



National Transportation Safety Board Aviation Accident Final Report

Location:	OSAGE BEACH, MO	Accident Number:	CHI96LA174
Date & Time:	05/25/1996, 1245 CDT	Registration:	N40933
Aircraft:	Piper PA-32	Aircraft Damage:	Substantial
Defining Event:		Injuries:	4 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot reported that within minutes of departure the engine started to lose power but did not quit completely. He reported that the engine was barely above idle. Passengers flying with the pilot also reported that the engine did not sputter but continued to run smoothly at partial power. The pilot reported that he was unable to restore power to the engine and executed a forced landing at a nearby golf course. Due to golfers on the fairways, the pilot was unable to land on the golf course's fairway. The aircraft landed in rough terrain and went through a ravine which produced substantial damage to the aircraft. The examination of the aircraft revealed that fuel was available in all four fuel tanks prior to impact damage. The fuel lines to the engine driven fuel pump were inspected and were intact with no leakage. The electric boost pump was operated and it indicated normal fuel pressure. The engine driven fuel pump was bench tested and operated normally. The engine was test run and operated within specifications.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: a partial loss of power for undetermined reasons.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

1. (F) REASON FOR OCCURRENCE UNDETERMINED

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

2. EVASIVE MANEUVER - PERFORMED - PILOT IN COMMAND
3. TERRAIN CONDITION - RAVINE

Factual Information

On May 25, 1996, at 1245 central daylight time, a Piper PA-32, N40933, operated by Sparta Aero Services, sustained substantial damage during a forced landing due to a partial loss of engine power after takeoff near Osage Beach, Missouri. The private pilot and three passengers were not injured. The 14 CFR 91 flight departed Grand Glaize Memorial Airport, Osage Beach, Missouri, on a local flight. Visual meteorological conditions prevailed and no flight plan was filed.

The pilot reported that he had departed Sparta, Illinois, and flew to Osage Beach, Missouri. The distance was about 140 nautical miles and took approximately 1.5 hours.

The pilot reported that he departed Osage Beach about 15 minutes later. He reported that within minutes of departure the engine started to lose power but did not quit completely. He reported that the engine was barely above idle. Passengers flying with the pilot also reported that the engine did not sputter but continued to run smoothly at partial power. The pilot reported that he was unable to restore power to the engine, so he did a forced landing at a nearby golf course. Due to golfers on the fairways, the pilot was unable to land on the golf course's fairway. The aircraft landed in rough terrain and went through a ravine which produced substantial damage to the aircraft. The pilot and passengers deplaned without injuries.

The examination of the aircraft revealed that fuel was available in all four fuel tanks prior to impact damage. The fuel lines to the engine driven fuel pump were inspected and were intact with no leakage. The electric boost pump was operated and it indicated normal fuel pressure. The engine driven fuel pump was bench tested and it operated normally. The engine was run and it operated within specifications.

Pilot Information

Certificate:	Private	Age:	18, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	09/19/1995
Occupational Pilot:	Last Flight Review or Equivalent:		
Flight Time:	374 hours (Total, all aircraft), 2 hours (Total, this make and model), 120 hours (Pilot In Command, all aircraft), 12 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N40933
Model/Series:	PA-32 PA-32	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	32-74-00025
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	10/02/1995, Annual	Certified Max Gross Wt.:	3400 lbs
Time Since Last Inspection:	25 Hours	Engines:	1 Reciprocating
Airframe Total Time:	3675 Hours	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	O-540-E4B5
Registered Owner:	SPARTA AERO SERVICES	Rated Power:	260 hp
Operator:	SPARTA AERO SERVICES	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	TBN, 780 ft msl	Distance from Accident Site:	40 Nautical Miles
Observation Time:	1155 CDT	Direction from Accident Site:	150°
Lowest Cloud Condition:	Scattered / 3500 ft agl	Visibility	7 Miles
Lowest Ceiling:	Broken / 25000 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	3 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	150°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	-1° C / -7° C
Precipitation and Obscuration:			
Departure Point:	(K15)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1345 CST	Type of Airspace:	Class E

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC): JAMES P SILLIMAN **Report Date:** 02/18/1997

Additional Participating Persons: JERRY GARRISON; KANSAS CITY, MO

Publish Date:

Investigation Docket: NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).



National Transportation Safety Board Aviation Accident Final Report

Location:	Osage Beach, MO	Accident Number:	CHI01FA146
Date & Time:	05/28/2001, 1757 CDT	Registration:	N7331P
Aircraft:	Piper PA-24-250	Aircraft Damage:	Substantial
Defining Event:		Injuries:	3 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

During a forced landing the airplane stalled and impacted trees and terrain. Witnesses to the accident reported that the engine was running rough and intermittently prior to the accident. A global positioning system (GPS) receiver was recovered at the accident site and its track data was downloaded. The recovered GPS data showed the airplane's ground speed was between 73.7 - 79.8 mph during the last 10 seconds of data. The stall speed for the accident airplane with flaps retracted is 70 mph. Post-accident fuel samples taken from the fuel strainer and both electric fuel pumps were contaminated with water and particulate. Both electric fuel pumps contained rust, water, and particulate. The carburetor float bowl and accelerator pump-well were contaminated with fine particulate resembling silicon sand. The same fine particulate was observed in the carburetor idle tube passage and nozzle well. Fuel samples taken from the right main fuel cell and fuel selector were clear of debris and water. A fuel sample obtained from the departure airport was clear of debris and water. The accident airplane had been operated approximately 164 hours in the last 35 years, 47 hours in the last 15 years, 35 hours in the last 5 years, and 35 hours in the last year. According to Federal Aviation Regulations (FAR), the pilot-in-command is required to complete an aircraft preflight inspection in order to determine if the aircraft is in an airworthy condition. According to FAA AC 20-43C, "Fuel having a 'cloudy' appearance or definitely 'offcolor' should be suspected of contamination or deterioration and should not be used." According to Airplane Flying Handbook, "Significant and/or consistent water or sediment contamination are grounds for further investigation by qualified maintenance personnel. Each fuel tank sump should be drained during preflight and after refueling."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Aircraft control not being maintained by the pilot during the forced landing and inadequate preflight inspection performed by the pilot. Contributing factors to the accident were the fuel system contamination that resulted in the loss of engine power, the encountered stall, and trees.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - NONMECHANICAL
Phase of Operation: MANEUVERING

Findings

1. (C) AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
2. (F) FUEL SYSTEM - CONTAMINATION, WATER
3. (F) FUEL SYSTEM - CONTAMINATION, OTHER THAN WATER

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

4. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
5. (F) STALL - ENCOUNTERED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings

6. (F) OBJECT - TREE(S)

Factual Information

HISTORY OF FLIGHT

On May 28, 2001, at 1757 central daylight time (cdt), a Piper PA-24-250, N7331P, piloted by a private pilot, sustained substantial damage during an in-flight collision with trees and terrain following a loss of control while maneuvering over Lake of the Ozarks State Park, Osage Beach, Missouri. Visual meteorological conditions prevailed at the time of the accident. The personal flight was operating under the provisions of 14 CFR Part 91 without a flight plan. The pilot and his two passengers were fatally injured. The flight departed the Lee C. Fine Memorial Airport (AIZ), Kaiser, Missouri, at 1743, and had the intended destination of Schaumburg Regional Airport (O6C), Schaumburg, Illinois.

A witness to the accident reported, "I heard a chugging sound approaching from the east overhead upon looking up I saw a single engine plane in obvious distress. The propeller was turning in a jerking motion. The plane appeared to be about 30 feet above tree top level. I observed it for about 10 seconds before it disappeared into the tree line."

Another witness to the accident reported, "I looked up and saw a small single engine plane traveling parallel with [highway] 54. The engine continued to sputter, quit, restart and sputter for the entire time I observed it in flight, which was 15-20 seconds. The plane was on a very level flight path at an altitude I would estimate at 200 [feet] to 250 [feet] off the water and at a distance of approximately 1/4 mile away."

