Aviation Investigation Final Report

Location:	Great Bend, Kansas	**Accident Number:**	CHI04FA157
Date & Time:	June 16, 2004, 23:30 Local	**Registration:**	N6698P
Aircraft:	Piper PA-24-180	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane was destroyed during an in-flight collision with terrain in night instrument meteorological conditions. The non-instrument rated private pilot and three passengers sustained fatal injuries. The flight encountered a rapidly moving line of thunderstorms after takeoff and was attempting to return to the departure airport at the time of the accident. The pilot contacted Wichita Automated Flight Service Station (AFSS) while in-flight, about 15 minutes prior to the accident. He reported his position as 4 miles north of the airport and intended to conduct a local flight. The AFSS briefer stated that an area of "pretty severe thunderstorms" were immediately to the west and estimated that the storms would be getting into the area within the next 5 minutes. The briefer added: "I would not recommend . . . flying around the . . . area at this time." The pilot replied that he was turning around and returning to the airport. The were no further communications with the accident pilot. There was no record of a pre-flight weather briefing being obtained by the pilot. A witness reported seeing an aircraft flying near her home about 10 minutes prior to the accident. She commented, "the wind started to come up and the dirt started blowing, then raining. I could not see across the field in front of my house." A second witness stated that about the time of the accident, he and his wife were at their residence watching a thunderstorm in progress. He reported that they heard a low flying aircraft approaching from the east. He noted that he looked out a window and saw a plane at a low altitude. He added that as the aircraft banked toward the northwest, a bolt of lightning struck near the house. The accident site was located the following morning in a field immediately north of his residence. Weather recorded at the departure airport about 5 minutes after the accident noted northwest winds gusting to 23 knots, 1/2 mile visibility with thunderstorms, broken clouds 200 feet above ground level (agl), and overcast clouds at 900 feet agl. A convective SIGMET was in effect for severe thunderstorms moving through the area, with storm tops exceeding 45,000 feet mean sea level, moving to the east at 30 knots. Weather radar data depicted a line of thunderstorms moving through the area. About 30 minutes prior to the accident the extreme east edge of the thunderstorm line arrived over the area. In the image recorded about 25 minutes after the

accident, this area had passed over and was located approximately 15 miles to the east. The Federal Aviation Administration (FAA) Civil Aero Medical Institute toxicology report stated that the pilot's blood alcohol level was 54 mg/dL (0.054 percent by weight). FAA regulations prohibited any person from acting as the pilot of a civil aircraft while under the influence of alcohol or while having a 0.04 or greater percent by weight of alcohol in their blood.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate preflight planning due to his failure to obtain a weather briefing prior to takeoff. Additional causes were the pilot's inadvertent flight into adverse weather and his failure to maintain clearance with the terrain during his attempt to return to the departure airport. Contributing factors were the pilot's impairment due to alcohol, the low altitude at which the aircraft was flying, the thunderstorms and associated turbulence in the area, the low ceilings, and the dark night lighting conditions.

Findings

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

Findings
1. (C) PREFLIGHT PLANNING/PREPARATION - INADEQUATE - PILOT IN COMMAND
2. (C) FLIGHT INTO ADVERSE WEATHER - INADVERTENT - PILOT IN COMMAND
3. (F) ALTITUDE - LOW
4. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
5. (F) IMPAIRMENT(ALCOHOL) - PILOT IN COMMAND
6. (F) WEATHER CONDITION - THUNDERSTORM
7. (F) WEATHER CONDITION - TURBULENCE(THUNDERSTORMS)
8. (F) WEATHER CONDITION - LOW CEILING
9. (F) LIGHT CONDITION - DARK NIGHT
10. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On June 16, 2004, at 2330 central daylight time, a Piper PA-24-180, N6698P, piloted by a private pilot, was destroyed during an in-flight collision with terrain about 3-1/2 miles southeast of Great Bend Municipal Airport (GBD), Great Bend, Kansas. The personal flight was operating under 14 CFR Part 91 without a flight plan. Night instrument meteorological conditions with convective activity prevailed at the time of the accident. The pilot and three passengers sustained fatal injuries. The local flight departed GBD about 2300.

