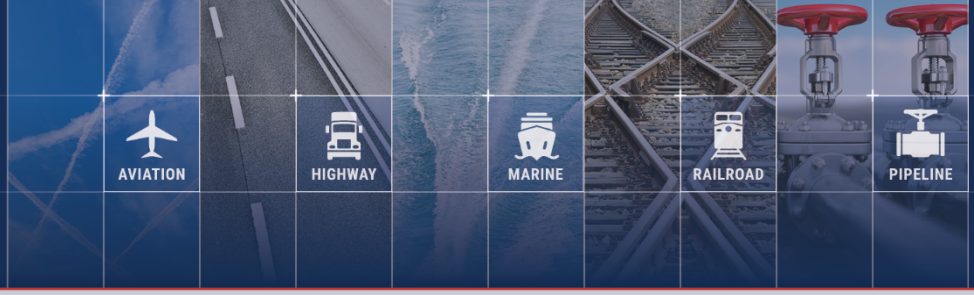

Aviation Investigation Final Report

Location:	DANVILLE, Illinois	**Accident Number:**	CHI00FA039
Date & Time:	December 9, 1999, 19:09 Local	**Registration:**	N5038Q
Aircraft:	Cessna 310N	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The instructional flight crashed 1-sm mile south of the airport during initial climb. A witness reported that while the airplane was taking off he heard a, '...whoosh sound and thought an engine failure had occurred...' The witness stated that the aircraft, from an altitude of 100-200 feet above ground level (agl), started a high rate descent towards the runway, then recovered into level flight for a few seconds, then began a climb that took the aircraft into the clouds. Weather conditions at the time of the accident were reported to be instrument meteorological conditions with 2-sm visibility, partial obscuration due to light precipitation, and an overcast ceiling of 1,300-feet. The accident occurred during a dark night. The governing FAA air traffic control center, Champaign approach, reported no communications were received from or transmitted to the accident airplane and additionally no flight plan information was filed or requested. No anomalies were found with the airframe, or its related systems, that could be associated with a preexisting condition. No anomalies were found with either engine, or their related systems, that could be associated with a preexisting condition.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Aircraft control not being maintained by the flight instructor and the flight instructor's inadequate supervision of the flight. Factors to the accident were the flight instructor's VFR flight into IMC weather conditions, the inadequate preflight planning/preparation conducted by the flight instructor, the dark night, the low ceiling, and the rain.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND(CFI)
2. (C) SUPERVISION - INADEQUATE - PILOT IN COMMAND(CFI)
3. (F) VFR FLIGHT INTO IMC - ENCOUNTERED - PILOT IN COMMAND(CFI)
4. (F) PREFLIGHT PLANNING/PREPARATION - INADEQUATE - PILOT IN COMMAND(CFI)
5. (F) LIGHT CONDITION - DARK NIGHT
6. (F) WEATHER CONDITION - LOW CEILING
7. (F) WEATHER CONDITION - RAIN

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On December 9, 1999, at 1909 central standard time, a Cessna 310N, N5038Q, owned and operated by a private pilot, was destroyed during an in-flight collision with terrain following a loss of control shortly after takeoff from runway 21 (5,399 feet by 100 feet, wet/asphalt) at the Danville-Vermilion County Airport (DNV), Danville, Illinois. Instrument meteorological conditions prevailed at the time of the accident. The instructional flight was operating under the provisions of 14 CFR Part 91 and was not on a flight plan. The Certified Flight Instructor (CFI) and private rated dual student were fatally injured. The flight was departing at the time of the accident and the flight's destination was unknown.

A witness to the accident had landed on runway 21 about 30 minutes prior to the accident time. The pilot-rated witness stated that the CFI asked him, over the Common Traffic Advisory Frequency (CTAF), what the cloud bases were. The witness reported that he transmitted that the cloud bases were 1,700 feet mean sea level (msl) and the CFI acknowledged the transmission. The witness stated that he also saw the accident aircraft departing on runway 21. The witness reported that he heard a, "...whoosh sound and thought an engine failure had occurred..." The witness stated that the aircraft, from an altitude of 100-200 feet above ground level (agl), started a high rate descent towards the runway, then recovered into level flight for a few seconds, then began a climb that took the aircraft into the clouds.