Another witness to the accident reported seeing an airplane flying in a southwest direction at an altitude of 150-200 feet above the treetops. The witness stated, "This plane startled me at first because there wasn't any engine noise at first, then the engine fired for approximately 1-2 seconds at a low rpm (say 20%) followed by no engine noise for 1-2 seconds followed by another engine starting for 1-2 seconds at low rpm followed by no engine noise as the plane went out of sight."

The written witness statements are appended to this factual report.

The airplane impacted trees and terrain 0.848 nautical miles (nm) south-southwest from the Grand Glaize - Osage Beach Airport (K15).

PERSONNEL INFORMATION

The pilot held a private pilot certificate with a rating for single engine land airplanes. The pilot's last medical examination was conducted on January 11, 2000, and he was issued a First Class medical certificate with no limitations or restrictions.

The pilot was issued a private pilot certificate on August 27, 2000, after logging 65.7 hours of dual instruction and 27.0 hours of solo. The pilot's first flight in the accident airplane was listed in his flight logbook as March 31, 2001. The pilot received an endorsement for high performance and complex airplanes on April 1, 2001, after receiving 4.0 hours of dual instruction in the Piper PA-24-250. On April 2, 2001, there was logbook entry for instruction covering Piper PA-24-250 emergency procedures and fuel system.

According to the pilot's flight logbooks, the pilot had a total flight time of 185.3 hours, all of which were in single engine airplanes. The pilot logged 31.8 hours in the Piper PA-24-250, of which 20.8 were as pilot-in-command (PIC) and 11.0 hours were as dual instruction. The pilot

had flown 43.2 hours in the last 90 days, 34.8 hours in the last 60 days, and 5.3 hours in the last 30 days. There were no flight logbook entries within 24 hours of the accident. The last flight logbook entry was on May 3, 2001.

AIRCRAFT INFORMATION

The aircraft was a Piper PA-24-250, serial number 24-2510. The Piper PA-24-250 is a single-engine all-metal airplane of semimonocoque design and is equipped with a retractable landing gear, flaps and a constant speed propeller. The PA-24-250 can accommodate a pilot and three passengers.

The airplane was issued a standard airworthiness certificate on January 25, 1961, and was certified for normal category operations. At the time of the accident the airframe had accumulated a total flight time of 886.08 hours. According to a purchase receipt, the pilot bought the airplane on March 30, 2001. A copy of the purchase receipt is appended to this factual report.

The last annual inspection was performed on May 5, 2000, at 850.31 hours total time and the airplane had accumulated 35.77 hours since the inspection. According to the airframe logbook, all applicable airframe airworthiness directives (AD) were complied with at the last annual inspection. A copy of the logbook entry for the last airframe annual inspection is appended to this factual report.

During the last annual inspection the following tasks were accomplished:

Main and auxiliary fuel cells were replaced.

All flexible fuel lines were replaced along with new fittings.

Both electric fuel pumps were drained and inspected.

Two fuel caps, one main and one auxiliary, were replaced.

Bird nests were removed from wings.

The accumulated airframe flight time over the life of the airplane was as follows:

Time Interval	Accumulated Hours
05/05/2000 - 05/28/2001	35.77
10/21/1994 - 05/05/2000	3.31
09/23/1990 - 10/21/1994	4.97
08/13/1986 - 09/23/1990	3.44
01/02/1982 - 08/13/1986	6.83
03/24/1976 - 01/02/1982	40.29
06/20/1971 - 03/24/1976	33.47
10/1966 - 06/20/1971	36.00
01/25/1961 - 10/1966	722.00

The engine was a 250 horsepower Lycoming O-540-A1D5, serial number L-3760-40. The engine had accumulated 886.08 hours since new. The engine had accumulated 35.77 hours

since the last annual inspection, which was completed on May 5, 2000. According to the engine logbook, all applicable engine airworthiness directives (AD) were complied with at the last annual inspection. A copy of the logbook entry for the last engine annual inspection is appended to this factual report.

The propeller was a Hartzell HC-A2VK-1, serial number J1097. According to the airframe logbook, the propeller was last overhauled on July 14, 1999.

According to the Piper PA-24-250 Pilot Operating Handbook (POH), the stall speed with flaps retracted is 70 mph and 65 mph with flaps extended.

METEOROLOGICAL INFORMATION

A weather observation station, located at AIZ, about 6 nautical miles (nm) from the accident site on a 103.4 degree magnetic heading, recorded the weather approximately 2 minutes prior to the accident as:

Observation Time: 1755 cdt

Wind: 050 degrees magnetic at 6 knots

Visibility: 10 statute miles

Sky Condition: Sky Clear

Temperature: 26 degrees Celsius

Dew Point: 14 degrees Celsius

Pressure: 29.90 inches of mercury

According to Federal Aviation Administration (FAA) records, a pilot representing the accident airplane contacted the St. Louis Automated Flight Service Station (AFSS) and requested a weather briefing for a flight from AIZ to O6C.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located at the base of a wooded ravine in the Lake of the Ozarks State Park. A GPS receiver recorded the position of the main wreckage as 38-degrees 07-minutes 21.8-seconds north latitude, 92-degrees 40-minutes 17.9-seconds west longitude. All major airframe components were located at the accident site.

The fuselage and wings were supported between two trees and the terrain. One of the trees had several slash marks penetrating into the tree trunk and there was a 10-foot section of tree-bark missing. The engine, firewall, and instrument panel were bent to the right approximately 30 degrees and were lying on their left side. The remainder of the fuselage was positioned vertically with the angle between the fuselage bottom and the terrain measured to be approximately 10 degrees past vertical. The fuselage aft of the rear baggage-area bulkhead, including the entire empennage, was separated from the airplane. Local authorities reported the aft fuselage and empennage was slung over the main cabin and was removed to gain access to cabin. The horizontal stabilator and vertical stabilizer remained attached to the aft fuselage structure. The rudder remained attached to the vertical stabilizer. The elevator and rudder control cables were cut. Elevator and rudder control cable continuity was established from the cut cable ends to the individual control surfaces and to the main cabin area.

The right wing was separated from all fuselage attachment points. A fractured three-foot

section of main wing spar remained attached to the fuselage. The outboard 3 1/2 feet of wing was separated from the remainder of the wing. The right aileron was partially separated from the wing and was hanging off the inboard hinge. The right aileron bellcrank remained attached to wing structure. Aileron control cable continuity was established from the bellcrank to the main cabin area. The right flap remained attached to all attachment points and was in the fully retracted position. The right main landing gear was free moving and was hanging out of the wheel well. Both main and auxiliary fuel cells were ruptured. A fuel sample was taken from the remaining portion of the main fuel cell. The fuel sample was clear of debris, clear of water, and was transparent blue in color. Both fuel tank caps were in place and intact. The main fuel tank finger screen was contaminated with trace amounts of dirt and stone material. The auxiliary fuel cell finger screen was clear of debris and was not obstructed.

The left wing remained attached to the fuselage. The left wing tip was separated from the remainder of the wing. The left aileron remained attached to the two inboard attachment points. Aileron control cable continuity was established from the aileron bellcrank to the main cabin area. The left flap remained attached to all attachment points and was in the fully retracted position. The left main landing gear was in the fully retracted position. Both main and auxiliary fuel cells were ruptured. Both fuel tank caps were in place and intact. Both fuel tank finger screens were clear of debris and were not obstructed.

The fuel selector was in a left main fuel tank position. A fuel sample was taken from the fuel selector and photographed. The fuel sample was clear of debris, clear of water, and was transparent blue in color. The fuel selector was removed for examination. The fuel selector was operational in all selector positions. The interior of the fuel selector was corroded.

