Accident Rpt# ERA11CA171	**02/25/2011 1130 EST**	**Regis# N444TT**	**Princeton, NJ**	**Apt: Princeton Airport 39N**
Acft Mk/Mdl AEROSTAR AIRCRAFT CORPORATION		**Acft SN 61P-0444-168**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO-540 SERIES		**Acft TT 2992**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: BRAVO AVIATION, LLC		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

Before he arrived in the vicinity of the destination airport, the pilot checked the wind at a nearby airport which was reported to be at 20 knots with gusts to 25 knots. Additionally, the on-board global positioning system (GPS) receiver depicted the wind from 010 degrees at 12 knots. The pilot executed a GPS approach to runway 28; maintaining 120 knots with 20 degrees of flaps extended, and before landing noted the wind sock was not fully extended. He extended full flaps about 1 mile from the runway, and slowed to 100 knots, then crossed the threshold at 80 knots. The airplane touched down about 75 knots on the wet runway, and the pilot gently applied the brakes. He reported that he was unable to press the brakes hard as the airplane started hydroplaning approximately 1,000 feet before the end of the runway. Unable to stop, the airplane rolled past the departure end of the runway, where the nose landing gear traveled into a small depression causing it to twist. The forward pressure bulkhead was later found to be cracked. The pilot reported there was no mechanical failure or malfunction. The airport was equipped with an automated weather observing system (AWOS). A total of 12 observations were recorded for the approximate time of the accident. Review of the 12 observations indicated the wind was from 230 degrees at 8 knots with gusts to 18 knots.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to stop the airplane resulting in a runway overrun.

Events

1. Landing-landing roll - Runway excursion

Findings - Cause/Factor

1. Personnel issues-Action/decision-Action-Incorrect action performance-Pilot - C
2. Aircraft-Aircraft oper/perf/capability-Aircraft capability-Braking capability-Incorrect use/operation - C

Narrative

Before approach to the destination airport, the pilot checked the wind at a nearby airport which was reported to be at 20 knots with gusts to 25 knots. Additionally, the on-board global positioning system (GPS) receiver depicted the wind from 010 degrees at 12 knots. He executed a GPS approach to runway 28, maintaining 120 knots with 20 degrees of flaps extended, and before landing noted the wind sock was not fully extended. He extended full flaps about 1 mile from the runway, and slowed to 100 knots, then crossed the threshold at 80 knots. The airplane touched down about 75 knots on the wet runway, and he "gently applied the [brakes] on touchdown. I was unable to do hard [braking]." The airplane started hydroplaning approximately 1,000 feet before the end of the runway. Unable to stop, the airplane rolled past the departure end of the runway, where the nose landing gear traveled into a small depression causing it to twist. The forward pressure bulkhead was later found to be cracked. The pilot reported there was no mechanical failure or malfunction. The airport is equipped with an automated weather observing system (AWOS). A total of 12 observations were recorded for the approximate time of the accident (1130 local, or 1630 UTC). Review of the 12 observations indicated the wind was from 230 degrees at 8 knots with gusts to 18 knots.

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Accident Rpt# ERA10FA115	**01/18/2010 1345 CST**	**Regis# N810JA**	**Madison, AL**	**Apt: Huntsville HSV**
Acft Mk/Mdl BEECH B-60		**Acft SN P-591**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING TI0-541 SER		**Acft TT 3383**	**Fatal 2** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: WHITE JOHN J		**Opr dba:**		**Aircraft Fire: GRD**
				AW Cert: STN

Summary

The multiengine airplane was at an altitude of 6,000 feet when it experienced a catastrophic right engine failure, approximately 15 minutes after takeoff. The pilot elected to return to his departure airport, which was 30 miles away, instead of diverting to a suitable airport that was located about 10 miles away. The pilot reported that he was not able to maintain altitude and the airplane descended until it struck trees and impacted the ground, approximately 3 miles from the departure airport. The majority of the wreckage was consumed by fire. A 5 1/2 by 6-inch hole was observed in the top right portion of the crankcase. Examination of the right engine revealed that the No. 2 cylinder separated from the crankcase in flight. Two No. 2 cylinder studs were found to have fatigue fractures consistent with insufficient preload on their respective bolts. In addition, a fatigue fracture was observed on a portion of the right side of the crankcase, mostly perpendicular to the threaded bore of the cylinder stud. The rear top 3/8-inch and the front top 1/2-inch cylinder hold-down studs for the No. 2 cylinder exceeded the manufacturer's specified length from the case deck by .085 and .111 inches, respectively. The airplane had been operated for about 50 hours since its most recent annual inspection, which was performed about 8 months prior the accident. The right engine had been operated for about 1,425 hours since it was overhauled, and about 455 hours since the No. 2 cylinder was removed for the replacement of six cylinder studs. It was not clear why the pilot was unable to maintain altitude after the right engine failure; however, the airplane was easily capable of reaching an alternate airport had the pilot elected not to return to his departure airport.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to divert to the nearest suitable airport following a total loss of power in the right engine during cruise flight. Contributing to the accident was the total loss of power in the right engine due to separation of its No. 2 cylinder as a result of fatigue cracks.

Events

1. Enroute-cruise - Loss of engine power (total)
2. Emergency descent - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Personnel issues-Action/decision-(general)-(general)-Pilot - C
2. Aircraft-Aircraft power plant-Engine (reciprocating)-Recip eng cyl section-Failure - F
3. Personnel issues-Task performance-Maintenance-Repair-Maintenance personnel

Narrative

HISTORY OF FLIGHT

On January 18, 2010, about 1345 central standard time, a Beechcraft B-60, N810JA, operated by the private pilot, was destroyed after it experienced a right engine failure and impacted terrain in Madison, Alabama. The certificated private pilot and a passenger were fatally injured. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the flight that departed Huntsville International Airport (HSV), Huntsville, Alabama, destined for Nashville International Airport (BNA), Nashville, Tennessee. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91.

The airplane was owned by the pilot and based in Decatur, Illinois.

According to information obtained from the Federal Aviation Administration (FAA), the flight originated at Boca Raton, Florida, and arrived at HSV about 1230. The airplane was "topped-off" with 185 gallons of 100-low-lead aviation gasoline, and departed at about 1315. The airplane was subsequently cleared to climb to 6,000 feet and proceed direct to BNA. At 1327, the pilot reported that the airplane was level at 6,000 feet; however, about 3 minutes later, the pilot reported that the airplane had experienced a right engine failure. He further stated "...we've got control but ah we we're gonna need to land" and at one point the pilot stated that the right engine was "feathered." The controller informed the pilot that the airplane was about 10 miles west of the Fayetteville Municipal Airport (FYM), Somerville, Tennessee; however, the pilot replied "alright how about ah taking us back to Huntsville that's a big runway." (FYM was equipped with a 5,000-foot-long, asphalt runway) The airplane was then cleared direct to HSV, which was located about 30 miles to the south.

Radar data revealed the airplane made a right turn to reverse course, while gradually descending. At 1333, the airplane was at an altitude of 4,800 feet, about 7 miles west of FYM. At 1337, the pilot reported that he was "trying" to maintain an altitude of 3,000 feet; however, the airplane continued to descend. At 1341, the

airplane was issued a low altitude alert and the pilot reported that he was "having a hard time holding altitude." At that time, the airplane was about 10 miles north of HSV, at an altitude of about 1,700 feet. At 1343, the airplane was cleared to land on runway 18R, a 12,600-foot-long, asphalt runway. The airplane's last radar target was recorded at 1345, at an altitude of 800 feet, about 3 miles north of the airport.

Witnesses observed the airplane flying toward the airport at a low altitude, with the right engine not operating. One witness stated that he also observed the right engine "cover or cowling propped up." Another witness observed the airplane impact tree tops and then "nose dive straight in the ground." The airplane was engulfed in flames upon impact.

PERSONNEL INFORMATION

The pilot, age 52, held a private pilot certificate, with ratings for airplane single-engine land, airplane multiengine land, and instrument airplane. Pilot logbooks found at the accident site were compromised due to fire, water and impact damage.

The pilot reported 1,600 hours of total flight experience, which included 52 hours in the past 6 months on his most recent application for an FAA third-class medical certificate, which was issued on November 4, 2009. He reported 1,350 hours of total flight experience, which included 60 hours in the past 6 months, on an FAA third-class medical certificate application dated November 21, 2006.

AIRCRAFT INFORMATION

According to FAA records, the pilot purchased the airplane on March 26, 1998.

The six seat-seat, low-wing, retractable-gear airplane, serial number P-591, was manufactured in 1982. It was powered by two Lycoming TIO-541-E1C4, 380-horsepower engines that were each equipped with a Hartzell constant-speed, full-feathering, three-bladed propeller.

Review of maintenance records revealed that the airplane had undergone an annual inspection on May 20, 2009, at a total airframe time of 3,383 hours. At the time of the accident, the airplane had been operated for about 50 hours since the annual inspection.

The right engine had been operated for about 1,425 hours since it was overhauled on October 10, 1995. On April 11, 2003, at an engine total time of 970.5 hours, the No. 2 cylinder was removed for the replacement of "all 4 small case studs" and the "large forward top...and lower stud."

The left engine had been operated about 270 hours since it was installed on March 1, 2006, after being overhauled.

METEOROLOGICAL INFORMATION

A weather observation taken at HSV (elevation 629 feet), about the time of the accident reported, calm winds; visibility 10 statute miles; few clouds at 25,000 feet, temperature 13 degrees Celsius (C), dew point 7 degrees C; altimeter 30.05 inches of mercury.

WRECKAGE INFORMATION

The airplane struck the tops of about 70-foot tall trees and impacted the ground within a housing development, approximately 3 miles north-northeast of HSV. The initial ground scar was located about 30 feet northeast of the main wreckage. Several freshly cut tree branches, which exhibited 45-degree cuts were observed at the accident site. The airplane came to rest upright, on a heading of about 165-degrees magnetic. All major portions of the airframe were accounted for at the accident site. The majority of the airframe, which included the left wing, cabin, and the airframe structure aft of the rear pressure bulkhead, was consumed by fire. The remaining portions of the airframe and both engines sustained significant fire damage.

The right engine throttle, mixture, and propeller controls in the cockpit were observed in an aft position, and the right fuel selector handle was in the "OFF" position. The left engine throttle, mixture, and propeller controls were observed in a forward position, and the left fuel selector handle was about 10 degrees left of the "ON" position.

Measurement of the left and right flap actuators corresponded with a 0-degree flap position. The landing gear actuators' position at the landing gear retract gearbox was consistent with the landing gear in the retracted position.

The right engine remained partially attached to the airframe. The right engine propeller assembly was separated and partially buried in the ground, near the initial ground scar. All three propeller blades were in a low pitch position and did not display evidence consistent with rotation. A 5 1/2 by 6 inch hole was observed in the top right portion of the crankcase. In addition, the crankcase was circumferentially cracked through the No.'s 1 and 3 cylinders. The No. 2 cylinder assembly was separated from the engine and located 40 feet beyond the main wreckage. Evidence of chaffing was observed between the No.'s 2 and 4 cylinder cooling fins. The No. 2 connecting rod and connecting rod cap were also separated and located in the debris path. The No. 2 piston and piston pin were not recovered. The engine could not be rotated. All spark plugs were removed and their electrodes were intact. A borescope examination of cylinder No.'s 1, and 3 through 6, did not reveal any anomalies. Both magnetos remained attached. The right magneto was destroyed by fire. The left magneto was removed and sparked on all towers when rotated by hand. Metallic debris was observed in the oil sump; however, the oil filter was absent of visible metallic debris. The right engine was retained for further examination.

The left engine was separated and located 28 feet prior to the main wreckage. The propeller remained attached. All three propeller blades displayed leading edge gouges and chordwise scratches consistent with rotation. Both magnetos remained attached. The right magneto was fire damaged and did not spark when rotated by hand. The left magneto sparked on all towers when rotated. The crankshaft was rotated via the crankshaft flange. Thumb compression was attained and valve train continuity was observed on all cylinders. All spark plugs were removed and their electrodes were intact. Fuel was observed in the fuel inlet. The fuel inlet and oil suction screens were absent of debris. A borescope examination of all cylinders did not reveal any anomalies that would have precluded normal engine operation.

Additional examination of both propellers was conducted by a representative of Hartzell Propeller Inc., under the supervision of an NTSB investigator. All propeller damage was consistent with impact damage and there were no discrepancies that would have precluded normal engine operation.

The left propeller was confirmed to be at a low pitch and rotating at the time of the impact; however, an estimation of power output could not be determined. The right propeller was at a low pitch and did not have evidence of rotation. It could not be determined if the propeller had been feathered prior to impact.

The right engine was examined at Lycoming Engines, Williamsport, Pennsylvania, under the supervision of an NTSB Investigator. During the examination, it was noted that the rear top 3/8-inch and the front top 1/2-inch cylinder hold down studs for the No. 2 cylinder exceeded the manufacturers specified length from the case deck by .085 and .111 inches; respectively. In addition, grease was found on all thru studs, contrary to Lycoming installation procures. The teardown did not reveal any failures pertaining to cylinder assemblies other than the No. 2 cylinder.

The No. 2 connecting rod, No. 2 cylinder, two through bolts, and portions of the engine crankcase where the No. 2 cylinder would have been mounted were retained and forwarded to the Safety Board's Materials Laboratory, Washington, DC, for further examination.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies were performed on the pilot and passenger by the Alabama Department of Forensic Sciences, Huntsville, Alabama, on January 19th and 20th, 2010; respectively.

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma, with no anomalies noted.

TESTS AND RESEARCH

According to the NTSB Metallurgist's Factual report, examination of the retained right engine components revealed in part, that the No. 2 cylinder had plastic deformation and tearing of the skirt at the base of the cylinder where it would have mated to the crankcase. The damage was consistent with overstress and did not suggest any preexisting anomalies. One of the through bolts had failed due to a fatigue fracture and the other failed due to an overstress fracture. Additionally, one of the cylinder studs failed due to a fatigue fracture and a fatigue fracture was also observed on the right side of a portion of the crankcase, which remained attached to the cylinder. The fracture was in a plane mostly perpendicular to the threaded bore of the cylinder stud. In addition, the surface of the crankcase surrounding the bore for the through bolt was slightly depressed in the area that would have been covered by the No. 2 cylinder flange. [For additional information please see the NTSB Metallurgical Factual Report located in the public docket.]

ADDITIONAL INFORMATION

Aircraft Performance

The aircraft manufacturer calculated the airplane's climb performance based on an estimated gross weight of 6,400 pounds, with one propeller stopped (not feathered), with the atmospheric conditions present at the time of the accident. The airplane's maximum rate of climb at an altitude of 6,000 feet and at the accident site elevation was determined to be 191, and 341 feet-per-minute; respectively.

Accident Rpt# WPR10FA158	**03/12/2010 1624 PST**	**Regis# N5392E**	**Boulder City, NV**	**Apt: Boulder City Municipal BVU**
Acft Mk/Mdl BEECH K35		**Acft SN D-5883**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl TELEDYNE CONTINENTAL MOTORS		**Acft TT 3190**	**Fatal 1** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: BRETT BEUKENS		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

The pilot was on a cross-country flight to an airport that he had previously visited several times. Radar data indicated that he was flying northwest. The pilot contacted airport personnel 15 miles short of his intended destination, stating that he was low on fuel and that he needed to land immediately. Airport personnel informed him that runway 15 was active. The pilot reported that he did not see the airport and asked for help locating it. About 4 minutes 20 seconds later, the pilot requested a straight-in landing and indicated that he was gliding. Witnesses in another aircraft reported that they saw the airplane strike power lines and then descend directly to the ground east of the airport while on final approach for the runway. Inspection of the wreckage found that approximately 5 gallons of usable fuel remained in the left main tank. The remainder of the fuel tanks were either breached or contained less than usable amounts of fuel. Investigators found no anomalies that would have precluded normal operation of the airframe or engine. The sun was 16 degrees above the horizon directly in the direction of the runway and glare likely hindered the pilot from seeing the wires.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: A loss of engine power due to fuel starvation as a result of the pilot's inadequate fuel management; also causal was his subsequent failure to maintain clearance from power lines.

Events

1. Enroute-descent - Fuel starvation
2. Emergency descent - Loss of engine power (total)
3. Emergency descent - Off-field or emergency landing
4. Emergency descent - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Fluids/misc hardware-Fluids-Fuel-Fluid management - C
2. Personnel issues-Task performance-Use of equip/info-Use of equip/system-Pilot - C
3. Environmental issues-Physical environment-Object/animal/substance-Wire-Effect on equipment
4. Environmental issues-Conditions/weather/phenomena-Light condition-Glare-Effect on personnel

Narrative

HISTORY OF FLIGHT

On March 12, 2010, at 1624 Pacific standard time, a Beech K35, N5392E, collided with power lines near Boulder City, Nevada. The pilot/owner was operating the airplane under the provisions of 14 Code of Federal Regulations (CFR) Part 91. The private pilot sustained fatal injuries; the airplane sustained substantial damage to the fuselage, wings, and left stabilator from impact forces. The cross-country personal flight departed Queens Creek, Arizona, at an undetermined time, with a planned destination of Henderson, Nevada. Visual meteorological conditions prevailed, and no flight plan had been filed.

At 1602:30, recorded radar data displayed a secondary 1200 visual flight rules (VFR) beacon code at a mode C reported altitude of 8,500 feet mean sea level (msl). The ensuing radar target matched the projected flight path of the accident airplane. This target was heading 317 degrees; it proceeded on the northwesterly heading and began descending at 1614:31.

Recordings of the Boulder City airport universal communications frequency (UNICOM) indicated that runway 15 was the active runway. Boulder City airport was about 13 nautical miles (nm) east of Henderson. The pilot contacted UNICOM; he stated that he was low on fuel, and needed to get on the ground right away. He did not see the airport, and needed some help in locating it. He indicated that he was by a lake. The radar data indicated that the target was over Lake Mojave at 1616:07. It was at 7,800 feet; the heading was 319 degrees, and its ground speed was 164 knots. At 1617:20, the ground speed began decreasing, and went down to 90 knots in less than a minute. Routine aviation weather reports for Henderson that included the accident time frame indicated that winds were from 160-190 degrees at 6 to 8 knots.

About 4 minutes 20 seconds later, the pilot stated that he would like a straight in landing, and that he was gliding. A little over 30 seconds later, he said that he was passing through 5,000 feet, and had the airport in sight. At 1620:56, the radar data indicated that the target was at 5,000 feet, heading 327 degrees, and the speed was 83 knots.

Fifty seconds later, the pilot reported that he was about 5 miles from the airport at 4,000 feet. At 1622:20, the target was at 4,000 feet, and heading 321 degrees at 77 knots.

About 3 minutes later, a witness in another aircraft reported that he saw the airplane strike power lines, and then descend directly to the ground east of the airport on final for runway 27 left. He estimated that the crash site was about 1/2 mile from the runway numbers for 27.

The last target with altitude and airspeed was at 1624:44; it was at 2,300 feet, and heading 306 degrees at 76 knots. Boulder Municipal Airport's elevation was 2,201 feet.

PERSONNEL INFORMATION

A review of Federal Aviation Administration (FAA) airman records revealed that the 45-year-old pilot held a private pilot certificate with ratings for airplane single-engine land and rotorcraft-helicopter. His third-class medical certificate was issued on May 13, 2004. It had the limitations that the pilot must wear corrective lenses. The application for that medical certificate noted a total time of 800 hours.

Investigators found one of the pilot's logbooks in the airplane. The last entry was on April 6, 2007. Total time at this point was about 542 hours. An entry dated March 1, 1999, was the first flight that was logged in N5392E. He logged 301 hours in this airplane. The logbook contained at least one entry to Henderson or the immediate area for 6 of the 7 years prior to the last entry in 2007.

A certified copy of the airman's records from the FAA in Oklahoma City, Oklahoma, indicated that the pilot obtained a rotorcraft rating on August 7, 2001. There was no rotorcraft time recorded in the logbook found in the wreckage, which indicated a total time of 399 hours in airplanes as of that date. The application for the rotorcraft certificate indicated 97.4 hours total time; 87.3 hours of instruction received (35.7 hours of cross-country solo instruction), 10.1 hours pilot-in-command (PIC) solo (3 hours cross-country PIC solo), 3.6 hours night instruction, and 12 night landings. No other pilot logbooks were located.

AIRCRAFT INFORMATION

The airplane was serial number D-5883. A review of the airplane's logbooks revealed a total airframe time of 3,164 hours at the last annual inspection. The logbooks contained an entry for an annual inspection dated January 15, 2007. The tachometer read 3,164.29 at the last inspection; the tachometer read 3,190 at the accident scene.

The engine was a Teledyne Continental Motors (TCM) IO-470-C(1), serial number 242115-R. Total time recorded on the engine at the last annual inspection was 462 hours.

COMMUNICATIONS

The pilot was in contact with Boulder City UNICOM on frequency 122.7.

WRECKAGE AND IMPACT INFORMATION

The National Transportation Safety Board investigator-in-charge (IIC) examined the wreckage on site.

The airplane came to rest on an easterly heading about 1/2 mile from the approach end of runway 27L. Three parallel sets of power lines ran from the northeast to the southwest. The closest point from the middle power line to the numbers for runway 27L was about 0.7 mile. One of the two top static wires on the middle power line appeared shiny in several spots that aligned with the debris path.

The paint markings and material for the first identified piece of debris were similar to the markings and material from the junction of the right tip tank and the right wing. This piece was about 100 feet from the middle power line wires, and in the direction of the main wreckage.

The debris path consisted of paint shards and Plexiglas. The right tip tank separated; it was on the left side of the debris field and about 200 feet from beyond the wires. The tank contained an angled semicircular indentation approximately the diameter of the power lines, and numerous striation marks.

The main wreckage came to rest upright about 260 feet beyond the wires. The debris path was along a magnetic bearing of 306 degrees. The engine partially separated from the airframe; it twisted and rotated about 80 degrees to the left. The nose landing gear remained attached to the airframe, and was in the extended position.

About 5 to 6 feet from the outboard edge of the right wing was an angled semicircular indentation with dimensions similar to the power lines. This portion of the leading edge exhibited aft crush damage, and striations went along the length of the crush area toward the tip.

One propeller blade bent forward 90 degrees beginning about 1/3 of the span from the hub. The other blade exhibited leading edge gouges on the outboard third, and striation marks consistent with power line contact on the cambered side at the midpoint.

The IIC established control continuity for the flight controls. The gear and flap switches were in the up position. The main landing gear were in the up position.

METEOROLOGY

Sun calculations from the US Naval Observatory indicate that at 1620, the sun was 16 degrees above the horizon at 269 degrees magnetic from the accident site.

MEDICAL AND PATHOLOGICAL INFORMATION

The Clark County Coroner completed an autopsy. The FAA Forensic Toxicology Research Team, Oklahoma City, performed toxicological testing of specimens of the pilot.

Analysis of the specimens contained no findings for carbon monoxide, cyanide, volatiles, and tested drugs.

TESTS AND RESEARCH

The airplane's flight manual (AFM) indicated that the best glide speed was 105 knots indicated airspeed (KIAS), and the emergency landing approach speed was 78 KIAS.

Fuel System

The AFM describes the fuel system. It consists of two 25-gallon (22 usable) main fuel tanks. Fuel feeds from each tank to a main fuel selector valve (FSV), which is located just forward of and to the left of the left front seat. It then feeds through a strainer to the fuel pump and the engine. The instrument panel contains subpanels on both sides that contain various systems switches. Two switches, which are not spring loaded, allow the pilot to select which main and auxiliary fuel tank is displayed on their respective quantity gauges.

This airplane was equipped with the two optional 10-gallon (19 gallons usable) auxiliary wing tanks. Both auxiliary wing tanks connected to a common port on the main FSV. Both fed simultaneously when the main FSV was set to AUX. This airplane's main FSV had four positions. OFF, LH TANK 22 GAL, AUX, and RH TANK 22 GAL.

The airplane had a 20-gallon tip tank installed on each wing in accordance with supplemental type certificate (STC) SA4-1629. The schematic of the tip tank system discussed fuel management. It noted that two additional FSVs were installed to select the tip tanks. The left tip FSV applied to the left tip tank, and the right tip FSV applied to the right tip tank. The left tip FSV was a two-position switch, OFF and LEFT. The right tip FSV was a three-position switch, OFF, RIGHT, and AUX.

The AFM notes that the fuel injection system returns about 10 gallons per hour of excess fuel. The excess is returned to whichever main tank is being used. When the auxiliary tanks are being used, the excess goes into the left main tank only.

The system description noted that the pilot should use at least 10 gallons of fuel from the left main fuel tank prior to using fuel from the auxiliary system. To use fuel from the tips, it instructed the pilot to turn the tip tank selectors to LH or RH tip tank. It advised the pilot to check the left main fuel tank quantity periodically, and return to the left main whenever it indicated 3/4 full. It stated that fuel could be used from both tip tanks simultaneously, but one could be turned off if an

unsymmetrical load developed.

The description instructed the pilot to turn the main FSV to a main tank when the tip tank fuel had been exhausted. It then stated that the LH tip tank FSV should be turned to the OFF position. It indicated that to use the wing auxiliary fuel tanks, the pilot should position the RH tip tank FSV to the AUX position, and turn the main FSV to AUX. A note stated that the tip tanks selectors must be off when not in use except for the RH FSV when using the wing auxiliary tanks. It indicated that the main FSV should be set to a main tank, and all other tank selectors should be turned off, after all auxiliary fuel had been used.

The AFM directed the pilot to use the left main tank for takeoffs, and the main tank that was more full for landings. Investigators observed the main FSV in the AUX position. They observed the left tip tank FSV in the OFF position; the right tip tank FSV was in the AUX position. The main fuel quantity indicator switch was on the right position, and the auxiliary fuel quantity indicator switch was on the left position.

