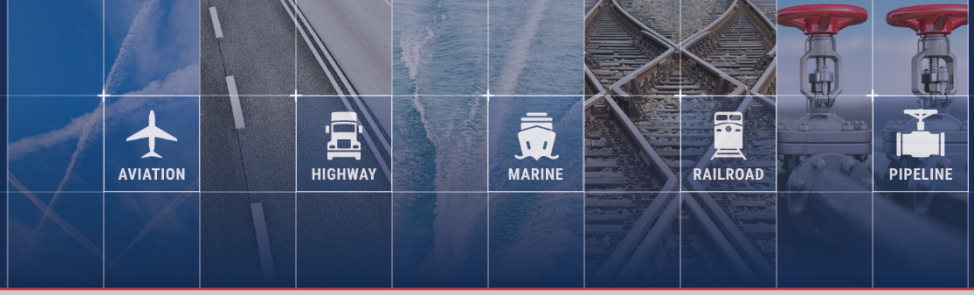

Aviation Investigation Final Report

Location:	Renfrew, Pennsylvania	**Accident Number:**	NYC03FA058
Date & Time:	February 27, 2003, 21:35 Local	**Registration:**	N3404S
Aircraft:	Cessna 182G	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The pilot received three preflight briefings before departing on the accident flight, and changed his planned departure time twice before departing. During all three briefings the pilot was advised of icing conditions in the area and along his planned route of flight. While en route, the pilot reported accumulating a significant amount of ice. During descent, the pilot reported the airport in sight, and was cleared for the visual approach to runway 8. The airplane impacted the ground about 1/2 mile from the airport, and approximately 100 feet left of the extended centerline for runway 8. Ice fragments were located at and near the main wreckage. The fragments were approximately 2 inches thick, 4.5 inches high, and shaped consistent with wing and tailplane ice accumulations. The airplane was not certified or equipped for flight into icing conditions. Examination of the wreckage revealed no preimpact failures or malfunctions.

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 control of the airplane while maneuvering to land. Factors in the accident were the pilot's decision to fly into forecasted\known icing conditions, and the accumulation of structural ice.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: CRUISE

Findings
1. WEATHER CONDITION - ICING CONDITIONS
2. (F) PLANNING/DECISION - IMPROPER - PILOT IN COMMAND

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

Findings
3. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
4. (F) WING - ICE
5. (F) HORIZONTAL STABILIZER - ICE

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

Findings
6. OBJECT - TREE(S)

Factual Information

HISTORY OF FLIGHT

On February 27, 2003, about 2135 eastern standard time, a Cessna 182G, N3404S, was substantially damaged when it impacted terrain near Renfrew, Pennsylvania, while executing a visual approach to runway 8 at the Butler County Airport (BTP), Butler, Pennsylvania. The certificated private pilot was fatally injured. Night visual meteorological conditions prevailed for the business flight that departed Philadelphia International Airport (PHL), Philadelphia, Pennsylvania, destined for Butler. An instrument flight rules (IFR) flight plan was filed and activated for the flight conducted under 14 CFR Part 91.

A review of Automated Flight Service Station (AFSS) audio recordings revealed that the pilot received three separate preflight briefings before departing on the accident flight about 1920.

At 0727, the pilot filed an IFR flight plan with a planned departure time of 1400. The briefer advised the pilot of a weather advisory for occasional moderate rime icing from 4,000 to 8,000, and that a 1400 departure would put the airplane ahead of a storm approaching from the south.

At 1418, the pilot changed his departure time to 1435, and received an updated briefing. The briefer advised the pilot that the storm system was still to the south, and being blocked by high pressure. The briefer added that moderate rime icing in clouds below 8,000 were forecasted along the pilot's route of flight, and that IFR conditions and mountain obscuration were forecasted for the southern half of Pennsylvania.