The fuel system strainer was removed for examination. The fuel contained in the fuel strainer bowl and filter was contaminated with water and particulate. A sample was collected from the fuel strainer bowl and photographed. The lower 3/4 of the sample was completely opaque with visible water and particulate suspended in the solution. The remaining 1/4 of the sample remained separated from the lower 3/4. The upper 1/4 of the sample was slightly opaque, medium tan in color, with no visible particulate. The inside surface of the fuel strainer bowl was partially covered with a fine particulate resembling silicon sand. The bottom of the fuel strainer bowl was pitted and corroded.

Both electric fuel pumps were opened, drained, and inspected.

The aft electric fuel pump was contaminated with water, rust, and particulate. A fuel sample was collected from the fuel pump and photographed. The fuel sample was homogenous, transparent and light green/gray in color. The fuel sample had trace amounts of particulate contamination. The fuel pump screen was not rusted. The fuel pump cap was corroded.

The forward electric fuel pump was contaminated with water, rust, and particulate. A fuel sample was collected from the fuel pump and photographed. The lower 1/2 of the sample was completely opaque and was orange in color with water and particulate contamination. The upper 1/2 of the sample remained separated from the lower 1/2. The upper 1/2 was slightly opaque and was green/tan in color with no visible water or particulate contamination. The fuel pump screen was rusted and the cap was corroded.

The engine remained partially attached to the airframe and was bent approximately 30 degrees to the right. The engine was resting on the left rocker box covers. The carburetor was broken off the engine. The carburetor was retained for inspection and teardown. Engine crankshaft

and valve train continuity was established by rotating the crankshaft through the accessory gear section. There was thumb compression on all cylinders. Both magnetos produced spark on all leads when the engine crankshaft was rotated. Engine timing matched magneto timing. The magnetos were removed for bench testing and inspection. The engine-driven fuel pump was removed and functioned when rotated by hand. The upper and lower spark plugs were removed and the electrodes were light tan in color.

A differential compression test was performed and the following results were obtained:

	Before Staking Valves (psi)	After Staking Valves (psi)
#1 cylinder	45/80	60/80
#2 cylinder	48/80	64/80
#3 cylinder	60/80	60/80
#4 cylinder	42/80	52/80
#5 cylinder	30/80	51/80
#6 cylinder	10/80	50/80

Note: Differential compression test was done with cylinders cold and without a mechanical stop to hold pistons at top dead center.

The carburetor was examined at the manufacturer's facility. The float bowl and accelerator pump-well was contaminated with fine particulate resembling silicon sand. The same fine particulate was observed in the idle tube passage and nozzle well.

Both magnetos were examined and bench tested at an overhaul facility. The left magneto initially did not provide spark and the points were inspected. The points were noticeably corroded. The leads were cleaned with a fine file and the magneto was remounted on the bench test fixture. The magneto produced spark on all leads when rotated in the test fixture. The left magneto was heated in a 160-degree Fahrenheit oven for 20 minutes and then remounted in the bench test fixture. The heated left magneto produced spark on all leads when rotated in the test fixture. The right magneto produced spark on all leads when rotated in the test fixture. The right magneto was heated in a 160-degree Fahrenheit oven for 20 minutes and then remounted in the bench test fixture. The heated right magneto produced spark on all leads when rotated in the test fixture.

The propeller remained attached to the engine with spinner in place. One propeller blade was missing approximately four inches of blade tip. The blade tip fracture surface was consistent with overload failure. The outboard portion of the remaining propeller blade was twisted towards low pitch, more than 90 degrees. The propeller blade was bent and curled. There was chordwise scratching of the propeller face and back. The other propeller blade was bent slightly aft and there was chordwise scratching of the propeller face and back.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot at the Boone/Callaway County Medical Examiner's Office, Columbia, Missouri, on May 29, 2001.

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

The toxicology results for the pilot were:

- * No Carbon Monoxide detected in Blood
- * No Ethanol detected in Vitreous
- * 0.004 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid (Marijuana) detected in Blood
- * 0.0056 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid detected in Lung
- * 0.0888 (ug/ml, ug/g) Tetrahydrocannabinol Carboxylic Acid detected in Urine
- * 0.014 (ug/ml, ug/g) Tetrahydrocannabinol (Marijuana) detected in Lung

TESTS AND RESEARCH

A global positioning system (GPS) receiver was located in the airplane wreckage. The GPS receiver was sent to the manufacturer for a data download. The recovered data from the GPS receiver was plotted using commercial computer software. The plots are appended to this factual report along with a copy of the source data.

According to the plotted GPS track data, at 1743 the accident airplane took-off on runway 03 at AIZ and then departed the traffic pattern on the left downwind leg. The plotted data shows the airplane flying circuits over Lake of the Ozarks, north of the Grand Glaize Bridge, for a period of approximately eight minutes. The plotted data then shows the accident airplane flying over the city of Osage Beach, along Missouri Highway 54. The last recorded GPS position was at 38-degrees 07-minutes 22.50-seconds north latitude, 92-degrees 40-minutes 18.00-seconds west longitude. The last recorded GPS position was 67 feet from where the main wreckage was located, which was 0.848 nautical miles (nm) south-southwest from the Grand Glaize - Osage Beach Airport (K15).

The last 42 seconds of speed and course data was recorded as:

Time (hhmm:ss)	Ground Speed (mph)	Course (degrees magnetic)
1756:19	76.6	210
1756:31	90.0	286
1756:37	85.8	262
1756:48	83.9	244
1756:51	79.8	224
1756:55	76.2	210
1756:58	73.7	195
1757:01	75.2	188

The accident airplane was fueled with 20 gallons of 100-low lead aviation fuel prior to departing on the accident flight.

Subsequent to the accident, a 5-gallon sample of the airport's 100-low lead aviation fuel was collected. The fuel sample was clear of debris, clear of water, and was transparent blue in color.

According to 14 CFR Part 91.7, "Civil aircraft airworthiness":

(a) No person may operate a civil aircraft unless it is in an airworthy condition.

(b) The pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight. The pilot in command shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur.

The Federal Aviation Administration Advisory Circular 20-43C, Aircraft Fuel Control, stated the following concerning fuel contamination and airplane preflight:

"Fuel having a 'cloudy' appearance or definitely 'offcolor' should be suspected of contamination or deterioration and should not be used."

"Drain a generous sample of fuel - considerably more than just a trickle - into a transparent container from each of the fuel sumps and from the main fuel strainer or gascolator. (Remember that it was necessary to drain ten ounces in the field tests.) On certain aircraft having fuel tanks located in each wing, positioning of the fuel tank selector valve to the 'BOTH ON' position may not adequately drain the system. This is due to the fuel taking the path of least resistance. In this case, the fuel selector valve should be positioned at each tank in turn."

"Examine the fuel samples for water and dirt contamination. If present, it will collect at the bottom of the container and should be easily detected. Continue to drain fuel from the contaminated sump until certain the system is clear of all water and dirt."

"The use of quick drain valves in the sumps and gascolator makes it practical to keep tanks free of significant quantities of water and other contaminants."

"In addition to the preflight and postflight actions, certain precautionary or routine maintenance should be performed on the aircraft at periodic intervals. These precautions include the inspection and cleaning of pertinent fuel tank outlet finger strainers and carburetor screens (filters), and flushing of the carburetor bowl."

The FAA Handbook, Airplane Flying Handbook, stated the following concerning airplane preflight and fuel contamination:

"Checking for water and other sediment contamination is a key preflight element. Water tends to accumulate in fuel tanks from condensation, particularly in partially filled tanks. Because water is heavier than fuel, it tends to collect in the low points of the fuel system. Water can also be introduced into the fuel system from deteriorated gas cap seals exposed to rain, or from the supplier's storage tanks and delivery vehicles. Sediment contamination can arise from dust and dirt entering the tanks during refueling, or from deteriorating rubber fuel tanks or tank sealant. The best preventive measure is to minimize the opportunity for water to condense in the tanks. If possible, the fuel tanks should be completely filled with the proper grade of fuel after each flight, or at least filled after the last flight of the day. The more fuel there is in the tanks, the less opportunity for condensation to occur. Keeping fuel tanks filled is also the best way to slow the aging of rubber fuel tanks and tank sealant."

