



National Transportation Safety Board Aviation Accident Final Report

Location:	Naches, WA	Accident Number:	LAX08MA007
Date & Time:	10/07/2007, 1959 PDT	Registration:	N430A
Aircraft:	CESSNA 208B	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	10 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot was returning a group of skydivers to their home base after a weekend of skydiving. He flew several jump flights, and then stopped early in the afternoon to prepare the airplane for the flight home. The flight was planned into an area of clouds, turbulence, and icing, which the pilot had researched. He delayed the departure until he decided that he could complete the planned flight under visual flight rules (VFR). The accident occurred at night with little illumination of the moon, and the airplane was in an area of layered clouds. A detailed analysis of the weather conditions revealed that the flight probably encountered broken to overcast layers both below and above its flight altitude. The satellite and sounding images suggested that it was possibly in an area of mountain wave conditions, which can enhance icing. The recorded radar data indicated that the pilot was likely maneuvering to go around, above, or below rain showers or clouds while attempting to maintain VFR. The airplane likely entered clouds during the last 3 minutes of flight, and possibly icing and turbulence. It was turning when it departed from controlled flight, and a performance study showed that the angle-of-attack at this point in the flight was increasing rapidly. The study determined that the departure from controlled flight was consistent with an aerodynamic stall. The unpressurized airplane was flying at over 14,000 feet mean sea level for more than 1 hour during the flight. It reached 15,000 feet just prior to the accident in sequential 360-degree turns while climbing and descending. Supplemental oxygen was not being used. At these altitudes, the pilot would be substantially impaired by hypoxia, but would have virtually no subjective symptoms, and would likely be unaware of his impairment. The pilot had logged over 2,000 hours of total flight time, with nearly 300 hours in this make and model of airplane. He was instrument-rated, but had only logged a total of 2 hours of actual instrument flight time. Company policy was to fly under visual flight rules only, and they had not flight-checked the pilot for instrument flight.

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 an adequate airspeed to avoid an aerodynamic stall while maneuvering. Contributing to the accident were the pilot's impaired physiological state due to

hypoxia, the pilot's inadequate preflight weather evaluation, and his attempted flight into areas of known adverse weather. Also contributing were the pilot's inadvertent flight into instrument meteorological conditions that included clouds, turbulence, and dark night conditions.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER

Phase of Operation: MANEUVERING

Findings

1. (F) WEATHER CONDITION - CLOUDS
 2. (F) WEATHER CONDITION - TURBULENCE
 3. (F) LIGHT CONDITION - DARK NIGHT
 4. (F) WEATHER EVALUATION - INADEQUATE - PILOT IN COMMAND
 5. (F) FLIGHT INTO KNOWN ADVERSE WEATHER - ATTEMPTED - PILOT IN COMMAND
 6. (F) VFR FLIGHT INTO IMC - INADVERTENT - PILOT IN COMMAND
-

Occurrence #2: LOSS OF CONTROL - IN FLIGHT

Phase of Operation: MANEUVERING

Findings

7. (C) AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND
 8. (F) PHYSICAL IMPAIRMENT(ANOXIA/HYPOXIA) - PILOT IN COMMAND
 9. (C) STALL/SPIN - ENCOUNTERED - PILOT IN COMMAND
-

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: DESCENT - UNCONTROLLED

Findings

10. TERRAIN CONDITION - MOUNTAINOUS/HILLY

Factual Information

HISTORY OF FLIGHT

On October 7, 2007, about 1959 Pacific daylight time, a Cessna 208B, N430A, collided with terrain near Naches, Washington. Kapowsin Air Sports Ltd was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The commercial pilot and nine passengers were killed; the airplane was destroyed. The flight departed Star (ID92), Idaho, about 1750 PDT, en route to Shelton (SHN), Washington. A ground observer reported low clouds, rain, and fog at the accident site. Stampede Pass (KSMP), Washington, immediately north of the accident site, reported low instrument flight rule (LIFR) conditions. Night time conditions prevailed, and no flight plan had been filed.

The pilot flew a group of skydivers from Shelton to Star on October 5th for a weekend of jumping. The owner of the Skydive Center at Star indicated that several jump flights were accomplished on the day of the accident.

A witness stated that the pilot checked the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) web site several times during the day. He also noted that the pilot spoke to someone. After the last check, the pilot indicated that he would be able to make the trip under VFR conditions.

The pilot quit flying early in the afternoon to prepare the airplane for the flight back to Shelton. The flight departed about 1750, and the pilot circled the airport once before departing the area.

