Aviation Investigation Final Report

Location:	Charlotte, North Carolina	**Accident Number:**	NYC07FA052
Date & Time:	December 31, 2006, 11:24 Local	**Registration:**	N7090S
Aircraft:	Cessna TR182	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While receiving vectors for an instrument approach, the pilot had difficulty maintaining his assigned heading and altitude. The air traffic controller issued numerous vectors to the pilot to assist him on the approach, and instructed him to "check [his] altitude," when he observed the airplane was 400 feet too low. Witnesses observed the airplane emerge from the base of a cloud deck, in a nose-dive, then break apart prior to impacting the ground. An examination of the airplane revealed no preimpact mechanical anomalies. Sections of the left wing exhibited upward loading. The pilot reported 465 hours of total flight experience, and 7.8 hours of total actual instrument experience. The pilot's most recent actual instrument experience was 1 hour, recorded 3 months prior to the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's spatial disorientation, which resulted in a loss of aircraft control and subsequent in-flight breakup. Contributing to the accident was instrument meteorological conditions.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH

Findings
1. (F) WEATHER CONDITION - CLOUDS

2. AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
3. (C) SPATIAL DISORIENTATION - PILOT IN COMMAND

Occurrence #2: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. DESIGN STRESS LIMITS OF AIRCRAFT - EXCEEDED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On December 31, 2006, at 1124 eastern standard time, a Cessna TR182, N7090S, was destroyed when it impacted terrain in Charlotte, North Carolina. The certificated private pilot and the three passengers were fatally injured. Instrument meteorological conditions prevailed and an instrument flight rules (IFR) flight plan was filed. The flight originated at Dare County Regional Airport (MQI), Manteo, North Carolina, and was destined for Shelby Municipal Airport (EHO), Shelby, North Carolina. The personal flight was conducted under 14 Code of Federal Regulations Part 91.

According to air traffic control information provided by a Federal Aviation Administration (FAA) inspector, the pilot checked in with Charlotte Approach Control at 1057, at an altitude of 6,000 feet. The controller asked the pilot what type of approach he wanted at Shelby, and if he had the current weather. The pilot responded, "ah we do the gps rnav rnav five," and stated he did not have the current weather. The pilot was then instructed to descend to 5,000 feet and to inform the controller when he had the weather. The pilot acknowledged the transmission, and shortly thereafter was instructed to fly a heading of 250 degrees. The controller asked the pilot whether he wanted vectors for the approach, and the pilot responded, "ah skylane nine zero sierra we would like to take some vectors to help."

At 1109, the controller stated, "november nine zero sierra say ah heading." The pilot responded, "ah my heading is way off I'm banking back I am now tracking three oh five trying to get back." The controller instructed the pilot to "turn left, heading two five zero." The pilot acknowledged the instruction; however, he did not turn the airplane to the assigned heading. The controller subsequently issued additional vectors to assist the pilot and instructed him to "check [his] altitude," when he observed the airplane 400 feet too low. After observing the airplane continuing to the north, at 1116, the controller asked if the pilot was "doing alright," and the pilot responded, "I'm struggling a little."

Over the next 60 seconds, the airplane continued its right turn, heading to the south, and the controller issued several vectors to the pilot to assist him in turning left, to a westbound heading. At 1118, the controller informed the pilot that he appeared to be correcting, and the airplane appeared to be at the correct altitude. One minute later, the controller informed the pilot that he was again drifting to the southwest, and was issued a heading of 280 degrees. The pilot acknowledged the transmission, and at 1122, the controller issued another vector of 270 degrees. The pilot again acknowledged the transmission, and no further transmissions were received from the airplane.

A witness, who first heard the airplane as he was standing on his back porch, stated that it

sounded as if it was "going up and down, searching for altitude." The airplane then appeared through the cloud deck, in a "nose-dive," at an approximate 80-degree nose-down attitude. The witness observed the right wing separate from the airplane as it continued to travel downward at a high rate of speed. The airplane then disappeared behind trees, and shortly afterwards the witness heard the sound of an impact.