While in-flight, at 2316, a pilot representing N6698P contacted the Wichita Automated Flight Service Station (AFSS). The briefer advised the pilot that severe thunderstorms were in the vicinity of GBD and that he would recommend returning to the airport. The briefer told the pilot that the storms were moving to the east at 25 knots and estimated that they would be passing GBD within approximately 5 minutes. The pilot responded that he was returning to the airport. There was no further contact between the accident aircraft and the AFSS. A transcript of these communications is included with the docket of this report.

A witness stated that she was standing on her front porch about 2320 watching the weather. She reported that she noticed a small airplane north of her home. She noted the airplane was initially traveling westbound, but it turned "straight south" as she watched it. As the airplane approached the road in front of her home, it turned and proceeded westbound again. She noted, "the wind started to come up and the dirt started blowing, then raining. I could not see across the field in front of my house."

A second witness stated that about 2330 he and his wife were at their residence watching a thunderstorm in progress. He reported that they heard a low flying aircraft approaching from the east. He noted that he looked out of a south-facing window and saw an airplane at a low altitude. He added that as the aircraft banked toward the northwest, a bolt of lightning struck near the house.

The accident site was found about 0730 the following morning by the second witness. The accident site was located in a field immediately north of his residence.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with a single-engine land airplane rating issued by the Federal Aviation Administration. He was issued a third-class airman medical certificate on January 23, 2003. The medical certificate was issued without limitations.

The pilot reported a total flight time of 628 hours on his application for the medical certificate. He reported no flight time within the previous 6 months. His pilot logbook was not located.

AIRCRAFT INFORMATION

The accident airplane was a 1960 Piper PA-24-180 Comanche (serial number 24-1824). It was a four-place; low-wing aircraft of predominantly aluminum construction with a retractable tricycle landing gear configuration. A 180-horsepower Lycoming O-360-A1A engine (serial number L-4254-36) powered the airplane.

An annual inspection was completed on December 3, 2002, at a total airframe time of 4,213 hours. At the time of the inspection, the recording tachometer was noted as 1,368 hours. An altimeter and static system pressure check was completed in October 1996. An entry for a more recent static system check was not observed in the logbook.

The recording tachometer indicated 1,383.28 hours at the accident site.

METEOROLOGICAL INFORMATION

The Automated Weather Observing System (AWOS-3), located at GBD, recorded observations are listed below. The AWOS-3 unit did not have a precipitation sensor.

At 2315: Winds from 280 degrees at 19 knots, gusting to 23 knots; 10 miles visibility with thunderstorms; few clouds at 1,800 feet above ground level (agl), scattered clouds at 6,500 feet agl. The record also included the notes: lightning distant south, and thunderstorm began 1 minute after the hour.

At 2335: Winds from 320 degrees at 19 knots, gusting to 23 knots; 1/2 mile visibility with thunderstorms; broken clouds at 200 feet agl, overcast clouds at 900 feet agl. A note: Lightning distant all quadrants was also included.

A Convective Significant Meteorological Information (SIGMET) was issued at 2255 for an area of severe thunderstorms moving from 270 degrees at 30 knots. The SIGMET noted that cloud tops were above 45,000 feet mean sea level (msl). The region affected by the SIGMET was from 60 miles southwest of Wolbach, Nebraska; to 30 miles west of Enid, Oklahoma; to 30 miles west of Amarillo, Texas; to 10 miles northeast of Goodland, Kansas; to 60 miles southwest of Wolbach Nebraska. GBD was located along the east edge of this area. The SIGMET was valid until 0055.