Investigators drained 5 gallons of a blue fluid that smelled like aviation gasoline from the left main fuel tank, and a short dribble of fluid from the left auxiliary tank. Just enough fuel was visible in the left auxiliary tank to cover the pickup tube. The left tip tank was breached on the bottom; it leaked as it was lifted up, and the ground was wet underneath. Some blue fluid was observed, but not a measurable amount was drained. No liquid was observed in the right main tank, which had not been breached, and drained a few drops from it. A blue fluid was observed that was above the level of the pickup tube in the right auxiliary tank, and drained 1/2 gallon from it. The right tip tank separated, and contained no fluid.

The Teledyne Continental Motors (TCM) investigator examined the engine under the supervision of the FAA at Air Transport, Phoenix, Arizona, on March 22, 2010. He observed no anomalies of the engine that would have precluded normal operation.

Accident Rpt# CEN11CA403	**06/18/2011 1845 CDT**	**Regis# N24HM**	**Montgomery City, MO**	
Acft Mk/Mdl BELL 47G-4A		**Acft SN 7688**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING VO-540 SERIES		**Acft TT 11153**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 137**
Opr Name: RHINELAND GRAIN INC		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: SPR

Narrative

The pilot reported that he had returned from a prior agricultural application flight. The helicopter chemical tank was loaded with cleaning solution. The pilot stated that he increased engine power and lifted off again. However, immediately after takeoff, the engine and rotor speed began to decrease, and the pilot selected a nearby location for a landing. He flared for touchdown about 10 feet above ground level in order to minimize the forward speed. The helicopter touched down on the rear portion of the landing skids and began to pitch forward. The pilot responded by applying aft cyclic control to prevent the helicopter from nosing over. He subsequently heard a bang and observed debris coming from the aircraft. He shut down the engine and secured the helicopter. A postaccident examination revealed that the main rotor had struck the tailboom resulting in substantial damage to the airframe. The pilot did not report any failures or malfunctions related to the helicopter that occurred prior to the accident. However, the chemical tank was determined to have been loaded with approximately 90 gallons of cleaning solution, instead of the intended 70 gallons. He commented that the aircraft may have been on a slight incline when the solution was loaded, allowing the right side tank to fill more than the left side tank. As a result, he was unaware of the overload condition. The pilot added that closer monitoring of the helicopter and chemical truck incline, and the final amount of solution being loaded onto the helicopter, might have prevented the accident.

Accident Rpt# CEN11LA365	**05/27/2011 1500 EDT**	**Regis# N60147**	**Freemont, MI**	
Acft Mk/Mdl BOEING A75N1 (PT17)		**Acft SN 75-1951**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl CONTINENTAL W670		**Acft TT 3885**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: PILOT		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STA

Narrative

On May 27, 2011, about 1500 eastern daylight time, a Boeing A75NA (PT17), N60147, descended and impacted terrain while turning crosswind after takeoff from Fremont Municipal Airport Fremont (FFX), Michigan. The certificated airplane transport pilot sustained minor injuries and the pilot rated passenger sustained unknown injuries. The airplane sustained substantial damage to both wings. The airplane was registered to and operated by the pilot as a personal flight under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan had been filed for the flight that was to remain in the airport traffic pattern of FFX. The flight originated from FFX about 1430.

Accident Rpt# ERA10LA009 10/01/2009 1400 EDT	**Regis# N81FW**	**Brooksville, FL**	**Apt: Hernando County Airport BKV**	
Acft Mk/Mdl BUTLER AIRCRAFT COMPANY	**Acft SN 61-0049-94**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO-540	**Acft TT 4232**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: JOHN J KLINOWSKI	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: STN	

Summary

The pilot/owner selected the landing gear to the extended position in preparation for landing. The amber light, which was designed to illuminate temporarily to indicate that the gear was in transit, did not illuminate during the gear extension, but all other indications were normal. After touchdown on the paved runway, the nose gear did not remain extended and the airplane pitched down until the nose contacted the runway surface. The airplane came to a stop on the runway and sustained substantial damage. Preliminary examination revealed that the cockpit landing gear position indicator lights functioned properly. However, lack of replacement parts availability had prevented the repair of the airplane through at least January 2011, and the detailed functional checks and examinations that were planned to be conducted concurrently with the repair have not been accomplished. Maintenance records documented several recent, preaccident repairs to the nose and main landing gear systems, but it could not be determined whether the nose gear collapse was related to those maintenance activities.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The collapse of the nose landing gear during landing rollout for undetermined reasons.

Events

1. Landing-landing roll - Landing gear collapse

Findings - Cause/Factor

1. Aircraft-Aircraft systems-Landing gear system-Nose/tail landing gear-Failure - C
2. Not determined-Not determined-(general)-(general)-Unknown/Not determined - C

Narrative

HISTORY OF FLIGHT

On October 1, 2009, about 1400 eastern daylight time, a Butler Aircraft Aerostar 601, N81FW, was substantially damaged when the nose gear collapsed on landing at Hernando County Airport (BKV), Brooksville, Florida. The certificated private pilot/owner, the sole person on board, was not injured. The personal flight was operated under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the flight.

According to the pilot, he departed in the mid-wing, twin-engine airplane from Albert Whitted Airport (SPG), St. Petersburg, Florida for the flight to BKV, a non-towered airport. He set up for a landing on runway 3, which was charted as a concrete surface 5,015 feet long and 150 feet wide. The airplane was equipped with three green lights, one for each landing gear, that were designed to illuminate when the three landing gear were properly extended for landing. The pilot reported that after he selected the landing gear to the down position, he observed that the three green lights were illuminated.

The pilot reported that the airplane touched down "normally" on the main landing gear, but when he lowered the nose to place the nose gear on the runway for the rollout, the airplane continued to pitch down until the nose structure contacted the runway surface. The propeller tips contacted the runway, and the airplane slid to a stop on its main landing gear and the nose structure. The airplane did not depart the paved runway surface, and there was no fire.

PERSONNEL INFORMATION

Federal Aviation Administration (FAA) records indicated that the pilot held a private pilot certificate with airplane single-engine and multi-engine land ratings, and an instrument airplane rating. He had approximately 1,847 total hours of flight experience, which included approximately 51 hours in the accident airplane make and model, and approximately 8 hours in the accident airplane. His most recent flight review was completed in August 2008, and his most recent FAA third-class medical certificate was issued in September 2008.

AIRCRAFT INFORMATION

According to FAA records, the airplane was manufactured in 1970, and was equipped with two Lycoming IO-540 series piston engines. Previous registration numbers assigned to this airplane included N7482S and N31FW. The accident pilot purchased the airplane in June 2009. The airplane's most recent annual inspection was completed in January 2009, and at that time, it had accumulated a total of 4,232 hours in service. The pilot reported that at the time of the accident, the airplane had accumulated a total time in service of 4,255 hours.

METEOROLOGICAL INFORMATION

The 1353 BKV recorded weather observation included winds from 010 degrees at 5 knots, 10 miles visibility, clear skies, temperature 28 degrees C, dew point 9 degrees C, and an altimeter setting of 29.99 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

According to information provided by the FAA inspector who examined the airplane, the nose gear doors, the lower forward nose skins and the underlying structure exhibited crush and abrasion damage from the runway contact.

Post-accident discussions with the pilot revealed that an amber light normally illuminated to denote when the landing gear was in transit to the extended position, but on the accident flight, the amber light did not illuminate when the gear was in transit. The airplane was also equipped with a warning horn designed to sound when the throttles were retarded whenever the landing gear was not extended. The pilot stated that there was no pre-takeoff check of this warning horn system, and that the horn did not sound during the accident approach and landing.

ADDITIONAL INFORMATION

Previous Maintenance Activity

Review of FAA records revealed that in 1989, a major repair was accomplished on the lower nose section of the airplane. The repairs included replacement of webs, skins, and nose landing gear door assemblies. The reason for the repair was not determined.

Review of maintenance records indicated that concurrent with the most recent annual inspection, which was completed in January 2009, several discrepancies were identified and corrected. Discrepancy number 15 was cited as "Nose gear doors hang open about 4 inches," and the stated corrective action was reported as "Checked and found rigging not correct and incorrect attach bracket installed. Installed correct attach bracket on nose gear and rigged and adjusted doors as needed." The correct, newly-installed component was part number 5462014-1. Subsequent discussions with the maintenance facility technician who conducted the subject maintenance revealed that the nose gear doors were opened and closed by a series of mechanical sequencing links that were driven by the retraction or extension of the nose gear, without any additional actuation or control system components. The technician stated that it was one of those sequencing links that was the component referred to as the "attach bracket" in the corrective action write-up for the discrepancy.

Discrepancy number 16 was cited as "Nose gear oleo strut leaking," and the stated corrective action was "resealed and serviced nose gear strut." Discrepancy number 31 was "hydraulic leak coming from belly," and the sources were identified as the landing gear actuating valve and the flap actuating valve. The stated corrective action was "removed and resealed valves."

Airplane Examination

Subsequent to the accident, the airplane was partially hoisted, the nose gear was manually extended and locked, and the airplane was placed in a hangar on its gear. An FAA inspector conducted a preliminary examination of the airplane in this condition. He reported that when electrical power was applied to the airplane, the three green landing gear lights on the instrument panel illuminated, which was the normal indication that all three landing gear were properly extended. The amber "gear in transit/unsafe" light was equipped with a push-to-test feature, and illuminated when pushed.

According to the pilot, he has had the airplane scheduled for repair since the October 2009 nose gear event, but as of January 2011, lack of available replacement parts has prevented the start of that maintenance activity. As a consequence, certain investigative activities that were contingent upon the planned

maintenance activities have not been accomplished. Those investigative activities included functional checks of the landing gear aural warning system, and the landing gear retraction and extension system. Therefore, to date, no failure mechanisms or component failures, including the items repaired during the most recent annual inspection, have been identified as contributory or causal to the accident sequence.

Accident Rpt# CEN11LA448	**06/29/2011 1615 CDT**	**Regis# N2332V**	**Burlington, WI**	**Apt: Burlington Municipal Airport BUU**
Acft Mk/Mdl CESSNA 140		**Acft SN 14568**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR C90 SERIES			**Fatal 0** **Ser Inj 1**	**Flt Conducted Under: FAR 091**
Opr Name:		**Opr dba:**		**Aircraft Fire: NONE**

Narrative

On June 29, 2011, about 1615 central daylight time, a Cessna 140, N2332V, sustained substantial damage during a forced landing after a loss of power during the initial climb from runway 11 (4,300 feet by 75 feet, asphalt) at the Burlington Municipal Airport (BUU), Burlington, Wisconsin. The pilot received serious injuries. The airplane was registered to Stick and Rudder and operated by the pilot on a personal flight under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed at the time of the accident. The flight originated from the Kenosha Regional Airport (ENW), Kenosha, Wisconsin, about 1545.

The pilot reported that the engine started to lose power when the airplane was about 100 feet above the runway during the initial climb. The pilot determined that there was not enough runway remaining to land on runway 11. He entered a left turn and attempted to land on runway 19. The pilot reported that the airplane landed hard on the nose and left wheel. The pilot's arm was broken during the impact sequence, and the airplane sustained substantial damage to the fuselage.

Accident Rpt# CEN11CA221	**02/05/2011 1751 CST**	**Regis# N11790**	**Gonzales, LA**		
Acft Mk/Mdl CESSNA 150L		**Acft SN 15075634**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR 0-200 SERIES			**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: MICHAEL SCHAFF		**Opr dba:**		**Aircraft Fire: NONE**	
				AW Cert: STN	

Narrative

The certified flight instructor did not visually inspect the fuel tanks prior to departure, but the fuel gauge was just below the full mark and the student pilot told him the fuel tanks were full. Based on his experience in the airplane, the instructor estimated a total of 4 hours of fuel on board and then departed on an instructional flight that included numerous practice take offs and landings. Approximately 3 hours into the flight, as they were returning to their home airport, the engine lost power. The instructor was unable to re-start the engine and made a forced landing to a grass field where the right wing hit a tree causing substantial damage to the strut. The nose gear separated from the airframe and both wing tips, the engine cowling, and wheel fairings were damaged. A Federal Aviation Administration inspector drained both fuel tanks and reported that approximately 3/4 of a gallon of fuel was drained from the right wing tank and 1/2 of a gallon of fuel was drained from the left wing tank. The fuel line to the carburetor was removed and some fuel was found in the line. The gascolator was removed and approximately 7 to 8 ounces of fuel (absent of debris) was recovered. The carburetor was removed and disassembled and approximately 2 ounces of fuel (absent of debris)was found in the bowl. No mechanical deficiencies were noted with the airplane or engine.

Accident Rpt# WPR10LA312 **06/23/2010 1305 MST** **Regis# N432PB** **Parker, AZ** **Apt: Avi Suquilla Airport P20**

Acft Mk/Mdl CESSNA 170B **Acft SN 26664** **Acft Dmg: SUBSTANTIAL** **Rpt Status: Unk** **Prob Caus: Pending**

Eng Mk/Mdl CONT MOTOR C145 SERIES **Fatal 0** **Ser Inj 0** **Flt Conducted Under: FAR 091**

Opr Name: FLOYD W. GRIFFITH **Opr dba:** **Aircraft Fire: GRD**

Summary

An airport employee stated that the pilot called for an airport advisory several minutes before he landed. He reported that at that time the wind was from 220 degrees at 7 knots. The pilot reported that as he approached the airport, the wind was from 255 degrees at about 7 knots, a direct crosswind for either runway; therefore, he elected to land on runway 1. The pilot said that while on approach, when he first saw the windsock, it appeared to be partially inflated, but as he approached touchdown the windsock was straight out. After the airplane touched down, the left wing rose up and the right wing and propeller contacted the runway. The airplane cartwheeled, departed the right side of the runway, and came to rest upright. Both wing tips were bent up during the accident. Subsequently, a fire erupted, which consumed the fuselage. Postaccident inspection of the airplane confirmed control continuity to all flight control surfaces. The pilot also reported that it was obvious that the crosswind was more than he or the airplane could handle and that there were no mechanical failures or malfunctions.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain directional control while landing with a crosswind.

Events

1. Landing-landing roll - Loss of control on ground

Findings - Cause/Factor

1. Environmental issues-Conditions/weather/phenomena-Wind-Crosswind-Contributed to outcome
2. Environmental issues-Conditions/weather/phenomena-Wind-Tailwind-Contributed to outcome
3. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
4. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C

Narrative

On June 23, 2010, about 1305 mountain standard time, a Cessna 170B, N432PB, sustained substantial damage following a loss of control during the landing roll at the Avi Suquilla Airport, Parker, Arizona. The private pilot and his passenger received minor injuries. The owner/pilot was operating the airplane under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the personal flight, which had originated approximately 90 minutes earlier from Corona, California. A flight plan had not been filed.

The pilot reported to the Federal Aviation Administration (FAA) inspector that as he approached the airport, the wind was from 255 degrees at about 7 knots. He elected to land on runway 01, and as he touched down, the airplane's left wing rose up, and the right wing and propeller contacted the runway. The airplane cartwheeled, departed the right side of the runway, and came to rest upright. Both wing tips were bent up during the accident. Subsequently, a post accident fire erupted, which consumed the fuselage. The pilot further reported that it was obvious that the crosswind was more that he or the airplane could handle. No mechanical failures or malfunctions were reported.

An employee at the airport stated that the pilot called for an airport advisory several minutes before he landed. He reported that at that time the wind was from 220 degrees at 7 knots. Additionally, the pilot said that when he first saw the windsock it appeared to be partially inflated, but as he approached touchdown, the windsock was straight out.

Postaccident inspection of the airplane by an FAA inspector confirmed control continuity to all flight control surfaces.

The pilot did not submit a National Transportation Safety Board Pilot/Operator Aircraft Accident Report Form 6120.1/2.

Accident Rpt# WPR10LA123	**01/30/2010 945 PST**	**Regis# N8959B**	**Pahrump, NV**	**Apt: North Las Vegas Airport VGT**
Acft Mk/Mdl CESSNA 172-U		**Acft SN 36659**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl CONTINENTAL MOTORS O-300		**Acft TT 3884**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: CHAPTER 163 FLYING CLUB		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Narrative

On January 30, 2010, about 0945 Pacific standard time, a Cessna 172U, N8959B, experienced a loss of engine power during cruise flight and the pilot made a forced landing in the vicinity of a landing strip in the desert near Pahrump, Nevada. Chapter 163 Flying Club operated the personal cross-country flight under the provisions of Title 14 Code of Federal Regulation Part 91. The certified private pilot and one passenger were not injured. The airplane sustained structural damage to the tail section. Visual meteorological conditions prevailed for the flight that departed the Shoshone Airport (L61), Shoshone, California, at 0930. The flight was destined for North Las Vegas Airport (VGT), Las Vegas, Nevada, and no flight plan had been filed.

In a written statement, the pilot reported that about 10-15 minutes after departure he heard three loud "pops" and the engine rpm dropped to about 1200 rpm. The pilot attempted to restart the engine by adjusting the fuel selector, mixture, and throttle, but was unsuccessful. The pilot initiated a forced landing to desert terrain. As the airplane touched down, the nose landing gear sunk into the soft ground, and the airplane nosed over and came to rest inverted.

During a post accident examination of the engine by a Federal Aviation Administration (FAA) inspector, the carburetor was removed from the engine and disassembled. The fuel inlet screen was removed. The FAA inspector reported that fine sand and pebbles consistent with an impact with the ground were observed. The FAA inspector further reported that carburetor bowl was removed and the float valve was found to be improperly installed.

A review of the airplane's maintenance logbooks revealed that the airplane's most recent inspection, an annual inspection, occurred on February 27, 2009. The most recent engine overhaul occurred in February 2004. Maintenance conducted on the carburetor or fuel system was not mentioned in the logbook entries.

A representative from Continental Motors reported that the time between overhaul for a carburetor is the same as specified by the engine manufacturer; 10 to 12 years since placed in service or overhaul, whichever comes first.

Accident Rpt# ERA11LA388	**07/04/2011 1435 CDT**	**Regis# N109DP**	**Orange Beach, AL**	
Acft Mk/Mdl CESSNA 172N		**Acft SN 17270607**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING 0-320-A4M			**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: GULF COAST AERIAL ADVERTISING INC		**Opr dba:**		**Aircraft Fire: NONE**

Narrative

On July 4, 2011, about 1435 central daylight time, a Cessna 172N, N109DP, registered to and operated by Gulf Coast Aerial Advertising, Inc., nosed over during a forced landing in water near Orange Beach, Alabama. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 Code of Federal Regulations (CFR) Part 91 banner tow flight from Resort Airport (0AL1), Foley, Alabama. The airplane sustained substantial damaged, and the certificated airline transport pilot and certificated commercial second pilot were not injured. The flight originated from 0AL1 about 1355.

The pilot-in-command stated that about the return point of their planned route, they began to climb to the north to return to the field. He then noticed a loss of engine rpm and a small vibration. He attempted to resolve the issues but was unable and reported the engine continued losing power. He then elected to release the banner and maneuvered towards Wolf Field, but was unable to land there. He then maneuvered the airplane for a forced landing in water near shore of Walker Island, and after touchdown, the airplane nosed over.

Preliminary inspection of the engine by a Federal Aviation Administration airworthiness inspector revealed damage to the No. 3 cylinder near the bottom spark plug.

Accident Rpt# CEN10FA465	**07/23/2010 1017 EDT**	**Regis# N82531**	**Ludington, MI**		
Acft Mk/Mdl CESSNA U206F		**Acft SN U-206-01734**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl CONTINENTAL IO-520-F3B		**Acft TT 3946**	**Fatal 4 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: JERRY FREED		**Opr dba:**		**Aircraft Fire: NONE**	

Summary

The pilot reported that he was crossing Lake Michigan at 10,000 feet above mean sea level when the engine lost power. He was near the mid-point (about 24 miles from the shoreline) of the lake with a 40-knot headwind, so he turned around to return to shore. He attempted to restart the engine but was unsuccessful. The pilot ditched the airplane about 5 miles from shore and it quickly sank. Postaccident inspection of the airplane revealed that the firewall fuel strainer gasket did not provide a complete seal between the fuel screen and the fuel strainer's upper body. A portion of the gasket was positioned over the exit port, which created a gap. This allowed debris in the fuel to migrate to the engine's fuel inlet filter screen in the fuel metering assembly. The inspection of the fuel inlet filter screen revealed that it was partially obstructed with debris. The orifice of the fuel inlet passage contained the same debris that obstructed the flow of fuel through the orifice to the fuel screen. The airplane had undergone an annual maintenance inspection about 7.5 hours prior to the accident. The mechanic, who had an inspection authorization, reported that he did not inspect the gasket on the firewall fuel strainer, nor did he remove and inspect the fuel inlet filter screen as required by the manufacturer's service manual. The debris was composed of materials similar to wood chips, sawdust, paint, varnish, cloth, glass fibers, metal shavings, sand, and soil. The source of the contaminants was not determined. The postaccident inspection revealed no other preexisting airframe anomalies. The engine was run on a test stand and the engine produced the rated horsepower. The airplane's owner's manual indicated that the glide distance for an airplane at 10,000 feet above the water's surface was 15 miles.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The total loss of engine power due to fuel starvation as a result of accumulated debris in the fuel system from an undetermined source. Also causal was the inadequate annual maintenance inspection that did not include inspection of the firewall fuel strainer and the fuel inlet screen.

Events

1. Enroute-cruise - Loss of engine power (total)
2. Emergency descent - Ditching

Findings - Cause/Factor

1. Aircraft-Aircraft systems-Fuel system-Fuel filter-strainer-Inadequate inspection - C
2. Aircraft-Aircraft systems-Fuel system-Fuel filter-strainer-Malfunction - C
3. Personnel issues-Task performance-Inspection-Scheduled/routine inspection-Maintenance personnel - C

Narrative

HISTORY OF FLIGHT

On July 23, 2010, at 1017 eastern daylight time (edt), a Cessna U206F, N82531, sustained substantial damage when it was ditched in Lake Michigan about 5 miles west of Ludington, Michigan, after a loss of engine power. The airplane was owned and operated by the pilot as a personal flight under 14 Code of Federal Regulations Part 91. It departed the Gratiot Community Airport (AMN), Alma, Michigan, at 0850 and was en route to Rochester International Airport (RST), Rochester, Minnesota. The single-engine airplane was over Lake Michigan at 10,000 feet above mean sea level (msl) when the engine lost power. The pilot reversed course but was unable to reach the shore, and he ditched the airplane. The pilot survived and was rescued by a fishing boat about 38 minutes later. The pilot rated passenger and three other passengers did not survive. Visual meteorological conditions prevailed at the time of the accident. An instrument flight rules (IFR) flight plan was activated.

On July 23, 2010, about 0659, the pilot rated passenger called the Princeton Automated Flight Service Station to obtain a weather brief and to file an IFR flight plan. The briefer informed him that there was an airmen's meteorological information (AIRMET) for IFR conditions for the entire route of flight that was valid until about 1100 - 1400. There was a Convective significant meteorological information (SIGMET) to the south that paralleled the route of flight. The briefer reported that the winds aloft were from 260 degrees at 41 knots at 9,000 feet, and 270 degrees at 35 knots at 12,000 feet. The pilot rated passenger filed the flight plan and identified the flight as a "lifeguard" flight.

The pilot reported that the purpose of the flight was to take one of the passengers to the Mayo Clinic in Rochester, Minnesota, for medical treatments. The flight was a personal flight and was not associated with a charity organization. The patient and his wife were seated in the aft seats, seats 5 and 6. The patient's doctor was sitting in the middle row on the left in seat 3. The pilot was in the left front seat and the pilot rated passenger was in the right front seat, seat 2. The fuel tanks

were filled to capacity the night before the flight. The pilot reported that after climbing to 10,000 feet msl, he leaned the fuel mixture to approximately 14 gallons per hour (gph).

The pilot reported that all of the instrument readings were within normal limits as they crossed the shore near Ludington, Michigan. The head winds were about 40 knots "directly on the nose." Near mid-point over the lake (about 24 statute miles from the shoreline), the engine began to misfire and lose power, with the fuel flow dropping to about 11 gph. The pilot attempted to regain power by pushing in the mixture control to full rich but without effect. About 1005, the pilot contacted the Minneapolis Air Route Traffic Control Center (ARTCC) and reported that the airplane was losing power. He reversed course toward the Michigan shoreline. The fuel flow dropped to about 8 gph. The pilot switched fuel tanks and adjusted the mixture control in and out to try to regain power. He attempted to prime the engine but that had no effect. He reported that he turned on the high boost pump and got a short burst of power for about 30 - 45 seconds, but then the engine "failed completely."

The airplane descended through a cloud layer. About 1012, the airplane was about 12 miles from Ludington and about 2,300 feet above mean sea level (msl) and the airplane was still in the clouds. The surface weather at Ludington indicated that the cloud bases were at 1,800 feet msl. The pilot reported that they had a few minutes before water impact after breaking out of the clouds, so he had everyone don and inflate their life vests. Before impact, the pilot unlatched the pilot's door on the left side of the airplane, and he had the front door of the rear cargo door unlatched. The pilot reported that he did not lower the flaps since the cargo doors would not open if the flaps were extended.

The pilot reported that when he ditched the airplane, either the tail or the landing gear hit the water as he pulled up to go over a swell. The airplane pitched forward, flipped over on its back, and began to fill with water. The pilot unbuckled his seat belt and shoulder harness, fell a short distance, pushed the door open, and got out. He reported that the airplane was sinking rapidly. He saw the right seat passenger and the doctor in the water. A wave hit the pilot and when he resurfaced "everything was gone." He kept yelling but got no response. He eventually started to swim toward the shoreline. About 30 minutes later a US Coast Guard helicopter flew over him but they did not spot him. A few minutes later a fishing boat spotted him and rescued him from the water. He was transferred to a Coast Guard vessel and was taken to shore.

Using side scanning sonar, the Michigan State Police Dive Team located the airplane in about 173 feet of water on July 30. The dive team recovered all the bodies, with the last body being recovered on the morning of August 1, 2010.

The airplane was found resting on its main landing gear on the sandy lake bottom. The airframe and engine were separated by the water impact. Both were raised to the surface by a local commercial recovery service on August 1, 2010. The airframe and engine were taken to a local facility where the National Transportation Safety Board (NTSB) conducted its on-site investigation.