A second witness also heard the airplane before he observed it. He stated that he heard the airplane's engine "sound loud one second and then cut out the next." This pattern repeated several times, before the witness heard a loud "bang," and observed parts of the airplane "falling from the air." The airplane continued downward until it impacted the ground in the backyard of a residence.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with ratings for airplane single engine land and instrument airplane. His most recent FAA third class medical certificate was issued on April 14, 2006. At that time, the pilot reported 425 total hours of flight experience.

An examination of the pilot's logbook revealed entries from January 2, 1997, to December 18, 2006. During that time, the pilot recorded 465 hours of total flight experience, and 7.8 hours of total actual instrument experience. The pilot's most recent actual instrument experience was 1 hour, recorded on September 9, 2006.

According to the logbook, the pilot received his instrument rating on September 19, 2005. He accumulated 3 hours of actual instrument experience since that date.

AIRCRAFT INFORMATION

An examination of the airplane and engine logbooks revealed the most recent annual inspection was performed on May 20, 2006, with no anomalies noted.

METEOROLOGICAL INFORMATION

The closest weather reporting station to the accident site was at Charlotte/Douglas International Airport (CLT), Charlotte, North Carolina, about 2 miles to the southwest. The weather, reported at 1100, included winds from 040 degrees at 4 knots, 3/4 mile visibility with rain and mist, a broken cloud layer at 500 feet, an overcast cloud layer at 1,200 feet, temperature 11 degrees Celsius (C), dew point 10 degrees C, and an altimeter setting of 30.31 inches of mercury.

On December 31, 2006, at 0810, the pilot contacted the Raleigh Automated Flight Service Station (AFSS), Raleigh, North Carolina, to obtain current weather for a flight from MQI to EHO. He also filed an IFR flight plan for the flight.

According to a transcript, the AFSS specialist advised the cloud conditions would become scattered to overcast en route, at 3,000 to 4,000 feet, with light rain and drizzle. The weather conditions were forecasted to be IFR near the destination airport, with a cloud layer of 1,800 feet overcast, two miles of visibility and mist. An AIRMET for occasional IFR conditions was in effect at the time of the briefing, for the destination area. The briefer stated that the AIRMET would probably extend eastward to cover central North Carolina. The briefer also stated that additional AIRMETS would be issued for turbulence below 12,000 feet in response to a low pressure system in the central part of the country, and fronts extended south and east of the area.

At the time of the briefing, the departure airport reported 10 miles visibility, with a broken cloud ceiling at 5,000 feet. The forecast for eastern North Carolina included a broken cloud layer at 4,000 to 5,000 feet. For the middle of the state, occasional light rain was forecasted with a cloud layer at 2,500 feet. The forecasted weather for the destination area included overcast clouds at 4,000 to 5,000 feet, with occasional visibility 3 to 5 miles in light rain and mist. The forecast included continuing IFR conditions and a chance of thunderstorms.

A review of flight service station data revealed no record of the pilot requesting any in-flight weather information.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted a residential area, and the debris field extended into several backyards over a 1-block area. The initial point where wreckage was observed was along a road where the left wingtip and left wing came to rest. In a front yard adjacent to the road, the left aileron and a portion of the left elevator were also observed. The wreckage path continued over several yards, oriented on a heading of 280 degrees. Located along the wreckage path was the roof, pilot-side door, right aileron, and elevator.

Approximately 250 feet from where the left wing was observed, the airplane impacted power lines in the backyard of a residence. The wreckage path continued 35 feet from the power lines, to a 12-foot long and 2-foot deep crater. Approximately 12 feet from the crater, the main wreckage impacted the base of a tree. The main wreckage included the cockpit area, fuselage area, right wing, a portion of the empennage, and one propeller blade. On the other side of the tree, in another backyard, additional fragmented fuselage and cabin sections were noted, as well as a second propeller blade.

