Aviation Investigation Final Report

Location:	Browerville, Minnesota	**Accident Number:**	CHI08FA027
Date & Time:	October 23, 2007, 22:12 Local	**Registration:**	N327ND
Aircraft:	Piper PA-44-180	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The accident flight was the third of a three-leg dual instructional night cross-country flight. The airplane was established in normal cruise flight at 4,500 feet mean sea level (msl) when the airplane abruptly departed controlled flight and impacted a bog. The bog was about 15 to 20 feet deep, with a thin layer of vegetation floating on the surface. The airplane came to rest inverted, and damage to the airframe was consistent with an inverted impact to the surface of the bog. Data recovered from the airplane's flight display system indicated that the airplane was in stable flight on a 320-degree magnetic heading, at 4,500 feet msl, and approximately 160 knots true airspeed prior to the accident, when it abruptly departed from controlled flight. The airplane rolled approximately 20 degrees left wing down, yawed to the left about 30 degrees, and simultaneously pitched nose-down about 40 degrees. It then reversed and immediately entered a descending, right roll for the duration of the flight. The airplane impacted the bog within 30 seconds of the upset. The post accident examination noted that the left half of the horizontal stabilator was bent upward approximately 90 degrees, inconsistent with the damage to the remainder of the airframe. This damage was consistent with the initial left yaw and nose down pitch recorded during the upset. In addition, a depression and tear were observed on the upper wing skin near the left wing tip. Microscopic examination and DNA testing of material on the inside surface of the wing skin was identified as remains of a Canada goose. The natural history of this species was consistent with the location, time, and date of the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: An in-flight collision with at least one Canada goose, and the resulting damage to the left stabilator that caused the airplane to become uncontrollable. Contributing to the accident was

the night lighting condition, which precluded any possibility of the flight crew seeing the bird(s) prior to impact.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: CRUISE - NORMAL

Findings
1. (C) OBJECT - BIRD(S)
2. (C) FLIGHT CONTROL,STABILATOR - BENT
3. (C) FLT CONTROL SYST,STABILATOR CONTROL - LOSS,TOTAL
4. (F) LIGHT CONDITION - NIGHT

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: CRUISE

Findings
5. (C) AIRCRAFT CONTROL - NOT POSSIBLE - FLIGHTCREW

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
6. TERRAIN CONDITION - WATER

Factual Information

HISTORY OF FLIGHT
On October 23, 2007, about 2212 central daylight time, a twin-engine Piper PA-44-180, N327ND, operated by the University of North Dakota, was substantially damaged during an in-flight collision with terrain near Browerville, Minnesota. The dual instructional flight was being conducted under Title 14 Code of Federal Regulations Part 91 on a visual flight rules (VFR) flight plan. The private pilot and flight instructor were fatally injured. Night visual meteorological conditions prevailed at the time of the accident. The cross-country flight departed St. Paul Downtown Airport (STP), St. Paul, Minnesota, at 2115. The intended destination was Grand Forks International Airport (GFK), Grand Forks, North Dakota.

The pilot and flight instructor planned a three-leg, dual instructional, cross-country night flight as part of the University of North Dakota (UND) commercial/instrument flight program. The initial leg was from GFK to Hutson Field Airport (GAF), Grafton, North Dakota. From GAF, the flight planned to fly to STP before returning to GFK.

The pilot contacted flight service at 1711 and filed two VFR flight plans. The first was for a flight from GAF to STP, with a proposed departure time of 1815. The second was for the return flight from STP to GFK, with a proposed time off of 2115. A Direct User Access Terminal (DUAT) session attributed to the flight was initiated at 1713.

The flight departed GFK about 1745, and made an intermediate stop at GAF before continuing to STP. At 1825, the flight crew contacted Grand Forks Automated Flight Service Station (AFSS) and requested that their VFR flight plan to STP be activated. The flight arrived at STP at 2000, and it subsequently departed on the accident flight at 2115. At 2125, the flight crew contacted Princeton AFSS and requested that their VFR flight plan from STP to GFK be activated.

According to employees at the fixed base operator (FBO) at STP, the arrival and departure of the UND flight was uneventful. The flight crew seemed relaxed. The FBO customer service representative recalled that the pilots borrowed the crew car in order to get something to eat. At the request of the flight instructor, the airplane was topped-off with 41.8 gallons of 100 low-lead aviation fuel.