PERSONNEL INFORMATION

The 66-year-old pilot held a private pilot certificate with a single-engine land and airplane instrument ratings. He reported that he had 2,660 total flight hours with 1,200 hours in a Cessna 206. He had logged 25 hours of flight time in the last 90 days, and 7 hours in the last 30 days. He held a third-class medical certificate that was issued in November 2008.

The pilot reported that he had flown similar "lifeguard" flights in the airplane with the pilot rated passenger in the past. He reported that the pilot rated passenger performed copilot duties when he flew with him. The pilot rated passenger also owned an airplane. When they flew in the pilot rated passenger's airplane, the accident pilot would perform copilot duties.

The 70-year-old pilot rated passenger held a private pilot certificate with a single-engine land and airplane instrument ratings. He held a third-class medical certificate that was issued on November 17, 2009. He had 2,150 hours of total flight time at the time of his medical examination.

AIRCRAFT INFORMATION

The airplane was a single-engine Cessna U206F, serial number U-206-01734, manufactured in 1972. It was designed to seat six and it had a maximum gross weight of 3,600 pounds. The airplane was equipped with a pilot (left) side door and a clamshell rear door serving the back two rows of seats. The accident airplane had its middle, right seat (Seat 4) removed. The engine was a 300-horsepower Continental IO-520-F3B, serial number 280171R.

Annual Inspections

The airplane's maintenance logbooks indicated that four different inspection authorization (IA) mechanics had conducted the required annual maintenance inspections on the airplane within the last ten years. The logbooks indicated that the same IA mechanic had performed the last three annual maintenance inspections. On September 27, 2007, the IA mechanic performed his first annual maintenance inspection of the airplane. The total airframe time was 3,893.4 hours. His second annual inspection of the airplane was conducted on October 1, 2008, and the airplane had a total time of 3,908.1 hours. The last annual maintenance inspection was conducted on November 5, 2009, and it had a total time of 3,938.0 hours. At the time of the accident, the airplane had flown 7.5 hours since the last inspection and had a total time of 3,945.5 hours.

FAA inspectors interviewed the IA mechanic concerning the annual maintenance inspections he had conducted on the accident airplane. According to the FAA inspectors, the IA mechanic reported that he used the inspection checklists provided by the pilot/owner in order to conduct the annual maintenance inspections. The pilot/owner provided the IA mechanic with the Cessna Service Manual for "Stationair Series, Skywagon 206 Series and Super Skylane Series, 1969 thru 1971." The service manual indicated the items that needed to be inspected during a 50-hour inspection and 100-hour (annual) inspection. In the section of the checklist covering the "Engine Compartment," Item 29 states that the "Fuel-air control unit screen" is required to be checked during every 100-hour inspection. In the section of the checklist covering the "Fuel System," Item 2 states that the "Fuel strainer screen and bowl" is required to be checked during every 100-hour inspection.

The Cessna Service Manual provides the following information about the fuel strainer:

"Section 13-42. FUEL STRAINER DISASSEMBLY. (See figure 13.9.) To disassemble and assemble the strainer, proceed as follows:

a. Turn off fuel selector valve.
b. Disconnect strainer drain tube and remove safety wire, nut, and washer at bottom of filter bowl and remove bowl.
c. Carefully unscrew standpipe and remove.
d. Remove filter screen and gasket. Wash filter screen and bowl in solvent (Federal Specification P-S-661, or equivalent) and dry with compressed air.
e. Using a new gasket between filter screen and top assembly, install screen and standpipe. Tighten standpipe only finger tight.
f. Using all new O-rings, install bowl. Note that step-washer at bottom of bowl is installed so that step washer seats against O-ring. Connect strainer drain tube.

The engine manufacturer's "Operator's Manual for IO-520 Series Aircraft Engines, FAA Approved September 1980," also provided a checklist for 100-hours inspections of the engine. Item 14 of the 100-hour inspection checklist stated: "Fuel Metering Unit Inlet Screen: Inspect and clean."

According to the FAA inspectors, the IA mechanic reported that during the last annual inspection of the fuel strainer screen and bowl, he removed the bowl and found some water in it, but he did not remove the screen or gasket. According to the FAA, he also stated several times during the interview that he never checks the fuel metering inlet fuel screen, and that he did not check it during the last annual inspection.

The aircraft logbook indicated that during the annual maintenance inspection on May 20, 2004, the following entry was made by a different IA mechanic: "Replaced fuel strainer cable assy [assembly] and replaced strainer screen assy [assembly]." The engine logbook for the same annual inspection had this entry: "Removed engine primer system and capped at engine."

METEOROLOGICAL CONDITIONS

At 0955, the observed surface weather observation at Ludington (LUD), Michigan, was: wind 290 degrees at 6 knots with gusts to 17 knots; visibility 10 miles; ceiling 1,800 feet overcast; temperature 24 degrees Celsius; dew point 22 degrees Celsius; altimeter 29.81 inches of mercury.

At 1016, the observed surface weather observation at Ludington (LUD), Michigan, was: wind 270 degrees at 7 knots; visibility 10 miles; ceiling 1,600 feet overcast; temperature 24 degrees Celsius; dew point 22 degrees Celsius; altimeter 29.82 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The postaccident inspection of the airframe and engine occurred on August 2 - 3, 2010. The inspection revealed that the fuselage was intact; however, the empennage was partially separated with extensive wrinkling and bending around the tailcone section aft of the rear seats. Some of the damage to the empennage was a result of the recovery effort. Both wingtips exhibited aft crushing. The engine was separated from the fuselage. The nose landing gear was separated from the fuselage and not recovered. All flight control surfaces remained attached to the airframe structure. Flight control cable continuity was

established from all flight controls to all the primary and secondary flight control surfaces. The elevator trim tab measurement equated to about 10 degrees up. The flaps were found down about 30 degrees. The flap indicator and flap switch were found at the 20 degree position. The push pull rods to lift the flaps were cut by rescue divers during the recovery of the bodies. The rear cargo doors were found in the closed position, but they opened and closed normally. The key was still in the ignition and on the "Both" position.

The inspection of the airplane's fuel system revealed that about 60 gallons of fuel remained in the wing fuel tanks, about 30 gallons in each side. About the first five gallons drained from the wings appeared to be a mixture of fuel and water. The remaining liquid drained was light blue in color and appeared to be aviation fuel. Both wing fuel bladder tanks and exit port screens were clean. The fuel boost pump was removed and drained of water. The boost pump operated when it was powered by a 12 volt battery. The airplane was equipped with the optional fuel primer and the fuel primer control lever in the cockpit; however, the fuel line was capped-off (not operational) at the firewall.

The inspection of the firewall fuel strainer revealed that the gasket did not provide a complete seal between the fuel screen and upper body. Instead, a portion of the gasket was positioned over the exit port which created a gap between the fuel screen and the upper body of the fuel strainer.

The inspection of the engine revealed that all the cylinders and engine accessories remained attached to the crankcase. Oil was present in the engine. The crankshaft was rotated and drive train continuity to the cylinders and accessories was confirmed. All damage observed was consistent with impact. The propeller remained attached to the engine crankshaft flange. Both propeller blades exhibited aft bending toward the non-cambered side of the propeller blade.

The inspection of the engine's throttle and fuel metering assembly revealed that the fuel inlet filter screen was safety wired. The safety wire was removed and the fuel inlet screen was removed from the fuel metering assembly. The removal of the fuel inlet screen required a consistent pull (it did not come out freely) to remove it. The visual inspection of the inlet screen revealed that it was partially obstructed by debris that had become attached to the screen. The orifice of the fuel inlet passage was inspected. It contained the same debris material that obstructed the fuel screen and the debris blocked a majority of the orifice opening.

The firewall fuel strainer, the fuel inlet screen, and debris found in the fuel inlet screen were sent to the NTSB Materials Laboratory for examination. The engine was shipped to the engine manufacturer for further inspection.

MEDICAL AND PATHOLOGICAL INFORMATION

No autopsies were performed.

SURVIVAL ASPECTS

The pilot reported that he used the life vests that were in the pilot rated passenger's airplane since he could not find his life vests the night prior to the flight. He put the life vests in the seat pockets so that they would be accessible to the passengers. He reported that the passengers donned their life vests during the descent prior to water impact. He had the pilot rated passenger take the controls momentarily while he donned his life vest. He stated that he heard "a couple of the vests go off" while still inside the airplane.

During recovery of the airplane and its occupants, the patient and his wife were found in the airplane with the patient still seated in seat 6. The patient still had his vests on, but the wife's vest had come off and it was found in the airplane. Both life vests were deflated when the bodies were recovered. The pilot rated passenger and the patient's doctor were found on the lake bottom within 50 yards of the airplane. The doctor still had his vest on but in a deflated condition. The pilot rated passenger was not wearing a life vest. A life vest was found near the copilot's seat, seat 2, in a deflated condition.

The inspection of the life vests revealed that they were manufactured in the 1980's and the CO2 cartridges used to inflate the vests were also manufactured in the 1980's. The inspection of the life vests revealed that passenger life vests had one CO2 cartridge attached to the vest. All the cartridges were found expended during the on-site inspection. The pilot's vest had two CO2 cartridges but only one cartridge had been expended. The pilot reported that he was not aware that the vest had two cartridges.

Search Conditions

According to the Mason County Sheriff's Department, the weather was cloudy with good visibility during the initial on-scene search for the wreckage and survivors. The water temperature was between 68 and 72 degrees Fahrenheit on the surface with 2 to 4 foot seas. The waters current appeared to be moving

north towards Big Sauble Lighthouse, and then moving to the northwest from the lighthouse.

Cessna Stationair Owner's Manual

The Cessna Stationair Owner's Manual provided information and procedures for emergency landing without engine power, ditching, clamshell cargo doors, cargo door emergency exit procedures, and glide distance.

Emergency Landing Without Engine Power

The Emergency Procedure section of the airplane Owner's Manual provides the procedures for "Emergency Landing Without Engine Power." The procedure stated the following:

If an engine stoppage occurs, establish a flaps up glide at 85 MPH. If time permits, attempt to restart the engine by checking for fuel quantity, proper fuel selector valve position, and mixture control setting. Also check that engine primer is full in and locked and ignition switch is properly positioned.

If all attempts to restart the engine fail and a forced landing is imminent, select a suitable field and prepare for the landing as follows:

1. Pull mixture control to idle cut-off position.
2. Turn fuel selector valve "OFF".
3. Turn off all switches except master switch.
4. Approach at 90 MPH.
5. Extend wing flaps as necessary with gliding distance of field
6. Turn off master switch.
7. Unlatch cabin doors prior to final approach.
8. Land in a slightly tail-low attitude.
9. Apply heavy braking.

Ditching

The Emergency Procedure section of the airplane Owner's Manual provides the procedures for "Ditching." The ditching procedures state:

1. Plan approach into wind if winds are high and seas are heavy. With heavy swells and light wind, land parallel to swells.
2. Approach with flaps 40 degrees and sufficient power for a 300 ft./min rate of descent at 75 MPH.
3. Unlatch the cabin door.
4. Maintain a continuous descent until touchdown in level attitude. Avoid a landing flare because of difficulty in judging airplane height over a water surface.
5. Place folded coat or cushion if front of face at time of touchdown.
6. Evacuate airplane through cabin doors. If necessary, open window to flood cabin compartment for equalizing pressure so that door can be opened.
7. Inflate life vests and raft (if available) after evacuation of cabin.

Information on Cargo Door

The airplane's Owner's Manual states that when conducting the "Before Entering the Airplane" checklist during the preflight, it is important check the cargo doors are securely latched and locked. An "IMPORTANT" note states:

"The cargo doors must be fully closed and latched before operating the electric wing flaps. A switch in the upper door sill of the front cargo door interrupts the wing flap electrical circuit when the front door is opened or removed, thus preventing the flaps being lowered with possible damage to the cargo door or wing flaps when the cargo door is open."

The Owner's Manual section titled "Cargo Door Emergency Exit" states the following information:

"If it is necessary to use the cargo door as an emergency exit and the wing flaps are not extended, open the forward door and exit. If the wing flaps are extended, open the doors in accordance with the instructions shown on the placard which is mounted on the forward cargo door."

The red placard found on the front cargo door of the accident airplane stated:

EMERGENCY EXIT OPERATIONS

1. OPEN FWD CARGO DOOR AS FAR AS POSSIBLE.
2. ROTATE RED LEVER IN REAR CARGO DOOR FWD.
3. FORCE REAR CARGO DOOR FULL OPEN.

Glide Distance

The Operator's Manual indicated that the maximum glide distance for the airplane with the following parameters: 1) Speed 85 mph indicated airspeed; 2) Propeller windmilling; 3) Flaps up; and 4) Zero wind. The Maximum Glide chart indicated that the maximum glide distance from a height of 10,000 feet above the terrain is a ground distance of 15 statute miles.

TESTS AND RESEARCH

Life Vests

The life vests were tested at a manufacturer's facility. The vests were overdue their inspection requirements. The pressure tests indicated that the vests inflated when new CO2 cartridges were used and held pressure. No anomalies were found with the life vests that would have precluded normal inflation and operation. Federal Aviation Regulation (FAR) Part 91 regulations do not require life vests for each occupant if the airplane is operated not for hire.

Engine Inspection

The engine was sent to the manufacturer for inspection and operational testing. The engine was put on a test stand and run. The engine experienced a normal start. The engine RPM was advanced to 1,200 rpm and held for 5 minutes to stabilize; 1,600 rpm and held for 5 minutes to stabilize; 2,450 rpm and held for 5 minutes to stabilize; and at full throttle and held for 5 minutes to stabilize. The throttle was rapidly advanced from idle to full throttle six times and it accelerated and decelerated without hesitation or interruption in power. It produced rated horsepower.

NTSB Materials Laboratory Examination

The NTSB Materials Laboratory examined the debris found in the fuel metering assembly's fuel inlet screen. The examination of the material removed from the filter revealed several categories of materials present within the mixture. The materials present included: 1) cellulosic material similar to wood and sawdust; 2) non-metallic amber-colored flakes similar to varnish or shellac; 3) thin, ribbon-like metallic shavings; 4) white flakes similar to paint; 5) granular particulates similar to sand or dirt; and 6) fibers similar to fabric and glass fibers.

Accident Rpt# ANC11CA017	**03/16/2011 1715 ADT**	**Regis# N5160X**	**Nenana, AK**	
Acft Mk/Mdl CHAMPION 7GCBC		**Acft SN 166**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320 SERIES			**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: BAKER ADAM W		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STA

Summary

The pilot stated that he was landing a wheel-equipped airplane on a frozen, snow-covered river when the main landing gear wheels encountered soft snow and the airplane nosed over, receiving substantial damage to both wings and the vertical stabilizer. The pilot reported no preaccident mechanical anomalies with the airplane.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's selection of an unsuitable off-airport landing site, which resulted in a nose over.

Events

1. Landing - Off-field or emergency landing
2. Landing-landing roll - Nose over/nose down

Findings - Cause/Factor

1. Personnel issues-Action/decision-Info processing/decision-Identification/recognition-Pilot - C
2. Environmental issues-Physical environment-Runway/land/takeoff/taxi surfa-Snow/slush/ice covered-Contributed to outcome

Narrative

The pilot stated that he was landing a wheel-equipped airplane on a frozen, snow-covered river when the main landing gear wheels encountered soft snow and the airplane nosed over, receiving substantial damage to both wings and the vertical stabilizer. The pilot reported no preaccident mechanical anomalies with the airplane.

Accident Rpt# WPR11FA021	**10/21/2010 1210 PDT**	**Regis# N427MC**	**Agua Dulce, CA**	**Apt: Agua Dulce KL70**
Acft Mk/Mdl CIRRUS DESIGN CORP SR-22		**Acft SN 0152**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl CONT. MOTOR IO-550		**Acft TT 827**	**Fatal 3 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: DALE J. SMET		**Opr dba:**		**Aircraft Fire: GRD**

Narrative

HISTORY OF THE FLIGHT

On October 21, 2010, at 1210 Pacific daylight time, a Cirrus SR-22, N427MC, impacted a horse stable in mountainous terrain, 1.5 miles west of the Agua Dulce Airport, Agua Dulce, California. The owner operated the airplane under the provisions of Title 14 Code of Federal Regulations Part 91. The private pilot and his two passengers were fatally injured, and the airplane was substantially damaged. The airframe was severely fragmented and consumed by a post impact fire. Instrument meteorological conditions prevailed, and no flight plan had been filed. The flight originated at Van Nuys, California, about 1156.

Radar data indicated that the airplane departed Van Nuys Airport at 1156:45 initially to the south, then turned to the north, and climbed to 1,500 feet mean sea level (msl). Van Nuys tower requested a (cloud) base report from the pilot. The pilot reported before he switched off frequency that there were few clouds at 2,300 feet msl, and the layer above that was between 3,500 and 3,800 feet msl. The radar track shows that the airplane leveled off at 1,500 feet msl for 2 minutes, climbed to approximately 3,300 feet momentarily, then descended to approximately 2,200 feet. The final radar return was at 1202:04 at 2,200 feet, 11.6 miles southwest of the accident site.

Witnesses reported that they heard the airplane overhead in the vicinity of the Agua Dulce Airport, but could not see it due to low clouds, fog, and mist. One witness stated that seconds before the airplane impacted terrain it overflew her upside down. Two witnesses working on a nearby roof top said they observed the airplane flying very low, pass between two hills north of the accident site, then make a steep right-hand descending turn and impacted the ground "like a missile." They said the engine pitch increased slightly while behind the hill, and then was steady in pitch until the airplane impacted the ground.

The pilot's wife said that the purpose of the flight was to travel to Parker, Arizona. The pilot had called her prior to departing Van Nuys, and told her that he intended to fly from Van Nuys, over Agua Dulce, to Palmdale, over to the Cajon Pass, and then direct to Parker. The terrain between Van Nuys and Palmdale consists of mountainous terrain (Angeles National Forest) with ridgelines between 4,000 feet and 5,000 feet msl to the north and south of the Antelope Valley Freeway. The Antelope Valley Freeway (CA-14) passes through the Angeles National Forest from southwest to northeast and the highest elevation is about 3,200 feet msl, near Agua Dulce.

The airplane wreckage was contained in a compact area about 40 feet in diameter and located in a horse corral. As a result from the ground impact, three horses were fatally injured, and corral structures exhibited soot and fire damage.

PERSONNEL INFORMATION

The pilot, age 51, held a private pilot certificate for airplane single-engine land issued June 2, 2004, and a third-class medical certificate issued October 21, 2010, with the limitation that the pilot must have glasses available for near vision. Portions of the pilot's logbook were recovered and examined; the majority of the logbook had been destroyed by fire. The pilot's logbook contained an endorsement for a flight review on June 28, 2008. On the pilot's October 21, 2010, medical application he reported having 285 hours of total pilot time, and accumulated 45 hours within the previous 6 months.

AIRCRAFT INFORMATION

The four seat, low-wing, fixed gear airplane, serial number 0152, was manufactured in 2002. It was powered by a Teledyne Continental Motors IO-550-N, 310-hp engine and equipped with a 3-bladed constant speed Hartzell propeller.

Review of the maintenance logbook showed an annual inspection was completed May 2, 2010, at a recorded Hobbs time and total aircraft time of 827.4 hours. Neither the engine tachometer nor the Hobbs meter was recovered from the aircraft wreckage, therefore, the actual time on the airplane at the time of the accident was not determined.

METEROLOGICAL INFORMATION

A Citizen Weather Observers Program station at Agua Dulce was located about 1.4 miles to the east of the accident site at an elevation of 2,592 feet. Data from this station indicated that wind speeds were relatively light and relative humilities were in the low 90's (%) during the times surrounding the accident. Determining a cloudy area based on relative humidity values alone can be relatively difficult. While values close to 100% (greater than 95%) are safe in defining cloudy thresholds, values below 90% have been observed at cloud boundaries.

The closest surface reporting station with visibility and ceiling detection capabilities was Palmdale Regional Airport, Palmdale, California, located at an elevation of 2,543 feet. Palmdale Airport is located approximately 15 miles to the northeast of the accident site, and was equipped with an Automated Surface Observing System (ASOS). Reports from Palmdale were issued while a certified weather observer was logged into the system. During the times surrounding the accident, the Palmdale ASOS indicated clear skies with excellent visibility. At 1153 PDT, the wind was from 210 degrees at 15 knots.

The accident airplane's departure airport was Van Nuys Airport, Van Nuys, which is located at an elevation of 802 feet. Van Nuys Airport is located approximately 19 miles to the south-southwest of the accident site and was equipped with an ASOS. Reports from Van Nuys Airport were issued while a certified weather observer was logged into the system. At 1151 PDT, the airport was mostly VFR (visual flight rules) with broken ceilings at 1,800 feet above ground level (agl) and an overcast cloud base at 2,800 feet agl, visibility greater than 10 miles, and a light wind.

A North American Mesoscale (NAM) model sounding for the accident location (where the surface elevation is estimated at 2,690 feet) at 1100 PDT was retrieved from NOAA's Air Resources Laboratory. The NAM model sounding indicated near-saturated conditions between about 3,175 and 4,725 feet, where relative humidity values were 97% or greater. Relative humidity values were 90% at the surface, and above the near-saturated layer, the atmosphere dried out considerably. Classifications made by the Rawinsonde Observation program (RAOB) indicated overcast clouds were likely preset in the near saturated layer, with bases within about 500 above the surface. The wind at the surface was 7 knots from the southwest, and the NAM model data indicated the wind rotated clockwise with height and had magnitudes approaching 20 knots from the northwest above 6,000 feet.

A camera image taken by one of the accident passengers after departure and prior to reaching Agua Dulce was examined. The exact location and altitude of the airplane at the time this image was captured is estimated to be about 5 miles north of the Van Nuys Airport. The image does indicate a ceiling that partially obscures the tops of terrain in front of the airplane.

A Los Angeles Police Department (LAPD) helicopter pilot, who was operating in the area near the time of the accident, indicated conditions would have made it impossible to fly beneath the clouds in the area of the accident. The LAPD pilot indicated that clouds obscured the hill tops to the north of the accident site and that conditions there were basically 0/0 (zero visibility and ceiling at surface).

Numerous AIRMETs (Notice for Airmen) for IFR (instrument flight rules), mountain obscuration and icing conditions were active over southern California during the time of the accident. At the time of the accident, an AIRMET for mountain obscuration, which advised of mountains obscured by clouds, was active for the accident location. Several AIRMETs for IFR conditions was also active near the accident site.

The entire Meteorological Weather Study is contained in the official docket of this investigation.

WRECKAGE AND IMPACT INFORMATION

Los Angeles County Fire received the call of an airplane crash and fire at 1219. The wreckage was located at an elevation of 2,690 feet msl, in a residential horse stable, and had impacted on level ground and corral fencing 15 feet from a wooden stable structure. The airplane wreckage had experienced an extreme post impact fire, consuming much of the airplane structure, leaving only carbon fiber cloth material and wing spar structure. The magnetic bearing taken from the engine and directed back towards the flight path perpendicular to the wing spars, was 110 degrees magnetic.

Examination of the airframe revealed that all control surfaces were present and control continuity was confirmed through cable connections to control bell cranks or overload failure signatures. The airframe parachute system was located within the wreckage, the rocket motor case was located next to the engine with propellant expended, the parachute was in the stowed configuration, and exhibited thermal damage. Neither the parachute activation handle nor the safety pin was identified in the wreckage.

The engine was imbedded into the ground about 2 feet, and was removed using a hoist. Fuel odor was evident as the engine was lifted, and dark oil like fluid

drained from the engine. Cylinders 1, 3, and 5 had impact damage and the forward end of the engine case was fragmented. The oil pan had been crushed up into the engine case. The exhaust manifold exhibited bends and folds consistent with plastic deformation. The two magnetos were not present on their respective mounting pads. The propeller had been separated from the engine, but was located in the ground in line with the engine crankshaft. The propeller was removed from the earth using a hoist. All three blade shanks were in the propeller hub, two blades were present in the hub, and the third blade had fractured at the shank end. Blades exhibited leading edge polishing and sinusoidal s-bending.

Post accident examination of the airframe and engine found no preimpact mechanical malfunctions or failures that would have precluded normal operation.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot October 26, 2010, by the Los Angeles County Coroner, Los Angeles, California. The autopsy findings specified the cause of death as multiple blunt force injuries.

Forensic toxicology was performed on specimens from the pilot by the FAA Bioaeronautical Sciences Research Laboratory CAMI, Oklahoma City, Oklahoma. The toxicology report stated tests for carbon monoxide and cyanide were not performed. Volatiles detected were 78 mg/dL of ethanol detected in the kidney, 27 mg/dL ethanol detected in lung, 18 mg/dL ethanol detected in muscle, 0.044 ug/ml codeine were detected in kidney, and codeine detected in lung.

Accident Rpt# CEN11LA466	**07/09/2011 1105 CDT**	**Regis# N22DH**	**Benton, KS**	**Apt: Lloyd Stearman 1K1**
Acft Mk/Mdl DEHAVILLAND DHC-1		**Acft SN C1-0886**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl DEHAV ENG GIPSY MAJOR			**Fatal 0** **Ser Inj 1**	**Flt Conducted Under: FAR 091**
Opr Name: FRAZIER MICHAEL E.		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: SPE

Narrative

On July 9, 2011, at 1105 central daylight time, N22DH, a Dehavilland DHC-1, sustained substantial damage after it stalled on final approach to runway 17 at Lloyd Stearman Airport (1K1), Benton, Kansas. The private pilot/registered owner sustained serious injuries. Visual meteorological conditions prevailed and no flight plan was filed for the personal flight conducted under 14 Code of Federal Regulations Part 91.

Two witnesses, who were flying a helicopter in the traffic pattern, saw the airplane enter a sudden hard right 360 degree turn over the end of the runway. According to one of the witnesses, as the airplane entered the turn, the wings appeared to experience a pre-stall buffet but the pilot recovered on a north heading about 200 feet above the ground. As the pilot attempted to turn back to the runway, the airplane stalled and spun to the right. It collided with terrain about a half mile north west of the runway.