"Sufficient fuel should be drained from the fuel strainer quick drain and from each fuel tank sump to check for fuel grade/color, water, dirt, and smell. If water is present, it will usually be in bead-like droplets, different in color (usually clear, sometimes muddy), in the bottom of the sample. In extreme cases, do not overlook the possibility that the entire sample, particularly a small sample, is water. If water is found in the first fuel sample, further samples should be taken until no water appears. Significant and/or consistent water or sediment contamination are grounds for further investigation by qualified maintenance personnel. Each fuel tank sump

should be drained during preflight and after refueling."

The FAA Advisory Circular 20-43C, Water In Aviation Fuels, stated the following concerning fuel contamination and PIC preflight responsibilities:

"Water can enter an aircraft fuel system through leaks in the vents, seals, or poorly fitting fuel caps on filler openings during rain or snow storms or when the aircraft is washed, from refueling system equipment, by condensation and precipitation (especially when an aircraft has partially filled tanks), and when refueling during rain or snow storms."

"Aircraft engines will tolerate a small amount of free water (30 ppm. is usually considered to be the maximum) if it is in a fine, uniformly dispersed state. The best way to minimize the amount of water entering a system is through inspection and maintenance of equipment and by making certain that only clean and dry fuel is received into storage and delivered into an aircraft."

"The pilot in command has the final responsibility to determine that the aircraft is properly serviced. An important part of the preflight inspection is to drain aircraft fuel tank sumps, reservoirs, gascolators, filters, and other fuel system drains to assure that the fuel supply is free of water. A review of National Transportation Safety Board Briefs of Aircraft Accidents involving 114 accidents due to fuel contamination with water occurring between January 7, 1980, and September 11, 1981, showed that the probable cause in 85 of those accidents was "Pilot in Command - Inadequate Preflight Preparation and/or Planning." Since water in fuel accounts for a major share of fuel quality accidents, pilots should make it a practice to include this check beginning with the next preflight inspection."

ADDITIONAL DATA/INFORMATION

Parties to the investigation included the FAA, The New Piper Aircraft, and Textron Lycoming.

The main wreckage was released to a representative of the Lake of the Ozarks State Park on May 31, 2001. The GPS receiver was returned to a representative of the owner on August 28, 2001. The remainder of the wreckage was returned to a representative of the pilot's family on May 28, 2002.

Pilot Information

Certificate:	Private	Age:	32, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	01/11/2000
Occupational Pilot:		Last Flight Review or Equivalent:	08/27/2000
Flight Time:	185 hours (Total, all aircraft), 32 hours (Total, this make and model), 105 hours (Pilot In Command, all aircraft), 43 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N7331P
Model/Series:	PA-24-250	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	24-2510
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	05/05/2000, Annual	Certified Max Gross Wt.:	2900 lbs
Time Since Last Inspection:	35.77 Hours	Engines:	1 Reciprocating
Airframe Total Time:	886.08 Hours at time of accident	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, aided in locating accident	Engine Model/Series:	O-540-A1D5
Registered Owner:	Kent J. Arendt	Rated Power:	250 hp
Operator:	Kent J. Arendt	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	AIZ, 869 ft msl	Distance from Accident Site:	6 Nautical Miles
Observation Time:	1755 CDT	Direction from Accident Site:	103°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	50°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.9 inches Hg	Temperature/Dew Point:	26° C / 14° C
Precipitation and Obscuration:			
Departure Point:	Kaiser, MO (AIZ)	Type of Flight Plan Filed:	None
Destination:	Schaumburg, IL (06C)	Type of Clearance:	None
Departure Time:	1743 CDT	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	2 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Fatal	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	Andrew T Fox	Report Date:	07/02/2002
Additional Participating Persons:	Marvin Trease; Federal Aviation Administration - Kansas City FSDO; Kansas City, MO Robert Martellotti; The New Piper Aircraft, Inc.; Vero Beach, FL Gregory Erikson; Textron Lycoming; Wayne, IL		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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National Transportation Safety Board Aviation Accident Final Report

Location:	Osage Beach, MO	Accident Number:	CHI05CA132
Date & Time:	05/30/2005, 1600 CDT	Registration:	N3225U
Aircraft:	Cessna 182F	Aircraft Damage:	Substantial
Defining Event:		Injuries:	4 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The airplane impacted the runway following a loss of control while landing. The pilot stated that upon returning to the airport the winds were reported over the UNICOM frequency as being calm, so he entered the traffic pattern for runway 14. He stated he that he was too high during this landing attempt so he initiated a go-around. The pilot stated he extended his final approach during the next landing attempt. He stated the approach looked good, but he "misjudged the flare and porpoised several times." The pilot stated he realized the airplane was damaged when he heard a clicking sound while using the right rudder pedal.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper flare and his inadequate recovery from the bounced landing which resulted in a hard landing. A factor associated with the accident was the improper landing flare.

Findings

Occurrence #1: HARD LANDING

Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

1. (C) FLARE - IMPROPER - PILOT IN COMMAND
2. (C) RECOVERY FROM BOUNCED LANDING - INADEQUATE - PILOT IN COMMAND
3. PORPOISE/PILOT-INDUCED OSCILLATION - INADVERTENT - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

4. TERRAIN CONDITION - RUNWAY

Factual Information

Pilot Information

Certificate:	Private	Age:	38, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	None	Second Pilot Present:	
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	Class 3 With Waivers/Limitations	Last FAA Medical Exam:	01/01/2003
Occupational Pilot:		Last Flight Review or Equivalent:	12/01/2004
Flight Time:	180 hours (Total, all aircraft), 77 hours (Total, this make and model), 138 hours (Pilot In Command, all aircraft), 3 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N3225U
Model/Series:	182F	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	18254625
Landing Gear Type:	Tricycle	Seats:	
Date/Type of Last Inspection:		Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Continental
ELT:		Engine Model/Series:	O-470-R
Registered Owner:	Daniel Boone Flying Club, Inc.	Rated Power:	230 hp
Operator:	Thomas S. Gittemeier, Jr.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	AIZ	Distance from Accident Site:	
Observation Time:	1555	Direction from Accident Site:	
Lowest Cloud Condition:	Scattered / 4500 ft agl	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	7 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	40°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.93 inches Hg	Temperature/Dew Point:	28° C / 16° C
Precipitation and Obscuration:			
Departure Point:	Osage Beach, MO (K15)	Type of Flight Plan Filed:	None
Destination:	(K15)	Type of Clearance:	None
Departure Time:	CDT	Type of Airspace:	

Airport Information

Airport:	Runway Surface Type:
Airport Elevation:	Runway Surface Condition:
Runway Used:	IFR Approach:
Runway Length/Width:	VFR Approach/Landing:

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	
Total Injuries:	4 None	Latitude, Longitude:	38.110556, -92.680556

Administrative Information

Investigator In Charge (IIC):	Pamela S Sullivan	Report Date:	09/13/2005
Additional Participating Persons:	Larry Wahl; Kansas City, MO FSDO		
Publish Date:			
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.		
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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National Transportation Safety Board Aviation Accident Final Report

Location:	OSAGE BEACH, MO	Accident Number:	CHI95LA165
Date & Time:	06/05/1995, 1230 CDT	Registration:	N6122L
Aircraft:	GRUMMAN AA-1	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