A hunter was at a campground a few hundred yards east of the accident site. He estimated that about 1950 he heard a loud noise that he thought sounded like a dragster or engine winding out. A few minutes later, he was outside his trailer, and heard an airplane engine and observed airplane lights west of his position. He saw a bright white light as well as red and green navigation lights. The lights appeared to be moving horizontally, and then moved vertically toward the ground. He heard what he thought was a thud, and reported this to local officials. He noted that the cloud bases were below the mountain tops with misty rain conditions and low visibility.

Examination of a topographical map indicated that the peak immediately west of the accident site was about 6,350 feet. The accident site elevation was 4,300 feet.

Yakima officials began to mobilize search teams, and notified the Federal Aviation Administration (FAA). The FAA reported at the time that they had no reports of a missing airplane. Yakima Search and Rescue was about to terminate the mobilization, when the operator notified the FAA of an overdue airplane. The Prescott Automated Flight Service Station (AFSS) issued an alert notice (ALNOT) at 0108. Yakima Search and Rescue began searching the following morning, and found the wreckage about 2000 that evening.

RADAR DATA

A review of recorded radar data identified a target in the vicinity of Star about 1751, at a mode C reported altitude of 2,400 feet mean sea level (msl). The target circled around Star one time, and then transited across Oregon on a northwesterly course. (All target times have been converted to PDT, and the target points occur about every 12 seconds).

About 1807, the target attained a mode C altitude of 12,400 feet, and maintained that altitude

until 1828:30. The target then began a climb, and reached a mode C altitude of 14,400 feet at 1832:17. At 1839:02, the target began a descent, reached its lowest point of 13,700 feet, and then climbed to and leveled off at 14,200 at 1841:01. The target maintained a northwesterly course and mode C altitudes of 14,200 and 14,300 feet. The target then turned to the north toward Yakima as it approached the Washington border. At 1924:53, the target began a descent and reached a low point of 9,300 feet at 1931:15, and then immediately began a climb. At 1944:10, the target reached a mode C altitude of 14,400 feet, and maintained this altitude until 1955:41.

Near Yakima, the target began maneuvering. The target turned west, then southwest, west, then northwest, west, southwest, and then west again. As the target neared the accident site area, it descended to 13,700 feet at 1956:17.

As the target started a gradual right turn to the north, it began a climb to 14,300 feet. The target then descended to 13,600 feet, and then the right turn tightened as it climbed to the east, reaching a peak altitude of 15,000 feet at 1958:40. There were three targets at 15,000 feet, as the right turn continued.

The next three targets were the last three targets from this radar site that had altitudes associated with them. They were at 14,900 feet as the target was going west; 14,800 feet as the target was going north, and 14,400 feet as the target was going east. The next two targets continued the right turn, but did not have altitude data. Data from a different radar site recorded targets at 13,000 and 8,900 feet. A Safety Board specialist examined the radar data during this time frame to examine the performance of the airplane, and his findings are discussed later in this report.

PERSONNEL INFORMATION

A review of FAA airman records revealed that the 46-year-old pilot held a commercial pilot certificate with ratings for airplane single-engine land, multiengine land, and instrument airplane.

The pilot held a second-class medical certificate issued on March 27, 2007, with limitations that he must wear corrective lenses.

An examination of the pilot's logbook revealed that the last entry was on September 27, 2007. At that date, he had an estimated total flight time of 2,054 hours with 1,963 hours as pilot-in-command. Approximately 161 hours had been logged in the previous 90 days. Approximately 296 hours had been logged in the make and model airplane involved in the accident, with 31 hours in the accident airplane. The pilot logged 1.2 hours with 4 landings at night on September 27, 2007.

The pilot logged 2 hours of actual instrument flight time, which consisted of 4 flights of 0.5 hours instrument time each in January 2004. He logged 46.7 hours of simulated instrument time; the last entry for simulated instrument time was 2.1 hours on April 3, 2006. The pilot also logged 29.6 hours in a simulator.

The pilot primarily flew for Snohomish Flying Service in Snohomish, Washington. They provided a record of an instrument proficiency check on January 3, 2007. The pilot completed a flight review on April 23, 2007. The operator followed a training checklist for their pilots, and the records for the accident pilot contained blank check boxes for cross-country, instrument flight, and instrument approach. The operator reported that this indicated that they had not

performed these maneuvers together with the pilot in an airplane.

