



National Transportation Safety Board Aviation Accident Final Report

Location:	Atlanta, ID	Accident Number:	SEA02GA053
Date & Time:	03/12/2002, 1437 MST	Registration:	N2336V
Aircraft:	Piper PA-31	Aircraft Damage:	Substantial
Defining Event:		Injuries:	3 Fatal
Flight Conducted Under:	Public Aircraft		

Analysis

The aircraft was cleared direct and to climb to 14,000 feet. During the climb out, the controller inquired several times as to the flights altitude. The pilot's response to the controllers queries were exactly 10,000 feet lower than what the controller was indicating on radar. Eventually the controller instructed the pilot to stop altitude squawk, which he did. During the last communication with the pilot, he reported that he was level at 14,000 feet. During the next approximately 45 minutes, the aircraft was observed proceeding generally in the direction of its destination. When the controller observed the flight track turn approximately 45 degrees to the right and headed generally northwest, he attempted to contact the pilot without a response. The tracking then turned about 90 degrees to the left for a few minutes, then turned 180 degrees to the right. The aircraft dropped from radar coverage shortly thereafter. On site investigation revealed that the aircraft broke-up in flight as the wreckage was scattered generally east-to-west over the mountainous terrain for approximately .3 nautical miles. Further investigation revealed that the right wing separated at the wing root in an upward direction. Separation points indicated features typical of overload. The right side horizontal stabilizer separated upward and aft. The left side horizontal stabilizer remained attached however, it was twisted down and aft. The aft fuselage was twisted to the left. Both engines separated in flight from the wings. Post-crash examinations of the airframe and engines did not reveal evidence of a mechanical failure or malfunction. Both altimeters were too badly damaged to test. Autopsy and toxicology results indicated that the pilot had severe coronary artery disease with greater than 95% narrowing of the left anterior descending coronary artery by atherosclerotic plaque. The coroner also reported that superimposed upon this severe narrowing was complete occlusion of the lumen by brown thrombus. Toxicology results indicated a moderate level of diabetes. The pilot's actions leading up to the accident were consistent with an incapacitation due to hypoxia. The role of a possible heart attack was unclear, since it is possible that it occurred as a result of the hypoxia

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 aircraft control while in cruise flight which resulted in the in-

flight separation due to overload of the spar at the right wing root. Hypoxia was a factor.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION

Phase of Operation: MANEUVERING

Findings

1. (C) WING,SPAR - OVERLOAD
2. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
3. (F) INCAPACITATION(ANOXIA/HYPOXIA) - PILOT IN COMMAND
4. INCAPACITATION(CARDIOVASCULAR) - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On March 12, 2002, approximately 1437 mountain standard time, the Federal Aviation Administration (FAA) Air Route Traffic Control Center (ARTCC) at Salt Lake City, Utah (Salt Lake Center), lost contact with a Piper PA-31 airplane, N2336V, which was on a public-use flight under instrument flight rules (IFR) from Idaho Falls, Idaho, to Boise, Idaho. At the time contact was lost, the aircraft, which was owned by the Idaho State Aeronautics Division, was transporting a juvenile offender to a commitment facility, with the commercial pilot-in-command (a part-time pilot for the Idaho State Aeronautics Division), an Idaho State Department of Juvenile Corrections transport officer, and the juvenile offender aboard. Search-and-rescue (SAR) forces subsequently acquired an emergency locator transmitter (ELT) signal from the missing aircraft, and located the wreckage of N2336V the following day. The substantially damaged aircraft wreckage was dispersed over mountainous terrain at elevations between 8,900 feet and 9,600 feet in the Sawtooth Wilderness, near the last recorded radar position, approximately 10 nautical miles north-northeast of Atlanta, Idaho. A ground party that reached the wreckage on March 15, 2002, found all three aircraft occupants to have been fatally injured. At 1450 marginal visual flight rules (MVFR) conditions (scattered clouds at 1,000 feet, ceiling 2,300 feet broken, visibility 15 statute miles) were reported at Friedman Memorial Airport, Hailey, Idaho, the closest weather reporting station to the accident site.

