Aviation Investigation Final Report

Location:	Yuma, Colorado	**Accident Number:**	DFW08FA212
Date & Time:	August 24, 2008, 08:28 Local	**Registration:**	N5476P
Aircraft:	Piper PA-24-250	**Aircraft Damage:**	Substantial
Defining Event:	VFR encounter with IMC	**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was taking two adult family members to the destination airport, which he had regularly flown to for years. Two witnesses at the airport said that it was "very foggy" with "no ceiling" and that the heaviest fog began approximately 20 to 30 minutes before the accident. The estimated visibility in the fog was approximately 1/2 mile. Witnesses at the airport said that they were inside their office when they heard an airplane coming toward them from the west. The witnesses ran outside after the airplane flew over their office "very low and very fast." The witnesses could not see the airplane, but heard it continue flying away from the airport to the east and heard a change in the sound that indicated "the plane was making a hard turn." Approximately ten seconds after hearing the change in sound, and while the witnesses were looking toward the sound of the airplane, they heard a "loud thump" or "thud" and almost immediately saw a ball of fire. No precrash anomalies were noted with the airframe or engine that would have precluded normal operation. The pilot was rated, and the airplane was certified, for instrument-flight-rules flight, although no flight plan was filed. The Federal Aviation Administration (FAA) Denver air route traffic control center provided visual-flight-rules flight following to the pilot during the flight. The center's last radio contact with the pilot was at 0810, when the flight was approximately 20 miles southwest of the destination airport, after the pilot had terminated flight following. The investigation was unable to determine whether the pilot requested a formal weather briefing prior to the flight.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain control of the airplane after an encounter with instrument meteorological conditions.

Findings

Personnel issues	(general) - Pilot
Environmental issues	Low ceiling - Contributed to outcome
Environmental issues	Low visibility - Contributed to outcome
Personnel issues	Aircraft control - Pilot
Aircraft	(general) - Not attained/maintained

Factual Information

History of Flight

Maneuvering-low-alt flying	VFR encounter with IMC (Defining event)
Approach	Loss of visual reference
Approach	Loss of control in flight
Approach	Collision with terr/obj (non-CFIT)
Post-impact	Fire/smoke (post-impact)

HISTORY OF FLIGHT

On August 24, 2008, approximately 0828 mountain daylight time (MDT), a Piper 24-250, N5476P, was destroyed when it impacted terrain near Yuma, Colorado. The private pilot and his two passengers, were fatally injured. The airplane was owned and operated by the pilot. Instrument meteorological conditions (IMC) prevailed at the time of the accident and a flight plan had not been filed for the Title 14 Code of Federal Regulations Part 91 personal flight. The flight departed Pueblo Memorial Airport (PUB) Pueblo, Colorado, at approximately 0720 and was destined for Yuma Municipal Airport (2V6) Yuma, Colorado.

The pilot was taking two adult family members from the PUB airport to visit other family members near the 2V6 airport. Witnesses said the pilot had flown out of the 2V6 airport quite often for many years.

Witnesses at the 2V6 airport said they were inside their office when they heard an airplane coming toward them from the west. The witnesses ran outside after the airplane flew over their office "very low and very fast". The witnesses heard the airplane in the fog continue flying away from the airport to the east and they then heard a change in the sound that indicated "the plane was making a hard turn".

Approximately ten seconds after hearing the change in sound, while the witnesses were looking toward the sound of the airplane hidden in the fog they heard a "loud thump" or "thud" and almost immediately saw a ball of fire. One of the witnesses immediately called 9-1-1 and the other witness went to the accident scene and directed first responders to the scene.

PERSONNEL INFORMATION

The pilot, age 63, held a private pilot certificate with airplane single-engine land and instrument airplane ratings. The pilot certificate was limited to aircraft with hand operated brakes and FAA approved hand operated rudder controls. The pilot was issued a third-class medical certificate on August 27, 2007, with a restriction that he must wear corrective lenses. The pilot's most recent biennial flight review (BFR) was dated October 3, 2007 and he completed an instrument

proficiency check on August 5, 2007. A review of the pilot's logbook shows he had logged 3,410 hours, of which approximately 1,700 hours were in the accident airplane, and 68 hours were accrued in the preceding 90 days.