According to a Federal Aviation Administration (FAA) inspector, who performed an on-scene examination of the airplane and interviewed the pilot, he said the pilot had recently purchased the airplane and was practicing touch and go landings when the accident occurred. The pilot said that while on final approach, he made a right 360 degree turn for spacing and subsequently got slow, stalled, and entered a spin. The pilot was unable to recover and the airplane struck the ground and came to rest against a residential shed resulting in substantial damage to the fuselage, both wings, and the tail section. There was no post-impact fire. The pilot also reported there were no mechanical problems with the airplane or engine prior to the accident.

Accident Rpt# CEN09FA340	**06/07/2009 1745 CDT**	**Regis# N448DM**	**Humbird, WI**	
Acft Mk/Mdl GULFSTREAM AMERICAN CORP AA-5B		**Acft SN AA5B0976**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-360-A4K		**Acft TT 1110**	**Fatal 2 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: DAVID P. HOLTROP		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

The non-instrument-rated private pilot obtained two weather briefings before departing on the visual flight rules (VFR) cross-country flight. During the weather briefings he was advised that VFR flight was not recommended because of an active weather advisory for widespread instrument meteorological conditions that encompassed his planned route. The weather advisory was for occasional cloud ceilings below 1,000 feet above ground level (agl) and surface visibilities less than 3 miles with light precipitation/mist. The forecast weather was for ceilings 1,500 to 2,500 feet agl with widely scattered light rain showers and isolated thunderstorms. Approximately 1 hour after departure, several witnesses located near the accident site reported hearing an airplane overfly their position. These witnesses noted that because of a low cloud ceiling, fog, and light precipitation they could not see the airplane. The witnesses reported hearing the sound of an airplane engine operating at a high speed. Several witnesses noted that the loudness of the airplane's engine increased and decreased several times, as if the airplane was turning, before they heard a ground impact. The distribution of the wreckage was consistent with an airplane that experienced a loss of control and an in-flight breakup at low altitude and high airspeed. The challenging visibility conditions were conducive to the onset of pilot spatial disorientation and the airplane's rapid, near-vertical descent is consistent with the pilot's loss of control of the airplane because of spatial disorientation. The postaccident investigation revealed no preexisting mechanical malfunctions or anomalies that would have prevented the normal operation of the airplane or its systems.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's decision to attempt a visual flight rules flight into an area of known instrument meteorological conditions, which resulted in a loss of control due to spatial disorientation.

Events

1. Enroute-cruise - VFR encounter with IMC
2. Enroute-cruise - Loss of visual reference
3. Enroute-cruise - Loss of control in flight
4. Uncontrolled descent - Aircraft structural failure

Findings - Cause/Factor

1. Personnel issues-Task performance-Planning/preparation-Weather planning-Pilot - C
2. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Low ceiling-Decision related to condition - C
3. Personnel issues-Psychological-Perception/orientation/illusio-Spatial disorientation-Pilot - C
4. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
5. Aircraft-Aircraft structures-(general)-(general)-Capability exceeded

Narrative

HISTORY OF FLIGHT

On June 7, 2009, about 1745 central daylight time, a Gulfstream American Corporation model AA-5B (Tiger), N448DM, owned and operated by a non-instrument rated private pilot, was destroyed during impact with terrain near Humbird, Wisconsin. Instrument meteorological conditions prevailed at the time of the accident. The personal flight was being operated under the provisions of 14 Code of Federal Regulations (CFR) Part 91 without a flight plan. The pilot and his passenger were fatally injured. The flight departed at 1643 from Lake Elmo Airport (21D), St. Paul, Minnesota, and was destined for Sheboygan County Memorial Airport (KSBM), Sheboygan, Wisconsin.

At 1043, about six hours before departure, the pilot contacted the Lansing Automated Flight Service Station (AFSS) to obtain a weather briefing for a visual flight rules (VFR) flight from 21D to KSBM. The briefer noted that VFR flight was not recommended because of an active weather advisory for widespread instrument meteorological conditions (IMC) that encompassed the planned route of flight. The briefer noted that there were low overcast ceilings ranging 400 to 1,200 feet above ground level (agl) along the planned route of flight. Additionally, there were areas of rain showers and isolated thunderstorms with cloud tops reaching 34,000 feet. The pilot stated that he would call back in a couple of hours to check if the weather conditions had improved.

At 1558, about 45 minutes before departure, the pilot contacted the Washington AFSS to obtain an updated weather briefing. The briefer noted that VFR flight was not recommended because of an active weather advisory for widespread IMC that still encompassed the planned route of flight. The departure airport had an overcast ceiling of 1,300 feet agl and a surface visibility of 10 miles. The briefer noted that there were low overcast ceilings ranging 900 to 1,500 feet agl along

the planned route of flight. The forecast was for ceilings 1,500 to 2,500 feet agl, with layered clouds up to 20,000 feet (FL200). The forecast also called for widely scattered embedded light rain showers and isolated thunderstorms. The briefer specifically advised that VFR flight was not recommended on four separate occasions during the 17 minute weather briefing. The pilot did not file a flight plan during the weather briefing.

According to aircraft radar track data, there was only one visual flight rule (VFR) beacon track that originated from 21D within the 1-hour period before the accident. This radar track began at 1643:31 and continued to the south-southeast between 1,900 and 2,000 feet mean sea level (msl). The last radar return was recorded at 1708:18 over Durand, Wisconsin, at an altitude of 1,900 feet msl. The last radar return was 42.6 nautical miles (nm) west of the accident site. The last recorded position was at the lower altitude limit for radar coverage in that area and radar contact was not reestablished with the flight.

Several witnesses located near the accident site reported hearing an airplane overfly their position. These witnesses noted that because of a low cloud ceiling, fog, and light precipitation they could not see the airplane. All of the witnesses reported hearing the sound of an airplane engine operating at a high speed. Several witnesses noted that the loudness of the airplane's engine increased and decreased several times as if the airplane was turning in flight, before they heard a ground impact. Local law enforcement and property owners immediately commenced a search for the accident site, which was subsequently located about 2045.

PERSONNEL INFORMATION

According to Federal Aviation Administration (FAA) records, the pilot of N448DM, age 45, held a private pilot certificate with an airplane single-engine land rating. The pilot certificate was issued on February 17, 2005. He was not instrument rated. His last aviation medical examination was completed on February 5, 2009, when he was issued a third-class medical certificate with no limitations. A search of FAA records showed no accident, incident, enforcement, or disciplinary actions.

The pilot's most recent logbook entry was dated June 4, 2009. He had accumulated 271.6 hours total flight time, of which 189.6 hours were as pilot-in-command. He had accumulated 271.6 hours in single-engine airplanes, 36.6 hours at night, 4.2 hours in simulated instrument conditions, and no time in actual instrument conditions. The most recent logbook entry that included instrument time was dated February 10, 2005, while the pilot was receiving his primary flight instruction. He had accumulated 171.5 hours in a Gulfstream American Corporation model AA-5B (Tiger) airplane.

The pilot had flown 54.2 hours during the past year, 20.5 hours during the prior 6 months, 18.6 hours during previous 90 days, and 8.4 hours during the prior 30 days. All of the flight time accumulated during those periods was completed in the accident airplane. The pilot had not flown during the 24 hour period before the accident flight.

The pilot's last flight review was completed on February 15, 2009, in a Gulfstream American Corporation model AA-5B (Tiger) airplane.

AIRCRAFT INFORMATION

The accident airplane was a 1978 Gulfstream American Corporation model AA-5B (Tiger) airplane, serial number (s/n) AA5B0976. The model AA-5B was a low wing, all-metal, single-engine, four-place monoplane. The airplane had a certified maximum takeoff weight of 2,400 lbs. The airplane was equipped for operation under instrument flight rules. A Lycoming model O-360-A4K reciprocating engine, s/n L-25566-36A, powered the airplane. The 180-horsepower engine provided thrust through a Sensenich model 76EM8S10-0-63, s/n 23979K, fixed-pitch, two-blade, metal propeller.

The accident airplane was issued a standard airworthiness certificate on October 26, 1978. The pilot purchased the airplane on April 30, 2005. The airframe and engine had a total service time of 1,110 hours. The last annual inspection was completed on July 3, 2008, at 1,057 hours total service time. On September 25, 2007, tests on the static system, altimeter system, automatic pressure altitude reporting system, and transponder were completed.

A review of the maintenance records found no history of unresolved airworthiness issues.

METEOROLOGICAL INFORMATION

The closest weather reporting facility was at Chippewa Valley Regional Airport (KEAU), Eau Claire, Wisconsin, located about 30 nm northwest of the accident site. The airport was equipped with an automated surface observing system (ASOS).

At 1756, the KEAU ASOS reported the following weather conditions: Wind 090 degrees true at 9 knots; visibility 10 miles; overcast ceiling at 1,700 feet agl; temperature 12 degrees Celsius; dew point 8 degrees Celsius; altimeter setting 29.96 inches of mercury.

The accident location was within the boundaries of an active instrument flight rules (IFR) weather advisory. The weather advisory was for cloud ceilings below 1,000 feet agl and surface visibilities less than 3 miles with light precipitation/mist. The forecast weather was for ceilings 1,500 to 2,500 feet agl, with additional layered clouds up to 20,000 feet (FL200). The forecast also called for widely scattered embedded light rain showers and isolated thunderstorms.

Several witnesses and local law enforcement personnel reported that there was a low cloud ceiling with light rain and fog preceding the accident and during the subsequent ground search for the accident site.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located in hilly and heavily-wooded terrain. The wreckage debris path was orientated on an easterly heading and was approximately 461 feet in length. The outboard half of the right wing was found at the beginning of the debris path. The vertical stabilizer was found 423 feet west of the main wreckage. The right aileron and right flap were located about 400 feet from the main wreckage. The cockpit canopy was found 357 feet from the main wreckage. The inboard half of the right wing was located 141 feet from the main wreckage. Both elevators and their respective stabilizers were found 89 feet west of the main wreckage. The main wreckage was located in an impact crater that measured about 3 feet deep and 10 feet wide. Damage to the dense overhead foliage was limited, consistent with a near vertical descent path. The overall wreckage distribution was consistent with an in-flight breakup at a low altitude. The main wreckage consisted of the fuselage, cockpit, left wing, engine, and propeller.

All airframe structural components and flight control surfaces were located along the wreckage debris path or amongst the main wreckage. A majority of the airframe's primary structure exhibited severe impact damage and fragmentation. The lower firewall, cabin floor, and instrument panel were crushed upward and aft. Both wings were found in several sections. The observed damage to the wing and empennage load bearing components was consistent with a positive-g flight maneuver. All structural component failures were consistent with overload separations. Flight control cable continuity could not be established due to multiple cable separations. All observed flight control cable separations were consistent with overload failures.

The engine was found partially attached the fuselage firewall. The propeller remained attached to the crankshaft propeller flange. The carburetor and its induction box were separated from the engine and found amongst the cabin wreckage. The carburetor fuel inlet screen was removed and was clear of contaminants. Internal engine and valve train continuity was confirmed as the engine crankshaft was rotated. Compression and suction were noted on all cylinders in conjunction with crankshaft rotation except for the number one cylinder. The exhaust pushrod for the number one cylinder was separated due to impact damage. All cylinders were inspected with a lighted boroscope, and no discrepancies were noted. The engine-driven fuel pump had significant impact damage that precluded an operational test. Both magnetos remained attached to the engine. The left magneto exhibited extensive impact damage that prevented an operational test of its impulse coupling. The right magneto appeared undamaged, but did not produce a spark when rotated by hand. The ignition harness exhibited multiple-point fraying throughout its length. The upper spark plugs were removed, and their electrodes exhibited normal wear when compared to a manufacturer's service chart. Both propeller blades exhibited blade twisting, lengthwise bending, and leading-edge rotational scoring/burnishing.

Functional testing and subsequent disassembly of the vacuum pump showed no evidence of preimpact failure. The directional gyro and attitude indicator were dissembled and rotational scoring was noted on their gyros.

The on-scene investigation revealed no preimpact mechanical malfunctions or anomalies that would have prevented the normal operation of the airplane or its associated systems.

MEDICAL AND PATHOLOGICAL INFORMATION

On June 8, 2009, an autopsy was performed on the pilot at the University of Wisconsin School of Medicine and Public Health in Madison, Wisconsin. The pilot's cause of death was attributed to multiple blunt force injuries sustained during the accident.

The FAA's Civil Aeromedical Institute in Oklahoma City, Oklahoma, performed toxicology tests on the pilot. No ethanol was detected in liver and muscle tissues. No drugs were detected in liver tissue.

Toxicology tests were also performed on the passenger. No carbon monoxide, cyanide, or drugs were detected in the passenger's blood samples. No ethanol

was detected in urine samples.

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Accident Rpt# CEN11CA398	**06/16/2011 2050 CDT**	**Regis# N5595L**	**Le Center, MN**	
Acft Mk/Mdl LINDSTRAND LBL120A-NO SERIES		**Acft SN 5482**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
			Fatal 0 Ser Inj 1	**Flt Conducted Under: FAR 091**
Opr Name: EDWARD J. CHAPMAN		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Narrative

The accident occurred as the pilot attempted to land the balloon in a 7-8 knot wind. The pilot stated that he briefed the passengers regarding the landing procedures prior to the landing. The first three landing approaches were aborted due to obstacles. During the fourth approach the pilot shut off the pilot lights for the burner and instructed the passengers to brace prior to touchdown. The basket touched down and pendulumed forward, which the pilot expected. He stated he was deflating the envelope when one of the passengers began to stand up and was nearly ejected from the basket as it touched down a second time. The pilot stated he grabbed the passenger's belt to prevent her from falling out of the basket which resulted in him being in an unstable position. With the next bump, the pilot stated, he was ejected from the basket. The pilot held onto the deflation line and was drug by the basket, sustaining serious injuries. The ground crew instructed the passengers to pull the "red line" deflation valve allowing the balloon to come to a stop.

Accident Rpt# CEN11FA420	**06/26/2011 1450 EDT**	**Regis# N71687**	**Farmdale, OH**	**Apt: Private Airstrip PVT**	
Acft Mk/Mdl LUSCOMBE 8A		**Acft SN 3114**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl TELEDYNE CONTINENTAL MOTORS C65		**Acft TT 1861**	**Fatal 1 Ser Inj 1**	**Flt Conducted Under: FAR 091**	
Opr Name: BRIAN NEIL BETTS		**Opr dba:**		**Aircraft Fire: NONE**	
				AW Cert: STN	

Narrative

On June 26, 2011, at 1450 eastern daylight time, a Luscombe model 8A airplane, N71687, was substantially damaged when it impacted terrain while performing a low-altitude aerobatic maneuver at a private airstrip near Farmdale, Ohio. The pilot sustained serious injuries. The passenger was fatally injured. The airplane was registered to and operated by the private pilot under the provisions of 14 Code of Federal Regulations Part 91. Day visual meteorological conditions prevailed for the flight, which operated without a flight plan. The local-area flight was originating at the time of the accident.

Several witnesses reported that the pilot had flown at least two flights earlier in the day, during which they observed the airplane perform several aerobatic maneuvers near the private strip. On the accident flight, the airplane was observed to enter a near vertical climb shortly after liftoff on a southerly heading. The airplane continued in the near-vertical climb to about 300 feet above the ground before turning to the left and entering a nose-down descent toward the runway. One witnesses described the aerobatic maneuver as a wingover or a hammerhead. Another witness stated that the airplane appeared to stall at the apex of the vertical climb, before it entered the left turn and nose-down descent. The same witness reported hearing the engine operate at a high speed during the descent. Several witnesses noted that the airplane impacted the grass runway as it was recovering from the dive on a northerly heading.

Accident Rpt# CEN11CA233	**03/17/2011 926 MDT**	**Regis# N4550R**	**Albuquerque, NM**	**Apt: Double Eagle Ii Airport AEG**
Acft Mk/Mdl MAULE M-4-220C		**Acft SN 2017C**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl FRANKLIN 6A-350-C1		**Acft TT 1716**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: KEVIN CARPENTER		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

The pilot reported that the tailwheel airplane began to pitch left during landing. The pilot made crosswind corrections and could not maintain keeping the wings level. The left wing touched the runway and the airplane continued forward and then yawed to the right. The pilot was unable to correct the yaw with rudder application and engine power and the airplane exited the runway. The airplane's left landing gear folded when it contacted the terrain off the runway. The airplane sustained substantial damage to its left wing spar. The pilot indicated that there were no preimpact mechanical malfunctions or failures.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to maintain control of the airplane during landing, which resulted in a runway excursion.

Events

1. Landing-landing roll - Loss of control on ground
2. Landing-landing roll - Runway excursion

Findings - Cause/Factor

1. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-(general)-Not attained/maintained - C

Narrative

The pilot reported that the tailwheel airplane began to "pitch left" during landing. The pilot made crosswind corrections and could not maintain wings level. The left wing touched the runway and the airplane continued straight. The airplane subsequently yawed to the right. The pilot was unable to correct the yaw with rudder application and engine power, and the airplane exited the runway. The airplane's left landing gear folded when it contacted the terrain off the runway. The airplane sustained substantial damage to its left wing spar. The pilot did not indicate that there were any airplane mechanical malfunctions prior to the airplane exiting the runway.

Accident Rpt# CEN10CA489	**08/19/2010 1500 CDT**	**Regis# N189M**	**Justin, TX**	**Apt: Propwash 16X**
Acft Mk/Mdl MEYERS INDUSTRIES INC 200C		**Acft SN 283**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR O-470 SERIES			**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: SAMSON AIR INC		**Opr dba:**		**Aircraft Fire: NONE**

Accident Rpt# CEN10LA489	**08/19/2010 1500 CDT**	**Regis# N189M**	**Justin, TX**	**Apt: Propwash 16X**
Acft Mk/Mdl MEYERS INDUSTRIES INC 200C		**Acft SN 283**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR O-470 SERIES		**Acft TT 1854**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: SAMSON AIR INC		**Opr dba:**		**Aircraft Fire: NONE**

Narrative

On August 19, 2010, approximately 1500 central daylight time, N189M, a Meyers Industries Incorporated 200C, sustained substantial damage during a forced landing to Propwash Airport (16X), near Justin, Texas. The certificated commercial pilot was not injured. The airplane was registered to and operated by a private company based in Traverse City, Michigan. No flight plan was filed for the flight that originated at Front Range Airport (FTG), Denver, Colorado, about 1200. Visual meteorological conditions prevailed for the personal flight conducted under 14 CFR Part 91.

The pilot stated that after departing Colorado with full fuel (80 gallons total/74 gallons usable) he climbed to an altitude of 11,500 feet to avoid operating in higher than normal air temperatures as he approached Texas. He maintained this altitude for as long as possible and then made a rapid descent to avoid entering Class B airspace as he approached his destination airport by pulling the throttle to idle and lowering the nose of the airplane. The engine subsequently stopped producing power and the pilot said he didn't recognize the power loss until he entered the traffic pattern because the propeller was windmilling and he was wearing noise-canceling headsets. The pilot said he was unable to re-start the engine or maintain altitude. As the airplane continued to glide toward the runway, he realized the gear warning horn had not activated when he pulled the throttle to idle and had to quickly extend the landing gear manually. The pilot did not have enough time to fully extend the gear and landed short of the runway in a pasture.

According to the pilot, approximately 1-2 flights prior to the accident, the throttle would not go to full idle and he had to use the mixture control to shut off the engine. Plus, the landing gear warning horn was inoperative. A mechanic based in Texas troubleshot the problem and found that the throttle control and attached gear warning switch actuator assembly were worn, which caused it to get caught up on the actuator. He replaced the new assembly three days before the accident and performed an engine run-up. The engine ran normally at all RPM speeds. The pilot then flew the airplane to Colorado and said there were no problems during the flight.

A Federal Aviation Administration (FAA) inspector, who performed a post-accident examination of the airplane, stated that the fuselage sustained substantial damage when the nose gear separated and the left main gear collapsed. The airplane came to rest upright and the left wing tip was resting on the ground. The propeller, the left wing tip, and the leading edge of the left wing were also damaged; however, the four fuel tanks were not breached. The inspector, who examined the wreckage several hours after the accident, visually inspected the fuel tanks and found the right outboard fuel tank was empty, the right inboard fuel tank was 3/4 full, the left inboard tank was full, and the left outboard tank was 3/4 full. The fuel selector was found set to the right outboard tank position. However, in a written statement, the pilot stated the fuel selector was set to the left inboard tank (which he estimated had 15 minutes of fuel remaining) when the engine quit and he had "switched to the full tank" to restart the engine. He said that even though the outboard fuel tanks "looked empty" after the accident he still had about 1.5 hours of fuel remaining and that he did not run any of the tanks out of fuel. Examination of the fuel system, ignition, and throttle assemblies revealed no mechanical deficiencies.

Weather at Alliance Airport (AFW), Fort Worth, Texas, about 6 miles south of the accident, at 1453, was reported as calm winds, visibility 10 miles, few clouds at 6,500 feet, light rain, temperature 37 degrees C, dewpoint 21 degrees C, and a barometric pressure setting of 29.85 inches of Hg.

Accident Rpt# WPR11FA316	**07/07/2011 1920 PDT**	**Regis# N7759M**	**Watsonville, CA**	**Apt: Watsonville Municipal WVI**
Acft Mk/Mdl MOONEY M20F		**Acft SN 22-0019**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO-360 SER			**Fatal 4** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: DAVI D EDWARD HOUGHTON		**Opr dba:**		**Aircraft Fire: GRD**
				AW Cert: STN

Narrative

On July 7, 2011, about 1920 Pacific daylight time, a Mooney M20F, N7759M, was substantially damaged when it impacted a parking lot and a building shortly after takeoff from Watsonville Municipal Airport (WVI), Watsonville, California. The private pilot and the three passengers received fatal injuries. The personal flight was operated under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed, and no flight plan was filed for the flight.

The airplane was co-owned by the pilot and one other individual. According to the co-owner, the airplane was based at WVI. Relatives reported that the pilot, his wife, and their two children planned to travel to Groveland, California, for the weekend. Lockheed Martin Flight Services (LMFS) information indicated that the pilot contacted LMFS by telephone on the day of the accident about 1023, and again about 1417, to obtain weather briefings. The pilot informed the LMFS representative that his intended destination was Pine Mountain Lake Airport (E45), Groveland.

According to information provided by several eyewitnesses, the airplane departed from WVI runway 20. Two witnesses, in separate locations, and one of whom was a pilot, reported that the climb angle after takeoff appeared "steep." Both observed the airplane commence a very rapid left roll when it was approximately 500 feet above the threshold of runway 2. The airplane appeared to roll until it was "nearly inverted," and the nose "dropped," so that it was pointing towards the ground. It descended rapidly, and completed about two "tight turns" or "spirals" before it appeared to begin to recover, and then disappeared behind trees. Both witnesses observed fire and smoke immediately thereafter. Ground scars indicated that the airplane first impacted a parking lot about 700 feet southeast of the threshold of runway 2, slid about 130 feet forward, and struck the building. Parallel slash marks in the pavement were consistent with propeller strikes from an engine that was developing power. The airplane structure was severely disrupted by the impact, and portions were consumed by fire.

According to Federal Aviation Administration (FAA) information, the airplane was manufactured in 1974, and was equipped with a Lycoming IO-360 series engine, and a 3-blade propeller. The pilot was issued his private pilot certificate on March 17, 2011. The airplane co-owner indicated that they purchased the airplane in late November 2010. The co-owner indicated that the pilot accrued about 140 total hours in the airplane, which included most of his flight training for his pilot certificate.

The WVI 1853 automated weather observation included winds from 190 degrees at 6 knots; visibility 10 miles; clear skies; temperature 16 degrees C; dew point 12 degrees C; and an altimeter setting of 29.91 inches of mercury. Multiple witnesses reported that the low layer of stratus clouds that was typical for the region at that time of year, was present just southwest of the airport. Some witnesses reported that the boundary of the stratus layer was coincident with Highway 1, which ran perpendicular to runway 2/20, and was situated about 1/4 mile from the threshold of runway 2.

Accident Rpt# ERA11FA055	**11/10/2010 1940 EST**	**Regis# N6878V**	**Copake, NY**	**Apt: Walter J Koladza GBR**
Acft Mk/Mdl MOONEY M20F		**Acft SN 22-1271**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO-360			**Fatal 2** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: JOHN B WELCH		**Opr dba:**		**Aircraft Fire: GRD**

Summary

The airplane was approaching the destination airport in night visual meteorological conditions, on an instrument flight rules (IFR) flight plan. The destination airport was at an elevation of 739 feet mean sea level (msl), located in the vicinity of mountainous terrain. About 10 miles from the destination airport, the pilot elected to cancel his IFR clearance. At that time, the airplane was at 3,900 feet msl and began a descent consistent with a 45-degree entry to a left downwind leg of the destination airport traffic pattern, which was 1700 feet msl. About 2 minutes later, the airplane had descended to 2,400 feet and was approximately 1/4 mile from the 2,000-foot summit of a mountain. About 10 seconds later, the airplane had descended to 2,100 feet, about 1,000 feet horizontally from the summit. The airplane impacted trees near the summit and came to rest about 500 feet beyond the initial impact. The summit was approximately 5 miles southwest from the destination airport. Examination of the wreckage did not reveal any preimpact mechanical malfunctions. The end of civil twilight occurred about 2 hours prior to the accident. Moonset occurred about 1 hour after the accident and the phase of the moon was waxing crescent with only 22 percent of the moon's visible disc illuminated.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's failure to monitor and maintain clearance from mountainous terrain during a visual descent to the destination airport at night, which resulted in controlled flight into terrain.

Events

1. Enroute-descent - Controlled flight into terr/obj (CFIT)

Findings - Cause/Factor

1. Personnel issues-Psychological-Attention/monitoring-Monitoring environment-Pilot - C
2. Environmental issues-Conditions/weather/phenomena-Light condition-Dark-Effect on operation

Narrative

HISTORY OF FLIGHT

On November 10, 2010, about 1940 eastern standard time, a Mooney M20F, N6878V, was substantially damaged when it collided with wooded terrain, near the summit of Mount Frey, Copake, New York. The certificated private pilot and passenger were killed. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Night visual meteorological conditions prevailed and an instrument flight rules (IFR) flight plan was filed for the planned flight to Walter J Koladza Airport (GBR), Great Barrington, Massachusetts. The flight departed Lorain County Regional Airport (LPR), Elyria, Ohio, about 1550.