Other witnesses to the accident described an unusual engine sound then seeing the aircraft in a descent, then leveling off, and finally starting a climbing turn toward the east into the clouds.

PERSONAL INFORMATION

Federal Aviation Administration (FAA) records indicate that the Certified Flight Instructor (CFI) held a commercial pilot certificate with airplane single engine land, airplane multi-engine land, and instrument airplane ratings. The last commercial certificate/rating was issued to the CFI on October 30, 1995.

FAA records indicate the CFI held a flight instructor certificate with airplane single engine land, airplane multi-engine land, and instrument airplane ratings. The last flight instructor certificate/rating was issued to the CFI on February 25, 1998.

FAA records indicate that the CFI's last aviation medical examination was conducted on August 23, 1999, and was issued a second-class medical certificate with no limitations or restrictions.

According to the CFI's flight logbook, he had logged, as of December 5, 1999, an accumulated flight time of:

Total Flight Hours 682.4 hours Multi-Engine Land Airplane 256.4 hours Single Engine Land Airplane 426.0 hours Complex Airplane 318.1 hours Pilot-In-Command 607.7 hours As Fight Instructor 309.9 hours Total Instrument Time 105.5 hours Actual Instrument Time 33.8 hours Simulated Instrument Time 71.7 hours Night 91.7 hours

The CFI's flight logbook indicated that the CFI had completed a biennial flight review on February 22, 1998.

FAA records indicate that the dual student held a private pilot certificate with airplane single engine land and airplane multi-engine land ratings. The last private certificate/rating was issued to the dual student on October 22, 1995.

FAA records indicate that the dual student's last aviation medical examination was conducted on March 24, 1999, and was issued a third-class medical certificate with the limitation, "Holder shall wear lenses that correct for distance vision and possess glasses that correct for near vision".

According to the dual student's flight logbook, he had logged, as of December 5, 1999, an accumulated flight time of:

Total Flight Hours 656.6 hours Multi-Engine Land Airplane 369.4 hours Single Engine Land Airplane 286.0 hours Pilot-In-Command 598.7 hours Dual Received 154.4 hours Total Instrument Time 77.8 hours Actual Instrument Time 11.9 hours Simulated Instrument Time 65.9 hours Night 113.2 hours

The flight logbook showed that the dual student was working towards an instrument rating. The dual student began receiving dual instruction, provided by the CFI, on November 11, 1998, and had logged 71.5 hours of instruction towards the instrument rating as of the last logbook entry.

The dual student had two endorsements entered into his logbook. The first one was an endorsement for the instrument written examination and the second one was an endorsement for the instrument oral and practical examinations. The endorsement for the instrument oral and practical examinations was dated, "12/10/99".

The dual student's flight logbooks indicated that the dual student had completed a biennial flight review on October 12, 1997.

AIRCRAFT INFORMATION

The aircraft was a Cessna 310N, N5038Q, serial number 310N-0138. The Cessna 310N is a production built, two engine, low wing monoplane of all metal construction, equipped with a retractable landing gear and controllable pitch propellers. According to FAA records, the airplane was issued a Standard Airworthiness Certificate on February 4, 1969. According to the airplane's service records, the airplane had accumulated a total-time of 4,980.0 hours as of November 2, 1999. At the time of the accident the aircraft was calculated to have logged 5,000 total hours. The last annual inspection was completed on December 10, 1998 at 4,800.3 hours.

The left engine was a Continental IO-470-VO, serial number 170217-9-V-R.

The right engine was a Continental IO-470-VO, serial number 171204-R.

The Engine logbooks were not recovered, and accurate engine times could not be established from available information.