At 2118, after departure from STP, the flight crew contacted the Federal Aviation Administration (FAA) Minneapolis Terminal Radar Approach Control (TRACON) facility and requested VFR flight-following services en route to GFK. Handling of the flight was subsequently transferred to Minneapolis Air Route Traffic Control Center (ARTCC), which provided flight-following services until 2155. At that time, the flight was approaching the extent of normal radar coverage and the flight-following services were terminated. The

airplane was approximately 13 miles north of St Cloud, Minnesota, at 4,500 feet mean sea level (msl). During the time flight-following services were provided, communications were routine. The pilots did not communicate any difficulties or anomalies prior to the accident.

The FAA was notified that the flight was overdue about 0016 on October 24th. An Alert Notice was issued at 0146 when initial attempts to locate the airplane were unsuccessful. The airplane was subsequently located about 1810 that evening after a search by local authorities and the Civil Air Patrol.

FAA radar track data indicated that the flight departed STP and proceeded on course toward GFK. The initial radar data point was recorded at 2117:21 (HHMM:SS), with a Mode-C transponder altitude of 900 feet. According to the track data, the airplane climbed to a cruise altitude of 4,500 feet and was established on a course to GFK. About 2155 when flight-following was terminated, the flight changed from the assigned discrete transponder beacon code to a 1200 VFR transponder code. Based on VFR transponder returns correlated to the accident airplane, the flight remained within radar coverage until 2203:24 when it left the normal radar coverage area. It was approximately 2 miles west of Little Falls, Minnesota, at 4,600 feet at that time. No further radar data was recorded related to the accident flight. The accident site was located 16.5 miles northwest of the final radar data point.

PERSONNEL INFORMATION

The pilot was enrolled in the Commercial/Instrument Pilot Airplane training program at the University of North Dakota – Grand Forks. A university flight instructor accompanied the pilot on the night cross-country flight. The flight instructor was a former student of the university flight program.

The flight instructor, age 22, held a Commercial Pilot certificate with single and multi-engine land airplane, and instrument airplane ratings. She held a Flight Instructor certificate with single and multi-engine airplane, and instrument airplane ratings. She was issued a Second-Class Airman Medical certificate on July 27, 2007. The medical certificate included a limitation that corrective lenses be worn.

A review of the flight instructor's logbook revealed that her most recent logged flight was dated October 1, 2007. University records indicated 9 additional flights between October 1st and October 23rd. According to the logbook and university records, the flight instructor had accumulated 647.1 hours total flight time, with 128.8 hours in multi-engine airplanes. Of that total, 80.4 hours were at night, 6.0 hours were in actual instrument conditions, and 56.0 hours were in simulated instrument conditions. She had accumulated at least 121.5 hours in Piper PA-44-180 (Seminole) airplanes.

The pilot, age 20, held a Private Pilot certificate with a single-engine land airplane rating. He was issued a Second-Class Airman Medical certificate on July 27, 2007. The medical certificate was issued without limitations.

According to university records, the pilot had accumulated 171.5 hours total flight time, with 13.0 hours in multi-engine airplanes. All of the multi-engine flight time was as dual instruction in a Piper PA-44-180. He had accumulated 18.4 hours of night and 50.9 hours of cross-country flight time. The records indicated that the pilot had 37.6 hours of instrument flight time. In addition, the pilot had acquired 10.7 hours of time in a multi-engine flight-training device. Of that total, 5.8 hours were on instrument flight procedures.

The two flights prior to the accident flight (GFK to GAF, and GAF to STP) and the accident flight totaled approximately 2.8 hours of additional flight time. This was split with about 1.2 hours under day/dusk lighting conditions and 1.6 hours of night conditions.

AIRCRAFT INFORMATION

The accident airplane was a 2003 Piper PA-44-180 Seminole, serial number 4496174, certificated by the FAA under Type Certificate A19SO. The airplane was a four-place, low-wing, T-tail design, with a retractable, tricycle landing gear configuration. A cockpit/cabin door was located on the right side of the airplane adjacent to the forward passenger's seat. The left side window adjacent to the pilot's seat could be separated from the airframe for use as an emergency exit.