According to data from the Federal Aviation Administration (FAA), the flight was in radar and radio contact with Albany terminal radar approach control (TRACON) as the flight approached GBR. At 1921, the pilot advised the controller that he intended to make a visual approach to runway 29 at GBR, which was located 739 feet above mean sea level (msl). At 1927, the controller instructed the pilot to descend from 7,000 msl, to 4,000 feet msl, which the pilot acknowledged. At 1936, the pilot reported that he had GBR in sight and the controller cleared the flight for a visual approach to runway 29 at GBR. At 1937, the controller gave the pilot the option of canceling his IFR clearance on the current radio frequency or with flight service on the ground, and approved a frequency change to the GBR common traffic advisory frequency. The pilot elected to cancel his IFR clearance at that time with the Albany controller. The controller acknowledged the cancellation, instructed the pilot to change the transponder code, and reported no traffic between the accident airplane and GBR. The pilot acknowledged the last instruction and no further communications were received from the accident airplane.

Review of radar data revealed that at the time of the IFR flight plan cancellation, the airplane was at 3,900 feet and began a descent on a northeasterly track, consistent with a 45-degree entry to the left downwind leg of the GBR traffic pattern. At 1939:12, the airplane had descended to 2,900 feet and was approximately 1.5 miles from the summit of Mount Frey. The summit of Mount Frey was located about 5 miles southwest of GBR. At 1939:45, the airplane had descended to 2,400 feet and was approximately .25 mile from the summit of Mount Frey. At 1939:54, the airplane had descended to 2,100 feet and was approximately 1,000 feet from the summit of Mount Frey. The summit elevation at Mount Frey was approximately 2,000 feet msl and the GBR traffic pattern altitude was 1,700 feet msl.

PILOT INFORMATION

The pilot, age 64, 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 February 2, 2009. At that time, the pilot reported a total flight experience of 1,410 hours. The pilot's logbook was not recovered

AIRCRAFT INFORMATION

The four-seat, low-wing, retractable-gear airplane, serial number 22-1271, was manufactured in 1975. It was powered by a Lycoming IO-360, 200-horsepower engine and equipped with a three-bladed, constant-speed Hartzell propeller. Review of the airframe and engine logbook revealed that the most recent annual inspection was performed on June 22, 2010. At that time, the airplane had accumulated 3,534 total hours of operation. The engine had accumulated 2,243 total hours of operation.

METEOROLOGICAL INFORMATION

According to data from Lockheed Martin, the pilot telephoned flight service at 1524. He received a standard weather briefing and filed an IFR flight plan for the flight from LPR to GBR.

Pittsfield Municipal Airport (PSF), Pittsfield, Massachusetts, was located about 20 miles northeast of GBR. The recorded weather at PSF, at 1954, was: wind calm, visibility 10 miles, sky clear, temperature 1 degree Celsius, dew point minus 2 degrees Celsius, altimeter 30.20 inches of mercury.

According to the U.S. Naval Observatory, for the GBR area, sunset occurred at 1637, the end of civil twilight occurred at 1706, and moonset occurred at 2034. The phase of the moon was waxing crescent with 22 percent of the moon's visible disc illuminated.

WRECKAGE INFORMATION

The airplane was located by a hunter on November 11, 2010, about 5 miles southwest of GBR, at an elevation of 1,861 feet msl. The main wreckage came to rest inverted, oriented on a southerly heading, near the summit of Mount Frey, with the empennage suspended in a tree. An approximate 500-foot long debris path, oriented on a northeasterly heading, was observed originating with tree strikes and terminated at the main wreckage. Pieces from the outboard left wing were located near the beginning of the debris path, along with freshly cut branches from the tops of 25-foot tall trees. No tree damage was observed in the vicinity of the main wreckage, and an approximately 5-foot-long, 3-foot-wide, 2-foot deep crater was present about 10 feet from the wreckage.

A postcrash fire consumed the cockpit and fuselage. The flaps and landing gear were retracted. The inboard sections of the left and right wings remained attached to the fuselage, and the flaps remained attached to their respective wings. The outboard section of left wing was found along the debris path, and its aileron remained attached. The outboard section of the right wing was consumed by fire. The empennage sustained minor damage, and its vertical stabilizer, horizontal stabilizer, rudder, and elevator remained attached. The flight control system consisted of push-pull tubes, which were partially consumed by fire. Subsequently, flight control continuity could not be confirmed.

The engine and one propeller blade were partially buried in the ground. All three propeller blades remained attached to the engine. One blade exhibited s-bending, another blade was bent forward, and the third blade exhibited leading edge gouging and tip curling. The engine had sustained thermal damage and the propeller could not be rotated.

The engine was examined further following recovery to a hangar. The No. 2 cylinder was impact damaged, the intake pushrod was missing, and the intake rocker arm was fractured. The No. 1 cylinder also exhibited impact damage. Due to impact damage, the bottom sparkplugs were removed on the No. 2 and No. 4 cylinders. The top sparkplugs were removed from the No. 1 and No. 3 cylinders. Examination of the sparkplugs revealed the electrodes were intact, and light gray in color. Some debris was noted in the No. 2 and No. 4 sparkplugs, consistent with impact damage. The magnetos sustained thermal damage and could not be tested. The valve covers were also removed. The crankshaft could only be rotated about 90 degrees via the propeller; however, a borsecope examination of the cylinders did not reveal any catastrophic failures and oil was noted throughout the cylinders.

Examination of the elevator trim jackscrew revealed 7 threads, which equated to an approximate takeoff trim setting.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on November 14, 2010, by the Albany County Medical Examiner's Office, Albany, New York.

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma.

Accident Rpt# WPR11LA313 06/26/2011 930 MST	**Regis# N9246M**	**Flagstaff, AZ**	**Apt: Flagstaff Pulliam Airport FLG**	
Acft Mk/Mdl PIPER PA 46-350P	**Acft SN 4622149**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING TIO-540 SER		**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: KAREN SLAKEY	**Opr dba:**		**Aircraft Fire: NONE**	

Narrative

On June 26, 2011, about 0930 mountain standard time, a Piper PA-46-350P, N9246M, sustained substantial damage when the nose landing gear collapsed during landing roll at the Flagstaff Pulliam Airport (FLG), Flagstaff, Arizona. The airplane was registered to N9246M LLC, Las Vegas, Nevada, and was operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91. The airline transport rated pilot and the two passengers were not injured. Visual meteorological conditions prevailed and no flight plan was filed for the personal flight. The cross-country flight originated from Las Vegas, Nevada, about 0810 with an intended destination of FLG.

During a telephone conversation with the National Transportation Safety Board investigator-in-charge, the pilot reported that just after landing on runway 21, the airplane encountered a gust of wind. Despite her control inputs, the airplane exited the left side of the runway and the nose wheel landing gear collapsed. Subsequently, the airplane came to rest nose low about 150 feet left of the runway surface.

Examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed that the engine firewall was bent.

Accident Rpt# WPR11FA319 07/08/2011 730 PDT	**Regis# N8721C**	**Verlot, WA**		
Acft Mk/Mdl PIPER PA-22-135	**Acft SN 22-1368**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-290 SERIES		**Fatal 2 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: MATTHEW ANNIS	**Opr dba:**		**Aircraft Fire: GRD**	
			AW Cert: STN	

Narrative

On July 8, 2011, about 0730 Pacific daylight time, a Piper PA-22-135, N8721C, sustained substantial damage when it impacted terrain while maneuvering near Verlot, Washington. The airplane was registered to and operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91. The private pilot and his passenger sustained fatal injuries. Visual and instrument meteorological conditions prevailed within the vicinity of the accident and no flight plan was filed for the personal flight. The cross-country flight originated from a private airstrip near Elk, Washington, about 0520, with an intended destination of Arlington, Washington.

Family members reported that the pilot departed Elk, Washington with the intention of flying to Arlington to attend the fly-in. The pilot told the family that he may go to Ellensburg, Washington, if the weather was bad.

A family member of the pilot reported the airplane overdue to local law enforcement the morning of July 9, 2011, after becoming concerned when the pilot had not arrived at his intended destination. The Federal Aviation Administration (FAA) issued an Alert Notification (ALNOT) for the missing airplane. The wreckage was located by United States Navy Search and Rescue (SAR) personnel about 1400 on July 9 within heavily wooded mountainous terrain near Liberty Mountain.

Examination of the accident site by the National Transportation Safety Board investigator-in-charge (IIC) revealed that the airplane came to rest on sloping terrain about 200 to 300 feet below a ridge line at an elevation of about 4,100 feet mean sea level (msl). The wreckage was mostly consumed by fire.

Accident Rpt# CEN10FA322	**06/16/2010 2352 CDT**	**Regis# N7SE**	**Rochester, MN**	**Apt: Rochester International Airpor RST**
Acft Mk/Mdl PIPER PA-23		**Acft SN 23-1127**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING 0-320-A1A			**Fatal 3** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: CHRISTOPHER D. LIVINGSTON		**Opr dba:**		**Aircraft Fire: GRD**
				AW Cert: STN

Summary

During the night flight, the pilot reported a loss of engine power to air traffic controllers and requested assistance locating the nearest airport. Radar track data indicated that the airplane was on-course to an airport about 18 nautical miles away. The pilot elaborated to the controllers that the twin engine airplane's left engine had lost power and that he was attempting to maintain altitude. Later, the pilot stated that he was unsure if he would be able to make the airport. The airplane impacted trees and terrain about a mile from the runway. A postaccident examination of the airplane disclosed no anomalies that would explain the loss of engine power.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The loss of engine power for undetermined reasons.

Events

1. Enroute-cruise - Loss of engine power (total)
2. Maneuvering - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Not determined-Not determined-(general)-(general)-Unknown/Not determined - C

Narrative

HISTORY OF FLIGHT

On June 16, 2010, about 2352 central daylight time, a Piper PA-23, N7SE, was destroyed when it impacted trees and terrain about 1.2 nautical miles north-northwest of the Rochester International Airport (RST), Rochester, Minnesota. The pilot had reported engine trouble to air traffic controllers and was attempting to land at RST. The private pilot and two passengers were fatally injured. The 14 Code of Federal Regulations Part 91 personal flight was operating in visual meteorological conditions and was not on a flight plan. The flight departed from the Stanton Airfield, Stanton, Minnesota, about 2315.

At 2303:55, the pilot contacted the Minneapolis Approach Control and received flight following assistance from the Flying Cloud Airport, Minneapolis, Minnesota, to the Stanton Airfield (SYN), Stanton, Minnesota. At 2312:04, radar service was terminated and a frequency change approved when after the pilot reported having SYN in sight. The airplane is presumed to have landed at SYN.

Aircraft radar track data showed that, at 2321:22, the airplane was airborne about 5.5 nautical miles (nm) west-southwest of SYN heading in an east-southeast direction. At 2337:17, the pilot contacted Minneapolis Approach Control and reported engine problems. He requested assistance locating the nearest airport. At this time, radar track data indicated that the airplane was about 18 nm north-northwest of RST at 5,400 feet pressure altitude and was heading south. The controller suggested the Red Wing Regional Airport, about 26 nautical miles north. However, the pilot elected to continue to RST which was closer to his current position.

At 2339:47, the controller informed the pilot that RST was now the closest airport. Radar data indicated that RST was about 14.3 nm and 160 degrees from the airplane's position at that time; however, the Dodge Center Airport (TOB), Dodge Center, Minnesota, was about 10.9 nm and 230 degrees from the airplane's position. The airplane continued on a track toward RST. The pilot reported that the airplane had lost partial power on the left engine.

At 2343:19, the pilot confirmed having RST in sight and stated that he was trying to maintain altitude. At that time, the airplane was at 3,500 feet pressure altitude and 10 nm from RST. At 2346:26, the pilot stated that he was unsure if he would have sufficient altitude to make it to RST. At 2346:39, the pilot again stated that he was unsure if he would make RST. At this time the airplane was at 2,500 feet pressure altitude and 6 nm from RST. No further communications were received from the pilot. Another pilot approaching RST reported seeing a fireball at 2351:45.

PERSONNEL INFORMATION

The pilot, age 29, held a private pilot certificate with single engine, and multi-engine land airplane ratings. He was issued a second-class airman medical

certificate with no limitations on May 19, 2008. The pilot had satisfied the flight review requirements of 14 CFR 61.56 when he successfully completed the practical test for his multi-engine rating on October 3, 2009.

The pilot's logbook was not recovered during the investigation. However, the pilot reported having 259 hours of total flight experience on the application for his multi-engine practical test. The pilot reported having 4.0 hours flight experience in a Piper PA-44-180 (Seminole) on that application. No further information was found regarding the pilot's flight experience in multi-engine airplanes.

AIRCRAFT INFORMATION

The accident airplane was a 1957 Piper model PA-23 (Apache), production serial number 23-1127. At the time of the accident, it was owned by the pilot, and registered as N7SE. The airplane was a four-place, twin-engine aircraft, with a retractable tricycle landing gear configuration.

The airplane was powered by two Lycoming O-320-A1A engines. The left and right engine serial numbers were L-7318-27 and L-7321-27, respectively. The engines were four cylinder, reciprocating engines rated to develop 150 horsepower each.

The aircraft maintenance records were not recovered during the investigation.

METEOROLOGICAL INFORMATION

At 2354, the weather conditions recorded at RST were: Wind from 120 degrees at 7 knots, 10 statute miles visibility, clear skies, temperature 18 degrees Celsius, dew point 16 degrees Celsius, and an altimeter setting of 30.02 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest in a hilly wooded area about 0.8 nautical miles north of the approach end of runway 13 at RST. The cabin, nose and left wing of the airplane exhibited significant fire damage. The cabin section and left wing were almost completely burned.

On scene examination of the airplane confirmed that all major components of the airplane were accounted for in the immediate area of the main wreckage. The airplane had sustained impact and fire damage. The wreckage path was oriented on about a 165 degree magnetic heading.

The right wing was mostly intact with impact and fire damage. Most of the fire damage was to the inboard section of the wing from the engine nacelle inboard. The engine was separated from the wing. The propeller remained attached to the engine. The aft engine accessories were consumed by fire. The aileron and flap remained attached at all hinge points.

The remains of the left wing consisted of the top skin which was lying on the ground. The rest of the wing had been consumed by fire. The left engine still had the propeller attached. The propeller was in the feathered position. The engine was still attached to the mounts and had fire damage to the aft accessories.

The remains of the fuselage structure were lying on top of the right wing. The fuselage aft of the baggage compartment was predominately intact and the tail surfaces remained attached. All of the tail control surfaces remained attached at all hinge locations. The forward fuselage was consumed by fire.

The rudder control system was intact except for one cut in the right side cable that was made by first responders for occupant extrication and a broken horn on the rudder bar near the cockpit rudder pedals.

The elevator control system was intact except for a portion of the aluminum pushrod in the cabin section that was missing and presumed to be consumed by fire. About 4 inches of the pushrod at the control yoke assembly remained attached and had fire damage to the free end. The pushrod from the aft fuselage to about the aft end of the baggage compartment was intact with evidence of bending and fire damage. The portion of the elevator pushrod between these locations was not found.

The right aileron pushrod was broken at the rod end fitting at the aileron and at the forward end by the bellcrank at the leading edge of the wing. The bellcrank was intact with impact damage and the cables remained attached. One cable was intact from the bellcrank to its fitting by the yoke assembly except for a separation that exhibited evidence of overload failure. The aileron balance cable was intact from the bellcrank through the fuselage where it had been cut by first

responders. It remained attached by swage fittings to the rudder interconnect cable.

The left aileron cable was separated at the turnbuckle by the yoke assembly and its other end was cut by first responders. Beyond the cut evidence of overload failure was found. The balance cable also had evidence of overload failure. From these breaks, both the aileron and balance cables continued to the left aileron bellcrank assembly where they remained attached. The left aileron pushrod was broken into three pieces. One break was in the aluminum tubing and the second break was in the end fitting at the aileron.

No anomalies were detected with respect to the airframe or the flight control system.

The left propeller remained attached to the engine as did most of the engine accessories. The propeller was in the feather position. The engine was rotated, and crankshaft and valve train continuity was confirmed. The engine produced compression when rotated. One magneto produced spark when rotated. The other magneto did not produce spark but had evidence of impact damage. The carburetor was fire damaged and was broken loose from its mounting flange. No anomalies were detected with respect to the left engine that could be attributed to a pre-impact condition.

The right propeller remained attached to the engine. Most of the engine accessories were consumed by fire. The magnetos were fire damaged and consisted of the forward gearcase section of each magneto. The aft end of both magnetos was consumed by fire. The engine was rotated and compression was evident on 3 cylinders. The 4th cylinder had sustained impact and fire damage. No anomalies were detected with respect to the right engine that could be attributed to a pre-impact condition.

The fuel system within the cabin section was consumed by the post-impact fire.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was conducted by the Mayo Clinic, Rochester, Minnesota. The cause of death was attributed to multiple blunt-force injuries and evidence of fire/smoke inhalation.

The Federal Aviation Administration Civil Aerospace Medical Institute (CAMI) toxicology report for the pilot was negative for all tests performed.

Accident Rpt# CEN11LA405	**06/18/2011 730 MDT**	**Regis# N7018Z**	**Faith, SD**	**Apt: Faith Municipal D07**
Acft Mk/Mdl PIPER PA-25-235		**Acft SN 25-2773**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING 0-540 SERIES			**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 137**
Opr Name: ON FILE		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: SPR

Narrative

On June 18, 2011, about 0730 mountain daylight time, a Piper PA-25-235, N7018Z, was substantially damaged during an in-flight collision with terrain near Faith, South Dakota. The pilot sustained minor injuries. The aircraft was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 137 as an agricultural application flight. Visual meteorological conditions prevailed for the flight, which was not operated on a flight plan. The exact flight itinerary has not been determined at this time.

Accident Rpt# ERA11LA067	**02/26/2009 1400 EST**	**Regis# N616FT**	**Melbourne, FL**	**Apt: Melbourne International Airpor MLB**
Acft Mk/Mdl PIPER PA-28-161		**Acft SN 2841239**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320-D3G		**Acft TT 13197**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: F I T AVIATION LLC		**Opr dba: FLORIDA INSTITUE OF TECHNOLGY**		**Aircraft Fire: NONE**

Summary

According to the student pilot, the purpose of the instructional flight was to practice crosswind landings. The flight was to be the student pilot's last flight in preparation for his first solo flight. The certified flight instructor (CFI) who was giving the instruction reported that the airplane was landed hard with a side load. Inspection of the airplane after the flight revealed a crack in the right wing's rear spar. The student pilot reported that there were no mechanical malfunctions with the airplane during the flight.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The student pilot's inadequate crosswind landing technique and the certified flight instructor's delayed remedial action, which resulted in a hard landing.

Events

1. Landing-flare/touchdown - Hard landing

Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Landing flare-Incorrect use/operation - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Student pilot - C
3. Personnel issues-Action/decision-Action-Delayed action-Instructor/check pilot - C

Narrative

On February 26, 2009, about 1400 eastern standard time, a Piper PA-28-161, N616FT, operated by Florida Institute of Technology, was substantially damaged during a hard landing at Melbourne International Airport (MLB), Melbourne, Florida. The certificated flight instructor (CFI) and student pilot were not injured. Visual meteorological conditions prevailed for the local instructional flight which was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

According to the student pilot, the purpose of the instructional flight was to practice crosswind landings utilizing the wing low attitude as described in the training program. The flight was to be the student pilot's last flight in preparation for his first solo flight. The CFI who was giving the instruction reported that the airplane was landed hard with a sideload. Inspection of the airplane after the flight revealed a crack in the right wing's rear spar. The student pilot reported that there were no mechanical malfunctions with the airplane during the flight.

The CFI, age 25, held a commercial pilot certificate and a CFI certificate for airplane single-engine, multiengine, and instrument airplane. Her most recent application for a Federal Aviation Administration (FAA) first-class medical certificate was issued on May 22, 2008. According to documentation provided by the flight school on December 2, 2010, she had 1,410 total hours of flight experience, of which 1,356 total hours of flight experience were in airplane single-engine, and 1,068 total hours of flight experience as a flight instructor.

The student pilot, age 49, held a student pilot certificate. His most recent FAA third-class medical was issued on November 8, 2008. His flight experience at the time of the accident was 33 total hours of flight time in the same make and model of the accident airplane.

The 1353 recorded weather observation at MLB included winds from 100 degrees at 10 knots, visibility 10 miles, scattered clouds at 4,000 feet, temperature 29 degrees C, dew point 9 degrees C; altimeter 30.27 inches of mercury. In a review of the surface observations for MLB around the time of the accident the wind direction varied from 070 degrees to 100 degrees and was at 10 knots for all recorded observations.

The National Transportation Safety Board was notified of the accident on November 18, 2010.

Accident Rpt# ERA10CA337	**06/28/2010 30 EDT**	**Regis# N30062**	**Great Barringto, MA**	**Apt: Walter J Koladza Airport GBR**
Acft Mk/Mdl PIPER PA-28-181		**Acft SN 28-7990081**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O&VO-360 SER		**Acft TT 5210**	**Fatal 0** **Ser Inj 2**	**Flt Conducted Under: FAR 091**
Opr Name: BERKSHIRE AVIATION ENTERPRISES INC		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

The pilot departed his home airport at night, in fog, and returned on an instrument flight rules (IFR) clearance. He stated that the return flight was routine and the air traffic controller cleared him for the approach into the airport. The pilot then canceled his IFR clearance, descended visually, and entered a left traffic pattern to land. The pilot stated that he entered the downwind leg for a "tighter than normal" pattern to avoid the fog at the approach end of the runway; however, global positioning system data revealed a spiraling descent in the vicinity of the base leg of the traffic pattern. The pilot stated that not seeing the terrain surrounding the airport while having the airport in sight lulled him into the belief that he was on or near glide path when, in fact, he was much lower, causing the controlled flight into terrain. The airplane incurred substantial damage to the left wing and left side of the fuselage. The pilot reported that there were no mechanical failures or malfunctions of the airplane. Airports 15 miles north and 10 miles west each reported ceilings less than 100 feet, and visibility less than a half mile, and witnesses surrounding the airport described the fog as heavy with visibility of less than 100 feet.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's attempted visual flight into night instrument meteorological conditions, which resulted in spatial disorientation and subsequent controlled flight into terrain.

Events

1. Approach - VFR encounter with IMC
2. Approach-VFR pattern base - Controlled flight into terr/obj (CFIT)

Findings - Cause/Factor

1. Personnel issues-Action/decision-Action-Incorrect action performance-Pilot - C
2. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Low visibility-Effect on operation
3. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Fog-Effect on operation
4. Personnel issues-Psychological-Perception/orientation/illusio-Spatial disorientation-Pilot - C

Narrative

The pilot departed his home airport at night, in foggy conditions, and returned on an instrument flight rules (IFR) clearance. He stated that the return flight was "routine" and was cleared for the NDB-A approach into the airport. The pilot then canceled his IFR clearance and descended the airplane visually. He stated he entered the downwind leg for a "tighter than normal pattern" to avoid the fog at the approach end of the runway, however, GPS data revealed a spiraling descent in the vicinity of the base leg of the traffic pattern. The pilot stated, "Again, everything was routine until the base leg...As I continued, with the runway and runway environment in sight, I suddenly felt an impact...Not seeing the terrain surrounding the airport while having the airport in sight, lulled me into the belief that I was on or near glide path when, in fact, I was much lower, causing the CFIT (controlled flight into terrain)." The airplane incurred substantial damage to the left wing and left side of the fuselage. The pilot reported that there were no mechanical failures or malfunctions of the airplane. Weather reported 15 miles north included a 100-foot ceiling and a half mile of visibility due to fog. Witnesses surrounding the accident airport described the fog as "heavy" with visibility "less than 100 feet."

Accident Rpt# ERA10CA473	**09/09/2010 1745 EDT**	**Regis# N2753M**	**Montauk, NY**	**Apt: Montauk Airport MTP**
Acft Mk/Mdl PIPER PA-28-181		**Acft SN 28-7890243**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-360 SER			**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: 43RD AVIATION FLYING CLUB INC		**Opr dba:**		**Aircraft Fire: NONE**

Summary

According to the pilot, as he approached his destination airport, he requested airport advisories over the UNICOM frequency. He was advised that traffic was landing on runway 24, and the wind was reported at 310 degrees at 9 knots. During his first approach he believed he was too high and executed a go-around. He re-entered the pattern and as the airplane descended to the runway, it encountered windshear and stalled. The pilot made an attempt to go-around, but the airplane was too low and slow. He was unable to maintain the airplane's altitude, and it landed hard and veered off the left side of the runway. The airplane struck trees and the right wing was torn from the fuselage. The reported wind at the accident airport near the accident time was from 290 degrees at 10 knots, gusting to 18 knots.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's inadequate compensation for crosswind conditions which resulted in a hard landing and loss of directional control.

Events

1. Landing-flare/touchdown - Hard landing
2. Landing-landing roll - Loss of control on ground
3. Landing-landing roll - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
2. Personnel issues-Action/decision-Action-Incorrect action performance-Pilot - C
3. Environmental issues-Conditions/weather/phenomena-Wind-Gusts-Response/compensation - C

Narrative

According to the pilot, as he approached his destination airport, he radioed the Unicom and requested airport advisories. He was advised that traffic was landing on runway 24, and the wind was reported at 310 degrees at 9 knots. During his first approach he believed he was too high and executed a go-around. He re-entered the pattern from the northwest for landing. As he descended down to the "numbers" a wind shear struck the airplane and the stall alarm sounded along with a drop in airspeed. He made an attempt to go-around, but was to "low and slow". He was unable maintain altitude, landed hard and veered off of the left side of the runway. The airplane struck some small trees and the right wing was torn from the fuselage. The reported wind at the accident airport near the accident time was from 290 degrees at 10 knots, gusting to 18 knots.