METEOROLOGICAL INFORMATION

A weather observation, taken by an Automatic Weather Observing Station-3 (AWOS-3) located on the Danville-Vermilion County Airport, reported the weather eight minutes prior to the accident as:

Observation Time: 1901 cst Wind: 310-degrees at 3 knots Visibility: 2 statute miles Sky Condition: Partial Obscuration, 1,300 feet agl Overcast Temperature: 10-degrees centigrade Dew Point Temperature: 10-degrees centigrade Pressure: 30.00 inches of mercury

A weather observation station, located at the University of Illinois-Willard Airport, 34 nautical miles from the accident site on a 250-degrees magnetic heading, reported the weather 16 minutes prior to the accident as:

Observation Time: 1853 cst Wind: 340-degrees at 4 knots Visibility: 2 statute miles Sky Condition: Light Rain, Mist, 500 feet agl Overcast Temperature: 9-degrees centigrade Dew Point Temperature: 9-degrees centigrade Pressure: 29.97 inches of mercury Remarks: Surface Visibility 2-1/2 statute miles Remarks: Ceiling varying between 400-700 feet agl

COMMUNICATIONS

The governing FAA air traffic control center, Champaign approach, reported no communications were received from or transmitted to the accident airplane and additionally

no flight plan information was filed or requested.

AERODROME INFORMATION

The Danville-Vermilion County Airport is an uncontrolled airport with no operational control tower or on-airport air traffic control.

According to FAA records and charts, the Danville-Vermilion County Airport airspace is designated as Class-E from the surface to the base of the overlying airspace, which is Class-A airspace.

There is a remote communications outlet (RCO) located on the Danville-Vermilion County Airport. According to the Pilot/Controller Glossary, "[remote communications outlets] were established for the express purpose of providing ground-to-ground communications between air traffic control specialists and pilots located at a satellite airport for delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times."

WRECKAGE AND IMPACT INFORMATION

Examination of the wreckage started on December 10, 1999, and continued for a period of two days. The wreckage was distributed over an area that measured 300-feet by 150-feet. The initial impact crater was located at 40-degrees 11.235-mintues north latitude, 87-degrees 35.130-mintues west longitude, and was approximately 1-foot in depth. There was burnt soil and vegetation in the initial impact crater. A ground scar, originating from the initial impact crater, was 8-feet wide by 55-feet long, on a 045-degrees magnetic heading. Within a distance of about 25-35 feet, along the ground scar, there were three propeller slash marks in the soil. At a distance of 50 feet, along the ground scar, the right propeller hub assembly was found partially buried and about 5 feet further the left propeller hub assembly was found lying on the ground. A fan-shaped debris field originated from the completion of the ground scar. The debris field was centered on a northerly heading and measured 250-feet in length by 100-feet wide. The main wreckage was located at 40-degrees 11.278-minutes north latitude, 87-degreees 35.109-minutes west longitude. The main wreckage contained the empennage, tail surfaces, right engine nacelle, remnants of the main cabin, the carry-through wing spar, right and left main landing gear, and the left engine. The right engine was found 20-feet north of the main wreckage.

Reconstruction of the main wreckage was conducted in a hangar at the Danville-Vermilion County Airport. Elevator and rudder control continuity was established from the control surfaces to the main cabin. Aileron control continuity was established from the aileron bell-cranks to the main cabin. The main landing gear downlock assembly was in an orientation consistent with a retracted gear position. The wing flap motor/drive chain was torn form its structural mounting and the flap position could not be accurately determined. Both engine driven vacuum pumps were removed, disassembled, and no anomalies were found.

No anomalies were found with the airframe, or its related systems, that could be associated with a preexisting condition.

Left engine and valve train continuity was established by rotating the engine through the accessory section. Thumb compression was obtained on all cylinders and the upper spark plugs were removed and the electrodes exhibited a light gray color. The engine had been exposed to a post-impact fire and no fuel was noted in the fuel lines going to the fuel controller or in the flow-divider. The fuel screen was noted to be wet, clear of debris, and had the smell of fuel. Both left and right magnetos produced spark on all leads when rotated by hand. The forward end of the crankshaft was broken from the flange, and torsion overload signatures were observed. There was no debris found in the oil recovery pan, and oil was present throughout the engine. The crankshaft, bearings, journals, and connecting rods were inspected and no anomalies were found.