The airplane was powered by two wing-mounted reciprocating engines. The left engine was a Lycoming O-360-A1H6, serial number L-39103-36A. The right engine was a Lycoming LO-360-A1H6, serial number L-769-71A. They were four-cylinder, normally aspirated, carbureted engines, capable of developing 180 horsepower each. The airplane was equipped with Hartzell HC-C2YR-2CEUF, serial number AU10422B, and HC-C2YR-2CLEUF, serial number AU11265B, adjustable pitch, constant speed propellers.

The accident airplane was issued a normal category, standard airworthiness certificate on June 30, 2003. The airplane was subsequently purchased by the University of North Dakota on July 15, 2003, and registered as N327ND. It was placed on an experimental airworthiness certificate on September 7, 2005, for research and development purposes.

The airplane was equipped with the Avidyne Entegra avionics suite, to include a Primary Flight Display and Multifunction Flight Display. The airplane was returned to a normal category, standard airworthiness certificate on June 13, 2006.

The airplane was maintained under the University of North Dakota Progressive Inspection Program. Review of the maintenance records indicated that the most recent progressive inspection was a Phase 2 procedure, which was completed on October 1, 2007. The airframe had accumulated 1,801.6 hours total flight time as of that inspection. A Phase 1 inspection was completed on September 10, 2007, at 1,740.0 hours total airframe time.

According to the university personnel, the airplane experienced a bird strike event the day prior to the accident. Damage was limited to the left engine. Maintenance records indicated that the left engine mufflers, both forward and aft, were subsequently replaced the morning of the

accident. The airframe had accumulated 1,849.7 hours total flight time at the time of the maintenance work.

METEOROLOGICAL INFORMATION

The National Weather Service (NWS) Surface Analysis Chart and Weather Depiction Chart indicated Visual Flight Rules (VFR) conditions along the route of flight from STP to GFK, with generally clear skies and sustained north-northwesterly winds at 10 to 15 knots. VFR conditions are defined as cloud ceilings greater than 3,000 feet above ground level (agl) and visibilities greater than 5 miles. In addition, satellite imagery depicted clear skies over the site about the time of the accident.

The closest weather reporting facility to the accident site was Staples Municipal Airport (KSAZ), Staples, Minnesota, located approximately 14 miles north-northwest of the accident site at an elevation of 1,287 feet msl. The airport was equipped with an Automated Weather Observation System (AWOS-3) and reported the following conditions surrounding the time of the accident.

At 2155, winds from 340 degrees at 13 knots, gusting to 19 knots, visibility 10 miles, clear skies, temperature 8 degrees Celsius, dew point 2 degrees Celsius, and altimeter 30.11 inches of mercury.

At 2215, winds from 340 degrees at 13 knots, visibility 10 miles, clear skies, temperature 7 degrees Celsius, dew point 2 degrees Celsius, and altimeter 30.12 inches of mercury.

At 2237, winds from 350 degrees at 9 knots, visibility 10 miles, clear skies, temperature 7 degrees C, dew point 2 degrees C, altimeter 30.13 inches of mercury.

The next closest weather reporting facility to the accident site was from Little Falls/Morrison County Airport – Lindberg Field (KLXL), Little Falls, Minnesota, located approximately 18 miles southeast of the accident site at an elevation of 1,122 feet msl. The airport was equipped with an AWOS-3 system and reported the following weather conditions surrounding the time of the accident:

At 2155, wind from 300 degrees at 4 knots, visibility 10 miles, clear skies, temperature 6 degrees C, dew point 0 degrees C, altimeter 30.09 inches of mercury.

At 2215, winds from 320 degrees at 6 knots, visibility 10 miles, clear skies, temperature 7 degrees C, dew point temperature 0 degrees C, altimeter 30.09 inches of mercury.

At 2235, winds from 330 degrees at 11 knots, gusting to 17 knots, visibility 10 miles, clear skies, temperature 7 degrees C, dew point temperature 0 degrees C, altimeter 30.10 inches of mercury.

An Airman's Meteorological Advisory (AIRMET) for turbulence (AIRMET Tango Update 3) was

issued at 1545 and was valid until 2200. The advisory warned of the possibility of moderate turbulence below 8,000 feet. The accident site was located within the boundaries of the advisory.

At 2145, AIRMET Tango was re-issued and was valid until 0400 the following morning. The advisory noted the possibility of moderate turbulence below 15,000 feet. The accident site was located within the boundary of the advisory.