WITNESSES OBSERVED THE AIRPLANE LIFTOFF AT THE RUNWAY MIDPOINT. ONE WITNESS OBSERVED THE AIRPLANE BEGIN A TURN TO THE RIGHT WHEN IT WAS ABOUT 50 FEET ABOVE THE GROUND. HE SAID THE AIRPLANE CONTINUED TO BANK TO THE RIGHT AND DESCEND INTO THE TREES, ERUPTING INTO FLAMES SHORTLY AFTER COLLIDING WITH THE GROUND. THE PILOT SAID HE WAS BETWEEN 500 AND 800 FEET ABOVE THE GROUND WHEN HE BEGAN A RIGHT TURN TO THE DEPARTURE RUNWAY'S DOWNWIND LEG. HE SAID THE AIRPLANE SLIPPED MORE TO THE RIGHT THAN HE HAD INTENDED. HE SAID IT HAD SLIPPED INTO ABOUT A 45 DEGREE BANK AND THAT THE STALL HORN ACTIVATED. THE PILOT SAID THE AIRPLANE WOULD NOT LEVEL OFF WITH LEFT RUDDER APPLICATION. HE SAID HE HAD NOT USED LEFT AILERON TO HELP WITH THE RECOVERY. DURING THE ON-SCENE INVESTIGATION, NO MECHANICAL ANOMALIES WERE FOUND WITH THE AIRFRAME OR ENGINE.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: a low altitude maneuver performed by the pilot and the pilot not maintaining the airplane's airspeed. A factor in this accident was the pilot encountering a stall/mush.

Findings

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

Findings

1. (C) LOW ALTITUDE FLIGHT/MANEUVER - PERFORMED - PILOT IN COMMAND
2. (C) AIRSPEED - NOT MAINTAINED - PILOT IN COMMAND
3. (F) STALL/MUSH - ENCOUNTERED - PILOT IN COMMAND

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

Findings

4. OBJECT - TREE(S)

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings

5. TERRAIN CONDITION - GROUND

Factual Information

On June 5, 1995, at 1230 central daylight time (cdt), a Grumman AA-1, N6122L, piloted by a private pilot, was destroyed during a collision with trees, terrain, and post-crash fire shortly after takeoff from runway 14 (3,205' X 60' dry asphalt) at the Linn Creek Grand-Glaize Memorial Airport, Osage Beach, Missouri. Visual meteorological conditions prevailed at the time of the accident. The 14 CFR Part 91 personal flight was not operating on a flight plan. The pilot received serious injuries and a passenger was fatally injured. The flight departed Osage Beach, Missouri, at 1230 cdt.

An interview with the pilot was conducted on June 8, 1995. The pilot stated the airplane lifted off the runway at 65 mph. He said he climbed the airplane at 90 mph and banked it to the right immediately takeoff. Upon reaching 500 to 800 feet on the crosswind leg, the pilot said he began a turn to the downwind leg of the departure runway. He said it was at this point the airplane "slipped" to the right more than he had intended. The pilot was asked how steep a bank the airplane was in at that point in the flight. He said about 45 degrees. According to the pilot, once in the steep bank the airplane began a descent and the stall horn went off.

The pilot said he did not apply back pressure while the stall horn was activated. He said he could not level the wings with left rudder. He said everything was happening very fast and that he could not figure out why the airplane's wings would not level out with left rudder. He was asked if he applied left aileron with the left rudder application. He said that he did not, that the ailerons were flat.

According to the pilot, the passenger's feet were not on the rudder pedals or wedged under or next to them. He said his friend always kept his hands and feet away from the controls.

About an hour after the interview with the pilot and NTSB IIC spoke a second time. During this interview the pilot said he performed a "sweeping turn" and was continually climbing during the turn. He said the wings were level for only a short time before he started the turn to downwind. He was asked to define a short time and responded with a matter of seconds.

A friend of the pilot witnessed the flight from takeoff to the moment the airplane descended below the tree line west of the airport. He said the airplane lifted off at the runway's midpoint. The airplane, according to the witness, climbed to about 200 feet above the ground, and made a right bank over the trees that were west of the airport. He recalled what he thought was the left aileron in an "up" position right after the airplane began its bank following takeoff. The airplane kept banking to the right according to the witness. He said he watched it go below the trees. The same witness stated, during an interview with an Osage Beach Police Officer, that the accident airplane climbed to "...about 50 feet. At that time [it] started making a right banking turn and while banking right started losing altitude."

Shortly after descending below the trees the witness said he heard a "ping" sound. About 15 seconds later he heard a "poof" sound and saw black smoke rising above the trees. The witness was asked to describe the engine sound during the flight. He said it sounded just as it did during takeoff and remained the same sound as it went below the tree line.

The on-scene investigation revealed control continuity between each control surface and their respective cockpit control mechanism. The engine examination revealed mechanical continuity from front to rear, including magneto drive gears. Magnetos produced spark when each was rotated. The spark plugs were tan/gray in color and did not have any debris in

and/or around the electrodes. The carburetor was destroyed by the post impact fire. All airplane and pilot logbooks were destroyed in the post impact fire according to the pilot.

Pilot Information

Certificate:	Private	Age:	34, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	03/03/1995
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	327 hours (Total, all aircraft), 303 hours (Total, this make and model), 7 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	GRUMMAN	Registration:	N6122L
Model/Series:	AA-1 AA-1	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	322
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	09/13/1994, Annual	Certified Max Gross Wt.:	1500 lbs
Time Since Last Inspection:	30 Hours	Engines:	1 Reciprocating
Airframe Total Time:	2000 Hours	Engine Manufacturer:	LYCOMING
ELT:	Installed, not activated	Engine Model/Series:	O-235-F2C
Registered Owner:	RONALD R. KUCZER	Rated Power:	125 hp
Operator:	RONALD R. KUCZER	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	AIZ, 869 ft msl	Distance from Accident Site:	6 Nautical Miles
Observation Time:	1255 CDT	Direction from Accident Site:	95°
Lowest Cloud Condition:	Scattered / 4000 ft agl	Visibility	5 Miles
Lowest Ceiling:	Unknown / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	9 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	100°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	24° C / 19° C
Precipitation and Obscuration:			
Departure Point:	(K15)	Type of Flight Plan Filed:	None
Destination:	ST. LOUIS, MO (SUS)	Type of Clearance:	None
Departure Time:	1245 CDT	Type of Airspace:	Class E

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Fatal	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal, 1 Serious	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	FRANK S GATTOLIN	Report Date:	09/24/1995
Additional Participating Persons:	LARRY WAHL; KANSAS CITY, MO		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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National Transportation Safety Board Aviation Accident Final Report

Location:	Osage Beach, MO	Accident Number:	CHI05CA159
Date & Time:	06/25/2005, 1115 CDT	Registration:	N7195L
Aircraft:	Robinson R22 Beta	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	1 Minor, 1 None

Flight Conducted Under: Part 91: General Aviation - Other Work Use

Analysis

The helicopter was destroyed on impact with a lake. The pilot's accident report stated, "I was on a photo flight. We were taking pictures of boats on the Lake Of The Ozarks. I was descending from about 150 [feet above ground level] agl, to take photos. I tried to level off about 40 agl when the helicopter began to shudder and sink through. I pulled more collective which seemed to worsen the shudder. I began a flare and collided with the water for the most part skids level." The pilot did not list any mechanical malfunctions associated with the flight.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot not maintaining clearance from the water while maneuvering for photographs.