Accident Rpt# LAX08FA286	**08/28/2008 1434 PDT**	**Regis# N212HB**	**Las Vegas, NV**	**Apt: North Las Vegas VGT**
Acft Mk/Mdl PIPER PA-31-350		**Acft SN 31-8152072**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING LTIO-540-J2B		**Acft TT 6373**	**Fatal 1 Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: AERONET SUPPLY		**Opr dba:**		**Aircraft Fire: IFLT**
				AW Cert: STN

Summary

During climb a few minutes after takeoff, a fire erupted in the airplane's right engine compartment. About 7 miles from the departure airport, the pilot reversed course and notified the air traffic controller that he was declaring an emergency. As the pilot was proceeding back toward the departure airport witnesses observed fire beneath, and smoke trailing from, the right engine and heard boom sounds or explosions as the airplane descended. Although the pilot feathered the right engine's propeller, the airplane's descent continued. The 12-minute flight ended about 1.25 miles from the runway when the airplane impacted trees and power lines before coming to rest upside down adjacent to a private residence. A fuel-fed fire consumed the airframe and damaged nearby private residences.

The airplane was owned and operated by an airplane broker that intended to have it ferried to Korea. In preparation for the overseas ferry flight, the airplane's engines were overhauled. Maintenance was also performed on various components including the engine-driven fuel pumps, turbochargers, and propellers. Nacelle fuel tanks were installed and the airplane received an annual inspection. Thereafter, the broker had a ferry pilot fly the airplane from the maintenance facility in Ohio to the pilot's Nevada-based facility, where the ferry pilot had additional maintenance performed related to the air conditioner, gear door, vacuum pump, and idle adjustment. Upon completion of this maintenance, the right engine was test run for at least 20 minutes and the airplane was returned to the ferry pilot.

During the following month, the ferry pilot modified the airplane's fuel system by installing four custom-made ferry fuel tanks in the fuselage, and associated plumbing in the wings, to supplement the existing six certificated fuel tanks. The ferry pilot held an airframe and powerplant mechanic certificate with inspection authorization. He reinspected the airplane, purportedly in accordance with the Piper Aircraft Company's annual inspection protocol, signed the maintenance logbook, and requested Federal Aviation Administration (FAA) approval for his ferry flight. The FAA reported that it did not process the first ferry pilot's ferry permit application because of issues related to the applicant's forms and the FAA inspector's workload. The airplane broker discharged the pilot and contracted with a new ferry pilot (the accident pilot) to immediately pick up the airplane in Nevada and fly it to California, the second ferry pilot's base. The contract specified that the airplane be airworthy. In California, the accident pilot planned to complete any necessary modifications, acquire FAA approval, and then ferry the airplane overseas.

The discharged ferry pilot stated to the National Transportation Safety Board (NTSB) investigator that none of his airplane modifications had involved maintenance in the right engine compartment. He also stated that when he presented the airplane to the replacement ferry pilot (at most 3 hours before takeoff) he told him that fuel lines and fittings in the wings related to the ferry tanks needed to be disconnected prior to flight. During the Safety Board's examination of the airplane, physical evidence was found indicating that the custom-made ferry tank plumbing in the wings had not been disconnected.

The airplane wreckage was examined by the NTSB investigation team while on scene and following its recovery. Regarding both engines, no evidence was found of any internal engine component malfunction. Notably, the localized area surrounding and including the right engine-driven fuel pump and its outlet port had sustained significantly greater fire damage than was observed elsewhere. According to the Lycoming engine participant, the damage was consistent with a fuel-fed fire originating in this vicinity, which may have resulted from the engine's fuel supply line "B" nut being loose, a failed fuel line, or an engine-driven fuel pump-related leak. The fuel supply line and its connecting components were not located.

The engine-driven fuel pump was subsequently examined by staff from the NTSB's Materials Laboratory. Noted evidence consisted of globules of resolidified metal and areas of missing material consistent with the pump having been engulfed in fire. The staff also examined the airplane. Evidence was found indicating that the fire's area of origin was not within the wings or fuselage, but rather emanated from a localized area within the right engine compartment, where the engine-driven fuel pump and its fuel supply line and fittings were located. However, due to the extensive pre- and post-impact fires, the point of origin and the initiating event that precipitated the fuel leak could not be ascertained.

The airplane's "Pilot Operator's Handbook" (POH), provides the procedures for responding to an in-flight fire and securing an engine. It also provides single-engine climb performance data. The POH indicates that the pilot should move the firewall fuel shutoff valve of the affected engine to the "off" position, feather the propeller, close the engine's cowl flaps to reduce drag, turn off the magneto switches, turn off the emergency fuel pump switch and the fuel selector, and pull out the fuel boost pump circuit breaker. It further notes that unless the boost pump's circuit breaker is pulled, the pump will continuously operate.

During the wreckage examination, the Safety Board investigators found evidence indicating that the right engine's propeller was feathered. However, contrary to the POH's guidance, the right engine's firewall fuel shutoff valve was not in the "off" position, the cowl flaps were open, the magneto switches were on, the emergency fuel pump switches and the fuel selector were on, and the landing gear was down. Due to fire damage, the position of the fuel boost pump circuit breaker could not be ascertained.

Calculations based upon POH data indicate that an undamaged and appropriately configured airplane flying on one engine should have had the capability to climb between 100 and 200 feet per minute and, at a minimum, maintain altitude. Recorded Mode C altitude data indicates that during the last 5 minutes of flight, the airplane descended while slowing about 16 knots below the speed required to maintain altitude.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: A loss of power in the right engine due to an in-flight fuel-fed fire in the right engine compartment that, while the exact origin could not be determined, was likely related to the right engine-driven fuel pump, its fuel supply line, or fitting. Contributing to the accident was the pilot's failure to adhere to the POH's procedures for responding to the fire and configuring the airplane to reduce aerodynamic drag.

Events

1. Enroute-climb to cruise - Sys/Comp malf/fail (non-power)
2. Enroute-climb to cruise - Fire/smoke (non-impact)
3. Approach-VFR pattern final - Loss of engine power (total)
4. Approach-VFR pattern final - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Aircraft systems-Fuel system-Fuel distribution-Not specified - C
2. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Airspeed-Not attained/maintained
3. Aircraft-Aircraft systems-Fuel selector/shutoff valve-Not used/operated - F
4. Personnel issues-Task performance-Use of equip/info-Use of checklist-Pilot - F
5. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot

Sequence of Events

Type of Occurrence - Phase of Flight

Cause/Factor - Text

LOSS OF ENGINE POWER (PARTIAL) - NONMECHANICAL - CLIMB - TO CRUISE

- -

LOSS OF ENGINE POWER - MANEUVERING - TURN TO LANDING AREA (EMERGENCY)

CAUSE ENGINE COMPARTMENT - FIRE -

IN FLIGHT COLLISION WITH OBJECT - APPROACH - VFR PATTERN - FINAL APPROACH

----- OBJECT - TREE(S) -

----- OBJECT - WIRE,TRANSMISSION -

----- OBJECT - RESIDENCE -

Narrative

HISTORY OF FLIGHT

On August 28, 2008, at 1434 Pacific daylight time, a Piper PA-31-350 (twin engine airplane), N212HB, experienced a loss of right engine power during en route climb a few minutes after departing from runway 7 at North Las Vegas Airport (VGT), Las Vegas, Nevada. Thereafter, the pilot terminated his intended flight to Palo Alto, California (PAO), and attempted an emergency landing back at VGT. While descending on short final approach, the airplane collided with several objects and ultimately crashed in a residential area about 1.25 miles from the departure runway. The airplane was substantially damaged by fire. The airline transport pilot, who was the sole occupant in the airplane, was fatally injured. Of the five persons who were located at the impacted private residence, one received minor injuries, and four were not injured. The flight was performed under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed, and no flight plan was filed. The airplane was owned and operated by Aeronet Supply, an airplane brokerage company based in Gardena, California. The flight originated from VGT about 1422.

According to Aeronet's owner, the recently hired contract ferry (accident) pilot was intending to fly the airplane to Palo Alto (PAO), where the connection of

previously installed ferry tanks and avionics would be completed. Thereafter, upon obtaining Federal Aviation Administration (FAA) approval, the accident pilot was to ferry the airplane to Korea for delivery to its prospective new owner.

The National Transportation Safety Board investigator's review of recorded radar and audio data indicated that after the pilot took off from VGT's runway 7 (elevation 2,205 feet mean sea level (msl)), he commenced a counterclockwise left climbing turn to a westerly course. By 1427, the airplane had passed abeam and north of VGT and was climbing on a westerly track through 3,400 feet, as indicated by its altitude encoding Mode C transponder. By 1429, the airplane was about 5 miles west of VGT and had climbed to 3,900 feet, which was the maximum altitude gained during the accident flight.

During the next minute, the airplane commenced a left turn to a southwesterly heading and descended to 3,600 feet. By 1431, the airplane had descended to 3,500 feet and was about 7 miles west of VGT, which was the location farthest west of the airport that was reached during the flight. The pilot reversed course, and while tracking in an easterly direction (toward VGT) at 1431:29, the pilot advised the Las Vegas Terminal Radar Approach Control (TRACON) facility that he was declaring an emergency and desired to immediately return to VGT. By this time, the airplane had descended to 3,100 feet. Without delay, the TRACON controller cleared the pilot as requested.

At 1432:05, the pilot broadcast that he had an "engine failure rough engine." At this time, the airplane's altitude was 2,800 feet, and the airplane continued tracking toward runway 7. Its last recorded position was at 1433:48. At this time, the airplane had descended to 2,400 feet and was within about 400 feet of the initial point of impact (IPI).

Three witnesses were located at their residences within approximately 1.5 miles of each other and 6 to 7 miles west of VGT. The witnesses reported observing the accident airplane as it flew past their locations, and they provided statements of their observations.

The first witness stated that the airplane flew over her house. The witness stated "I heard several pops so I looked out my back window and saw the right side engine putting out black smoke." Thereafter, the airplane made a hard left turn and headed in an easterly direction toward VGT.

The second witness reported that he observed the airplane flying in a southerly direction past his home. Thereafter, the airplane turned toward the east. The witness stated that he initially observed puffs of smoke, and then there was a continuous stream of smoke coming from the airplane's right engine. No smoke was seen coming from the left engine. The smoke was white. As the airplane proceeded east of his location (toward VGT) flames were noted beneath the airplane's right engine. He stated that the flames were orange. Then, there was a "ball of flame" below the area of the engine. There were no flames anywhere else beneath the airplane. The witness stated that he heard three "boom" sounds that were like a backfire as the airplane descended.

The third witness provided the Safety Board investigator with a sketch documenting his observations regarding the airplane's flight track, fire, and smoke. The witness reported observing the airplane flying in a southerly direction over his residence. The witness stated that he lost sight of the airplane for a few seconds, and when he reacquired visual contact with it, the airplane was about 1 mile south of his location and was heading in an easterly direction toward VGT. The witness stated that he saw a "continuous stream" of white smoke streaming from the right engine of the airplane as it was descending in an easterly direction. The witness further reported that he observed fire and flames beneath the right engine. No fire was present beneath the right wing tip area. When the flames increased in size, he heard a couple of explosions and saw a fireball that got larger.

The third witness also stated that the left engine produced two or three quick puffs of smoke. One smoke stream was about 20 feet long, and then the smoke stopped. At no time did he observe fire coming from the left engine. During the entire time the witness observed the airplane, he heard a continuous engine running sound, and at no time did he hear "sputtering." The witness also stated that the airplane's landing gear was retracted.

As the airplane approached the airport, a witness driving on the street several houses away from the crash site observed it. The witness stated that as the airplane descended, she saw smoke and flames emanating from its right side. The airplane impacted power lines, nosed over, and crashed into a house in an inverted attitude. Thereafter, an explosion, fireball, and smoke were observed.

The Safety Board investigator's examination of the accident site revealed evidence of a severed tree top, downed power lines, and the airplane's right wing tip in the street, yards west of the main wreckage. The airplane's fuselage came to rest in an inverted attitude on a concrete block wall between two houses.

Several unidentified first responders reported to the Safety Board investigator that the airplane was engulfed in flames immediately upon impacting the ground.

PERSONNEL INFORMATION

The 38-year-old pilot held an airline transport pilot certificate. He had commercial privileges for single engine land and sea airplanes. The pilot also held an airframe and powerplant mechanic certificate with inspection authorization.

According to the pilot's resume, dated August 26, 2008, his total flight time was 3,195.3 hours. He had 2,733.1 hours as pilot-in-command, and 797.7 hours in airplanes. The pilot reported to the airplane's owner that he had 100 hours of flying experience in the PA-31 model of airplane.

In May 2007, the pilot was issued a first-class aviation medical certificate with the restriction that he wear corrective lenses. On this date, the pilot reported that his total flight time was 2,510 hours. A review of the pilot's initial flight training logbooks revealed no evidence of military flight training.

The pilot had no reported previous flying experience in the accident airplane. The pilot was not familiar with the specific ferry tank installation in the accident airplane.

AIRPLANE INFORMATION

The Piper PA-31-350 "Chieftain," serial number 31-8152072, was manufactured in 1981. The FAA issued the airplane a standard airworthiness certificate in the normal category. The airplane was equipped with Lycoming model TIO- and LTIO-540-J2B (left and right) 350 horsepower engines, Garrett turbochargers, and Hartzell propellers. At the time of the accident flight, the airplane's total time was about 6,373 hours. The engines' total time since last major overhaul was about 26 hours.

The operator reported that the airplane's weight during the accident flight was 6,600 pounds. The airplane's FAA certificated maximum gross weight is 7,000 pounds.

Modifications to Airframe

The airplane's flight performance characteristics had been modified by, in part, installation of Boundary Layer Research, Inc., vortex generators, and Colemill Enterprises, Inc., Panther conversion winglets.

According to the Boundary Layer Research's flight manual supplement included in the airplane's "Pilot's Operating Handbook" (POH), at the accident weight the single engine climb speed is about 105 knots (indicated airspeed).

Fuel System Design and Fuel Pumps

In an unmodified PA-31-350, fuel is routed from the wing fuel cells to the selector valve, the fuel filter, the fuel boost pump, the emergency fuel pump, the firewall shutoff, the engine driven fuel pump, and then to the fuel injectors. The engine driven fuel pump and its associated fuel line are located in the engine compartment forward of the turbocharger.

According to the Piper Aircraft Company, each engine is equipped with an engine driven fuel pump, an emergency fuel pump, and a fuel boost pump. The engine driven fuel pumps run continuously, and they are not controllable by the pilot.

The emergency fuel pumps are installed for emergency use in case the engine driven pumps fail. The emergency fuel pumps are also used for takeoff and landing and, when necessary, to prime the engines. Control switches for the emergency fuel pumps are located in the cockpit's overhead switch panel.

The fuel boost pumps operate continuously and are provided to maintain fuel under pressure to the other fuel pumps. There are no fuel boost pump control switches. Each fuel boost pump is controlled by a separate circuit breaker, located in the circuit breaker control panel. The fuel boost pumps are activated when the master switch is turned on, and they continue to operate until the master switch is turned off or the fuel boost pump circuit breakers are pulled to the off position.

Each wing contained an inboard main, outboard (auxiliary), and a nacelle fuel tank, which was located aft of the engine. The main and auxiliary tanks were standard Piper Aircraft components. The nacelle fuel tanks were installed prior to completion of the airplane's June 2008 annual inspection.

Fuel System Tank Modification

The original ferry pilot indicated that he had modified the fuel system to accommodate ferry fuel tanks. (The original ferry pilot was not the accident pilot. See the "Maintenance History" and the "Ferry Flight Arrangements" sections for additional information regarding the original ferry pilot.) This modification involved installing three ferry fuel tanks into the passenger cabin, and one ferry tank into the airplane's nose. These four tanks supplemented the existing six wing fuel tanks.

The original ferry pilot stated that the connections between his ferry tanks and the airplane's fuel system required fabrication and installation of a flexible fuel line to the tee fitting he placed in each wing. These fuel lines and tee fittings were located between the wing's fuel selector valve and the fuel strainer. To restore the airplane to its original Piper factory design, these fabricated fuel lines would have to be removed. The pilot further stated that none of his modifications involved fuel line connections within the engine compartment.

Pilot's Operating Handbook (POH) Information, Securing an Engine

Regarding in-flight fires, the POH states, in part, that the pilot should move the firewall shutoff valve of the affected engine to the off position. Then, he should close the throttle, feather the propeller, place the mixture control in the idle cutoff position, close the engine's cowl flaps to reduce drag, and secure the engine. To secure the engine, the pilot should turn off the magneto switches, the emergency fuel pump switch, and the fuel selector. The pilot should also pull out the fuel boost pump circuit breaker. The landing gear should be extended when landing is assured.

METEOROLOGICAL INFORMATION

During the airplane's approach to VGT at 1433, a controller advised the pilot that the local wind was "variable at four." At 1442, the following weather observation was taken at VGT: Wind calm; visibility 10 miles; sky clear; temperature 40 degrees Celsius; dew point 1 degree Celsius; and altimeter 29.77 inches of mercury.

Several photographs of the accident scene were taken before and after arrival of local fire department personnel. The photographs show a column of smoke rising vertically upward above the accident site.

WRECKAGE AND IMPACT INFORMATION

During an examination of the accident site and airplane wreckage, evidence was found indicating the airplane initially collided with and severed the top of a tree, at a height estimated between 50 and 75 feet above ground level. This initial point of impact (IPI) occurred about 1.25 miles west-southwest (251 degrees magnetic) from runway 7's threshold (elevation 2,204 feet msl), and about 650 feet south of the runway's extended centerline. Felled tree branches and Plexiglas airplane fragments were located a few yards from the branches.

There was evidence that the airplane next collided with residential power lines suspended between poles. Downed power lines were located on the west side of a north-south oriented city street. The impacted lines were located about 150 feet east of the IPI.

About 90 feet farther east, a few feet from a fire hydrant on the street's east curb, green navigation light lens fragments were located along with the airplane's partially burned right wing tip (winglet).

The main wreckage was located about 70 feet east of the right winglet. This location was adjacent to a driveway on which there was a crushed automobile containing the airplane's right propeller assembly. The fragmented and melted main wreckage was next to a two story residence that had been partially consumed by fire. Remnants of the airplane's fuselage were found on the ground in this area, a few yards south of the house. The cockpit, associated components, and portions of the fuselage were also observed in this area. Some components were leaning against the north and south face of a block wall in an inverted attitude and were melted.

In the main wreckage area, fragmented and melted airplane components were located comingled with the homeowner's property. This property was also destroyed by fire and included various pipes, fittings, and machinery amid other debris.

The magnetic bearing and distance between the IPI and the main wreckage was about 095 degrees and 280 feet. The main wreckage elevation was about 2,260 feet msl.

The global positioning system coordinates of the main wreckage were: 36 degrees 12.683 minutes north latitude by 115 degrees 13.479 minutes west longitude.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy on the pilot was performed by the Clark County Coroner, Las Vegas. The autopsy report lists the cause of death as extensive thermal injury and multiple blunt force trauma.

The FAA's Civil Aerospace Medical Institute performed forensic toxicology on specimens from the pilot. No evidence of carbon monoxide, cyanide, or ethanol was detected. In addition, no drugs of abuse were detected.

TESTS AND RESEARCH

Performance Data, Climb and Airspeed

The radar data indicates that about 1429, the airplane began reversing course and descending below the 3,900-foot maximum altitude it had attained during the flight. At this time, the airplane's ground speed was 125 knots. By 1434, the airplane had descended to 2,400 feet, and it had slowed to 100 knots.

The Safety Board investigator examined the Boundary Layer Research's flight manual supplement in the airplane's POH. Under the atmospheric conditions that prevailed at the time of the accident, an undamaged appropriately configured and properly flown PA-31-350 airplane should have had the capability to climb between 100 and 200 feet per minute with an inoperative engine. At the minimum, with one secured engine, an airplane should have had the capability to maintain altitude. Recorded Mode C altitude and flight track data indicates that the airplane descended from the time it reversed course until it impacted terrain.

To achieve the aforementioned climb performance, the airplane must be flown at 105 knots, indicated airspeed (IAS). The radar data indicates that the airplane's speed decreased to a ground speed of 100 knots. (Note: assuming zero wind, ground speed equals true airspeed (TAS).) Under the existing atmospheric conditions, an airplane flying at a TAS of 100 knots would have an IAS of 89 knots. This IAS is 16 knots slower than the required 105 knots IAS specified in the POH to achieve maximum single engine climb performance.

Maintenance History

In June 2008, an annual inspection was performed on the airplane by a FAA certified repair station located in Ohio. According to logbook entries, at the time the airplane's total time was 6,352.4 hours (Hobbs meter 2,364.7 hours), and the engines' total time since major overhaul was 5.2 hours. Part of the maintenance accomplished involved installing nacelle fuel tanks and overhauled engine driven fuel pumps, engines, propellers, and turbochargers. Upon the repair station's completion of its maintenance, the original ferry pilot picked up the airplane and flew it to VGT.

At VGT, after flying the airplane several hours, the original pilot had a VGT-based FAA certified repair station perform additional maintenance in part related to the air conditioner, gear door, vacuum pump and idle adjustment. This maintenance was accomplished in preparation for the airplane's export ferry flight. On July 28, 2008, at an airplane Hobbs meter time of 2,383.9 hours, the repair station recorded in the airplane's maintenance records that it had performed an engine run and leak check. The results were good. The VGT-based repair station personnel reported that it had test run the right engine between 20 and 30 minutes with its cowling removed. At the time of their maintenance, the ferry tanks had not been installed in the airplane. Also on July 28, 2008, the VGT repair station personnel returned the airplane to the original ferry pilot, and they did not see the airplane again.

Thereafter, the original ferry pilot modified the airplane by installing the four additional fuel tanks in the fuselage to supplement the airplane's existing six tanks, and he also connected the ferry tanks to the airplane's existing FAA certificated fuel system. The connections involved installation of custom made fuel lines and fittings. (See "Fuel System Design and Fuel Pumps" for details.)

Part of the ferry flight preparations to export the airplane to Korea involved acquiring FAA approval from the Las Vegas Flight Standards District Office (FSDO). The original ferry pilot submitted his export request to the FSDO for its approval.

On August 10, 2008, the original ferry pilot recorded in the airplane's maintenance logbook the following statement: "I have reviewed all the current AD's for this aircraft and no further action is required at this time.... I certify that I have completed an inspection of this aircraft in accordance with the Piper PA31-350 Service

Manual Annual Inspection Checklist and have found the aircraft to be in airworthy condition...." The original ferry pilot signed and dated the logbook with his Airframe and Powerplant mechanic certificate number and indicated that he had inspection authorization (IA). The airplane's Hobbs meter time was listed as 2,384.9 hours, and the airplane's total time was listed as 6,372.6 hours. The engines' and propellers' listed total time since overhaul was 25.4 hours. Having completed this maintenance, tank installations, and export document preparation, the original ferry pilot approached the Las Vegas FSDO with a request for ferry flight authorization.

Ferry Flight Arrangements

FSDO personnel did not issue ferry flight approval to the original ferry pilot. Additionally, the original pilot was informed that, if the airplane was to be flown to another FSDO (to acquire ferry flight approval), prior to flight the installed ferry tanks had to be disconnected from the airplane's Piper factory fuel system thereby returning the airplane to its original FAA approved configuration.

The original ferry pilot then notified the airplane's owner-operator (Aeronet) that he was unable to acquire FDSO approval to export the airplane to Korea in the desired time frame. As a result, Aeronet discharged the original ferry pilot and hired another ferry pilot (the accident pilot). The accident pilot was to pick up the airplane in VGT and fly it to PAO, where the accident pilot opined the FAA would be more responsive to the request for export.

On August 26, 2008, the newly hired accident pilot signed a contract with Aeronet to fly the accident airplane from VGT to Korea, via PAO. The flight was to occur on or after August 28, 2008. In part, the contract specified that Aeronet "...shall provide aircraft in airworthy condition and in compliance with aircraft type certificate...." The owner of Aeronet and the original ferry pilot reported to the Safety Board investigator that the accident pilot was aware his flight from VGT to PAO was not considered a ferry flight.

The accident pilot advised the original ferry pilot that he would fly on an airline to Las Vegas, arriving there at 1040 on August 28, 2008. Thereafter, he would proceed to VGT to pick up the accident airplane. He planned to fly the airplane from VGT to PAO, whereupon he would obtain the required export/ferry flight authorization from the FAA. The accident pilot informed the original ferry pilot that he planned to depart VGT (on the accident flight) at 1400. The original ferry pilot asserted to the Safety Board investigator that he had informed the accident pilot of the requirement to disconnect the ferry tanks from the airplane's fuel system prior to his flight to PAO.

Airframe Examination, Fire Evidence

The airplane wreckage was initially examined at the accident site. Additional examinations of the airframe, engines, and propellers were performed following the airplane's recovery. In addition, maintenance records were reviewed regarding the installation of the fuel tanks and related plumbing.

During the on scene investigation, the Safety Board investigator noted that the left engine was found in an exposed area of the crash site, whereas the right engine was located beneath debris and was somewhat shielded from fire.

Most of the airplane's structure was consumed by fire. Portions that remained were laid out and examined. They principally consisted of right wing segments and its nacelle fuel tank, the right horizontal stabilizer and elevator, a portion of the cockpit roof, a portion of a passenger cabin interior fuel tank, and engine and propeller assemblies. Also, fractured and partially melted components (fuel system fittings) were found in the wreckage.

A fire and explosion investigator from the Safety Board's Office of Research and Engineering, Materials Laboratory Division, Washington, D.C., also examined the wreckage. The investigator noted that the thermal damage to the left engine was uniform on its inboard and outboard sides.

The investigator reported that the right wing's nacelle fuel tank exhibited evidence of having been over pressurized, as demonstrated by the outward bowing of its aluminum structure in all directions and split weld seams. In the airplane, the nacelle tank was installed aft of the right engine's firewall.

The fire and explosion investigator further reported that the right engine sustained more thermal damage on its inboard side than on its outboard side. As photographically documented, severe thermal damage was observed in the vicinity of the turbocharger and engine driven fuel pump, which was partially melted on the inboard side of its circumference.

