Aviation Investigation Final Report

Location:	Waubun, Minnesota	**Accident Number:**	CHI04LA173
Date & Time:	July 8, 2004, 01:35 Local	**Registration:**	N248ND
Aircraft:	Piper PA-28-161	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The airplane was destroyed when it impacted terrain during cruise flight at 0135 central daylight time. The private pilot was working on his commercial and instrument flight ratings. The flight was a night cross-country flight which required landings at three different airports with one segment of the flight consisting of a straight-line distance of at least 250 nautical miles between airports. The pilot reported that on July 6th he woke up at 0800 and that he went to bed at 0200 on July 7th. On July 7th, he slept until 0730-0800. The pilot reported that he departed Grand Forks (GFK), North Dakota, at 1815. He flew to Airlake Airport (LVN), Minneapolis, Minnesota, on the first leg of his cross-country flight and arrived there at 2030. He departed LVN and continued on the second leg of the flight plan. He arrived at Crystal Airport (MIC) at 2130. He had the airplane fueled with 24 gallons of fuel. He met with a friend and they went to eat at a restaurant where he had a meal. He returned to the airport and departed at 2355. He reported that he climbed to 4,500 feet mean sea level (msl) and contacted flight service about 0030 to open his flight plan back to GFK. The pilot flew for about 1.5 hours on a northwesterly heading. The pilot reported that he remembered seeing Detroit Lakes, Minnesota, in the distance, but did not remember anything else about the flight. He reported that the next thing he remembered was when he opened his eyes and realized that he was in a corn field and that the airplane had crashed. He was unable to move, but he yelled for help when rescue personnel arrived at the accident site. Radar data indicated that N248ND was flying on a northwesterly heading. The airplane's altitude was approximately 4,200 - 4,800 feet msl and the ground speed was about 110 knots. The airplane proceeded on course until about 0126. The radar data indicated that the airplane entered descending turns to the left. The airplane completed 6 1/2 turns before it was lost from radar. The last radar return recorded was at 0133. It indicated the airplane's altitude was about 1,900 feet msl (less than 400 feet agl). The pilot reported to the NTSB the following information: "First, I should not have taken off thinking that I might get tired. I should have requested flight following to keep my attention. Possibly [I] should have recognized symptoms of fatigue and possibly state of consciousness, and landed before losing consciousness." The post accident inspection of the

airplane revealed no preexisting anomalies that could be associated with a pre-impact condition.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to get the proper rest prior to the night cross country flight and the pilot's failure to maintain altitude. Contributing factors to the accident were fatigue as a result of inadequate sleep, conditions conducive to fatigue, and night.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: CRUISE

Findings
1. (C) ALTITUDE - NOT MAINTAINED - PILOT IN COMMAND
2. (C) PLANNING/DECISION - IMPROPER - PILOT IN COMMAND
3. (F) FATIGUE (CONDITIONS CONDUCIVE TO PILOT FATIGUE) - PILOT IN COMMAND
4. (F) FATIGUE(LACK OF SLEEP) - PILOT IN COMMAND
5. (F) LIGHT CONDITION - NIGHT
6. TERRAIN CONDITION - GROUND
7. TERRAIN CONDITION - CROP

Factual Information

On July 8, 2004, about 0135 central daylight time, a Piper PA-28-161, owned and operated by the University of North Dakota flight training school, was destroyed when it impacted terrain near Waubun, Minnesota. The private pilot, who was the sole occupant, was seriously injured. The 14 CFR Part 91 instructional cross country flight was operating in night visual meteorological conditions on a visual flight rules (VFR) flight plan. The flight originated from Crystal Airport (MIC), Minneapolis, Minnesota, about 2355, July 7, 2004, and was en route to the Grand Forks International Airport (GFK), Grand Forks, North Dakota.

A farmer who lived in the Waubun, Minnesota, area, reported that he heard and saw an airplane circling over his farmstead at night. He heard the airplane crash but he could not locate the crash site. He notified authorities and a search for the crash site was made. The crash site could not be seen from the area roads because of rolling hills, ravines, knee high corn, and wheat. About 3 1/2 hours after the accident, the crash site and the pilot were located. The pilot was transported to a hospital by helicopter.

Radar data indicated that N248ND was flying on a northwesterly heading. The airplane's altitude was approximately 4,200 - 4,800 feet msl and the ground speed was about 110 knots. The airplane proceeded on course until 0126. The radar data indicated that the airplane entered descending turns to the left. The airplane completed 6 1/2 turns before it was lost from radar. The last radar return recorded was at 0133. It indicated the airplane's altitude was about 1,900 feet msl (less than 400 feet agl).

The pilot prepared a 72 hour history of events that transpired prior to the accident. The pilot reported that on July 6th he woke up at 0800 and that he went to bed at 0200 on July 7th. On July 7th, his alarm clock went off at 0600, but he continued to sleep until 0730-0800. He reported that he went to the university at 1000 for classes and a test in Aviation Meteorology. He ate around 1500 and went to the airport at 1530. He completed his cross country flight planning and reviewed the flight plan with his flight instructor. At 1655, he preflighted N350ND and attempted to start the airplane but it would not start. He was assigned another airplane, N248ND. He preflighted it and he amended his flight plan before departing. He reported that he departed GFK at 1815.

He reported that he flew to Airlake Airport (LVN), Minneapolis, Minnesota, on the first leg of his cross country flight and arrived there at 2030. He departed LVN and continued on the second leg of the flight plan. He arrived at Crystal Airport (MIC) at 2130. He had the airplane fueled with 24 gallons of fuel. The pilot met with a friend and they went to eat at a restaurant where he had barbequed ribs, chicken, French fries, and bread. He returned to the airport and departed at 2355. He reported that he climbed to 4,500 feet mean sea level (msl) and contacted flight service about 0030 to open his flight plan back to GFK.