A Severe Weather Forecast Alert was issued at 2005 for severe thunderstorms over Kansas in effect from 2005 on June 16, until 0100 on June 17. The associated Weather Watch warned of an area of severe thunderstorms 55 miles east and west of a line from 35 miles south-southeast of Hill City, Kansas, to 43 miles north of Gage, Oklahoma. The warning noted thunderstorm tops to 50,000 feet msl, hail to 1-1/2 inches in diameter, extreme turbulence and

wind gusts to 70 knots. The storms were moving from 270 degrees at 35 knots.

The technical discussion issued with the Weather Watch indicated that a well-defined bow echo was moving eastward at 35 knots across southwest Kansas and was expected to continue for the next several hours. The system was capable of producing damaging winds and large hail through 0100. The advisory warned that the greatest threat of severe weather would be located at the bow echo.

Nexrad weather data recorded by the Wichita, Kansas, site depicted a line of thunderstorms moving through the GBD area about 2300. At 2154, the Nexrad image showed the eastern edge of the weather area approximately 45 miles west of GBD. At 2258, the extreme east edge of the area had arrived over GBD.

Maximum radar reflectivity in the vicinity of GBD reached 50 decibels and was color-coded orange and red on the image. In the Nexrad image recorded at 2355, this area had passed over and was located approximately 15 miles east of GBD. Nexrad plots are included in the docket material associated with this report.

WRECKAGE AND IMPACT INFORMATION

The aircraft was located in a soybean field approximately 3-1/2 miles southeast of GBD. The initial impact point was in a harvested wheat field south of the bean field. The location of the main wreckage was 38 degrees 19 minutes 18 seconds north latitude, 098 degrees 47 minutes 22 seconds west longitude using a handheld global positioning system (GPS) receiver. The initial ground scar was located at 38 degrees 19 minutes 16 seconds north latitude, 098 degrees 47 minutes 27 seconds west longitude. This scar was approximately 8 feet long by 3 feet wide. Two additional ground scars were observed between the initial point and the main wreckage.

The main wreckage was located 490 feet from the initial impact point on a magnetic course of 060 degrees. The engine was dislodged from the airframe and came to rest 205 feet from the main wreckage. The total length of the impact and debris path was 693 feet.

A fan-shaped debris area began at the initial impact point and extended to the main wreckage. Components located in this area included the upper portion of the engine cowling, the propeller spinner, one propeller blade (separated from the engine), the aft baggage door, and the rear passenger seat. A triangular section of the engine crankcase approximately 3 inches by 3 inches was present in this area. Also present were the attitude indicator and directional gyro cases. They were deformed and empty. No internal components were present. The instrument gyros were not located.

The main wreckage was oriented on a 267-degree magnetic heading. The main wreckage consisted of the aircraft cabin area, empennage, left wing, and portions of the right wing.

The empennage was positioned behind the cabin area as on an intact aircraft. It was lying on its right side. The vertical and horizontal stabilizers remained securely attached to the fuselage. The rudder was intact. The right horizontal stabilizer rested on the ground and exhibited leading edge impact damage. The outboard 2-1/2 feet of the right stabilizer and elevator were bent aft. Control continuity from the elevator and rudder to the cabin area was confirmed.

The left wing was positioned adjacent to the fuselage cabin area. It was lying flat on the ground. The outboard portion of the wing exhibited leading edge crushing. The left aileron remained attached at the inboard hinge point. The left main landing gear was observed to the in the retracted position.

The inboard section of the right wing was positioned next to the fuselage, oriented vertically on its leading edge. The right flap was separated and located in the debris path. The right main landing gear was observed to be in the retracted position.

The engine was separated from the aircraft. The forward right-hand cylinder was separated from the crankcase. It was subsequently located in the debris path. A section of the crankcase adjacent to the cylinder was separated. Portions of the crankcase section remained secured to the cylinder by the cylinder bolts. Appearance of the fracture surfaces was consistent with overload failures. The corresponding piston and connecting rod were intact and securely attached to the crankshaft.