After the pilot checked in with the air traffic controller, the aircraft's radar track proceeded generally toward Boise for the next 45 minutes with no further radio communication with the aircraft. About 1425, the track turned approximately 45 degrees to the right and headed generally northwest. The controller then attempted to contact the aircraft at about 1426, but did not receive a response. The track turned about 90 degrees to the left, to a west-southwesterly track, about 1433. About 1436, the track initiated an approximate 180 degree turn to the right, heading northeast. The last recorded radar position was at 1437:01, at 43 degrees, 57 minutes, 28 seconds North latitude; 115 degrees, 03 minutes, 40 seconds West longitude. Following the aircraft's disappearance from radar, the Salt Lake Center controller continued to attempt radio contact with the aircraft and made a number of other efforts to locate the aircraft without success.

PERSONNEL INFORMATION

At the time of the accident, the pilot held commercial and flight instructor certificates. Ratings included single-engine land and sea, multi-engine land and instrument airplane. A representative from Idaho Division of Aeronautics reported that the pilot's flight logbook was not located, however, total flight time derived from company records indicated that the pilot had accumulated approximately 20,647 hours, with 338 hours in the accident aircraft make and model. The pilot had accumulated approximately 1,000 hours of actual instrument flight time. The pilot held a second class medical certificate dated December 18, 2001, with a limitation for corrective lenses.

On the day of the accident, the daily aircraft flight log located in the wreckage indicated that the pilot began his first flight of the day at 0800 from Boise, to Lewiston, Idaho with three passengers on board. The duration of the flight was logged as one hour and ten minutes. The aircraft then took off with two passengers at 0925 and landed in Coeur d'Alene, Idaho at 1000.

At 1030 the flight departed with four passengers and landed in Idaho Falls at 1240. The flight log indicated that the accident flight took off from Idaho Falls with two passengers at 1310 en route to Boise.

AIRCRAFT INFORMATION

The accident aircraft was manufactured in 1968, as a non-pressurized Piper PA-31-310 Navajo, serial number 31-135. State of Idaho Division of Aeronautics purchased this aircraft in 1995. The original Lycoming TIO-540-A2B engines were replaced in January 1978, with the installation of Colemill Enterprises, Inc. "Panther" engine conversion, Lycoming model TIO-540-J2BD, engines which developed 350 horsepower each. These engines use the Hartzell four-bladed Q-tip propellers.

Maintenance records indicated that the last Annual/100 hour inspection was accomplished on February 4, 2002, at a recording tachometer time of 976.0 hours, and an aircraft total-time of 7,940.3 hours. Approximately 27 hours had been accumulated on the aircraft since the last inspection.

The pilot's side Aerosonic Corp. altimeter part number: 101635-0197, serial number: C124847, and the co-pilot's side United Instruments altimeter part number: 5934PA-1, serial number 8D729, were both tested to 35,000 feet and signed off as serviceable on September 6, 2001. Both altimeters were equipped with three points to indicate 100 feet, 1,000 feet and 10,000 feet.

COMMUNICATIONS

According to FAA air traffic control (ATC) information from Salt Lake City, ARTCC, the aircraft took off from Idaho Falls (airport elevation of 4,741 feet) about 1308. At 1309, the pilot checked in with Salt Lake Center, Sector Radar 08 (R8) and reported that he would like to go from his present position, direct at 14,000 feet. The R8 controller responded that he had radar contact with the aircraft two miles southwest of Idaho Falls VOR. At 1310, the R8 controller contacted the pilot and asked if he copied that radar contact was now four miles southwest of Idaho Falls VOR, and wanted the pilot to verify that he was leaving 6,400 feet. The pilot responded that he was now at 6,500 feet, and asked the controller if he was cleared to go direct to Boise. The R8 controller responded that he was cleared via area navigation (RNAV) direct to Boise.

At 1319, the R8 controller contacted the pilot and asked him to say assigned altitude. The pilot responded 14,000. The R8 controller then informed the pilot that radar was showing the aircraft at 15,300 feet. The pilot responded that he was, "just going through 5,600 for right now..." The controller then stated to the pilot that it was not a problem, but wanted to know if he was correcting back to 14,000 feet. The pilot responded, "No I'm climbing to 14,000 and I'm just going through 6,300 now..." The controller responded to the pilot that he might need to check his altimeter as he was showing the aircraft at 16,200 feet. The pilot stated that he would see what he could do and reported "I'm gonna go off line just a moment." The R8 controller acknowledged this and reported the Idaho Falls altimeter as 29.87.

At 1321, the pilot informed the R8 controller that "...both my altimeters say I'm going through 7,000." At 1322, the R8 controller asked the pilot what altitude he was going through. The pilot responded that he was going through 8,500. The R8 controller acknowledged this and asked the pilot if he had ground contact. The pilot responded affirmative.