AIRCRAFT INFORMATION

The airplane was a Cessna 208B, serial number 208B0415. A review of the maintenance logbook indicated an entry for a 100-hour inspection dated September 10, 2007, with a Hobbs meter time of 3,103 hours. A form listing the life limited components indicated that as of February 5, 2007, the airframe total time was 9,313.4 hours, at a Hobbs time of 2,812.3 hours.

The engine was a Pratt & Whitney Canada PT6-114A, serial number PCE-19143. Total time recorded on the engine was 12,887 hours with 4,876 hours since overhaul.

The Skydive Center at Star fueled the airplane with 182 gallons of jet fuel just prior to the return flight. The owner of the center reported that the pilot wanted to depart with 700 pounds of fuel per side. The pilot indicated to the owner that this was to be less than a 2.5-hour trip, and he felt that this was adequate.

METEOROLOGICAL CONDITIONS

The FAA had no record of a pilot pre-flight weather briefing from either an FAA or FAA contract facility. However, witnesses observed the pilot utilizing the internet and using the National Weather Service (NWS) web site several times prior to his departure. This site contains links to several forecast products including convection, turbulence, and icing. It also has links to SIGMET (Significant Meteorological Information)/AIRMET (Airmen's Meteorological Information) advisories.

A staff meteorologist for the Safety Board prepared a factual report, which is part of the public docket. The report contained the weather conditions near the time of the accident for the departure area, route of flight, and destination.

The synoptic situation indicated a cold front extending across Washington east of the accident site. The radar summary charts indicated a north-to-south band of rain showers behind the front, which extended over the accident site. The NWS weather depiction charts indicated that visual flight rules (VFR) to marginal VFR (MVFR) conditions prevailed along the route of flight.

The GOES-11 infrared satellite imagery from 1930 through 2000 depicted a north-to-south band of clouds extending over the accident site with radiative cloud top temperatures from -12 to -12.5 degrees Celsius, which corresponded to cloud tops near 15,000 feet.

NWS WSR-88D weather radars across the region depicted a band of echoes with reflectivity's of 15 to 25 dBZ extending over the flight track of N430A, with maximum echo tops from 10,000 to 15,000 feet of the last 3 minutes of the track.

The NWS area forecast for the Cascade mountains predicted broken to overcast clouds at 7,000 feet with layers to 28,000 feet, and scattered light rain showers.

There were several AIRMETs in effect for the accident area. AIRMET Sierra indicated possible ceilings of 1,000 feet and visibility below 3 miles. It also indicated mountain obscuration by clouds, precipitation, and mist. AIRMET Zulu, update 3, indicated that the freezing level was between 5,000 and 9,000 feet. It forecast moderate ice between the freezing level and FL (flight level) 240. AIRMET Tango indicated moderate turbulence below 10,000 feet.

Numerous pilot reports indicated icing conditions above 10,000 feet through 18,000 feet over

the region. The NWS Current Icing Product indicated a high probability of icing conditions from 8,000 feet to 15,000 feet over the accident site.

The closest official weather observation station to the accident site was Yakima, Washington, which was 34 nautical miles (nm) east at an elevation of 1,099 feet msl. At 1956, it reported: winds from 300 degrees at 14 knots gusting to 21 knots; visibility 10 statute miles (sm); skies, few clouds at 6,500 feet, broken at 12,000 feet; temperature 16/61 degrees Celsius/Fahrenheit; dew point 8/46 degrees Celsius/Fahrenheit; and altimeter 29.96 inches of mercury.

Stampede Pass (KSMP), Washington, (approximately 001 degrees at 41 nm, elevation 3,959) reported at 1952: winds variable at 3 knots; visibility 1/4 sm in light rain and fog; skies, few clouds at 200 feet, broken at 900 feet, overcast 1,600 feet; temperature 4/39 degrees Celsius/Fahrenheit; dew point 4/39 degrees Celsius/Fahrenheit; and altimeter 30.04 inches of mercury.

Bowers Field Airport (KELN), Ellensburg, Washington, (approximately 052 degrees at 43 nm, elevation 1,764 feet) reported: winds 310 degrees at 18 gusting to 30 knots; visibility 10 sm; skies overcast 5,500 feet; temperature 13/55 degrees Celsius/Fahrenheit; dew point 4/39 degrees Celsius/Fahrenheit; and altimeter 29.98 inches of mercury.