Airframe Examination, Components

Components from remnants of the airplane's electrical system, left and right wing fuel system, instrument panel, and landing gear assembly were examined. In pertinent part, the following observations were noted:

Switches

The two left engine magneto switches and the two right engine magneto switches were found in the "ON" position. Both the left and right engine emergency fuel pump switches were found in the "ON" position.

Fuel System, Right and Left Wings

The right and left wing root areas each contained a fuel shutoff valve and two electric fuel pumps. Also found at the crash site were two tee fittings that were not components of the manufactured Piper airplane.

Specifically, at the crash site a tee fitting was identified by the original ferry pilot as being the tee fitting that was installed in the wing between the right wing's fuel selector valve and the fuel filter assembly. It was the fuel system component that connected a flexible fuel line to the ferry tanks. The fractured surfaces of the tee fitting component and the fuel selector component visually matched each other, which was consistent with the tee fitting having been connected to the airplane's fuel system at the time of the accident.

According to the Piper participant, under the FAA approved fuel system configuration for the airplane, the tee fitting would not be installed, and a flexible fuel line would connect the fuel selector valve engine port to the fuel filter assembly. Installation of the tee fitting component was not a Piper approved design modification.

During the on-scene wreckage examination, a 6-inch-long braided fuel line was found in an area of congealed aluminum material. No fittings were connected to either end of the fuel line. The fuel line was identified by the original ferry pilot as being the original fuel line for the airplane's fuel system, and he indicated that it should have been connected to the airplane's fuel system in lieu of the tee fitting.

The right engine's fuel shutoff valve was found in the open position. The fuel tank selector valve was found in an open position, allowing fuel to flow from a wing tank to the engine.

Landing Gear & Flight Controls

The landing gear selector lever was found in the gear up position. The section of cockpit panel in which the control column and landing gear selector were located was fire damaged. Also, the panel was bent and was separated from adjacent structure.

The landing gear's left main down lock was found engaged, and the up lock was present. The up lock was not distorted. The gear actuator was found extended, and this is consistent with the gear being down and locked, according to the Piper participant.

The rudder trim position was measured, and it was found in the full left rudder trim setting. The actuators were found for both the left and right wing flaps and the engine's cowl flaps. The actuator positions corresponded to the wing flaps being fully retracted (up) and the engine's cowl flaps being open.

Propeller Examination

Under Safety Board investigator observation, the propeller assemblies were examined by personnel at Hartzell Propeller, Inc. In summary, the Hartzell participant indicated that the left propeller exhibited deformation and impact signatures consistent with rotation with power on, as noted by scoring, torsional twisting, and a missing blade tip. Hartzell engineering staff calculated that, based upon blade angle-related witness marks, at impact the left engine was producing its maximum rated horsepower.

The right propeller exhibited signatures consistent with little or no rotational energy at the time of impact. The blades appeared to have been feathered. No discrepancies were noted with either propeller assembly that would have precluded normal operation.

Engine Examination

Both Lycoming engines and all of the accessories were fire damaged. Following the external examination of the left engine, the Lycoming Engine participant opined that no evidence was found that would have precluded it from making power prior to impact. The left engine's fuel pump sustained notably less thermal damage than the right engine's fuel pump.

Regarding the right engine, no evidence of a preimpact mechanical malfunction was found. The right engine's crankshaft was rotated. Thumb compression was noted in all cylinders except cylinder numbers 3 and 6, which were thermally distressed. No evidence of any internal engine component malfunction was observed. The attached engine driven fuel pump had sustained fire damage in the area of the fuel outlet port. A localized area of the pump's housing was missing in this area. According to the Lycoming engine participant, this is consistent with the fuel supply line "B" nut being loose, a failed fuel line, or an engine driven fuel pump anomaly. The fuel supply line and its connecting components were not located.

Turbocharger Examination

Both the left and right engine's Garrett turbochargers were fire damaged. The right engine's turbocharger was found secure to its mountings. No preimpact exhaust system disconnects were observed. The turbocharger compressor and turbine impellers remained intact and appeared undamaged. The turbine was free to hand rotate and was devoid of foreign object ingestion damage. Each exhaust system clamp was found secure. The exhaust bypass valve (wastegate) remained securely attached. No anomalies were noted regarding the turbocharger's installation.

Engine Driven Fuel Pump Examination

The engine driven fuel pumps were also examined by the Safety Board's Office of Research and Engineering, Materials Laboratory Division. Noted evidence consisted of globules of resolidified metal and areas of missing material consistent with the pumps having been engulfed in fire. As observed and photographed in side-by-side comparisons, there was more fire damage, distortion and missing material to the right pump than to the left pump.

ADDITIONAL INFORMATION

Responding to In-Flight Fires

As published in the FAA's "Airplane Flying Handbook," (FAA publication H-8083-3A , Chapter 16) "A fire in flight demands immediate and decisive action. The pilot therefore must be familiar with the procedures outlined to meet this emergency contained in the AFM/POH for the particular airplane." If the engine compartment fire is oil-fed, thick black smoke may be evident. A fuel-fed fire may produce bright orange flames.

"An in-flight engine compartment fire is usually caused by a failure that allows a flammable substance such as fuel, oil or hydraulic fluid to come in contact with a hot surface. This may be caused by a mechanical failure of the engine itself, an engine driven accessory, a defective induction or exhaust system, or a broken line. Engine compartment fires may also result from maintenance errors, such as improperly installed/fastened lines and/or fittings resulting in leaks."

"By the time a pilot becomes aware of an in-flight engine compartment fire, it usually is well developed. Unless the airplane manufacturer directs otherwise in the AFM/POH, the first step on discovering a fire should be to shut off the fuel supply to the engine by placing the mixture control in the idle cut off position and the fuel selector shutoff valve to the OFF position."

Accident Rpt# ERA10LA110 01/06/2010 1646 CST	**Regis# N8448Y**	**Auburn, AL**	**Apt: Auburn-opelika Airport AUO**	
Acft Mk/Mdl PIPER PA-32R-301T	**Acft SN 32R-8129111**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING TI0-540 SER	**Acft TT 3030**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: SAADEH MAMDOUH	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: STN	

Summary

After landing, the pilot applied the brakes to slow the airplane for a left turn off the runway. Instead, the airplane began a turn to the right, which could not be corrected with left brake application. The airplane departed the right side of the runway and came to a stop upright on a grass apron. A postaccident examination of both the left and right brakes by an aircraft mechanic revealed that the brakes turned freely with no dragging noted and that they appeared to be functional at the time of the examination.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's loss of directional control after landing, which resulted in a runway excursion.

Events

1. Landing-landing roll - Loss of control on ground

Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C

Narrative

On January 6, 2010, at 1646 central standard time, a Piper PA-32R-301T, N8448Y, was substantially damaged during a runway excursion after landing at the Auburn-Opelika Airport (AUO), Auburn, Alabama. The private pilot was not injured. Visual meteorological conditions prevailed for the personal flight conducted under the provisions of Title 14 Code of Federal Regulations Part 91. The flight originated from the Thomaston-Upson County Airport (OPN), Thomaston, Georgia, at 1615.

The pilot stated that after landing on runway 36 he applied the brakes to slow the airplane for a left turn off the runway. Instead, the airplane began a turn to the right, which could not be corrected with left brake application. The airplane departed the right side of the runway, the left main landing gear collapsed, and the airplane stopped upright on the grass apron.

According to Federal Aviation Administration (FAA) airman records, the pilot was issued a private pilot certificate with a rating for airplane single engine land, multi-engine land, and instrument airplane. However, the pilot had surrendered his certificate to the FAA one month prior to the accident. His most recent FAA third class medical certificate was issued on September 8, 2009, at which time the pilot reported 1,386 total hours of flight experience, 170 hours of which were in the same make and model of the accident airplane. He reported 20 total hours of flight experience in the 90 days preceding the accident.

According to FAA and maintenance records the airplane had accrued 3,030 total hours. Its most recent annual inspection was completed on January 1, 2010, at 3,029 hours.

At 1655, the weather reported at AUO, included clear skies and wind from 280 degrees at 4 knots. The visibility was 10 miles. The temperature was 3 degrees C and the dew point was -13 degrees C.

Examination of the airplane at the accident site by an FAA inspector revealed substantial damage to the left wing spar, a twisted fuselage, and collapsed landing gear. A detailed examination of the brakes was completed by a licensed airframe and powerplant mechanic. The mechanic reported that both the left and right brakes turned freely with no dragging noted and that the brake system appeared to be functional.

Accident Rpt# WPR10FA273 05/30/2010 830 MDT	**Regis# N44MC**	**Lincoln, MT**		
Acft Mk/Mdl PIPER PA-34-220T	**Acft SN 34-8133095**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR TSIO-360 SER	**Acft TT 3851**	**Fatal 2 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: MARC A. DOBROWITSKY	**Opr dba:**		**Aircraft Fire: NONE**	
			AW Cert: STN	

Summary

The instrument-rated pilot was on a visual-flight-rules cross-country flight over mountainous terrain in instrument meteorological conditions. The airplane was one of a flight of twelve participating in a guided air tour. Approximately 20 minutes after takeoff, the pilot of the accident airplane reported that he was encountering clouds at 8,500 feet and had received a global-positioning-system low-altitude alert. Minutes later there was an indistinct radio transmission believed to be the accident pilot; the transmission was followed by a radio transmission believed to be the passenger of the accident airplane who stated they had a problem and the airplane had hit trees. Scattered to broken cloud layers existed between 7,000 to 7,500 feet, with rain and mountain obscuration in the area of the accident. The wreckage was located in steep tree-covered terrain at 6,780 feet. Multiple trees with fresh slash marks were noted in the area of the wreckage. Postaccident examination of the aircraft wreckage showed no evidence of a preimpact mechanical malfunction or failure.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's decision to continue flight into an area of low ceilings and low visibility and his failure to maintain sufficient clearance from mountainous terrain.

Events

1. Enroute-cruise - VFR encounter with IMC
2. Enroute-cruise - Loss of visual reference
3. Enroute-cruise - Controlled flight into terr/obj (CFIT)

Findings - Cause/Factor

1. Personnel issues-Task performance-Planning/preparation-Weather planning-Pilot - C
2. Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Pilot - C
3. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Low ceiling-Effect on operation
4. Environmental issues-Conditions/weather/phenomena-Ceiling/visibility/precip-Low visibility-Effect on operation
5. Environmental issues-Physical environment-Terrain-Mountainous/hilly terrain-Effect on operation
6. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Altitude-Not attained/maintained - C

Narrative

HISTORY OF FLIGHT

On May 30, 2010, about 0830 mountain daylight time, a Piper PA-34-220T Seneca airplane, N44MC, sustained substantial damage following an in-flight collision with trees and mountainous terrain approximately 7 miles west of Lincoln, Montana. The private pilot and passenger were fatally injured. The airplane was registered to R&D Aviation, Inc, of Huntington Woods, Michigan, and operated by the pilot as a visual flight rules (VFR) cross-country flight under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91. Instrument meteorological conditions prevailed in the vicinity at the time of the accident. A VFR flight plan was filed but not activated for the flight that originated from Helena, Montana at 0812. The pilot's planned destination was Cranbrook, British Columbia, Canada (CYXC).

The airplane was one of a flight of twelve participating in a guided air tour. The multiple day tour originated at Helena on May 30, with a planned final destination of Friday Harbor, Washington. The tour itinerary included multiple overnight stops throughout Canada and Alaska before a planned arrival at Friday Harbor on June 13. The tour group planned to depart Helena on May 29, but was delayed by one day due to poor weather conditions.

The accident airplane departed Helena at 0812. Approximately 20 minutes later the pilot of the accident airplane reported (to the tour organizer who was piloting the lead aircraft) that he was "5 miles to Seeley Lake at 8,500 feet." Shortly thereafter, the accident pilot reported that he was "encountering clouds at 8,500 feet and receiving a low-altitude alert on his GPS [ground positioning unit]." The group leader stated that he advised the accident pilot to remain in visual conditions and maintain visual contact with the ground. The lead pilot reported that "minutes" later there was a indistinct radio transmission believed to be the accident pilot, followed by a radio transmission believed to be the passenger of the accident airplane who stated "we have a problem" followed by "we've hit trees."

There was no further radio communications with the accident pilot. Later that day, at 1202, the Federal Aviation Administration (FAA) issued an Alert Notice (ALNOT) for the missing airplane.

On June 1, about 1430, Montana Civil Air Patrol personnel located the airplane wreckage in a heavily wooded remote area west of Lincoln, Montana.

PERSONNEL INFORMATION

The pilot, age 60, held a private pilot certificate with ratings for airplane single engine land, multiengine land and instrument airplane. On the pilot's most recent application for a FAA medical certificate, dated September 21, 2009, the pilot listed 1,522 total flight hours and 39 flight hours during the six month period preceding the application.

The pilot held a second-class medical certificate issued on September 21, 2009. The medical certificate stipulated a limitation that required the pilot to wear corrective lenses while exercising the privileges of the medical certificate.

Personal flight time logbook records for the pilot were not located.

AIRCRAFT INFORMATION

The airplane was a Piper PA-34-220T Seneca, serial number 34-8133095. The low-wing, twin-engine airplane was powered by two Teledyne Continental Motors TSIO-360 reciprocating engines, each rated at 200 maximum continuous horsepower.

Maintenance records for the airplane showed that an annual inspection of the airframe and engines was completed in April of 2010. No open maintenance discrepancies were noted.

METEOROLOGY INFORMATION

The aviation weather observation at the departure airport in Helena, approximately 45 miles southeast of the accident site, at 0853 was, in part, calm winds, visibility unrestricted at 10 miles, a few clouds at 5,000 feet, temperature 7 degrees Celsius (C), dew point 3 degrees C, altimeter 30.00 inches of Mercury.

The aviation weather observation at Drummond, Montana, approximately 30 miles southwest of the accident site, at 0840 was, in part, calm winds, visibility unrestricted at 10 miles, broken clouds at 5,500 feet, temperature 7 degrees Celsius (C), dew point 4 degrees C.

A pilot flying in the vicinity of the accident site, about the time of the accident, reported a scattered to broken cloud layer with bases between 7,000 to 7,500 feet msl, with rain and mountain obscuration.

WRECKAGE AND IMPACT INFORMATION

The crash site was located in mountainous terrain at an elevation of approximately 6,780 feet. The terrain angle was approximately 30-40 degrees with a dense cover of conifer trees. The wreckage debris field encompassed an area approximately 45 feet in length (from approximately southeast to northwest). A large conifer tree with fresh slash marks was observed adjacent (upslope) to the impact crater. The tree was topped approximately 25 feet above its base. Multiple trees with fresh slash marks were observed along the wreckage path.

A majority of the wreckage was located in the confines of a large impact crater measuring approximately 15 feet in diameter and approximately 4 feet deep. The fuselage was oriented to a heading of approximately 270 degrees magnetic. All aerodynamic flight control surfaces and a majority of the aircraft components were located in the immediate area of the impact crater. The main wreckage, which consisted of the cockpit, fuselage and both engines, was located within the confines of the impact crater. The forward section of the airplane was destroyed. The wings, empennage and associated flight control surfaces were located adjacent to the main wreckage. The outboard end of the right wing, from an area near half span of the aileron to the tip of the wing, and aileron tip, were missing and not recovered. Heavy impact damage consistent with tree strikes was noted to both wings.

Both engines and associated propeller assemblies were located within the impact crater. The engine assemblies were partially separated from their respective firewalls and located at the bottom of the crater.

MEDICAL AND PATHOLOGICAL INFORMATION

Postaccident toxicological testing was performed by the FAA's Civil Aerospace Medical Institute. The postmortem toxicology report indicated that specimens from the pilot tested positive for acetaminophen and diphenhydramine. Ethanol was detected in the pilot's muscle specimens. Information noted in the July 30, 2010, toxicological report indicated that the ethanol found was from sources other than ingestion.

Diphenhydramine (commonly known by the trade name Benadryl) is an over-the-counter antihistamine with sedative effects, often used to treat allergy symptoms or as a nighttime sedative.

ADDITIONAL INFORMATION

On July 13, 2010, the engines were examined at a hangar facility in Belgrade, Montana, by representatives from the National Transportation Safety Board, Teledyne Continental Motors and Piper Aircraft. The engines sustained extensive impact related damage; however, no evidence of internal component failure, anomalous wear or preimpact mechanical malfunction was noted.

Accident Rpt# CEN11LA117	**12/18/2010 1705 CST**	**Regis# N92358**	**Lake Elmo, MN**		
Acft Mk/Mdl PIPER PA-46-350P		**Acft SN 4622147**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING TIO-540-AE2A		**Acft TT 1754**	**Fatal 0 Ser Inj 0**	**Flt Conducted Under: FAR 091**	
Opr Name: RICHARD DAVIDSON		**Opr dba:**		**Aircraft Fire: NONE**	

Summary

About an hour after takeoff the airplane was in cruise flight at 16,500 feet mean sea level (msl) when the pilot heard a loud noise followed by a rapid cabin depressurization. The pilot rapidly descended to 10,500 feet msl. The pressurization stabilized and he continued to his destination airport. About 3 hours and 25 minutes after takeoff, the airplane was approaching the destination airport and was about 1,500 feet above ground level when the engine suddenly lost power. The pilot attempted to restart the engine by putting the mixture, propeller, and throttle controls full forward. He turned on the emergency fuel pump and engaged the starter button, but the engine did not start. The pilot executed a forced landing at night to a field that had about 2 - 2.5 feet of snow in it. During the landing roll, the left wing separated from the fuselage. The inspection of the airplane revealed that the right wing fuel tank was empty. The left wing fuel tank was intact and appeared to be full of fuel. The fuel selector was found on the left tank. The pilot reported that he was certain that he had switched tanks sometime during the climb, but was not certain if he had switched tanks after that. The pilot reported that the loss of engine power was the result of fuel starvation.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's improper fuel management which resulted in the loss of engine power due to fuel starvation. Contributing to the accident was the distraction of the cabin depressurization.

Events

1. Enroute-cruise - Fuel starvation
2. Enroute-cruise - Loss of engine power (total)
3. Emergency descent - Loss of engine power (total)
4. Landing-flare/touchdown - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Fluids/misc hardware-Fluids-Fuel-Fluid management - C
2. Personnel issues-Action/decision-Action-Incorrect action performance-Pilot - C
3. Personnel issues-Task performance-Workload management-Task allocation-Pilot - F

Narrative

On December 18, 2010, at 1705 central standard time (all times cst), a Piper PA-46-350P, N92358, sustained substantial damage during a forced landing to a snow filled field near Lake Elmo, Minnesota, after a loss of engine power in cruise flight. The private pilot and passenger received minor injuries. The 14 Code of Federal Regulations Part 91 personal flight departed Bowling Green-Warren County Regional Airport (BWG), Bowling Green, Kentucky, about 1340 with Anoka County-Blaine Airport (ANE), Anoka, Minnesota, as the intended final destination. Night visual meteorological conditions prevailed at the time of the accident. No flight plan was filed, but the pilot was receiving VFR flight following from air traffic control (ATC).

The pilot reported that about an hour after departing BWG, the airplane was in cruise flight at 16,500 feet mean sea level (msl) when he heard a "loud pop" and the airplane had a rapid decompression. The pilot made a rapid descent to 10,500 feet msl. The pressurization stabilized and the pilot continued the flight to ANE. He tried to troubleshoot the pressurization problem by checking the flight manual and making adjustments to the pressurization controls. About 1530, he climbed to 12,500 feet msl to check if the cabin pressurization remained steady. The pilot reported that it remained steady at 5.2 psi with a cabin pressure set at 1,000 feet. About 1615, the pilot started the descent to ANE utilizing VFR flight following.

The pilot reported that he was near Hudson, Wisconsin, which is located about 20 nautical miles east-northeast of the Minneapolis-St.Paul International Airport (MSP), at 2,500 feet msl (about 1,500 feet above ground level [agl]), when the engine lost power. He attempted to regain engine power by putting the mixture, propeller, and throttle controls full forward. He turned the emergency fuel pump on and engaged the starter button, but the engine did not restart. He attempted 2 - 3 times to contact MSP Approach Control to declare an emergency but did not get a reply. The pilot then initiated a forced landing to a snow filled field. He made another attempt to contact approach control and was successful. He informed ATC that the airplane was about 200 - 300 feet agl and he was executing a forced landing to a field. He reported that he switched fuel tanks prior to ground impact. The pilot lowered the landing gear and flaps and the stall warning horn was sounding as the airplane touched down in the field that had about 2 - 2.5 feet of snow in it. During the landing roll, the left wing separated from the fuselage. The airplane decelerated quickly and came to rest about 120 feet from the initial touchdown point. The pilot made a phone call to 911, and emergency personnel arrived about 5 - 10 minutes later.

A Federal Aviation Administration inspector examined the airplane at the accident site. The inspection of the airplane revealed that the right fuel tank was empty. The left wing had separated from the fuselage, but the left fuel tank was still intact and appeared to be full of fuel. The amount of fuel remaining in the left fuel tank was not measured, and the fuel selector was found on the left tank.

The pilot was questioned whether he had switched fuel tanks during the flight. He reported that he was certain that he had switched tanks sometime during the climb, but was not certain if he had switched tanks after that. When asked if fuel starvation had led to the loss of engine power, the pilot reported, "After hearing about the fuel situation in both wings, I have to agree with your assessment of fuel starvation."

The Piper PA-46-350P holds 120 gallons of fuel and has a maximum range of 1,261 nautical miles. The pilot reported that the airplane had 120 gallons of fuel on board when he departed BWG.

Accident Rpt# WPR10LA393	**08/10/2010 818 MDT**	**Regis# N2660A**	**Billings, MT**	**Apt: Billings Logan International BIL**
Acft Mk/Mdl PIPER PA18A		**Acft SN 18-2184**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320-A2B		**Acft TT 2850**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: 172 LLC		**Opr dba:**		**Aircraft Fire: NONE**

Summary

As the airplane approached the airport, the pilot was given clearance to land on runway 28L. The pilot reported that he also heard the tower controller tell an inbound helicopter to follow him. Review of a recording of the tower communications revealed that the controller actually instructed the helicopter to pass behind the airplane and cleared the helicopter to land on taxiway H in the opposite direction of the airplane. (Taxiway H was south of and parallel to runway 28L with a taxiway centerline to runway centerline distance of about 200 feet.) About 1 1/2 minutes later, the tower controller told the airplane pilot that there was a helicopter on his left side and that it would be landing on the taxiway adjacent to the runway. The airplane pilot did not acknowledge the transmission.

The airplane pilot said that he was planning to fly the airplane low over the runway and land long to expedite his ground taxi. As the airplane pilot flew low over the approach end of the runway, he was surprised to see the helicopter flying towards him. He thought it was flying over the edge of his runway and that its rotor wash would impact his airplane. However, radar data from an antenna located on the airport indicated that the two aircraft were horizontally separated by about 300 feet when they passed each other at a point about 885 feet from the approach end of the runway. Additionally, the helicopter pilot reported that his landing on taxiway H was accomplished about 300 feet from the airplane.

The airplane pilot stated that just as he was passing the helicopter, his left wing tip was violently slammed down. The airplane veered right about 30 to 40 degrees, stalled, and impacted the ground. A witness observed the airplane's left wing strike the runway before the airplane veered right off the runway and over the grass. Airport operations personnel located a yellow paint transfer mark on the runway surface about 1,616 feet from the approach end of the runway. The location and paint color of the transfer mark were consistent with the airplane's left wing tip impacting the runway when the airplane's fuselage was over the runway's right edge. Radar data indicated that, at the time the airplane produced the mark, the helicopter was more than 1,350 feet away.

At the time, the airplane was landing with a direct crosswind of about 6 knots from the left.

The FAA Aeronautical Information Manual states that "Pilots of small aircraft should avoid operating within three rotor diameters of any helicopter in a slow hover taxi or stationary hover." Since this helicopter's main rotor disc diameter was about 33.5 feet, the recommended distance to maintain from small airplanes in order to prevent downwash encounters was about 100 feet. Additionally, a representative from the helicopter manufacturer's safety department said that a helicopter descending during air taxiing and with a forward speed of about 58 mph, the helicopter's ground speed when it passed the airplane, would produce significantly less downwash relative to what it would produce when static hovering or hover taxiing.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's inadequate compensation for the wind conditions and failure to maintain lateral and directional control of the airplane during landing.

Events

1. Landing - Loss of control in flight
2. Uncontrolled descent - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
2. Environmental issues-Conditions/weather/phenomena-Wind-Crosswind-Contributed to outcome - C
3. Environmental issues-Conditions/weather/phenomena-Wind-Crosswind-Response/compensation - C
4. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
5. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Lateral/bank control-Not attained/maintained - C

Narrative

On August 10, 2010, about 0818 mountain daylight time, a Piper PA18A, N2660A, was substantially damaged during impact with terrain subsequent to a loss of aircraft control during landing at Billings Logan International Airport (BIL), Billings, Montana. The private pilot and his passenger received minor injuries. The airplane was being operated by 172 LLC of Park City, Montana, under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the personal cross-country flight, which had departed from Laurel, Montana, approximately 15 minutes before the accident. A flight plan had not been filed.

According to the pilot, BIL tower cleared him to land on runway 28L. The pilot reported hearing BIL tower tell an inbound helicopter to "follow the cub," and he heard the helicopter pilot respond "traffic in sight." The pilot said he was planning to fly low down the runway in order to exit at the runway 25 intersection. The pilot said that "just as I was touching down, I saw the helicopter flying towards me. He was on the left edge of the runway, definitely not over the [parallel] taxiway." The pilot stated that, just as he was passing the helicopter, his left wing tip was "violently slammed down." He further stated that he had the flaps fully extended, which "magnified the effect of the rotor wash." He further stated that he must have added power to try and correct the problem because the airplane "broke right and hit more turbulence and at that time went out of control to the right." Next, he remembers seeing the ground rushing towards him as the airplane "slammed" into the ground at an extremely steep angle.