At 1324, the R8 controller asked the pilot to verify that his altimeter setting was 29.92 and not just 992. The pilot responded "okay 29.92 and we're just going through 9,800." The controller then asked the pilot to reset to Idaho Falls altimeter of 29.87. The pilot acknowledged this and reported that they were reading 10,700. The controller responded that he was showing the aircraft "exactly 10,000 feet higher than what you're showing." The pilot responded "okay, if I got to go VFR, I need to do it now." The R8 controller then asked the pilot to verify that he had ground contact. The pilot responded that he had ground contact to his left and thought that he could descend and go VFR. At 1325, the R8 controller asked the pilot to stop altitude squawk. The pilot acknowledged that it was stopped. The R8 controller then asked the pilot to report level at 14,000, and then told the pilot that when he got to Boise, he should have the equipment checked. The pilot responded that, "it sure does. It's some new equipment in here and it's the first time we've had a malfunction on the radar, or on the altimeter."

At 1328, the R8 controller asked the pilot to say what altitude he was leaving. The pilot responded that he was out of 13,300.

At 1331, the R8 controller asked the pilot to say altitude. The pilot responded "right on 14,000 now."

At 1340, the R8 controller instructed the pilot to contact Salt Lake Center on 118.05. The pilot acknowledged this transmission.

At 1341, the pilot contacted Salt Lake Center, sector 31(R31), and reported level at 14,000. The R31 controller informed the pilot that the Sun Valley altimeter was 29.90. The pilot acknowledged "29.90, 36V."

At 1403, the R31 controller transmitted "Attention all aircraft, hazardous weather information updates to airmets available through flight watch or flight service."

At 1426, the R31 controller tried to contact the accident aircraft but did not receive a response. The controller subsequently made several more attempts to contact the aircraft, all without response.

METEOROLOGICAL INFORMATION

The Salt Lake City, Utah, Area Forecast issued March 12, 2002, at 2045 Coordinated Universal Time (UTC), forecast conditions for the southwestern portion of Idaho during the time frame of the disappearance as broken clouds from 6,000 to 8,000 feet, overcast at 12,000 feet, widely scattered rain showers in the Snake River valley, and snow showers in the mountains, with cloud tops at flight level (FL) 200. AIRMET advisories were in effect for the accident area and time frame for IFR conditions, mountain obscuration, occasional moderate turbulence below FL 180, and occasional moderate rime and mixed icing in clouds and in precipitation from the freezing level (indicated by the AIRMET as being approximately 6,000 feet in the accident area) to FL 200. According to the Idaho Aeronautics Division, the aircraft was equipped for flight into known icing conditions.

A National Transportation Safety Board Meteorology National Resource Specialist evaluated the meteorological conditions at the time of the last recorded radar target. The specialist reported that the probable meteorological conditions that existed at the time were cloud bases near 6,000 feet with cloud tops above 15,000 feet. Flight visibility in the clouds were zero and greater than three miles below the lowest cloud base. The freezing level was reported near 6,500 feet. Light to moderate mixed/rime icing was reported above the freezing level to above

14,000 feet. Light to moderate mountain and/or atmospheric induced turbulence was reported below 18,000 feet. Mountain wave activity was reported with up and downdrafts and the mountains were obscured. A weak cold front was reported moving through the area. The specialist reported that airframe icing, turbulence, IFR conditions, and mountain obscuration were forecast by the National Weather Service for the time and area of the accident. (see attached Meteorological Factual Report for details).

WRECKAGE AND IMPACT INFORMATION

When the wreckage was located, aerial photographs of the accident site taken from a Search and Rescue (SAR) aircraft showed the aircraft wreckage on steeply sloping, snow-covered terrain. The photographs identified three major wreckage components: a section of tail surface, the cabin with one wing visible, and a section of the left side fuselage including part of the main cabin entry door frame. Due to the combination of hazardous terrain and environmental conditions, it was deemed infeasible to attempt an on-site wreckage examination shortly after the accident. The on-site wreckage examination was conducted on July 10, 2002.