The engine was located, embedded in the side of a residence, approximately 60 feet from the main wreckage.

The airplane and engine were recovered from the site, and transported to a facility for further examination. The airplane was reconstructed, and all components were accounted for. Examination of the left wing revealed it remained intact, and separated at the wing root. Both the left and right wing struts also separated from their attachment points on the wing and

fuselage. Aileron control continuity was confirmed from the cockpit area to the broomstraw-separated cable ends in the wing root. Rudder and elevator control continuity was confirmed from the cockpit to the flight control surfaces.

Examination of the flap actuator revealed the flaps were in the retracted position.

The left wing attachment hardware and left wing strut attachments were retained for further examination.

The engine could not initially be rotated due to impact damage to the number 2 cylinder. A lighted bore scope was used to examine all six of the cylinders top end components, which revealed no anomalies. The number 2 cylinder was removed, and the engine was successfully rotated by hand at the propeller flange. Valve train and crankshaft continuity were confirmed to the rear accessory drive section, and thumb compression was obtained on cylinders 1, 3, 4, 5 and 6. Examination of the top and bottom spark plugs, revealed their electrodes were intact and light gray in color. The dual magneto was impact damaged, and could not be tested for spark.

The vacuum pump was disassembled and examined. Impact damage was noted to the vanes, and the drive coupling was intact.

Examination of the propeller assembly revealed all of the propeller blades were separated from the propeller hub. Two of the blades displayed torsional twisting and chordwise scratching. The third propeller blade was not immediately located. It was located several days after the accident, deep within the main impact crater. Photographs of the third propeller third blade revealed torsional bending.

MEDICAL AND PATHOLOGICAL INFORMATION

The North Carolina Office of the Chief Medical Examiner performed an autopsy on the pilot on January 2, 2007.

The FAA Toxicology and Accident Research Laboratory, Oklahoma City, Oklahoma conducted toxicological testing on the pilot. The testing was negative for drugs or alcohol.

TESTS AND RESEARCH

The left wing strut was retained and examined at the National Transportation Safety Board's Materials Laboratory. Examination of the strut revealed the direction of deformation was consistent with upward loading of the wing. No evidence of any preexisting damage or fatigue cracking was noted at any of the fractures.

ADDITIONAL INFORMATION

Fueling Information

The airplane was last fueled prior to departure from MQI, at 1624, on December 30, 2006. At that time, 37.84 gallons of fuel was added to the airplane.

Pilot Information

Certificate:	Private	**Age:**	53,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Unknown
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 3 With waivers/limitations	**Last FAA Medical Exam:**	April 1, 2006
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	April 1, 2004
Flight Time:	465 hours (Total, all aircraft), 10 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N7090S
Model/Series:	TR182	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	R18201696
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	May 1, 2006 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2134 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	O-540
Registered Owner:	James Chitty	**Rated Power:**	250 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CLT,748 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	11:00 Local	**Direction from Accident Site:**	240°
Lowest Cloud Condition:		**Visibility**	0.75 miles
Lowest Ceiling:	Broken / 500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	40°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.3 inches Hg	**Temperature/Dew Point:**	11°C / 10°C
Precipitation and Obscuration:	N/A - None - Mist		
Departure Point:	MANTEO, NC (MQI)	**Type of Flight Plan Filed:**	IFR
Destination:	SHELBY, NC (EHO)	**Type of Clearance:**	IFR
Departure Time:		**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	35.231109,-80.90139

Administrative Information

Investigator In Charge (IIC):	Andrews, Jill
Additional Participating Persons:	Edwin Shields; FAA/FSDO; Charlotte, NC Edward Rogalski; Lycoming Engines; Williamsport, PA Thomas Teplik; Cessna Aircraft Company; Wichita, KS
Original Publish Date:	March 31, 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=65087