There were no Severe Weather Forecast Alerts, Significant Meteorological Advisories (SIGMETs), Convective SIGMETs, or Center Weather Advisories applicable to the accident flight.

Several pilot reports (PIREPs) noting turbulence across the region were on file. Between 1500 and 0100, fourteen PIREPs were filed – nine of them noted the presence of turbulence or low-level wind shear below 10,000 feet. At 1701, a report for moderate-to-severe turbulence between 4,000 feet and 6,000 feet in the vicinity of Minneapolis, southeast of the accident site, was filed. However, at 1946, a PIREP from a pilot in the vicinity of Marshall, Minnesota, noted negative turbulence between 4,000 feet and 9,000 feet.

Sunset was at 1820 on the day of the accident, and civil twilight ended at 1950. The moon rose at 1639, and was approximately 45.6 degrees above the horizon at the time of the accident. About 98-percent of the moon's visible disk was illuminated.

WRECKAGE AND IMPACT INFORMATION

The accident site was located in a sparsely populated, rural area northeast of Browerville, Minnesota. The airplane came to rest inverted in a shallow bog, about 15 to 20 feet deep. A portion of the tail of the airplane, including the lower rudder was visible above the water. The remainder of the airplane was submerged. The airplane was recovered to a hangar at the Little Falls-Morrison County Airport where a post accident examination was performed.

The aircraft was recovered as a single unit; however, the aft fuselage was dislocated tail downward relative to the cabin area and wings. In addition, the upper portion of the nose separated from the airframe and was not recovered from the bog. The aft fuselage and empennage were separated from the forward fuselage to facilitate recovery. The lower portion of the nose structure was also separated from the fuselage in order to facilitate recovery. At the time of the post accident examination, the airplane structural components consisted of the nose; wings and center cabin, with the cockpit floor and instrument panel; and the aft fuselage and empennage, with the cockpit/cabin roof still attached.

The nose section was separated from the airframe. The upper, hinged fiberglass nose cone was separated from the lower nose aluminum structure. The nose cone was not recovered from the bog. The nose landing gear remained attached to the trunnion fittings. The strut and wheel assemblies appeared intact. The cabin heater exhibited damage consistent with impact forces. The burner can was intact with the exception of weld fractures adjacent to deformed

areas. No anomalies consistent with a pre-impact malfunction were observed.

The cockpit floor was bent downward approximately 90 degrees near the leading edge of the wings. The cabin floor area and wing carry-through spars were intact. The pilot and passenger seats remained secured to the seat tracks. The instrument panel and flight controls remained attached to the floor structure. Damage to the cockpit flight and engine controls was consistent with impact forces. Flight control continuity was confirmed from the cockpit to the ailerons and the fuselage separation point at the aft cabin. Engine control continuity was confirmed from the throttle pedestal to the wing engine mounts. The fuel system exhibited continuity throughout the system. The fuel selectors were in the ON position when observed during the post accident examination. The left and right engine electric fuel pumps operated when energized, with no anomalies.

The wings remained attached to the center cabin structure. Both wings were twisted leading edge down approximately 30 degrees along the entire span. The upper skins were deformed downward against the internal structure of the wings. The location of the spars and ribs were evident due to the skin deformation. The leading edge upper skin between the fuselage and the engine nacelles was deformed downward to the extent that it had torn through. The upper and lower wing skins were also torn through along the outboard sides of the engine nacelles. The left upper wing skin immediately inboard of the wing tip exhibited a crescent-shaped depression forward of the spar. The upper wing skin was torn through along the aft edge of this depression, adjacent to the spar. (A section of wing skin from this area was removed for further testing as noted in the Tests and Research section later in this report.) The ailerons and flaps remained attached to the wings. The aileron counter weights remained securely attached. The flaps were observed in the retracted position. The wing tips had separated. The main landing gear remained attached to the trunnion structure. The struts and wheel assemblies appeared to be intact.

The aft fuselage and empennage remained attached to each other. The cockpit/cabin area of the roof (top of the fuselage) remained attached to the aft fuselage. The roof was deformed downward. The vertical stabilizer was deformed consistent with impact forces. The upper approximately one-half of the vertical stabilizer skin was wrinkled. The leading edge of the vertical stabilizer was crushed aft. The forward portion of the upper fiberglass fairing was separated and not recovered. The rudder and rudder trim tab remained attached to the vertical stabilizer. The upper approximately one-quarter of the rudder was buckled. Rudder control continuity was confirmed from the control surface to the forward end of the aft fuselage.