Federal Aviation Administration (FAA) records show that the pilot was originally certificated on October 10, 1971 as a private pilot, airplane single-engine land, with no limitations. On March 23, 1983, he passed a special medical flight test and was issued a private pilot certificate, airplane single-engine land, "limited to PA 24-180, serial no. 1196 equipped with rudder hand controls". At that time the pilot reported that he had logged a total of 198 hours. A review of the FAA records and the pilot's logbooks show that he had logged 3,212 hours as a pilot in airplanes with hand operated rudder controls.

AIRCRAFT INFORMATION

N5476P (s.n. 24-525), a model 24-250, was manufactured by the Piper Aircraft Corporation in 1958. It was a low-wing, 4-place, single engine land airplane, powered by a Lycoming O-540-A1A5 engine (s.n. L-1084-40) rated at 250 horsepower, driving a McCauley 3-blade, constant speed, aluminum alloy propeller.

The airplane was issued a standard airworthiness certificate on September 14, 2007, in the normal category. The airplane was registered to the owner on September 12, 1985. A review of the airplane maintenance records disclosed the last annual inspection was dated April 30, 2008, at a total airframe time of 6,020 hours. The airplane was equipped with an S-TEC autopilot, Garmin GNS-430 global positioning system (GPS), JPI engine analyzer, and was certificated for instrument flight.

The airplane had been modified with the installation of several performance modifications, wing tip fuel tanks, and with a rudder hand control. The engine had been modified with the installation of a fuel injector system and an add-on turbocharger system.

METEOROLOGICAL INFORMATION

A surface analysis chart at 0900 depicted a high pressure system located over southwestern Colorado and north central New Mexico. A low pressure system was located over southeastern Colorado and southwestern Kansas with a frontal wave (warm front and cold front) extending to the east over southern Kansas and northern Oklahoma. An extensive area of overcast skies and reduced visibility preceded ahead of the low associated with overrunning the warm front. The accident site was located north of the center of the low pressure system. Observations surrounding the area and witness statements at the accident site indicated IFR conditions prevailed at the time of the accident.

At 0818, the automated surface observing system (ASOS) at Imperial Municipal Airport (IML), Imperial, Nebraska, located approximately 38 miles northeast of the accident site, reported the wind from 150 degrees at 10 knots, visibility 10 statute miles, scattered clouds at 1,200 feet,

overcast clouds at 2,300 feet, temperature 19 degrees Celsius, dew point 16 degrees Celsius, and an altimeter setting of 30.20 inches of Mercury. The elevation of the reporting station at IML is 3,275 feet MSL.

At 0753, the ASOS at Colorado Plains Regional Airport (AKO), Akron, Colorado, located approximately 43 miles west of the accident site, reported the wind from 130 degrees at 13 knots, visibility 1/4 statute mile in fog, overcast clouds at 100 feet, temperature 14 degrees Celsius, dew point 14 degrees Celsius, and an altimeter setting of 30.20 inches of Mercury. The elevation of the reporting station at AKO is 4,714 feet MSL.

At 0840, the ASOS at Renner Field (GLD), Goodland, Kansas, located approximately 50 miles southeast of the accident site, reported the wind from 140 degrees at 12 knots, visibility 6 statute miles in mist, overcast clouds at 300 feet, temperature 17 degrees Celsius, dew point 16 degrees Celsius, and an altimeter setting of 30.21 inches of Mercury. The elevation of the reporting station at GLD is 3,656 feet MSL.

At 0753, the ASOS at Kit Carson County Airport (ITR), Burlington, Colorado, located approximately 51 miles south of the accident site, reported the wind from 120 degrees at 11 knots, visibility 1/4 statute mile in fog, indefinite ceiling at 100 feet, temperature 16 degrees Celsius, dew point 14 degrees Celsius, and an altimeter setting of 30.21 inches of Mercury. The elevation of the reporting station at ITR is 4,219 feet MSL.

At 0755, the ASOS at Mc Cook Ben Nelson Regional Airport (MCK), McCook, Kansas, located approximately 76 miles east of the accident site, reported the wind from 100 degrees at 6 knots, visibility 10 statute miles, broken clouds at 1,000 feet, overcast clouds at 1,400 feet, temperature 19 degrees Celsius, dew point 16 degrees Celsius, and an altimeter setting of 30.19 inches of Mercury. The elevation of the reporting station at MCK is 2,583 feet MSL.

At 0755, the ASOS at Limon Municipal Airport (LIC), Limon, Colorado, located approximately 82 miles southwest of the accident site, reported the wind variable at 3 knots, visibility 10 statute miles, clear of clouds, temperature 18 degrees Celsius, dew point 13 degrees Celsius, and an altimeter setting of 30.22 inches of Mercury. The elevation of the reporting station at LIC is 5,374 feet MSL.