At 1745, the pilot filed another IFR flight plan with a planned departure time of 1750, a cruise altitude of 6,000 feet msl, and a route of flight through the southern half of Pennsylvania. Once the flight plan was filed, the briefer advised the pilot of occasional moderate rime and mixed icing in clouds and precipitation below 16,000 for the entire route of flight, occasional IFR conditions and mountain obscuration for the entire route, and that the precipitation associated with the storm approaching from the south had crossed into the "extreme" southern portions of Pennsylvania. The briefer added that 35 to 40 minutes prior to the briefing, the pilot of a Cessna 208 had reported light clear icing during climbout. The briefer did not give the location of the pilot report.

According to air traffic control (ATC) data, the pilot reported accumulating a significant amount of ice while en route to Butler. Once in the Butler area, he advised the controller he had the airport in sight, and was cleared for the visual approach to runway 8. No report of mechanical problems was received from the pilot before the accident. When the airplane failed to arrive at Butler, it was listed as missing, and search and rescue operations were

initiated.

According to a witness that was approximately 1.2 miles northwest of the accident site, the airplane was "very low," and descending rapidly while making a 180-degree turn. He reported that the airplane appeared to be stable and that the landing light was on. He could not recall if he heard any engine noise, but added he was inside, and his television was on. He did not witness the airplane impact the ground.

According to another witness that was approximately 400 feet from the accident site, the airplane was very low, and unstable when it flew by her bedroom window. The wings were rocking back and forth, and believed she heard the engine, but was not 100 percent sure. She did not witness the airplane impact the ground, and was not aware of the accident until advised by local authorities.

The accident occurred during the hours of darkness. The wreckage was located at 40 degrees, 46.220 minutes north latitude, 79 degrees, 58.714 minutes west longitude, and an elevation of approximately 1,160 feet msl.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with an airplane single-engine-land rating, and airplane instrument rating. On his last Federal Aviation Administration (FAA) third-class medical certificate, dated April 23, 2002, he reported a total flight experience of 466 hours.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted the ground about 1/2 mile from the airport, and approximately 100 feet left of the extended centerline for runway 8. Terrain in the area consisted of rolling hills, farmland, and patches of forest. The debris path was approximately 50 feet long, orientated on a magnetic heading of 100 degrees, and up slope approximately 5 degrees. The start of the debris path was marked by freshly broken tree branches at the top of a 15-foot tree. The debris path then consisted of one continuous ground scar, miscellaneous airframe components, and the main wreckage. All the structural components of the airplane were accounted for at the accident site. In addition, ice fragments were located at and near the main wreckage. The fragments were approximately 2 inches thick and 4.5 inches high. The color of the fragments was clear to opaque, and the shapes were consistent with the leading edge surfaces of the wing and tailplane.

On February 28, 2003, the wreckage was moved to the Butler County Airport, and placed in a secure hangar. On March 1, 2003, the engine and airframe were examined.

Examination of the cockpit revealed that the airplane was not equipped with shoulder harnesses. The seat tracks were bent and broken, and the breaks matched the curvature of the floor. The right seat was intact, the left seat had separated from the floor, and the cushion

along with its associated structure had separated from the seat at all four of its connecting points. All four fracture surfaces were gray in color and consistent with overload.

Flight control continuity was confirmed from both ailerons to both control yokes. Continuity of the elevator was confirmed from the elevator to the base of the instrument panel, but not to the control yokes because of impact damage. Rudder control continuity was confirmed from the rudder to the forward part of the cockpit, but not to the actual pedals because of impact damage. Elevator trim was approximately neutral, and continuity was confirmed. The flap switch was in the neutral position, the flap indicator showed up, and the flaps were in the "UP" position.