The T-tail horizontal stabilator remained attached to the top of the vertical stabilizer. The right half of the stabilator appeared to be deformed downward about 10 degrees along the entire span beginning at the root. In addition, it was twisted leading edge down approximately 15 degrees along the entire span. The upper skin was deformed downward against the internal structure similar to the wing damage. The location of the spar and ribs was evident due to the skin deformation.

The left half of the stabilator was bent upward approximately 90 degrees at the tip, which was inconsistent with the damage to the remainder of the airframe. The inboard leading edge skin was torn from the spar. The spar was deformed but appeared otherwise intact. The stabilator section remained attached to the airframe by the spar, remaining stabilator skin aft of the spar, and the anti-servo trim tab.

The stabilator counter-weight and push-pull control tube were intact. Stabilator control continuity was confirmed to the forward end of the aft fuselage section. The anti-servo trim tab remained attached to the stabilator, and the control link was securely attached to the tab. The trim jack screw extension measured 1/2 inch, which was consistent with a neutral to slight nose-down trim position.

The forward cabin entry door had separated from the fuselage. It was distorted and deformed. The window had come out of the door. The emergency exit window normally installed on the left side of the airplane next to the pilot had separated from the airframe. It was not recovered from the bog.

The left engine and nacelle remained attached to the wing. The engine remained secured to the engine mount; however, the engine mount was partially separated from the firewall. The upper skin of the nacelle was deformed downward similar to the wing skins. The fuel bladder was breached. The engine sustained damage consistent with impact forces. Internal continuity was confirmed via crankshaft rotation, and compression was obtained on all cylinders. The spark plugs exhibited normal wear signatures. The magnetos appeared intact and produced a spark across all leads when rotated. Disassembly of the carburetor and engine driven fuel pump did not reveal any anomalies associated with a loss of engine power. Examination of the left engine did not reveal any anomalies associated with a pre-impact failure.

The two-bladed propeller remained securely attached to the engine. The spinner was deformed, but otherwise intact. One blade appeared undamaged. The second blade was bent aft approximately 20 degrees about a point near mid-span of the blade.

The right engine and nacelle had separated from the wing. The upper skin of the nacelle was deformed downward similar to the wing skins. The fuel bladder was intact. Fluid consistent with 100 low-lead aviation fuel and water was present in the bladder. The engine sustained damage consistent with impact forces. Internal continuity was confirmed via crankshaft rotation, and compression was obtained on all cylinders. The spark plugs exhibited normal wear signatures. The magnetos appeared intact and produced a spark across all leads when rotated. Disassembly of the carburetor and engine driven fuel pump did not reveal any anomalies associated with a loss of engine power. Examination of the right engine did not reveal any anomalies associated with a pre-impact failure.

The two-bladed propeller remained securely attached to the engine. The spinner was deformed, but otherwise intact. One blade was bent aft about 10 degrees over the span of the

blade. The second blade was bent aft approximately 40 degrees about a point near mid-span of the blade.

Instrument and annunciator panel light bulbs were examined. Four instrument panel bulbs (used for instrument illumination), two bulbs associated with the Pitot Heat OFF/INOP annunciator warning, and two bulbs associated with the Oil Pressure annunciator warning, exhibited deformation and stretching of the filaments consistent with the bulbs being ON at the time of impact. The remaining bulbs examined, including the Gear Warning, Low Buss Voltage, Alternator Inop, and Heater Overheat exhibited broken filaments and no sign of deformation consistent with being extinguished at the time of impact.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies of the pilot and flight instructor were conducted on October 26, 2007, at Mercy Hospital in Coon Rapids, Minnesota. The reports noted the presence of multiple blunt force injuries due to an aircraft accident.

The FAA Civil Aerospace Medical Institute Forensic Toxicology Reports for both pilots stated that the testing was negative for all substances in the screening profile.

TESTS AND RESEARCH

The Avidyne avionics normally retain flight parameters in non-volatile memory within the Primary Flight Display (PFD) and Multifunction Display (MFD) units. Download of the data associated with the MFD was not successful due to damage sustained in the accident. Download of the PFD data was successful, however.