Columbia Gorge Regional/The Dalles Municipal Airport (KDLS), The Dalles, Oregon, (approximately 172 degrees at 58 nautical miles, elevation 247 feet) reported: winds from 310 degrees at 20 knots gusting to 29 knots; visibility 10 statute miles (sm); skies, broken at 7,000 feet, overcast at 9,000 feet; temperature 17/62 degrees Celsius/Fahrenheit; dew point 11/52 degrees Celsius/Fahrenheit; and altimeter 29.99 inches of mercury.

The weather for the destination airport in Shelton (KSHN)(elevation 273 feet), was: winds 240 degrees at 15 knots; visibility 10 sm; skies clear; temperature 11/52 degrees Celsius/Fahrenheit; dew point 9/48 degrees Celsius/Fahrenheit; and altimeter 30.02 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

Investigators examined the wreckage at the accident scene.

The airplane came to rest in forested, mountainous terrain. The accident site debris distribution was approximately 100 feet long and 60 feet wide with the upper parts of the airplane oriented on a north heading.

The structure of the airframe compressed into the principle impact crater (PIC) so that the leading edges of the horizontal stabilizers were inches above ground level. They exhibited aft crush damage. Both wings exhibited aft crush damage. The propeller and nose of the engine were about 5 feet below ground level. The engine separated into multiple pieces. The propeller hub fragmented, and the blades exhibited S-bending, blade scratching, and twisting.

All major flight control components were accounted for at the accident site. Deice boots were observed on the wings, wing struts, and tail surfaces. The right aileron trim actuator measured 1.875 inches, which approximated 0 degrees deflection. Flight control cable continuity was established for the elevator trim. The elevator trim tab measured 1.45 inches on both the left and right sides, which equated to a 15-degree nose down setting.

The elevator, rudder, and aileron control cables exhibited multiple separations; the cables separated in a broomstraw manner, which was consistent with an overload condition. There were no indications of wear at the point of separation. The right flap was up; the left flap

separated from the airframe. The firewall, instrument panel, switch and circuit breaker panels, cockpit, cabin, and fuselage were fragmented. The cabin seats and emergency locator transmitter (ELT) were fragmented. Seat belts, an empty oxygen bottle, a stowed oxygen mask, and cased optical glasses were observed in the wreckage.

MEDICAL AND PATHOLOGICAL INFORMATION

The King County Coroner completed an autopsy on the pilot, and determined that the cause of death was multiple blunt force injuries. The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing of specimens of the pilot.

Analysis of the specimens for the pilot contained no findings for tested drugs. They did not perform tests for carbon monoxide or cyanide.

The report contained the following findings for volatiles: 839 (mg/dL, mg/hg) ethanol detected in liver, 73 (mg/dL, mg/hg) ethanol detected in muscle; 67 (mg/dL, mg/hg) ethanol detected in kidney; 16 (mg/dL, mg/hg) ethanol detected in lung; 2 (mg/dL, mg/hg) acetone detected in lung; 1 (mg/dL, mg/hg) isobutanol detected in liver; 2 (mg/dL, mg/hg) isopropanol detected in lung; 2 (mg/dL, mg/hg) N-butanol detected in liver; and 2 (mg/dL, mg/hg) N-propanol detected in kidney. The report noted putrefaction.

The pilot resided in Massachusetts, and spent the summer flying in the Seattle area. The owner of the airplane stated that they didn't use oxygen, so they did not service the system. However, they kept two masks in the airplane.

The duration of the flight was about 2 hours 8 minutes. Radar data indicated that over 6 1/2 minutes of the flight occurred between 12,500 feet and 14,000 feet. Over 1 hour 7 minutes occurred at 14,000 feet and above.

According to an aviation medicine textbook (Gradwell, D.P. 2006. Hypoxia and Hyperventilation. In: Ernsting's Aviation Medicine, Fourth Edition, Eds. D.J. Rainford and D.P. Gradwell. Hodder Arnold, London, U.K. p. 53), from 10,000 to 15,000 feet, an individual without supplemental oxygen "exhibits no or few signs and has virtually no symptoms [of hypoxia]. The ability to perform skilled tasks is impaired, however, an effect of which the subject is frequently unaware." The FAA Aeronautical Information Manual, paragraph 8-1-2, "Effects of Altitude," describes hypoxia as "a state of oxygen deficiency in the body sufficient to impair functions of the brain and other organs." The textbook also notes that "an individual breathing air at 8,000 feet may take significantly longer to achieve optimum performance at novel tasks than is the case at sea level. For example, this degree of hypoxia has been found to double the reaction times of initial responses to a complex choice-reaction task as compared with responses at sea level. The intensity of this effect increases with altitude and complexity of the task - markedly so above 12,000 feet." (Gradwell, 2006, p. 51). Studies also noted that research subjects exhibited mental performance impairment during task tests that were begun after only 5 minutes (Kelman, G.R.; Crow, T.J. 1969. Impairment of mental performance at a simulated altitude of 8,000 feet. In: Aerospace Medicine 40 (9). pp. 981-982) and 10 minutes (Denison, D.M.; Ledwith, F.; Poulton, E.C. 1966. Complex reaction times at simulated cabin altitudes of 5,000 feet and 8,000 feet. In: Aerospace Medicine. pp. 1010-1013. October 1966) of exposure to a simulated altitude of 8,000 feet.