The passenger in the airplane, who was a student pilot, said he was wearing a headset and was on intercom with the pilot. He said that as the airplane approached runway 28L for landing, the pilot lined up left of the runway centerline for landing. As the airplane passed over the end of the runway, he saw the helicopter for the first time. He thought it was over the accident airplane's left wing. The passenger said that next the airplane's left wing dipped hard, but did not touch the runway; he said it just missed the ground. He said the accident airplane "jumped" up to about 15 feet above ground level (agl) "as if rotor wash lifted it up." Next, the left wing rose up and the airplane veered to the right. Moments later, the airplane dropped steeply down with its left wing low impacting the ground with its wing tip and nose simultaneously.

A witness, located at the approach end of runway 28L, observed the accident airplane flare over the approach end of the runway and proceed to fly down the runway at 10 to 15 feet above ground level (agl). He said the airplane did not touch down. The witness observed a helicopter flying in the opposite direction over taxiway Hotel, which was parallel to and south of runway 28L. At about the midpoint of runway 28L, the helicopter, which had been descending, leveled out about 10 to 15 feet agl and continued to fly east along the taxiway. The witness stated that shortly after the two aircraft passed each other the airplane made an abrupt hard left roll, with its left wing tip striking the runway. He said the airplane appeared to recover and remain in the air without his tires touching the ground. Immediately the airplane veered right and appeared to be trying to gain altitude. During this time, the airplane was rocking back and forth. A few seconds later, it appeared to stall, roll left, and strike the ground from about 20 feet agl. From what the witness could see, it appeared that the left wing and propeller spinner hit the ground simultaneously. The airplane then cartwheeled to the right wing before the tail settled to the ground. The airplane came to rest upright heading about 180 degrees from the direction that it was headed in after the initial wing strike on the runway.

The helicopter pilot said the tower controller cleared him to land on taxiway Hotel and hover taxi to parking. He was established heading eastbound over taxiway Hotel at about 100 feet agl when he observed an airplane westbound on runway 28L. He continued his descent to taxiway Hotel and then hover taxied to parking. The helicopter pilot stated that "at no time did the helicopter ever hover over or around the [airplane]" and that the helicopter's "landing to a hover was accomplished approximately 300 feet from the [airplane]."

The mechanic who was a passenger in the helicopter stated that they executed a right turn over the west corner of runway 10R and descended over taxiway Hotel. He stated that the helicopter "never overflew any aircraft."

Review of a recording of BIL radio communications indicated that, as the helicopter approached the airport, the tower controller told the pilot of the helicopter to "pass behind [the airplane], you are cleared to land Hotel taxiway, taxi to parking." The review of the recording also indicated that when the airplane was about to turn onto final approach for runway 28L, the BIL tower controller told the pilot of the airplane that "off your left you'll see a helicopter, he'll be landing [on] Hotel taxiway." There was no acknowledgment of this transmission from the pilot of the airplane.

BIL has an Airport Surveillance Radar (ASR) site located on airport property at the north end of closed runway 18/36. The ASR recorded the positions of the two aircraft about once every 4.8 seconds. The recorded data depicted the airplane landing to the west on runway 28L and the helicopter landing to the east on taxiway Hotel. The radar tracks of the two aircraft were parallel with a lateral separation of about 300 feet. The radar data indicated the two aircraft passed one another about 885 feet from the approach end of runway 28R. At the time they passed one another, the helicopter's ground speed was about 58 mph, and the airplane's ground speed was about 50 mph. Additionally, the radar data shows that at the time of the last radar hit from the airplane, the helicopter was more than 1,350 feet from the airplane.

BIL operations personnel photographed the scene after the accident. These photographs show a yellow paint transfer on the runway surface, which appears to match the color of the accident airplane, located at 45:48:25.33 north and 108:33:17.42 west, or about 1,616 feet from the threshold of runway 28L and about 18 feet from the runway's right side edge. As determined from the radar data, the transfer mark was located 731 feet beyond the passing point of the two aircraft and about 170 feet beyond the airplane's last radar hit.

The airplane's wingspan was 35 feet 2 inches. To produce the paint transfer with its left wing, the airplane's fuselage would have been over the right edge of the runway. The main wreckage was located at 45:48:27.21 north and 108:33:19.17 west, or about 1,808 feet from the threshold of runway 28L and about 111 feet north of the runway's edge. The main landing gear collapsed, the fuselage was twisted, and the engine was displaced aft, damaging the firewall and the instrument panel. Additionally, the bottom of the rudder and the right elevator were bent and wrinkled.

The helicopter that was landing on taxiway Hotel was a Eurocopter Deutschland GMBH EC135P1. Its main rotor disc measured 33.46 feet in diameter. The Federal Aviation Administration's Aeronautical Information Manual states that "Pilots of small aircraft should avoid operating within three rotor diameters of any helicopter in a slow hover taxi or stationary hover." In this case, that would be 101 feet for the EC135P1. Additionally, a representative from the helicopter manufacturer's safety department said that a helicopter descending during air taxiing and with a forward speed of about 58 mph, the helicopter's ground speed when it passed the airplane, would produce significantly less downwash relative to what it would produce when static hovering or hover taxiing.

At 0826, the reported weather conditions at BIL were: wind 190 degrees at 6 knots; visibility 10 statute miles; cloud condition, clear; temperature 61 degrees Fahrenheit; dew point 55 degrees Fahrenheit; altimeter setting 29.95 inches of mercury. This weather report indicated a direct left crosswind for landing on runway 28L at BIL.

Runway 10R/28L is 3,801 feet long and 75 feet wide; it is paralleled on its south side by taxiway H, which is 44 feet wide. Measurements from aerial photographs indicate that the distance from the centerline of the runway and the centerline of the taxiway is 200 feet.

Accident Rpt# ERA11CA192	**03/15/2011 1530 EDT**	**Regis# N9212E**	**Vero Beach, FL**	**Apt: Vero Beach Municipal VRB**
Acft Mk/Mdl PIPER PA28-161		**Acft SN 2841017**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320		**Acft TT 10085**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: FLIGHTSAFETY INTERNATIONAL		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Summary

The student pilot stated that he was conducting his second solo flight. After performing maneuvers in the practice area, he returned to the airport to conduct takeoffs and landings. After the second landing, he tried to expedite exiting the runway and attempted to depress the brakes fully. The airplane turned to the right, travelled into a grassy area on the right side of the runway, and impacted a taxiway sign. It sustained substantial damage to the left wing. A postaccident examination by a Federal Aviation Administration inspector revealed no evidence of mechanical malfunctions or anomalies.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The student pilot's failure to maintain directional control during the landing rollout.

Events

1. Landing-landing roll - Runway excursion
2. Landing-landing roll - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
2. Personnel issues-Task performance-Use of equip/info-Aircraft control-Student pilot - C

Narrative

The student pilot stated that he was conducting his second solo flight. After performing maneuvers in the practice area, he returned to the airport to conduct takeoffs and landings. The student pilot stated that, after the second landing, he was "in a hurry" to exit the runway and attempted to depress the brakes "all the way." The airplane "turned to the right," travelled into a grassy area on the right side of the runway, and impacted a taxiway sign, resulting in substantial damage to the left wing. Postaccident examination by a Federal Aviation Administration inspector revealed no mechanical malfunctions or anomalies.

Accident Rpt# CEN11LA364	**05/21/2011 745 EDT**	**Regis# N7248Y**	**Philipsburg, OH**	**Apt: Phillipsburg Airport 3I7**
Acft Mk/Mdl PIPER PA30-NO SERIES		**Acft SN 30-273**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO-320-B1A		**Acft TT 5970**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: PILOT		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Narrative

On May 21, 2011, about 0745 eastern daylight time, a Piper PA-30, N7248Y, experienced a total loss of left engine power during takeoff roll from Phillipsburg Airport, Phillipsburg, Ohio. The airplane veered off the left side of runway 21 and impacted terrain. The certificated private pilot sustained minor injuries. The airplane received substantial damage to both wings. The airplane was registered to Miller Aircraft Inc and operated by the pilot as an personal flight under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan had been filed for the local flight that was to remain in the airport traffic pattern. The flight was originating at the time of the accident.

Accident Rpt# ERA11LA392	**07/10/2011 910 EDT**	**Regis# N10786**	**West Palm Beach, FL**	**Apt: Palm Beach International PBI**
Acft Mk/Mdl ROBINSON HELICOPTER R22 BETA		**Acft SN 2267**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING O-320		**Acft TT 1427**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: OCEAN HELICOPTERS INC		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Narrative

On July 10, 2011, about 0910 eastern daylight time, a Robinson R22 BETA, N10786, operated by Ocean Helicopters Inc., was substantially damaged during an autorotation, following a system malfunction during initial climb from Palm Beach International Airport (PBI), West Palm Beach, Florida. The certified flight instructor (CFI) was not injured and the student pilot incurred minor injuries. The instructional flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the planned local flight, which departed PBI about 0840.

According to the CFI, he and the student pilot performed five or six quick-stops. They then proceeded with a normal takeoff. About 200 feet above the ground, the helicopter yawed right, which was unable to be corrected with left pedal input. The CFI then entered an autorotation as the helicopter continued to yaw right. He also observed that the horizontal and vertical stabilizers had separated from the tailboom and were falling to the ground.

According to a Federal Aviation Administration inspector, a fuel cap separated and lodged in the tail rotor system, resulting in a loss of tail rotor thrust. The helicopter subsequently spun during the autorotation and landed hard. During the impact, the tail rotor separated and the fuselage sustained substantial damage.

Accident Rpt# CEN11FA468	**07/09/2011 927 EDT**	**Regis# N42333**	**Rising Sun, IN**		
Acft Mk/Mdl ROBINSON HELICOPTER COMPANY R44 II	**Acft SN 12601**		**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk**	**Prob Caus: Pending**
Eng Mk/Mdl LYCOMING IO-540-AE1A5	**Acft TT 494**		**Fatal 1**	**Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: JOSEPH OHNHEISER	**Opr dba:**				**Aircraft Fire: NONE**
					AW Cert: STN

Narrative

On July 9, 2011, about 0927 eastern daylight time, a Robinson R44 II, N42333, sustained substantial damage when it impacted trees and terrain near Rising Sun, Indiana. The pilot was fatally injured. The helicopter was owned and operated by the pilot as a personal flight under the provisions of the 14 Code of Federal Regulations Part 91. The flight departed from the Georgetown Scott County Airport (27K), Georgetown, Kentucky, about 0900, and was en route to the Anderson Municipal Airport (AID), Anderson, Indiana. Visual meteorological conditions prevailed at the time of the accident. No flight plan was filed.

The 0913 surface weather observation at the Cincinnati/Northern Kentucky International Airport (CVG), Covington, Kentucky, located about 13 nautical miles northeast of the accident site was: wind 090 degrees at 6 knots; 4 miles visibility; haze; scattered clouds at 1,100 feet; temperature 24 degrees Celsius (C); dew point 21 degrees C; altimeter 29.99 inches of mercury.

The accident site was near the top of a ridgeline about 0.3 miles west of the Ohio River. Witnesses who lived near the accident site reported observing dense ground fog along the river and near the accident site at the time of the accident.

Accident Rpt# CEN11TA279	**04/08/2011 1730 CDT**	**Regis# N51RF**	**Eden Prairie, MN**	**Apt: Flying Cloud Airport FCM**
Acft Mk/Mdl ROCKWELL INTERNATIONAL 500-S		**Acft SN 3298**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING TI0-540-E1B5		**Acft TT 11298**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR PUBU**
Opr Name: UNITED STATES DEPARTMENT OF COMMERCE		**Opr dba:**		**Aircraft Fire: NONE**

Summary

The pilot reported that he performed a stabilized visual approach with a right crosswind. The airplane touched down on the centerline and subsequently drifted to the right. The pilot overcorrected for the drift and the airplane veered hard to the left. The airplane continued off the left side of the runway and skid to a complete stop. The right main landing gear collapsed and the right wingtip hit the ground, which resulted in substantial damage to the fuselage and wing. A postaccident inspection of the airplane revealed no preimpact anomalies. The pilot additionally reported that there was no mechanical malfunction or failure.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The pilot's inadequate compensation for the crosswind while landing, which resulted in a loss of directional control.

Events

1. Landing-landing roll - Loss of control on ground
2. Landing-landing roll - Landing gear collapse
3. Landing-landing roll - Collision with terr/obj (non-CFIT)

Findings - Cause/Factor

1. Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Directional control-Not attained/maintained - C
2. Environmental issues-Conditions/weather/phenomena-Wind-Crosswind-Contributed to outcome
3. Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C

Narrative

On April 8, 2011, at 1730 central daylight time, a Rockwell International 500-S, N51RF, sustained substantial damage during the landing roll when the right main landing gear collapsed after the airplane veered off the left side of runway 10R (5,000 feet by 100 feet, asphalt) at the Flying Cloud Airport (FCM), Eden Prairie, Minnesota. The commercial pilot and the airline transport co-pilot were not injured. Visual meteorological conditions prevailed at the time of the accident. The airplane departed FCM at 1500 on a 14 Code of Federal Regulations Part 91 instructional flight, and had filed a visual flight rules (VFR) flight plan.

The pilot reported that he flew a stabilized visual approach with the airplane properly configured for landing. The airplane touched down on the centerline but it drifted to the right, and then "immediately went hard left." The pilot and co-pilot attempted to control the airplane and maintain centerline, but the airplane veered off the left side of the runway. The airplane skidded to a complete stop. The right main landing gear collapsed and the right wingtip hit the ground, which resulted in substantial damage to the fuselage and wing.

The postaccident inspection of the airplane revealed no pre-impact anomalies. The pilot reported that there was no mechanical malfunction or failure.

At 1653, the surface weather observation at FCM was: wind 170 degrees at 24 knots, visibility 10 miles, overcast 5,500 feet, temperature 16 degrees Celsius (C), dew point 6 degrees C, altimeter 29.90 inches of mercury.

The airplane was registered to and operated by the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) as a public aircraft. Because they are operated as public aircraft, they are not subject to many of the Federal Aviation Regulations. Exceptions being use of airspace, air traffic control, and aircraft registration regulations. However, it is NOAA policy that aircraft shall be operated and maintained in accordance with all pertinent regulations issued by the Federal Aviation Administration (FAA), the Department of Defense (DOD), and the NOAA Aircraft Operations Center (AOC), unless a deviation is approved by the Commanding Officer, AOC.

Accident Rpt# CEN11LA397	**06/15/2011 1450 CDT**	**Regis# N2077E**	**Grand Forks, ND**	
Acft Mk/Mdl SCHWEIZER 269C		**Acft SN S1844**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl LYCOMING HIO-360-D1A		**Acft TT 4453**	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: UNIVERSITY OF NORTH DAKOTA		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Narrative

On June 15, 2011, at 1450 central daylight time, a Schweizer 269C, N2077E, operated by the University of North Dakota, sustained substantial damage while recovering from a practice autorotation in Grand Forks, North Dakota. The certified flight instructor and the student pilot were not injured. The Title 14 Code of Federal Regulations instructional flight was operating in visual meteorological conditions without a flight plan. The local flight originated from the Grand Forks International Airport (GFK), Grand Forks, North Dakota, at 1430.

Accident Rpt# WPR11LA317	**07/08/2011 1721 MDT**	**Regis# N591CC**	**Bigfork, MT**	**Apt: Ferndale Airfield 53U**
Acft Mk/Mdl SCHWEIZER SGS 2-32		**Acft SN 34**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
			Fatal 1 **Ser Inj 1**	**Flt Conducted Under: FAR 091**
Opr Name: WAVE SOARING ADVENTURES INC		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STU

Narrative

On July 8, 2011, about 1721 mountain daylight time, a Schweitzer SGS2-32, N591CC, sustained substantial damage when it impacted terrain during takeoff initial climb following a practice low altitude rope release near the Ferndale Airport (53U), Bigfork, Montana. The airline transport rated pilot sustained fatal injuries and the airplane transport rated pilot examiner sustained serious injuries. The glider was registered to and operated by Wave Soaring Adventures Inc., Lake Tapps, Washington, under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the local instructional flight that was originating at the time of the accident.

Multiple witnesses located adjacent to the accident site reported that the pilot examiner was intending on conducting a simulated rope break shortly after takeoff. The witnesses observed the glider depart the airport uneventfully via a tow airplane. As the glider ascended through about 200 to 300 feet, it appeared to release from the tow rope. Shortly after, the glider was observed entering a steep right bank and descended into the ground.

In a written statement, the pilot of the glider tow airplane reported that he departed runway 15. As he ascended through about 200 feet above ground level, he felt the glider release the tow rope. The pilot of the tow plane circled the airport and landed uneventfully.

Information provided by a Federal Aviation Administration (FAA) inspector revealed that the accident flight was the second flight of the day and was part of a flight instructor reissuance check ride. Examination of the accident site by the inspector revealed that all major structural components of the glider were located throughout the wreckage debris area. The wreckage was recovered to a secure location for further examination.

Accident Rpt# ERA10LA387	**07/30/2010 1450 EDT**	**Regis# N17965**	**Windsor, VA**	**Apt: Garner Gliderport 3VA8**
Acft Mk/Mdl SCHWEIZER SGS 2-33AK		**Acft SN 265**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
		Acft TT 1545	**Fatal 0** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: TIDEWATER SOARING SOCIETY		**Opr dba:**		**Aircraft Fire: IFLT**

Summary

On the morning of the accident, the pilot arrived at the gliderport to practice for a check ride he was scheduled to take later that afternoon. The pilot, who was not a mechanic, selected and installed a "Gel-cell" battery behind the forward pilot seat during the preflight inspection of the glider. The battery was used to power the radio in the instrument panel. The pilot completed a low-level, traffic pattern flight and was then towed to 3,000 feet msl for a second flight. The glider climbed to 3,400 feet, about 5 miles from the gliderport, where the pilot smelled an unusual odor. The odor got stronger, he felt heat, and observed fire in the back seat. The pilot then deployed the spoilers and initiated an emergency descent. During the descent, the cockpit filled with smoke, and the pilot opened the canopy to clear the smoke. The smoke cleared, but the increased airflow exacerbated the fire. The pilot completed a forced landing to trees short of the gliderport, during which the glider sustained substantial damage in the ensuing post-crash fire. Examination of the glider by an NTSB fire and explosion expert could not determine the exact source of ignition in the battery or its associated wiring. Examination of the maintenance logbooks revealed that there were no entries for the work performed to install the electrical system, and neither was there any approval paperwork from the FAA pertaining to the modification.

Cause Narrative

THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINED THAT THE CAUSE OF THIS OCCURRENCE WAS: The unauthorized installation of a battery and associated wiring and electrical components, which resulted in an in-flight electrical fire of undetermined origin.

Events

1. Maneuvering - Fire/smoke (non-impact)
2. Emergency descent - Fire/smoke (non-impact)
3. Landing - Off-field or emergency landing

Findings - Cause/Factor

1. Aircraft-Aircraft systems-Electrical power system-Battery/charger-Malfunction - C
2. Personnel issues-Task performance-Maintenance-Modification/alteration-Maintenance personnel - C

Narrative

On July 30, 2010 about 1450 eastern daylight time, a Schweizer 2-33A glider, N17965, was destroyed when it collided with trees and terrain following an in-flight fire and forced landing near Windsor, Virginia. The certificated private pilot suffered minor injuries. The glider was consumed in the subsequent post-crash fire. Visual meteorological conditions (VMC) prevailed, and no flight plan was filed for the local instructional flight which departed Garner Gliderport (3VA8), Windsor Virginia, about 1435 and was conducted under the provisions of 14 Code of Federal Regulations Part 91.

In both a telephone interview and a written statement the pilot said that he had stopped flying airplanes several years earlier, but recently began training to add a glider rating to his certificate. On the morning of the accident, the pilot arrived at the gliderport to practice for a "check ride" that was scheduled for 1600 that afternoon. The pilot selected and installed a "Gel-cell" battery behind the forward pilot seat during the preflight inspection of the glider. The battery was used to power the radio in the instrument panel.

The pilot completed a low-level, traffic pattern flight and was then towed to 3,000 feet msl for a second flight. The glider climbed to 3,400 feet about 5 miles from the gliderport where the pilot "smelled something." The pilot said the odor got stronger, he felt heat, looked behind him, and "saw fire in the back seat."

The pilot then "put out all spoilers" to complete an emergency descent. During the descent, the cockpit filled with smoke, and the pilot opened the canopy to clear the smoke. The smoke cleared, but the increased airflow "caused the fire to worsen."

The pilot completed a forced landing to trees short of the gliderport, and egressed the glider with only minor burns to the back of his head.

The pilot held a private pilot certificate with a rating for airplane single-engine land. He reported 180 total hours of flight experience; 140 hours of which were in single engine airplanes, and 40 hours of which were in gliders. The pilot did not hold a current Federal Aviation Administration (FAA) medical certificate, but neither was he required to for glider flights.

According to FAA and maintenance records, the glider was manufactured in 1973 and had accrued 1,545 total aircraft hours as of December 2, 2009, when the

last annual inspection was completed. According an FAA safety inspector (airworthiness), examination of logbooks revealed the accident glider, and others in the soaring club fleet, had been modified to accommodate avionics and the batteries to power them. However, there were no logbook entries to reflect the work, or any FAA approval of the modifications.

At 1853, the weather conditions reported at Suffolk County Airport (SFQ), 12 miles south of the accident site, included clear skies, 10 miles visibility, and winds from 040 degrees at 9 knots. The temperature was 30 degrees Celsius (C), the dewpoint 19 degrees C, and the altimeter setting was 29.91 inches of mercury.

The glider was examined at the site on July 30, 2010, by FAA inspectors and all major components were accounted for at the scene. The glider rested upright in trees close to the ground, and the metal wings remained largely intact, though impact damaged. The fabric and wood-covered tubular metal frame was severely fire damaged. The battery and any recognizable electrical wiring was harvested and forwarded to the NTSB Materials Laboratory in Washington, DC, for examination at a later date.

On October 7, 2010, the battery and associated wiring from the accident glider were examined by a fire and explosion expert in the NTSB materials laboratory, Washington, D.C. The battery sustained too much fire-related damage to identify any signs of arcing on the contacts. The wiring had significant fire related damage and most of the insulation had burned away. The wiring showed no signs of arcing with the exception of one small bead on the end of a single conductor. The other conductors within that strand showed no signs of arcing or electrical damage. There were some signs of narrowing and necking on a few of the conductor ends. The rest of the conductor ends demonstrated either melting or fractures consistent with mechanical damage.

Accident Rpt# ERA11FA401	**07/15/2011 1535 EDT**	**Regis# N7475**	**Hollywood, MD**	**Apt: St. Mary's County Regional 2W6**
Acft Mk/Mdl SLINGSBY CAPSTAN TYPE 49B		**Acft SN 1664**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
		Acft TT 665	**Fatal 1** **Ser Inj 1**	**Flt Conducted Under: FAR 091**
Opr Name: MIRALES NICHOLAS JOHN		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Narrative

On July 15, 2011, about 1535 eastern daylight time, a Slingsby T-49B glider, N7475, was substantially damaged when it collided with trees while maneuvering for landing in Hollywood, Maryland. The glider had released from tow immediately after takeoff from St. Mary's County Regional Airport (2W6), Leonardtown, Maryland. The certificated commercial pilot was seriously injured, and the commercial-rated copilot was fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the personal flight that was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

The glider pilot provided a comprehensive written statement, and a brief interview following the accident. According to the glider pilot/owner, the glider was purchased a week prior to the accident, and he had accrued about 1 hour of flight experience in it. He assembled the glider and completed all post-assembly checks prior to departing. The pilot and copilot then performed the before-takeoff checks "outside the aircraft," and confirmed the tow release operation, and "confirmed trim and spoilers closed."

The glider and the tow pilot exchanged ready-for-takeoff signals and the takeoff was performed by both aircraft.. During the initial climb, the glider pilot noticed the glider "wasn't climbing." About 100 feet above ground level (agl), and over the trees beyond the departure end of the runway, the glider pilot observed the tow plane rudder "waggle" back and forth, and his copilot shouted, "Release! Release! Release!" The glider pilot pulled the release handle, released the glider from the tow, and entered a left turn to the north for a forced landing on the north/south divided highway east of the airport. The glider overshot the highway, and collided with trees on the east side of the roadway.

In an interview, the tow plane pilot provided a similar description of the events. During the takeoff, the tow plane was producing power as expected and the takeoff was smooth, but the tow plane pilot noted a slow rate of climb. He observed the glider spoilers were at least partially deployed above and below each wing and rapidly "wagged the rudder," to alert the glider pilot to "check his spoilers." At that moment, the glider released from the tow, banked to the north, and struck trees adjacent to the highway.

Accident Rpt# CEN11FA480	**07/16/2011 1048 EDT**	**Regis# N50408**	**Boyne City, MI**	**Apt: Boyne City Municipal Airport N98**
Acft Mk/Mdl TAYLORCRAFT DCO-65		**Acft SN 6257**	**Acft Dmg: SUBSTANTIAL**	**Rpt Status: Unk** **Prob Caus: Pending**
Eng Mk/Mdl CONT MOTOR A&C65 SERIES			**Fatal 1** **Ser Inj 0**	**Flt Conducted Under: FAR 091**
Opr Name: BALOGH EUGENE W		**Opr dba:**		**Aircraft Fire: NONE**
				AW Cert: STN

Narrative

On July 16, 2011, about 1048 eastern daylight time, a Taylorcraft DCO-65, N50408, sustained substantial damage when it impacted a city street that paralleled runway 27 at the Boyne City Municipal Airport (N98), Boyne City, Michigan. The pilot received fatal injuries. The airplane was registered to and operated by the pilot under the provisions of the 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed at the time of the accident. No flight plan was filed. The airplane departed N98 on a local flight, but the departure time is unknown.

Witnesses reported seeing the airplane flying over the city before the accident occurred. Nothing was reported as being out of the ordinary. Three witnesses observed the accident as it occurred. The witnesses were located just south of the airport standing in a parking lot. They heard the airplane approaching from the north. They saw the airplane flying southbound between their location and the runway. The engine sounded normal and was "not running rough." The airplane's altitude was between 50 - 75 feet above ground level. The airplane entered a steep left turn, and then spun 180 degrees as the airplane impacted the street in a nearly vertical, nose down attitude.