The PFD data indicated that the airplane was in stable flight on a 320-degree magnetic heading, at 4,500 feet msl, and approximately 160 knots true airspeed prior to the accident. About 2211:46, the airplane abruptly departed from controlled flight. It rolled approximately 20 degrees left wing down, yawed to the left about 30 degrees, and simultaneously pitched nose down about 40 degrees. The airplane then reversed and immediately entered a descending, right roll for the duration of the flight. The recorded data ended about 2212:10.

A section of upper wing skin was taken from near the left wing tip, at a point about mid-chord. The post accident examination noted the presence of material on the inside surface of the wing skin inconsistent with those used in the construction of an aircraft. The wing skin section was along a tear in the skin, adjacent to the spar. This portion of the airplane was submerged in the bog after the accident until recovery of the airplane.

Microscopic examination and DNA testing by forensic ornithologists identified the material on the wing skin section as remains of a Canada goose. The ornithologists further noted that the natural history of this species was consistent with the location, time and date of the accident.

ADDITIONAL INFORMATION

Analysis of bird strike data from 1990 through 2004 by the United States Department of

Agriculture, Wildlife Services, determined that 74 percent of bird strikes occurred within 500 feet of the ground, 19 percent between 500 feet agl and 3,500 feet agl, and 7 percent above 3,500 feet. Of the 26 percent of bird strikes that occurred above 500 feet, about 7 times more strikes occurred at night than during daylight hours. This was due to the fact that about 61 percent of the reported strikes above 500 feet agl occurred at night while only 18 percent of aircraft movements occurred at night. In addition, a proportionally higher incidence of strikes occurred between September and November, and between April and May, as compared to the number of flight operations.

Further review of the data indicated that the probability of a bird strike decreased by 32 percent for every 1,000-foot increase in altitude. Outside of the airport environment, the altitude zone from 500 feet agl to 3,500 feet agl was the most hazardous, especially at night.

Canada geese were attributed to 668 strikes with civil aircraft between 1990 and 2002. Of those strikes, 112 resulted in substantial damage to the aircraft. The average mass of a Canada goose is 9.2 lbs for a male and 7.8 lbs for a female, with a maximum mass of 13.8 lbs. This species exhibits strong flocking behavior.

The University of North Dakota provided additional pilot training regarding bird strike hazards and mitigation. In addition, they recommended to all of their pilots and flight instructors that when possible higher cruise altitudes should be selected, especially on night cross-country flights, in order to minimize the probability of a bird strike.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	22,Female
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	July 23, 2007
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 11, 2007
Flight Time:	647 hours (Total, all aircraft), 122 hours (Total, this make and model)		

Pilot Information

Certificate:	Private	**Age:**	20,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	July 27, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	March 15, 2006
Flight Time:	172 hours (Total, all aircraft), 13 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N327ND
Model/Series:	PA-44-180	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	4496174
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 1, 2007 AAIP	**Certified Max Gross Wt.:**	3816 lbs
Time Since Last Inspection:	51 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	1852 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-360-A1H
Registered Owner:	UNIVERSITY OF NORTH DAKOTA	**Rated Power:**	180 Horsepower
Operator:	UNIVERSITY OF NORTH DAKOTA	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	LXL,1122 ft msl	**Distance from Accident Site:**	18 Nautical Miles
Observation Time:	22:15 Local	**Direction from Accident Site:**	150°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	320°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.09 inches Hg	**Temperature/Dew Point:**	7°C / 0°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	St Paul, MN (STP)	**Type of Flight Plan Filed:**	VFR
Destination:	Grand Forks, ND (GFK)	**Type of Clearance:**	None
Departure Time:	21:15 Local	**Type of Airspace:**	

Airport Information

Airport:	Little Falls-Morrison County LXL	**Runway Surface Type:**	
Airport Elevation:	1123 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	46.159168,-94.657775

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	Richard Sherman; FAA-Minneapolis FSDO; Minneapolis, MN Dana D Siewert; University of North Dakota; Grand Forks, ND Frank Argenziano; University of North Dakota; Grand Forks, ND Paul Lehman; Piper Aircraft, Inc.; Vero Beach, FL Mark W Platt; Textron Lycoming; Van Nuys, CA
Original Publish Date:	December 28, 2008
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=66964

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.