Federal Aviation Regulation (FAR) 91.211 governs the use of supplemental oxygen. It states that the required minimum flight crew must be provided and use supplemental oxygen for that

part of the flight that is of more than 30 minutes duration at cabin pressure altitudes above 12,500 feet msl up to and including 14,000 feet msl. At cabin pressure altitudes above 14,000 feet msl, the required minimum flight crew must be provided with and use supplemental oxygen.

TESTS AND RESEARCH

The wreckage was recovered from the accident site and further examinations were accomplished at Avtech Service in Kent, Washington, on December 13, 2007.

The propeller hub fractured into several pieces at impact and all three blades separated. The two blades that were in the primary impact crater and the third blade that was about 15 feet away and several feet underground were examined. Blade A had leading edge polishing, and trailing edge gouges. The outboard 12 inches of the blade separated, and was curled; the fracture surface was angular and irregular. The blade twisted toward the low pitch, high revolutions per minute (rpm) position; the lug separated. Blade B bowed forward, twisted toward the low pitch, high rpm position, and had leading edge polishing. On blade C, the lug separated, and the leading edge twisted toward the low pitch high rpm position. It had leading edge gouges, and trailing edge buckling.

Severe impact and fire damage precluded formal disassembly of the engine. Disassembly was limited to sectioning the gas generator case and exhaust duct with a powered carbon rotary disc, and separating the power section for access to the turbine section. The compressor rotor and stators, the No. 2 bearing housing, the compressor turbine shroud, the compressor turbine, the power turbine guide vane ring, the power turbine shroud, and the power turbine displayed heavy circumferential rubbing and machining. The Pratt & Whitney investigator attributed this to their making contact with their adjacent components under impact loads and external housing deformation. The reduction gearbox 1st stage coupling fractured in torsion due to impact loads. There were no indications of any pre-impact distress or operational dysfunction to any of the engine components examined.

All personal gear recovered from the site was weighed. For computational purposes, the passengers' weights were distributed to optimize the most forward center of gravity (CG). The Cessna investigator determined that the airplane was under its certified maximum gross weight, and that the center of gravity was within limits throughout the flight.

Performance Study

A Safety Board specialist used recorded radar data to study the airplane's performance; the study is part of the public docket. It attempted to describe, to the extent possible, the airplane's motion during the flight using various data sources. Due to inherent limitations in the various input data sources and assumptions that had to be made, the results presented in the study are only estimates. Pertinent parts of the study follow.

The study indicated that the airplane was changing altitudes and turning before making an abrupt 360-degree turn, and lost over 10,000 feet in 2 minutes. The descent rate approached 8,000 feet per minute (fpm). The last target was at 8,900 feet at 1959:40. One of the three radar sites used appeared to have captured the first sign of the airplane stalling about 1957:33. Therefore, the specialist used data from only one radar site in the performance calculations, and these were limited to the time prior to the stall. During the last 360-degree turn, there were several other indications of the airplane approaching a stall followed by recovery. The airplane appeared to completely depart controlled flight around 1959.

The specialist used simulator data for airplane lift, drag, and side-force in comparison calculations. One goal was to help determine whether the airplane may have been operating in icing conditions. The calculated angle-of-attack history with no ice showed that the accident flight was very close to or beyond stall. If there had been significant ice present on the airplane, the specialist felt that the radar data would likely have recorded a departure from controlled flight sooner than 1957:33.

The study also noted that it required 620 shaft horsepower (shp) to trim the C-208B in the simulation at the accident conditions. This was close to the sea level 675 shp maximum power rating of a new PT6 engine before any losses due to normal wear. This high power requirement was consistent with a Cessna C-208B being operated close to its design limit and with very little maneuver margin.

