, serial number 102209. Total time recorded on the engine at the last inspection was 10,106 hours. Maintenance personnel installed the engine on this airplane in December 1998, at a total time of 9,607 hours, and with a hot section overhaul.

METEOROLOGICAL CONDITIONS

The closest official weather observation station was Dillon (KDLN); the elevation of the weather observation station was 5,241 feet msl. An aviation routine weather report (METAR) for KDLN was issued at 1046 MDT. It stated: winds from 230 degrees at 12 knots; visibility 10 miles; skies 1,700 feet scattered, 3,000 feet scattered, 3,900 feet overcast; temperature 5/41 degrees Celsius/Fahrenheit; dew point 2/35 degrees Celsius/Fahrenheit; and altimeter 29.65 inches of mercury. Dillon Airport had an Automated Surface Observation System (ASOS), which broadcast on frequency 135.225.

Airmen's Meteorological Information (AIRMET) ZULU Update 2 was in effect for an area that included the accident site. It noted that the freezing level was between 4,000 and 10,000 feet. It stated that there was the potential for moderate icing conditions from the freezing level to 20,000 feet.

COMMUNICATIONS

The airplane had been in contact with Salt Lake ARTCC on frequency 132.40. The controller cleared the pilot for the VOR, and terminated radar services. He also instructed the pilot to

cancel his flight plan via radio or via telephone when on the ground. When the pilot did not call to cancel, the controller called the Great Falls Automated Flight Service Station, and learned of the accident.

AIRPORT INFORMATION

The Airport/ Facility Directory, Southwest U. S., indicated that runway 16/34 was 6,500 feet long and 75 feet wide. The runway surface was asphalt.

WRECKAGE AND IMPACT INFORMATION

Investigators from the Safety Board, the FAA, and Cessna examined the wreckage at the accident scene. The airplane had a 52-foot wingspan.

The FIPC was a 27-foot ground scar that was about 6 inches wide at the initial point, and spread to about 1 foot at the end. The ground scar began less than 1/4 mile from the runway edge. It terminated at the principle impact crater (PIC), which was about 10 feet long, 8 feet wide, and 3 to 4 feet deep. Another ground scar of similar dimensions began at the end of the PIC, and extended another 20 feet. The initial ground scar was along a 044-degree magnetic bearing, and curved to the right at the PIC. From the PIC, the debris path centerline was along a magnetic bearing of 059 degrees. The furthest identified piece, the low-pressure core from the left engine, was 634 feet from the FIPC.

Proceeding along the debris path, the rotating beacon from the top of the rudder was in the lower right area of the PIC. In the bottom center of the PIC was the outboard section of the right elevator. Left side cockpit pieces were in the upper right area of the PIC. The right engine, empennage, and about 15 feet of the main spar were in the middle of the debris field. The right wing sustained more damage than the left wing. The left engine was the last large piece of debris; it fragmented, and its compressor section was about 45 feet passed it.

The TKS anti-ice fluid reservoir sustained mechanical damage and fragmented. Investigators located both TKS pumps. They found fluid in the aft TKS pump, which provides fluid to the stub wing leading edge TKS panels. Examination of the wing and tail TKS panels revealed that they were coated with a greasy fluid.

Numerous blades sheared off from both compressor sections. The remaining blades bent along the contours of the compressor, and in the direction opposite rotation.

COCKPIT VOICE RECORDER (CVR)

The airplane contained a CVR, and a Safety Board specialist made a summary report of the recording. The recording consisted of three channels of audio information, however, none of the audio was pertinent to the accident investigation. The CVR failed at a point prior to the accident events. Weather discussion and a date reference between the flight crew match the 0756 mountain standard time METAR observation at Gallatin Field, Bozeman, Montana, on February 21, 2007.

MEDICAL AND PATHOLOGICAL INFORMATION

The Montana Department of Forensic Science completed an autopsy, and determined that the cause of death was blunt force injuries. The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing of specimens of the pilot.

Analysis of the specimens contained no findings for carbon monoxide, cyanide, volatiles, and tested drugs.

TESTS AND RESEARCH

The airframe manufacturer's representative determined that the landing gear was down. The representative measured the flap actuator at 3 inches, which he equated to partial flap extension.

The engine manufacturer's representative examined the engines under the supervision of a Safety Board investigator. He submitted a report, which is part of the public docket. The representative stated that the examination revealed no indication of preimpact mechanical anomalies. He thought that the examination revealed signatures that indicated that both engines were producing significant power at the time of impact.

VOR Approach

The Dillon VOR approach plate depicted a course outbound on the 005-degree radial followed by a procedure turn inbound to intercept the inbound course of 185 degrees. It indicated a minimum altitude of 8,200 feet during the procedure turn. A family member who had flown this approach with the pilot indicated that he would typically initiate this turn by using the autopilot.

Pilot Information

Certificate:	Airline Transport; Flight Instructor	Age:	69, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Single-engine; Helicopter; Instrument Airplane	Toxicology Performed:	Yes
Medical Certification:	Class 1 With Waivers/Limitations	Last Medical Exam:	04/10/2007
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	5057 hours (Total, all aircraft), 1200 hours (Total, this make and model), 26 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	CESSNA	Registration:	N22HP
Model/Series:	5550	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	S550-0103
Landing Gear Type:	Retractable - Tricycle	Seats:	8
Date/Type of Last Inspection:	12/22/2006, AAIP	Certified Max Gross Wt.:	12500 lbs
Time Since Last Inspection:		Engines:	2 Turbo Jet
Airframe Total Time:	10526 Hours	Engine Manufacturer:	Pratt & Whitney Canada
ELT:	C91 installed, activated, did not aid in locating accident	Engine Model/Series:	JT15D-4B
Registered Owner:	Hamilton Ranches, Inc.	Rated Power:	2500 lbs
Operator:	Hamilton Ranches, Inc.	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KDLN, 5241 ft msl	Observation Time:	1046 MDT
Distance from Accident Site:		Direction from Accident Site:	
Lowest Cloud Condition:	Scattered / 1700 ft agl	Temperature/Dew Point:	5°C / 2°C
Lowest Ceiling:	Overcast / 3900 ft agl	Visibility	10 Miles
Wind Speed/Gusts, Direction:	12 knots, 230°	Visibility (RVR):	
Altimeter Setting:	29.65 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Rockford, IL (RFD)	Type of Flight Plan Filed:	IFR
Destination:	Dillon, MT (KDLN)	Type of Clearance:	IFR
Departure Time:	0844 CDT	Type of Airspace:	

Airport Information

Airport:	Dillon (DLN)	Runway Surface Type:	Asphalt
Airport Elevation:	5241 ft	Runway Surface Condition:	Dry
Runway Used:	16	IFR Approach:	VOR
Runway Length/Width:	6500 ft / 75 ft	VFR Approach/Landing:	Traffic Pattern

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:	45.253333, -112.548889

Administrative Information

Investigator In Charge (IIC):	Howard D Plagens	Adopted Date:	11/25/2008
Additional Participating Persons:	John Russell; Federal Aviation Administration; Helena, MT Jan Smith; Cessna Aircraft Company; Wichita, KS Tom Berthe; Pratt & Whitney Canada; Longueuil, Canada,		
Publish Date:	11/25/2008		
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/ .		

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