At 0653 the ASOS at Pueblo Memorial Airport (PUB), Pueblo, Colorado, located approximately 151 miles southwest of the accident site, reported calm winds, visibility 10 statute miles, clear of clouds, temperature 15 degrees Celsius, dew point 14 degrees Celsius, and an altimeter setting of 30.17 inches of Mercury. The elevation of the reporting station at PUB is 4,726 feet MSL.

At 0753 the ASOS at PUB reported calm winds, visibility 10 statute miles, clear of clouds, temperature 17 degrees Celsius, dew point 15 degrees Celsius, and an altimeter setting of 30.17 inches of Mercury.

Two witnesses located at the 2V6 airport said it was "very foggy" with "no ceiling" and the heaviest fog began approximately 20 to 30 minutes before the accident. One of the witnesses estimated the visibility in the fog at approximately 1/2 mile.

COMMUNICATIONS

The FAA Denver air route traffic control center (ARTCC) provided VFR flight following to the pilot during his flight to the 2V6 airport. Denver ARTTC's last radio contact with the pilot was at 0810 approximately 20 miles southwest of the 2V6 airport after the pilot had terminated flight following.

The FAA reported that it was unknown whether the automated flight service Station (AFSS) had any contacts with N5476P on the day of the accident.

AIRPORT INFORMATION

The Airport/ Facility Directory, Southwest U. S., indicated that runway 16/34 at the 2V6 airport was 4,200 feet long and 75 feet wide. The runway surface was composed of concrete.

An additional runway 12/30 at the 2V6 airport was 2,900 feet long and 40 feet wide. The runway surface was composed of asphalt/gravel.

There are no published instrument procedures at the 2V6 airport.

WRECKAGE AND IMPACT INFORMATION

The accident site was located in a dry recently mowed wheat field at a location of 40 degrees, 6 minutes, 43 seconds north latitude, and 102 degrees, 42 minutes, 38 seconds west longitude, and at an estimated elevation of 4,136 feet MSL.

Investigators from the Safety Board, the FAA, Piper, and Textron Lycoming examined the wreckage at the accident scene on August 24 and 25, 2008.

The debris path from the initial impact ground scar to the main wreckage was measured as 144 feet on a magnetic bearing of approximately 230 degrees. All wreckage debris was found within a distance of 234 feet to the southwest from the initial impact ground scar.

The distance and direction from the initial impact ground scar to the approach end of runway 16 at the 2V6 airport was estimated as 1,670 feet on a magnetic bearing of 240 degrees.

The initial impact ground scar matched markings observed on the right wing tip tank. The right tip tank was found approximately 50 feet to the southwest. The second ground scar was an impact crater 30 feet to the southwest of the initial impact ground scar.

The propeller hub and one propeller blade had separated from the engine and were observed partially buried in the impact crater. The blade appeared relatively straight. The second and third propeller blades were observed 35 to 50 feet to the southwest of the impact crater. Both blades showed S-bending and both had leading edge damage and forward face polishing.

The right wing outboard wing panel separated and was located in the debris path. The inboard right wing panel was fragmented. The inboard right wing spar and a portion of the right flap were recovered adjacent to the fuselage. The right aileron was separated and recovered separately. The aileron counterweight was separated and recovered separately. The right main landing gear was damaged and separated from the wing. The left main gear was damaged and partially extended. The nose gear was damaged and separated. The left and right flap surfaces were damaged and loose and the mechanism was in the flaps up position.

The left stabilator half and vertical fin remained attached to the aft fuselage. The left-hand stabilator balance weight was separated and recovered. The right stabilator half was separated on impact as one piece. The counter-weight on the end of the right stabilator was separated and not recovered.

The rudder remained attached to the vertical stabilizer which was attached to the aft fuselage. The rudder counter-weight was separated and recovered from the debris path. The rudder cables were attached to the rudder horn in the aft fuselage and continuity was confirmed to the midpoint of the fuselage. The stabilator cables were attached to the stabilator balance bar in the aft fuselage and continuity was confirmed forward to the midpoint of the fuselage.

The nose section came to rest upright. The engine and much of the instrument panel were burned by the post-crash fire.