Findings

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

Findings

1. TERRAIN CONDITION - WATER
2. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

Pilot Information

Certificate:	Commercial	Age:	29, Male
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Helicopter	Second Pilot Present:	
Instructor Rating(s):	Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 Without Waivers/Limitations	Last FAA Medical Exam:	01/01/2005
Occupational Pilot:		Last Flight Review or Equivalent:	02/01/2005
Flight Time:	606 hours (Total, all aircraft), 489 hours (Total, this make and model), 175 hours (Last 90 days, all aircraft), 60 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Robinson	Registration:	N7195L
Model/Series:	R22 Beta	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	3203
Landing Gear Type:	Skid	Seats:	2
Date/Type of Last Inspection:	Annual	Certified Max Gross Wt.:	1370 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Lycoming
ELT:		Engine Model/Series:	O-360-J2A
Registered Owner:	Midwest Aeronautical Inc.	Rated Power:	180 hp
Operator:	Midwest Aeronautical Inc.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	AIZ, 869 ft msl	Distance from Accident Site:	
Observation Time:	CDT	Direction from Accident Site:	
Lowest Cloud Condition:		Visibility	
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	KAISER/LAKE OZA, MO (AIZ)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1035 CDT	Type of Airspace:	

Airport Information

Airport:		Runway Surface Type:	
Airport Elevation:		Runway Surface Condition:	
Runway Used:		IFR Approach:	
Runway Length/Width:		VFR Approach/Landing:	

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Destroyed
Passenger Injuries:	1 Minor	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor, 1 None	Latitude, Longitude:	38.110556, -92.680556

Administrative Information

Investigator In Charge (IIC):	Edward F Malinowski	Report Date:	10/27/2005
Additional Participating Persons:	Bob Arnsperger; Kansas City, MO, FSDO		
Publish Date:			
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.		
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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National Transportation Safety Board Aviation Accident Final Report

Location:	OSAGE BEACH, MO	Accident Number:	CHI92LA240
Date & Time:	08/13/1992, 1010 CDT	Registration:	N701PT
Aircraft:	PIPER PA-31T1	Aircraft Damage:	Substantial
Defining Event:		Injuries:	5 None

Flight Conducted Under: Part 91: General Aviation - Executive/Corporate

Analysis

THE PILOT FLEW A VOR APPROACH AND CANCELLED HIS IFR CLEARANCE AFTER HE BROKE OUT OF THE CLOUDS. HE CONTINUED THE APPROACH FOR A VISUAL LANDING AND TOUCHED DOWN SHORT OF THE RUNWAY. THE MAIN LANDING GEAR WAS DAMAGED WHEN IT STRUCK THE APPROACH END OF THE RUNWAY ON ROLLOUT.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:
FAILURE TO ATTAIN THE PROPER TOUCHDOWN POINT.

Findings

Occurrence #1: UNDERSHOOT
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. (C) PROPER TOUCHDOWN POINT - NOT ATTAINED - PILOT IN COMMAND

Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: LANDING - ROLL

Findings
2. TERRAIN CONDITION - RUNWAY
3. LANDING GEAR,MAIN GEAR - OVERLOAD

Factual Information

Pilot Information

Certificate:	Private	Age:	36, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Glider	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	11/20/1990
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	1900 hours (Total, all aircraft), 700 hours (Total, this make and model), 1685 hours (Pilot In Command, all aircraft), 36 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	PIPER	Registration:	N701PT
Model/Series:	PA-31T1 PA-31T1	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	31T-8004008
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	04/03/1992, Continuous Airworthiness	Certified Max Gross Wt.:	8700 lbs
Time Since Last Inspection:	48 Hours	Engines:	2 Turbo Prop
Airframe Total Time:	3790 Hours	Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	PT6A-11
Registered Owner:	NATOLI ENGINEERING CO., INC.	Rated Power:	500 hp
Operator:	NATOLI ENGINEERING CO., INC.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Day
Observation Facility, Elevation:	AIZ, 869 ft msl	Distance from Accident Site:	6 Nautical Miles
Observation Time:	1015 CDT	Direction from Accident Site:	90°
Lowest Cloud Condition:	Unknown / 900 ft agl	Visibility	10 Miles
Lowest Ceiling:	Overcast / 900 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	7 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	40°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	17° C / 14° C
Precipitation and Obscuration:			
Departure Point:	CHESTERFIELD, MO (SUS)	Type of Flight Plan Filed:	IFR
Destination:	OSAGE BEACH, MO (K15)	Type of Clearance:	IFR
Departure Time:	0930 CDT	Type of Airspace:	Class G

Airport Information

Airport:	LINN CREEK-GRAND GLAIZE (K15)	Runway Surface Type:	Asphalt
Airport Elevation:	875 ft	Runway Surface Condition:	Dry
Runway Used:	32	IFR Approach:	VOR/DME
Runway Length/Width:	3205 ft / 60 ft	VFR Approach/Landing:	Full Stop; Straight-in

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	4 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	5 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	MARK E DOUB	Report Date:	06/30/1993
Additional Participating Persons:	FRED BEEMAN; KANSAS CITY, MO		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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National Transportation Safety Board Aviation Accident Final Report

Location:	OSAGE BEACH, MO	Accident Number:	CHI95LA300
Date & Time:	08/27/1995, 1700 CDT	Registration:	N54417
Aircraft:	PIPER PA-32-300	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

AIRPORT TRAFFIC WAS USING RUNWAY 32 AT THE TIME OF THE ACCIDENT. THE STUDENT PILOT, WHO WAS FLYING WITH A PASSENGER, LANDED ON RUNWAY 14. DURING THE LANDING, THE AIRPLANE CONTINUED PAST THE DEPARTURE END OF RUNWAY 14, AND WENT INTO AN AREA OF TREES AND BRUSH. THE PASSENGER REPORTED THAT THE STUDENT PILOT SAID HE LANDED LONG AND FAST.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the student pilot's misjudgement of distance and speed during the landing and failure to attain the proper touchdown point.

Findings

Occurrence #1: OVERRUN
Phase of Operation: LANDING - ROLL

Findings

1. (C) DISTANCE/SPEED - MISJUDGED - PILOT IN COMMAND
2. (C) PROPER TOUCHDOWN POINT - NOT ATTAINED - PILOT IN COMMAND

Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: LANDING

Findings

3. TERRAIN CONDITION - HIGH VEGETATION

Factual Information

On August 27, 1995 at 1700 central daylight time, a Piper PA-32-300, N54417, operated by Affiliated Bank Group LTD., ran off the end of runway 14 (3,205'x60'), and collided with trees while landing, at Grand Glaize Memorial Airport, Osage Beach, Missouri. The student pilot and one passenger were uninjured. The aircraft was substantially damaged. The 14 CFR Part 91 flight originated in Kansas City, Missouri, at 1500 central daylight time. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed.

In his written statement, the pilot reported that at the moment of touch down on runway 14 an airplane pulled onto the runway for takeoff on runway 32. The pilot reported that in order to avoid a collision he maneuvered the airplane off the runway.

A Federal Aviation Administration (FAA) Inspector reported that N54417 ended up past the departure end of runway 14 in the trees and bushes. Airport personal estimated the distance from the departure end of runway 14 to the trees and bushes as 200 feet. Investigation revealed airport traffic was using runway 32 at the time of the accident. During a personal interview with the FAA Inspector, the passenger reported, that the pilot said he landed long and fast.