Right engine and valve train continuity could not be established due to impact damage on the forward gearing. The upper spark plugs were removed and the electrodes exhibited a light gray color. Fuel was found in the fuel line going to the fuel controller, fuel screen, and flow-divider. Both left and right magnetos produced spark on all leads when rotated by hand. There was no debris found in the oil recovery pan, and oil was present throughout the engine. The crankshaft, bearings, journals, and connecting rods were inspected and no anomalies were noted. Valve covers were removed and no anomalies were found with the valve train assembly.

No anomalies were found with either of the engines, or their related systems, that could be associated with a preexisting condition.

The left propeller hub assembly and flange were sheared-off the crankshaft, and torsion overload signatures were observed. The left propeller blades exhibited S-shape bending, leading edge gouges, twisting, and chordwise scratching of the propeller face and back surfaces.

The right propeller hub assembly had pulled from the hub mounting bolts and part of the flange was fractured. The right propeller blades exhibited S-shape bending, leading edge gouges, twisting, and chordwise scratching of the propeller face and back surfaces. One propeller tip had been broken in forward bending. One propeller blade was fractured into two parts at the blade root.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies were performed on both pilots on December 10, 1999.

A Forensic Toxicology Fatal Accident Report was prepared, for both pilots, by the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma.

For both pilots, negative results were returned for all tests conducted.

ADDITIONAL INFORMATION

The minimum visibility to remain under visual flight rules (VFR) in class-E airspace is 3 statute miles. To remain under VFR conditions in class-E airspace, an airplane must have a minimum distance of 500-feet below, 1,000-feet above, and 2,000-feet horizontal from any cloud formation.

Fuel receipts were recovered that indicated that the aircraft had been fuelled, just prior to the accident flight, with 76.0-gallons of fuel from an Aviation 100LL fuel truck which was operated by a fixed base operator (FBO) on the airport. The fuel tank operator reported, "At about 6:30pm I drove the 100LL fuel truck to [the pilot's] hanger [hangar]. I watched him pull the plane out of the hanger [hangar]. Because it was raining they closed the hanger [hangar] door and were inside. I fueled all four tanks starting with the right tip and working my way to the other side. It took 76 gallons of 100LL."

Parties to the investigation were:

Federal Aviation Administration (FAA) Flight Standards District Office (FSDO), Springfield, Illinois.

Cessna Aircraft Corporation, Wichita, Kansas.

Teledyne-Continental Motors, Mobile, Alabama.

The bulk aircraft wreckage was released to a representative of the Danville-Vermilion County Airport on December 12, 1999.

Pilot Information

Certificate:	Commercial	**Age:**	27,Male
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 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	August 23, 1999
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	682 hours (Total, all aircraft), 241 hours (Total, this make and model), 608 hours (Pilot In Command, all aircraft), 47 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N5038Q
Model/Series:	310N 310N	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	310N-0138
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	December 10, 1998 Annual	**Certified Max Gross Wt.:**	5200 lbs
Time Since Last Inspection:	200 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	5000 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-470-VO
Registered Owner:	JAMES T. WYNJA	**Rated Power:**	260 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	DNV ,696 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	19:01 Local	**Direction from Accident Site:**	328°
Lowest Cloud Condition:		**Visibility**	2 miles
Lowest Ceiling:	Overcast / 1300 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	9°C / 9°C
Precipitation and Obscuration:	Light - None - Drizzle		
Departure Point:	(DNV)	**Type of Flight Plan Filed:**	None
Destination:	UNKNOWN	**Type of Clearance:**	None
Departure Time:	19:09 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	DANVILLE-VERMILION COUNTY DNV	**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	2 Fatal	**Latitude, Longitude:**	40.139366,-87.60968(est)

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	BILL COOLEY; SPRINGFIELD , IL TOM MOODY; WICHITA , KS ROBERT S BOYLE; ARVADA , CO
Original Publish Date:	May 16, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=47896