The airspeed indicator displayed zero, and the vertical speed indicator displayed 350 FPM down. The pilot altimeter indicated 7,560 feet and was set to 29.95 inches of mercury. The copilot altimeter indicated 7,150 feet and was set to 29.95 inches of mercury. The alternate static air was closed, and the pitot heat was "ON." The attitude indicator displayed nose high and approximately 45 degrees left wing low, the turn and bank indicator displayed right wing low, and the ball was free in the race. The No. 1 course deviation indicator (CDI) was set to 266 degrees, showed on course, and full deflection below glideslope. The No. 2 CDI was set to 254 degrees, indicated three dots right of course, and full deflection above glideslope. The directional gyro indicated 231 degrees, and the magnetic compass indicated 221 degrees. The ADF needle indicated 225 degrees, and the card was set to 035 degrees. In addition, no indication of "needle slap" was identified on any of the flight or navigation instruments.

The ICS control panel was configured with speaker and headphone for the No. 1 communication radio, nothing for the No. 2 communication radio, and nothing for the No. 1 navigation radio. Speaker and headphone were selected for the No. 2 navigation radio, and headphone was selected for the DME. Speaker and headphone were selected for the marker beacon, and speaker was selected for the ADF. In addition, the transmit selector was set to the No. 1 communication radio.

The No. 1 and No. 2 communication radios were "ON," and the volumes were mid range. The No. 1 and No. 2 navigation radios were "ON" and the volumes were approximately maximum. The ADF was "ON," the volume was mid range, and "ADF" was selected. The transponder was set to 2672, and the selector switch had separated from the unit.

The No. 1 and No. 2 communication radios, the No. 1 and No. 2 navigation radios, the Loran "C," and the ADF all had electronic displays. The airplane battery was reinstalled, and the master switch along with the avionics switch, were placed in the "ON" position. All the avionics displayed indications of power, but only the following data could be extracted. The No. 1 communication radio was set to 124.75 MHz active and 122.8 MHz standby. The No. 2 communication radio was set to 133.82 MHz active and 122.8 MHz standby. The No. 1 Navigation radio was set to 113.0 MHz active, and 112.5 MHz standby.

The engine oil pressure gauge indicated zero, the engine oil temperature gauge indicated zero,

and the vacuum gauge indicated zero. The manifold pressure gauge indicated 29 inches of mercury, and the tachometer indicated zero RPM and 2784.66 hours. The clock, which was powered by the airplane battery indicated 2050. In addition, no indication of "needle slap" was identified on any of the system instruments or clock.

The fuel selector displayed impact damage, and the handle was between "BOTH" and "OFF." The selector was opened and the valve was in the "BOTH" position. The throttle was full forward, the mixture was full "RICH," and the propeller control was approximately 1/2 inch aft of full forward. The carburetor heat was full forward. The primer was in and locked. The master switch was "OFF," and magnetos were set to "BOTH."

The propeller had separated from the engine and both blades were attached to the propeller hub. The No. 1 blade displayed chordwise scratches and "S" bends. The No. 2 blade was rolled back, displayed "S" bends, and chordwise scratches.

The engine case displayed minimal impact damage except for an impact mark below the propeller flange. Continuity of the induction and exhaust system could not be confirmed because of impact damage. All six top sparkplugs were removed. The No. 1, 2, 4, and 6, electrodes were gray in color and absent of debris. The No. 3, and 5 electrodes were oil soaked and absent of debris. A rotational force was applied to the engine crankshaft, compression was obtained on all six cylinders, valve train continuity was confirmed, and all the top ignition leads produced spark.

Engine control continuity was confirmed from the cockpit to the carburetor for the throttle and mixture controls, and from the cockpit to the propeller governor. Continuity of the carburetor heat control to the carburetor heat box was confirmed, but the position of the carburetor heat valve could not be determined because of impact damage. The throttle valve was in the closed position. The mixture control arm had separated from the carburetor, and the mixture control linkage was in the full rich position.