The left outboard wing panel with the partially attached left tip tank was observed near the main wreckage. The left aileron was attached to the outboard wing panel and the left aileron counterweight was in place. The left inboard wing panel and attached flap was partially attached to the fuselage. The forward portion of the left wing in front of the wheel-well area was missing. The inboard end of the panel was burned. The left aileron balance cable was separated with a broomstrawed appearance. The left aileron bell crank arm was separated from the bell crank with the aileron cable attached. The fracture surfaces of the bell crank arm showed a rough granular appearance.

PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on August 27, 2008 by the Jefferson County Coroner’s Office in Golden, Colorado. The autopsy findings reported the cause of death as "massive bodily injury secondary to blunt force trauma sustained in an airplane crash".

Forensic toxicology was performed on specimens from the pilot by the Federal Aviation Administration (FAA), Aeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma.

The toxicology report stated: NO CARBON MONOXIDE detected in Blood; NO CYANIDE detected in Blood; NO ETHANOL detected in Blood; TRIMETHOPRIM detected in Blood.

TESTS AND RESEARCH

Investigators examined the wreckage at the facilities of Beegles Aircraft Services, Inc. at the Greeley-Weld County Airport (GXY), Greeley, Colorado on August 26, 2008. The engine was suspended by a fork lift for the examination. The propeller flange, propeller governor, right magneto, fuel pump base, vacuum pump, valve covers, top spark plugs, and remaining baffling were then removed for inspection. The propeller governor screen was free of debris. The left magneto was observed separated from the engine. Both magnetos received thermal damage. The left magneto was tested and sparked all leads. The right magneto could not be tested. The engine driven fuel pump was also observed separated from the flange and the pump body was mostly consumed by fire. The cylinders were borescope inspected and no anomalies were noted. The crankshaft was rotated by hand and thumb compression was noted at all cylinders. Engine drive train continuity was confirmed. The spark plugs appeared normal as compared to the Champion Aviation Check a Plug Chart AV-27. The oil sump was observed separated from the engine and fragmented into numerous pieces. The exhaust and intake tubes were also separated from the engine. The vacuum pump was disassembled and visually inspected. The fuel flow divider was opened and found free of debris. The fuel injector nozzles were also found open. The fuel servo was separated from the flange and showed signs of thermal damage. The throttle rod end was found attached to the throttle arm and separated from the cable. The mixture arm and cable were found separated from the servo. The regulator cover brass hex plug was found tight and safety wired. The fuel injection system was visually inspected. The turbocharger was found separated from the engine. The turbine and compressor sections were found separated.

No pre-impact anomalies of the airframe, flight controls, engine or components were observed that would have precluded normal operations.

Pilot Information

Certificate:	Private	**Age:**	63,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	August 27, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	October 3, 2007
Flight Time:	(Estimated) 3410 hours (Total, all aircraft), 1700 hours (Total, this make and model), 3169 hours (Pilot In Command, all aircraft), 68 hours (Last 90 days, all aircraft), 6 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N5476P
Model/Series:	PA-24-250	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-525
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	April 30, 2008 Annual	**Certified Max Gross Wt.:**	3000 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	6020 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C91A installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-540-A1A5
Registered Owner:	On file	**Rated Power:**	250 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KAKO,4714 ft msl	**Distance from Accident Site:**	43 Nautical Miles
Observation Time:	07:53 Local	**Direction from Accident Site:**	265°
Lowest Cloud Condition:	100 ft AGL	**Visibility**	0.25 miles
Lowest Ceiling:	Overcast / 100 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	130°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.2 inches Hg	**Temperature/Dew Point:**	14°C / 14°C
Precipitation and Obscuration:	N/A - None - Fog		
Departure Point:	PUEBLO, CO (PUB)	**Type of Flight Plan Filed:**	None
Destination:	Yuma, CO (2V6)	**Type of Clearance:**	None
Departure Time:	07:20 Local	**Type of Airspace:**	

Airport Information

Airport:	Yuma Municipal Airport 2V6	**Runway Surface Type:**	Concrete
Airport Elevation:	4136 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	16	**IFR Approach:**	None
Runway Length/Width:	4200 ft / 75 ft	**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	40.107223,-102.70639(est)

Administrative Information

Investigator In Charge (IIC):	Latson, Thomas
Additional Participating Persons:	Billy Watts; FAA Denver FSDO; Denver, CO Christopher Lang; FAA Denver FSDO; Denver, CO George Hollingsworth; The New Piper Aircraft Inc.; Vero Beach, FL Troy Helgeson; Textron Lycoming; Williamsport, PA William H Gamble; National Transportation Safety Board; Arlington, TX
Original Publish Date:	August 12, 2010
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=68770