The specialist used flight lift and other flight-test validated, non-linear C-208B aerodynamic data from a simulator company to recreate the accident flight in simulation. He compared stand alone checkout data with flaps retracted to the simulation results to ensure that the C-208B aerodynamic data were properly implemented in the NTSB simulation. The comparison indicated that the simulation results were valid and consistent with a C-208B operating close to the accident conditions.

In summarizing the findings, the specialist noted that the airplane's radar target had just entered an area of green intensity weather (30 dBZ according to the chart's legend), and was turning when the radar site captured the departure from controlled flight. The performance study showed that the angle-of-attack at this point in the flight was increasing rapidly, and that the departure from controlled flight was consistent with an aerodynamic stall.

ADDITIONAL INFORMATION

The owner of the airplane indicated that it was placarded with "Not approved for Known Icing." He didn't keep the window deice plate on the airplane. He made it their policy to not fly in icing conditions at all. All deice equipment was working previously according to the owner. The autopilot was working well, as was the Global Positioning System (GPS) moving map. The owner indicated that the pilot had about 30 hours in this particular airplane, and was familiar with it and its systems.

The owner is a certified flight instructor and had flown with the accident pilot previously. He indicated that the pilot flew well even in an airplane that was new to him. They discussed the flight to Idaho and back; this included flying north of Mt. Ranier if need be, since the minimum en route altitude (MEA) was lower on that side of the mountain. The pilot didn't express any concerns about flying in instrument conditions.

Another pilot for Kapowsin indicated that he talked to the accident pilot about noon on the day of the accident. The pilot had planned to leave about 1630, but was going to delay until 1930. They discussed two routes; Ellensburg to Seattle and White Pass to Shelton, and noted that the latter's MEA was 10,000 feet.

A check pilot for Snohomish Skydive indicated that they operated VFR only, and did not go into clouds. He said that the accident pilot was diligent about checking weather on the computer, and would not plan his flight to go into the clouds. One skydiver on the flight had called him from Star to indicate that they were waiting out the weather. The check pilot indicated that the pilot was under no pressure to return to Shelton that night, and would not have hesitated to stop at Yakima or another intermediate point if necessary.

Astronomical conditions indicated that sunset was at 1845, and the end of civil twilight was at 1915, with the sun approximately 14 degrees below the horizon. The moon was more than 20 degrees below the horizon with only 8 percent of the disc illuminated.

Pilot Information

Certificate:	Commercial	Age:	46, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	03/27/2007
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	04/23/2007
Flight Time:	2054 hours (Total, all aircraft), 296 hours (Total, this make and model), 1963 hours (Pilot In Command, all aircraft), 191 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	Registration:	N430A
Model/Series:	208B	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	208B0415
Landing Gear Type:	Tricycle	Seats:	10
Date/Type of Last Inspection:	09/10/2007, 100 Hour	Certified Max Gross Wt.:	8950 lbs
Time Since Last Inspection:		Engines:	1 Turbo Prop
Airframe Total Time:	9604 Hours as of last inspection	Engine Manufacturer:	Pratt & Whitney Canada
ELT:	Installed, not activated	Engine Model/Series:	PT6-114A
Registered Owner:	Kapowsin Air Sports Ltd	Rated Power:	675 hp
Operator:	Kapowsin Air Sports Ltd	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Night
Observation Facility, Elevation:	KYKM, 1099 ft msl	Distance from Accident Site:	34 Nautical Miles
Observation Time:	1956 PDT	Direction from Accident Site:	90°
Lowest Cloud Condition:	Few / 6500 ft agl	Visibility	10 Miles
Lowest Ceiling:	Broken / 12000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	14 knots / 21 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	300°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	16° C / 8° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Star, ID (ID92)	Type of Flight Plan Filed:	None
Destination:	Shelton, WA (SHN)	Type of Clearance:	None
Departure Time:	1750 PDT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	9 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	10 Fatal	Latitude, Longitude:	46.587222, -121.352222

Administrative Information

Investigator In Charge (IIC):	Howard D Plagens	Report Date:	06/22/2009
Additional Participating Persons:	Mike Robertson; Federal Aviation Administration FSDO; Spokane, WA Thomas Berthe; Pratt & Whitney Canada; Quebec, Canada, Jan Smith; Cessna Aircraft company; Wichita, KS Denis Rivard; Transportation Safety Board of Canada; Montreal, Canada,		
Publish Date:	06/22/2009		
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](#).