The pilot reported that he contacted flight service when he was near St. Cloud, Minnesota, which was also his first VFR check point. He reported that he missed identifying the second check point, but he continued on course using the VOR and GPS for navigation. He reported that he visually identified Detroit Lakes, Minnesota, from a distance. The pilot reported that he did not remember anything else about the flight. He reported that the next thing he remembered was when he opened his eyes and realized that he was in a corn field and that the airplane had crashed. He was unable to move, but he yelled for help when rescue personnel arrived at the accident site.

The pilot reported the following information to the National Transportation Safety Board:

"First, I should not have taken off thinking that I might get tired. I should have requested flight following to keep my attention. Possibly [I] should have recognized symptoms of fatigue and possibly state of consciousness, and landed before losing consciousness."

The on-site inspection revealed that the debris path was oriented on a 178 degree heading and was about 342 feet long from the initial point of impact to the location of the main wreckage, which included the fuselage, empennage, and right wing. The location where the pilot had been found was about 379 feet from the initial impact point. The left wing had separated from the fuselage and was located about 190 feet from the initial impact point. The propeller was found about 35-40 east of the left wing.

All airframe components were present and identified. Control continuity was verified to all controls except the separated left wing. The fuel selector was found on the right tank. The flap handle was in the retracted position. The stabilator trim was found at a neutral pitch setting. Fuel was present in both tanks. The boost pump filter was free of debris. The post accident inspection of the airframe revealed no preexisting anomalies that could be associated with a pre-impact condition.

The inspection of the propeller revealed that one blade exhibited "S" bending near the tip with polishing of the leading edge. The blade had chordwise surface scratches and dents along its leading edge. The blade also had a bend in the trailing edge near the tip.

The second propeller blade was bent aft about 60 degrees and twisted toward low pitch. The blade exhibited leading edge polishing and chordwise surface scratches on the front of the blade.

The postaccident inspection of the engine exhaust system revealed no preexisting anomalies that could be associated with a pre-impact condition.

The airplane was a single-engine Piper PA-28-161, serial number 2842058. The airplane seated four and had a maximum gross weight of 2,447 pounds. The last phase inspection was conducted on June 20, 2004. The airplane had flown 21.9 hours since the last inspection and

had a total time of 3,997.3 hours. The engine was a 160 horsepower Lycoming O-320-D3G engine that had 1,407.6 hours time since overhaul.

Aircraft maintenance records indicated that both mufflers were replaced on May 6, 2004, and had 85.1 hours since replacement. The airplane's exhaust system was inspected during the phase inspection on June 20, 2004. Item 26 of the phase inspection required the following actions:

"Inspect for cracks, leakage, loose or missing nuts and clamps. Remove heat exchanger shroud and inspect for cracks, deformation, corrosion and signs of exhaust leakage. Inspect internal baffles for deterioration or looseness."

The pilot was enrolled as a senior at the University of North Dakota (UND) John D. Odegard School of Aerospace Sciences. On June 25, 2004, the pilot was issued a Temporary Airman Certificate for a private pilot certificate with a single-engine land rating. He held a Third Class medical certificate. Pilot records indicate that he had about 91.8 hours of total flight time, all of which were in make and model. He had flown 31.2 hours in the last 90 days and 8.8 hours in the last 30 days. He had a total of 8.6 hours of night flight time.

The pilot was currently enrolled in UND's Commercial/Instrument Pilot Airplane - SMEL course. The pilot was working on lesson five in the first block of instruction when the accident occurred. Lesson five required the pilot to fly a cross country flight with landings at three different airports with one segment of the flight consisting of a straight-line distance of at least 250 nautical miles between airports. A further requirement of the first block of the Commercial/Instrument Pilot Airplane - SMEL course was that the pilot must have a total of 5 hours and 10 takeoff and landings in VFR conditions at night at an airport with an operating control tower (between lessons 4, 5, 6, 7, and 8). During June and July, UND required its flight students to fly their night flights after 2200 central daylight time since the sun normally did not set until 2130. On July 8, 2004, the end of civil twilight was at 2159.

Pilot Information

Certificate:	Private	**Age:**	26,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 None	**Last FAA Medical Exam:**	September 13, 2002
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	June 25, 2004
Flight Time:	92 hours (Total, all aircraft), 92 hours (Total, this make and model), 9 hours (Pilot In Command, all aircraft), 31 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N248ND
Model/Series:	PA-28-161	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2842058
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 20, 2004 AAIP	**Certified Max Gross Wt.:**	2447 lbs
Time Since Last Inspection:	22 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3977 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-320-D3G
Registered Owner:	UNIVERSITY OF NORTH DAKOTA	**Rated Power:**	160 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	OG5R

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	PKD,1443 ft msl	**Distance from Accident Site:**	40 Nautical Miles
Observation Time:	01:53 Local	**Direction from Accident Site:**	110°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	0 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	11°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Crystal , MN (MIC)	**Type of Flight Plan Filed:**	VFR
Destination:	Grand Forks, ND (GFK)	**Type of Clearance:**	None
Departure Time:	23:55 Local	**Type of Airspace:**	Class E

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	47.176666,-95.915275

Administrative Information

Investigator In Charge (IIC):	Silliman, James
Additional Participating Persons:	Casey Heggerstrom; FAA-Minneapolis FSDO; Minneapolis, MN Michael McClure; The New Piper Aircraft Company; Prosper Dick Schultz; University of North Dakota Aerospace; Grand Forks, ND
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