Investigators found the aircraft wreckage dispersed on the southwest face of a northwest/southeast oriented ridge between approximately 8,900 feet and 9,600 above sea level. The wreckage distribution was along a generally west-to-east line in a pattern approximately .3 nautical miles long. The westernmost piece of wreckage in this pattern was the aircraft's right wing, less the engine, at an elevation of 8,987 feet. The entire section of the wing from root to tip was intact. Approximately 900 feet east of the right wing, two sections of the fuselage constituting the main wreckage were found. The first section comprised the aircraft's aft fuselage, vertical stabilizer, left horizontal stabilizer which was folded under itself, such that the outboard portion of the stabilizer was folded under the bottom of the inboard portion with the stabilizer tip pointing straight aft, and a portion of the upper cabin. The elevators on both sides of the stabilizers were missing from this section, as was the right horizontal stabilizer. The second fuselage section was located about 50 yards down slope from the first fuselage section, and comprised of the cabin and nose section of the aircraft with the left wing, less the engine, attached. The top of the cabin was missing from this section. The aircraft's detached left engine, with all four propeller blades still attached, was found about 50 yards east of the main wreckage. The elevation of the main wreckage was approximately 9,200 feet.

The aircraft's detached right engine, also with all four propeller blades still attached, was found about 900 feet east of the main wreckage. Various components were found further up slope, including an additional piece of the top of the cabin. The pilot's windscreen frame, and sections of the aircraft's right horizontal stabilizer and both elevators, were found near the spine of the ridge, with the highest pieces found approximately 9,600 feet. No evidence of fire was observed in any of the wreckage components.

MEDICAL AND PATHOLOGICAL INFORMATION

The Forensic Pathologist from the Boise County Coroner's Office reported that the pilot's cause of death was blunt force trauma due to an aircraft accident. During the post-mortem examination, evidence of severe coronary artery disease with greater than 95% narrowing of the left anterior descending coronary artery by atherosclerotic plaque was noted. The pathologist also reported that superimposed upon this severe narrowing was complete

occlusion of the lumen by brown thrombus. The pathologist reported that "Significance of this thrombus with relation to the aircraft accident is not known, although it is known that the Decedent died from the injuries he received as a result of the accident."

Toxicological samples were sent to the Federal Aviation Administration Civil Aeromedical Institute, Oklahoma City, Oklahoma, for analysis. The result of the analysis reported negative results for Carbon Monoxide, Cyanide and Ethanol. The Clinical Report detected 265(mg/dl) Glucose in Vitreous and 4487(mg/dl) Glucose detected in urine. 8.2 percent Hemoglobin A1C was detected in Blood. The NTSB Medical Officer reported that the 8.2 percent Hemoglobin A1C is consistent with a moderate level of diabetes.

ADDITIONAL DATA/INFORMATION

On November 20-21, investigators from the National Transportation Safety Board, Idaho Division of Aeronautics, The New Piper Aircraft, Lycoming Engines, and the Federal Aviation Administration met in Boise, Idaho, to examine the wreckage that had been recovered from the accident site. It was found that the right wing separated from the fuselage at the wing root. The floorboards were pulled up in the cabin to expose the wing spar. During the inspection it was found that the spar from the center section out to the right wing root fractured in three locations at the upper spar cap and one location at the lower spar cap. The spar as a whole displayed an aft and upward bend. These sections were sent to the National Transportation Safety Board Materials Laboratory for examination. The materials engineer reported that the fractures for the upper spar cap were at 2.5 inches outboard of the fuselage, one inch inboard of the fuselage, and 16 inches inboard of the fuselage. Inboard of the fuselage, deformation adjacent to the fracture was consistent with bending in the horizontal plane. Outboard of the fuselage, deformation adjacent to the fracture was consistent with upward bending. The deformation adjacent to the fracture in the lower spar cap was consistent with upward bending. The Materials Engineer reported that, "All fractures were on a slant plane with a matte gray color. The appearance of the fracture surfaces and deformation adjacent to the fracture are consistent with overstress fracture. No evidence of fatigue was observed."

The right side horizontal stabilizer separated at the root. The deformation was consistent with an upward/aft twisting. The right side elevator separated at the hinges and was broken in two pieces. The trim tab separated at the hinges.

The left side horizontal stabilizer remained attached at the root. The surface was twisted downward and aft. The elevator separated in two pieces at the hinges.

The empennage section just forward of the vertical stabilizer was twisted to the left. The vertical stabilizer displayed skin wrinkles near the base of the stabilizer on the left side.

The left wing remained attached at the wing root. Both flap and aileron remained attached at the hinges.