Pilot Information

Certificate:	Student	Age:	46, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Unknown	Last FAA Medical Exam:	01/26/1949
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	370 hours (Total, all aircraft), 339 hours (Total, this make and model), 22 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	PIPER	Registration:	N54417
Model/Series:	PA-32-300 PA-32-300	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	7440052
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	Unknown	Certified Max Gross Wt.:	3400 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	LYCOMING
ELT:		Engine Model/Series:	IO-540
Registered Owner:	AFFILIATED BANK GROUP	Rated Power:	300 hp
Operator:	CLARKE S DIXON	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	AIZ, 869 ft msl	Distance from Accident Site:	5 Nautical Miles
Observation Time:	1556 CDT	Direction from Accident Site:	90°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	3 Miles
Lowest Ceiling:	Unknown / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	10°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	34° C / 18° C
Precipitation and Obscuration:			
Departure Point:	KANSAS CITY, MO (MKC)	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1500 CST	Type of Airspace:	Class E

Airport Information

Airport:	OSAGE BEACH (K15)	Runway Surface Type:	Asphalt
Airport Elevation:	875 ft	Runway Surface Condition:	Dry; Rough
Runway Used:	14	IFR Approach:	None
Runway Length/Width:	3205 ft / 60 ft	VFR Approach/Landing:	

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	DAVID A BOLDENOW	Report Date:	02/27/1996
Additional Participating Persons:	LARRY WAHL; KANSAS CITY, MO		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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National Transportation Safety Board Aviation Accident Final Report

Location:	Osage Beach, MO	Accident Number:	CHI07CA008
Date & Time:	10/12/2006, 1600 CDT	Registration:	N8546P
Aircraft:	Piper PA-24-260	Aircraft Damage:	Substantial
Defining Event:		Injuries:	4 None

Flight Conducted Under: Part 91: General Aviation - Personal

Analysis

The airplane was substantially damaged during a hard landing. The pilot reported experiencing light to moderate turbulence during his descent to the destination airport. He reported that, "immediately prior to touchdown there was a gust of wind jerking us in our seats. There was an immediate loss of airspeed and lift." The pilot reported that he applied full engine power, but the airplane impacted the runway hard resulting in the damage to the aircraft. The pilot reported that the winds at the accident airport were from 270 degrees at 10 knots gusting to 30 knots. The nearest weather reporting station located about 7 nautical miles east of the accident airport recorded the wind from 270 degrees at 9 knots gusting to 14 knots. The weather report indicated that the wind direction was variable from 250 to 310 degrees. Runway 32 was used for the landing.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate compensation for wind conditions which resulted in the hard landing. The gusting crosswind was a factor.

Findings

Occurrence #1: HARD LANDING
Phase of Operation: LANDING

Findings

1. (F) WEATHER CONDITION - GUSTS
2. (C) COMPENSATION FOR WIND CONDITIONS - INADEQUATE - PILOT IN COMMAND
3. (F) WEATHER CONDITION - CROSSWIND

Factual Information

Pilot Information

Certificate:	Private	Age:	52, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Without Waivers/Limitations	Last FAA Medical Exam:	07/01/2005
Occupational Pilot:		Last Flight Review or Equivalent:	08/01/2005
Flight Time:	1467 hours (Total, all aircraft), 288 hours (Total, this make and model), 25 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N8546P
Model/Series:	PA-24-260	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	24-4003
Landing Gear Type:	Retractable - Tricycle	Seats:	4
Date/Type of Last Inspection:	07/01/2006, Annual	Certified Max Gross Wt.:	3000 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	7789 Hours as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	IO-540
Registered Owner:	On file	Rated Power:	260 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	AIZ	Distance from Accident Site:	
Observation Time:	1555	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	9 knots / 14 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	270°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.92 inches Hg	Temperature/Dew Point:	11 °C / -9 °C
Precipitation and Obscuration:			
Departure Point:	TOPEKA, KS (TOP)	Type of Flight Plan Filed:	None
Destination:	Osage Beach, MO (K15)	Type of Clearance:	None
Departure Time:	1500 CDT	Type of Airspace:	

Airport Information

Airport:		Runway Surface Type:	
Airport Elevation:		Runway Surface Condition:	
Runway Used:		IFR Approach:	
Runway Length/Width:		VFR Approach/Landing:	

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 None	Latitude, Longitude:	38.110556, -92.680556

Administrative Information

Investigator In Charge (IIC):	John M Brannen	Report Date:	01/31/2007
Additional Participating Persons:	Allan Martens; Kansas City		
Publish Date:			
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.		
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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National Transportation Safety Board Aviation Accident Final Report

Location:	Osage Beach, MO	Accident Number:	CHI02LA012
Date & Time:	10/25/2001, 1538 CDT	Registration:	N200RW
Aircraft:	Beech 200	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 None
Flight Conducted Under:	Part 91: General Aviation - Business		

Analysis

The Beech 200 was substantially damaged during an aborted landing. The winds were gusting in excess of the airplane's maximum demonstrated crosswind component. A witness reported finding landing gear strut pieces on the runway after the Beech 200's landing attempt. The flight then aborted the landing and continued on to its originating airport where the airplane veered off the runway and damaged airport property during its landing.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The inadequate planning/decision and the exceeded crosswind component by the pilot. The gusts were a contributing factor.

Findings

Occurrence #1: HARD LANDING
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. (F) WEATHER CONDITION - GUSTS
2. (C) PLANNING/DECISION - INADEQUATE - PILOT IN COMMAND
3. LANDING GEAR - OVERLOAD
4. (C) CROSSWIND COMPONENT - EXCEEDED - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: EMERGENCY LANDING

Factual Information

On October 25, 2001, at 1538 central daylight time, a Beech 200, N200RW, piloted by an airline transport pilot, received substantial damage during an aborted landing on runway 21 (6,497 feet by 100 feet, asphalt) at the Lee C. Fine Memorial Airport (AIZ), Osage Beach, Missouri. The pilot aborted the landing and returned to the Spirit of St. Louis Airport (SUS), St. Louis, Missouri, from which the flight originated. Upon landing at SUS on runway 26R (3,800 feet by 75 feet, asphalt), the airplane veered off the runway, impacted a visual approach slope indicator, crossed taxiway echo, and stopped short of several T-hangars located on the north ramp. The 14 CFR Part 91 business flight was operating on an instrument rules flight plan. The pilot was uninjured. The flight originated from SUS and was en route to AIZ prior to the accident.

The pilot reported in a written statement, "...I departed Spirit 14:45 and arrived at Lee C. Fine approximately 15:15. I was listening to the AWOS coming in, so I picked runway 21. I went out for a long final because of the winds. I also turned the right radio up to be sure I hear the reports. As I came down final, the reports were mostly 270/15, with some variation and gusts. As I touched down, I heard a kind of rattling sound. My reaction was to pull up and add take-off power. I was going to go around for another approach, but when I tried to raise the gear, I knew I had troubles. The left main gear would not come up. I headed for Spirit and contacted maintenance and the Spirit Tower. I was in the air over Spirit for about half an hour using up fuel and letting the emergency vehicles get in place. While I was in the air over Spirit, I tried to shake the gear down to no avail. I did shake some drawers out and lost power on the flaps, but I did manage to get the fuel off before touch down."

A witness, located on a ramp parallel to runway 21 at AIZ, reported in a written statement, "At approximately 3:30-3:45 pm on 10-25-01 I observed a King Air 200 attempt to land on [runway] 21 at Lee C. Fine Memorial Airport. It was extremely windy, with [gusts] up to 25 knots. As the aircraft touched down I noticed a large amount of smoke from the tires. The aircraft then appeared to settle toward the left wing. The aircraft [then] aborted the landing and then took back off. As he climbed out it appeared that the nose and [right] main gear retracted normally. The left gear appeared to remain down. The aircraft then made a left turn and headed east. Shortly thereafter a Pilatus also attempted to land and aborted the approach. He then attempted a second approach and aborted. At that time thinking the King Air may have blown a tire, I checked the runway and found the strut pieces. I then contacted Columbia flight services."

The maximum demonstrated crosswind is defined in The Design of the Airplane, by Darrol Stinton, as "The velocity of the crosswind component for which adequate control of the aeroplane during take-off and landing was actually demonstrated during certification tests." The maximum demonstrated crosswind component for the King Air 200 is 25 KIAS.

The AIZ automated weather observing system recorded the following:

At 1515, winds from 290 degrees at 17 knots gusting to 27 knots.

At 1535, winds from 300 degrees at 13 knots gusting to 31 knots.

At 1555, winds from 290 degrees at 14 knots gusting to 27 knots.