One propeller blade remained attached to the propeller shaft. The blade was bent forward (relative to the blade) approximately 90 degrees about a point at mid-span. It exhibited leading edge gouges and twisting toward low pitch.

The second blade was separated from the propeller shaft and located in the debris path. The blade tip was curled aft (relative to the blade) and exhibited twisting toward low pitch. The blade was torn from the outboard end, inboard approximately 6 inches. The forward face of the blade was scratched.

The carburetor was disassembled and no anomalies consistent with a pre-impact failure were observed. A fluid consistent in appearance and smell to 100LL aviation fuel was present in the carburetor. The fuel screen was free of debris. The magnetos provided a spark when the drive gear was rotated by hand. The spark plug electrodes were light gray in color, consistent with normal wear.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was performed at the Sedgwick County Regional Forensic Science Center in Wichita, Kansas, on June 18, 2004.

The FAA Civil Aero Medical Institute toxicology report for the pilot stated:

54 (mg/dL, mg/hg) ETHANOL detected in Blood
106 (mg/dL, mg/hg) ETHANOL detected in Vitreous
95 (mg/dL, mg/hg) ETHANOL detected in Muscle
10 (mg/dL, mg/hg) ACETALDEHYDE detected in Blood
9 (mg/dL, mg/hg) ACETALDEHYDE detected in Vitreous
5 (mg/dL, mg/hg) ISOPROPANOL detected in Blood

ADDITONAL INFORMATION

Title 14 Code of Federal Regulation Part 91.17, Alcohol and Drugs, states that no person may pilot a civil aircraft while under the influence of alcohol or while having a 0.04 or greater percent by weight of alcohol in their blood.

Convective SIGMET is a weather advisory concerning convective weather significant to the safety of all aircraft. Convective SIGMETs are issued for tornadoes, lines of thunderstorms, embedded thunderstorms of any intensity level, areas of thunderstorms greater than or equal to VIP level 4 with an area coverage of 4/10 (40%) or more, and hail 3/4 inch or greater.

Severe Weather Forecast Alerts (AWW) are preliminary messages issued in order to alert users that a Severe Weather Watch Bulletin is being issued. A Severe Weather Watch Bulletin (WW) defines areas of possible severe thunderstorms or tornado activity. Severe thunderstorm criteria are 3/4-inch hail or larger and/or wind gusts of 50 knots or greater.

The Federal Aviation Administration, New Piper Aircraft Inc., and Textron Lycoming were parties to the investigation.

The aircraft wreckage was released on June 18, 2004, at the conclusion of the on-scene investigation.

Pilot Information

Certificate:	Private	**Age:**	48,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	January 23, 2003
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	628 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N6698P
Model/Series:	PA-24-180	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-1824
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	December 3, 2002 Annual	**Certified Max Gross Wt.:**	2550 lbs
Time Since Last Inspection:	4213 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4228 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-360-A1A
Registered Owner:	On file	**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	GBD,1887 ft msl	**Distance from Accident Site:**	3 Nautical Miles
Observation Time:	23:35 Local	**Direction from Accident Site:**	315°
Lowest Cloud Condition:		**Visibility**	0.5 miles
Lowest Ceiling:	Broken / 200 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	19 knots / 23 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	320°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	17°C / 13°C
Precipitation and Obscuration:			
Departure Point:	Great Bend, KS (GBD)	**Type of Flight Plan Filed:**	None
Destination:	(GBD)	**Type of Clearance:**	None
Departure Time:	23:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Great Bend Muni GBD	**Runway Surface Type:**	
Airport Elevation:	1887 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	38.321109,-98.790832

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	James Lamb; FAA-Wichita FSDO; Wichita, KS Joseph Gonsalves; FAA-Wichita FSDO; Wichita, KS George Hollingsworth; New Piper Aircraft, Inc.; Vero Beach, FL John Butler; Textron Lycoming; Williamsport, PA
Original Publish Date:	June 8, 2005
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=59451