At some time after the investigative team was on site to when the wreckage was recovered from the site, the left engine, serial number RL-4726-61A, was taken from the site. Reportedly a hiker in the area saw and photographed what appeared to be a Bell 407 helicopter lifting something from the mountain using a long line. The photograph was turned over to the Federal Aviation Administration Security Division. As of this writing, the left engine has not been recovered.

On site examination of the left engine by the Air Safety Investigator from Lycoming Engines,

reported that the engine separated from the wing. The propeller assembly remained attached to the crankshaft flange. All four propeller blades were noted in the feathered position. The two bottom propeller blades rested on rocks and were bent outward/upward. The blade on the downhill side was bent mid-range about 10-15 degrees upward. The upslope blade was bent mid-blade 90 degrees toward the face (upward). The other two propeller blades were nearly straight. The ignition wires were found attached to their respective spark plugs. A stream of oil, which stained the ground under the engine was noted and flowed past the bottom cowling down the slope. The induction pipes remained attached and all fuel injector lines were intact. The pressure referencing tubes were intact, The servo remained attached and was undamaged. The oil sump was intact. The starter and alternator remained attached and were undamaged. The turbocharger was intact. The single-drive magneto remained attached and was verified secured.

The right engine, serial number RL-3272-61A, was examined in Boise, Idaho, after recovery from the accident site. The engine also had separated from the wing. The airframe engine mount was partially attached to the engine. Some of the wing mount substructure ripped away with sheared rivets still in place. Some of the mount tubes were fractured. The propeller assembly remained attached to the crankshaft flange. The propeller blades were in the feathered position. Damage was noted to the propeller tips. The crankshaft rotated easily by hand and gear and valve train continuity was established. Spark was produced from all leads. Compression was developed in each cylinder. At the conclusion of the examination, there was no evidence found to indicate a mechanical failure or malfunction. See attached Lycoming Engines Report for more detail.

The aircraft is equipped with an oxygen system for both the flight crew and passengers. The oxygen masks were found stowed. No oxygen fittings were found in any of the oxygen plug-in receptacles.

A Federal Aviation Administration Aviation Safety Inspector from the Boise, Idaho, Flight Standards District Office, observed the inspection of the left and right side altimeters, encoder and parts of the autopilot at Avionics Masters, Nampa, Idaho. The inspector reported that the encoder was supplied with voltage, however, there was no current draw. Both altimeters were internally damaged and continuity could not be established.

All wreckage, components and documentation retained by the National Transportation Safety Board for examination/review were returned to the Idaho Division of Aeronautics by February 2003.

Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	66, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	12/18/2001
Occupational Pilot:		Last Flight Review or Equivalent:	04/25/2001
Flight Time:	20647 hours (Total, all aircraft), 338 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N2336V
Model/Series:	PA-31	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	31135
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	02/04/2002, Annual	Certified Max Gross Wt.:	6500 lbs
Time Since Last Inspection:	27 Hours	Engines:	2 Reciprocating
Airframe Total Time:	7940 Hours as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, aided in locating accident	Engine Model/Series:	TIO-540-J2BD
Registered Owner:	IDAHO DIVISION OF AERONAUTICS	Rated Power:	350 hp
Operator:	IDAHO DIVISION OF AERONAUTICS	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:		Condition of Light:	Day
Observation Facility, Elevation:	SUN, 5315 ft msl	Distance from Accident Site:	42 Nautical Miles
Observation Time:	1450 MST	Direction from Accident Site:	115°
Lowest Cloud Condition:	Scattered / 1000 ft agl	Visibility	15 Miles
Lowest Ceiling:	Broken / 2300 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	5 knots / 15 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	132°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.87 inches Hg	Temperature/Dew Point:	3°C / -1°C
Precipitation and Obscuration:			
Departure Point:	Idaho Falls, ID (IDA)	Type of Flight Plan Filed:	IFR
Destination:	Boise, ID (BOI)	Type of Clearance:	IFR
Departure Time:	1308 MST	Type of Airspace:	Class E

Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	1 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Fatal	Latitude, Longitude:	43.950000, -115.051667

Administrative Information

Investigator In Charge (IIC):	Gregg Nesemeier	Report Date:	06/25/2003
Additional Participating Persons:	Ray C Glidden; Idaho Division of Aeronautics; Boise, ID Charles Little; The New Piper Aircraft; Chino Hills, CA Jeffrey Poschwatta; Lycoming Engines; Kent, WA Debra J Eckrote; National Transportation Safety Board; Seattle, WA Mike Misnick; FAA-FSDO; Boise, ID		
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/ .		

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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](#).