The carburetor displayed impact damage. The fuel line from the carburetor was removed and approximately 1.0 ounce of residual fuel was captured. The fuel was bluish in color and absent of contaminates. The fuel screen was removed, and absent of debris. About 1.5 ounces of fuel was drained from the carburetor bowl. It was bluish in color and absent of contaminates. The carburetor was then opened, and another 0.5 ounce of fuel was drained. The fuel was absent of debris, and had a purple tint to it. The float assembly, needle valve, and accelerator pump were intact.

The vacuum pump was removed, the shear coupling was intact, and the pump rotated freely. The pump was then opened. The rotor was intact, along with all of the vanes.

The attitude indicator was removed from the instrument panel, and the vertical gyro housing was opened. The rotor housing and housing cover displayed a rotational scar. No rotational scarring was identified on the rotor itself.

The carburetor ice indicator light was removed from the instrument panel and examined. The filament was broken, displayed no elongation, and the fracture surfaces were consistent with a cold break.

Examination of the airplane battery revealed it was in good condition, and capable of generating 11.17 volts. It was reinstalled in the airplane, and no reduction in battery performance was noted after approximately 30 minutes of having the majority of the avionics on.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot at Young's Funeral Home in Butler, Pennsylvania, by Dr. Leon Rozin on February 28, 2003.

The FAA Toxicology and Accident Research Laboratory in Oklahoma City, Oklahoma, performed a toxicological test on the pilot on April 10, 2003.

METEOROLOGICAL INFORMATION

A weather observation taken at the time of the accident at the Butler County Airport recorded the wind as 090 degrees at 5 knots, visibility 10 miles, ceiling 3,700 feet overcast, temperature 30 degrees Fahrenheit, dew point 23 degrees Fahrenheit, and an altimeter setting of 29.96 inches of mercury.

ADDITIONAL INFORMATION

Advisory Circular 91-51A states, "The most hazardous aspect of structural icing is its aerodynamic effects. Ice can alter the shape of an airfoil. This can cause control problems, change the angle of attack at which the aircraft stalls, and cause the aircraft to stall at a significantly higher airspeed. Ice can reduce the amount of lift that an airfoil will produce and increase drag several fold. Additionally, ice can partially block or limit control surfaces which will limit or make control movements ineffective. Also, if the extra weight caused by ice accumulation is too great, the aircraft may not be able to become airborne and, if in flight, the aircraft may not be able to maintain altitude."

According to the manufacturer, the airplane was not certified or equipped for flight into know icing conditions.

The wreckage was released to the owner's representative on March 1, 2003.

Pilot Information

Certificate:	Private	**Age:**	50,Male
Airplane Rating(s):	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 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	April 23, 2001
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	September 9, 2002
Flight Time:	442 hours (Total, all aircraft), 352 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N3404S
Model/Series:	182G	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	18255804
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	April 1, 2002 Annual	**Certified Max Gross Wt.:**	2800 lbs
Time Since Last Inspection:	57 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2784 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	O-470
Registered Owner:	David C. Howard	**Rated Power:**	230 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	BTP,1248 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	21:35 Local	**Direction from Accident Site:**	260°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 3700 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	90°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	-1°C / -5°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Philadelphia, PA (PHL)	**Type of Flight Plan Filed:**	IFR
Destination:	Butler, PA (BTP)	**Type of Clearance:**	IFR
Departure Time:	19:20 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	BUTLER COUNTY/K W SCHOLTER FIE BTP	**Runway Surface Type:**	Asphalt
Airport Elevation:	1248 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:	8	**IFR Approach:**	Visual
Runway Length/Width:	3998 ft / 100 ft	**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	40.770278,-79.978614

Administrative Information

Investigator In Charge (IIC):	Muzio, David
Additional Participating Persons:	Jeffery Halliday; FAA; West Mifflin, PA Henry Soderlund; Cessna Aircraft; Wichita, KS Scott Boyle; Teledyne Continental Motors; Arvada, CO Ralph Wetherell; Teledyne Continental Motors; Vernon, CT
Original Publish Date:	December 3, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=56550

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.