Pilot Information

Certificate:	Flight Instructor; Commercial	Age:	61, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	Toxicology Performed:	No
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	03/09/2001
Occupational Pilot:		Last Flight Review or Equivalent:	04/11/2001
Flight Time:	19213 hours (Total, all aircraft), 13242 hours (Total, this make and model), 18840 hours (Pilot In Command, all aircraft), 21 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	Registration:	N200RW
Model/Series:	200	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	BB242
Landing Gear Type:	Retractable - Tricycle	Seats:	12
Date/Type of Last Inspection:	04/23/2001, Continuous Airworthiness	Certified Max Gross Wt.:	12500 lbs
Time Since Last Inspection:	93.5 Hours	Engines:	2 Turbo Prop
Airframe Total Time:	11416.2 Hours	Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	PT6-41
Registered Owner:	200 RW Incorporated	Rated Power:	850 hp
Operator:	Williams Patent Crusher & Pulverizer Company	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	AIZ, 869 ft msl	Distance from Accident Site:	
Observation Time:	1535 CDT	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	13 knots / 31 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	295°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.19 inches Hg	Temperature/Dew Point:	13° C / -4° C
Precipitation and Obscuration:			
Departure Point:	St. Louis, MO (SUS)	Type of Flight Plan Filed:	Unknown
Destination:	Osage Beach, MO (AIZ)	Type of Clearance:	Unknown
Departure Time:	1445 CDT	Type of Airspace:	Class G

Airport Information

Airport:	Lee C. Fine Memorial (AIZ)	Runway Surface Type:	Asphalt
Airport Elevation:	869 ft	Runway Surface Condition:	Unknown
Runway Used:	21	IFR Approach:	Unknown
Runway Length/Width:	6497 ft / 100 ft	VFR Approach/Landing:	Full Stop; Straight-in

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	Mitchell F Gallo	Report Date:	07/02/2002
Additional Participating Persons:	Lemont L Wison; Federal Aviation Administration; Saint Louis, MO		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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National Transportation Safety Board Aviation Accident Final Report

Location:	Osage Beach, MO	Accident Number:	CHI03LA044
Date & Time:	12/20/2002, 1600 CST	Registration:	N3236Y
Aircraft:	Piper PA-28-180	Aircraft Damage:	Substantial
Defining Event:		Injuries:	2 Minor, 2 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The airplane was substantially damaged during a forced landing in a wooded area following a loss of engine power during descent for landing. The pilot reported having an electrical system failure during the flight. He reported that he switched the master switch off to conserve battery power about 12 to 15 nautical miles (nm) from the destination airport. He stated that the engine lost power about 5 to 6 nm from the destination. The pilot reported switching fuel tanks and turning the master switch and electric fuel pump on. The pilot reported that engine power was restored for about 10 to 15 seconds at which time the battery was completely drained and the engine stopped. Postaccident examination revealed that the mechanical fuel pump would not pump fuel when the engine was cranked using the starter. In addition, the fuel pump would not pump fuel unless the fuel pump's plunger was moved beyond the normal travel range. No determination was made as to the nature of the electrical system failure.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Fuel Starvation due to the failure of the mechanical fuel pump and the inoperable electric fuel pump caused by the electrical system failure. Factors were the unsuitable terrain and the trees.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: DESCENT

Findings

1. (C) ELECTRICAL SYSTEM - FAILURE
 2. (C) FUEL SYSTEM,PUMP - FAILURE
 3. (C) FUEL SYSTEM,PUMP - NOT OPERATING
 4. (C) FLUID,FUEL - STARVATION
-

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings

5. (F) OBJECT - TREE(S)
6. (F) UNSUITABLE TERRAIN OR TAKEOFF/LANDING/TAXI AREA - ENCOUNTERED - PILOT IN COMMAND

Factual Information

On December 20, 2002, at 1600 central standard time, a Piper PA-28-180, N3236Y, piloted by a private pilot, was substantially damaged when it impacted trees during a forced landing following a loss of engine power near Osage Beach, Missouri. The airplane was descending to land at the Grand Glaize-Osage Beach Airport (K15), when the power loss occurred. The 14 CFR Part 91 personal flight was operating in visual meteorological conditions without a flight plan. Two of the passengers received minor injuries. The pilot and the remaining passenger were not injured. The flight originated from the Sackman Field Airport (H49), Columbia, Illinois, at 1435.

The pilot reported that he had filled both fuel tanks prior to his departure from H49. He stated that he encountered strong headwinds and that his ground speed was about 75 knots at 2,400 engine rpm. He stated that he noticed an electrical system failure about 12 to 15 nautical miles (nm) from K15. The pilot did not report the nature of the electrical system failure. He stated that he announced his intention to land at K15 and then switched the master switch off to conserve battery power about 10 nm from K15. The pilot stated that the engine sputtered and quit about 5 to 6 nautical miles from K15. He states that he then turned the master switch and electric fuel pump on and switched to the right fuel tank and the engine started and ran for about 10 to 15 seconds until the battery completely drained and the engine subsequently stopped. The pilot executed a forced landing into a wooded area.

The Federal Aviation Administration (FAA) conducted a postaccident examination of the airplane. The right fuel tank contained fuel. No fuel was found in the left fuel tank; however, the fuel tank had been breached due to the impact. No evidence of a fuel spill was found at the accident site. The fuel selector was found positioned for the left fuel tank. The electric fuel pump switch was found in the "ON" position.

A mechanic, under the direction of the FAA and National Transportation Safety Board Inspectors, inspected the engine and fuel system subsequent to the removal of the airplane from the accident site. The engine driven fuel pump was removed from the engine and was able to pump fuel from a can when the plunger was moved through its full range. The output side of the fuel pump was then capped and the plunger arm depressed to see if fuel could be forced out of the vent hole. No fuel was observed being forced out of the vent hole. The fuel pump push pin within the engine was checked for operation on the fuel pump lobe and no deficiencies were found. The push pin travel was about one inch.

The engine driven fuel pump was re-installed on the engine. Electrical power was supplied to the aircraft electrical system and the electric fuel boost pump was checked for operation. No deficiencies were found with respect to the operation of the electric fuel boost pump. The mechanical fuel pump was again checked for signs of leakage from the vent hole while the electric boost pump was activated and no leakage was detected. The electric fuel pump was switched off, the carburetor drain plug was removed, and the engine was cranked several times using the starter. During engine cranking, no fuel was observed draining from the carburetor drain.

The engine exhibited "thumb" compression on all cylinders. The magnetos were checked for operation and re-installed on the engine. At that time, a determination was made not to attempt to start the engine since oil was observed leaking from the engine in the area of the crankshaft seal. The mechanic noted that the only time that fuel was able to be pumped by the

engine driven pump was when the pump's plunger was moved through its full range which was greater than the normal travel range of the push pin.

A subsequent disassembly of the mechanical fuel pump revealed no apparent deficiencies.

No determination was made as to the nature of the electrical system deficiency claimed by the pilot.

Pilot Information

Certificate:	Private	Age:	37, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	08/23/2001
Occupational Pilot:		Last Flight Review or Equivalent:	10/15/2002
Flight Time:	250 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N3236Y
Model/Series:	PA-28-180	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal; Utility	Serial Number:	28-1161
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	Unknown	Certified Max Gross Wt.:	2400 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:		Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	O-360-A3A
Registered Owner:	On file	Rated Power:	180 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KAIZ, 869 ft msl	Distance from Accident Site:	
Observation Time:	1555 CST	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	20 knots / 27 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	260°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.85 inches Hg	Temperature/Dew Point:	9° C / -9° C
Precipitation and Obscuration:			
Departure Point:	COLUMBIA, IL (H49)	Type of Flight Plan Filed:	None
Destination:	OSAGE BEACH, MO (K15)	Type of Clearance:	None
Departure Time:	1435 CST	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	2 Minor, 1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Minor, 2 None	Latitude, Longitude:	38.135278, -92.652222

Administrative Information

Investigator In Charge (IIC):	John M Brannen	Report Date:	03/30/2004
Additional Participating Persons:	Tom Bartels; FAA-Kansas City, Missouri; Kansas City, MO		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinquiry@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).