Aviation Investigation Final Report

Location:	Harrisburg, Oregon	**Accident Number:**	WPR17FA085
Date & Time:	April 7, 2017, 10:48 Local	**Registration:**	N123SB
Aircraft:	Piper PA 46-310P	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The commercial pilot and three passengers departed on an instrument flight rules cross-country flight. While on approach to the destination airport, the pilot indicated to the air traffic controller that the airplane was passing through areas of moderate-to-extreme precipitation. After clearing the airplane for the approach, the controller noted that the airplane descended below its assigned altitude; the controller issued a low altitude alert, but no response was received from the pilot.

The airplane subsequently impacted terrain in a level attitude about 12 miles from the airport. Examination of the airframe, engine, and system components revealed no evidence of preimpact mechanical malfunction that would have precluded normal operation. An area of disturbed, flattened, tall grass was located about 450 ft southwest of the accident site. Based on the images of the grass, the National Weather Service estimated that it would take greater than 35 knots of wind to lay over tall grass as the images indicated, and that a downburst/microburst event could not be ruled out. A downburst is an intense downdraft that creates strong, often damaging winds.

About 6 hours before the flight, the pilot obtained weather information through a mobile application. Review of weather data indicated the presence of strong winds, heavy precipitation, turbulence, and low-level wind shear (LLWS) in the area at the time of arrival, which was reflected in the information the pilot received. Given the weather conditions, it is likely that the airplane encountered an intense downdraft, or downburst, which would have resulted in a sudden, major change in wind velocity. The airplane was on approach for landing at the time and was particularly susceptible to this hazardous condition given its lower altitude and slower airspeed. The downburst likely exceeded the climb performance capabilities of the airplane and resulted in a subsequent descent into terrain.

It is unknown if the accident pilot checked or received additional weather information before or during the accident flight. While the flight was en route, several PIREPs were issued for the area of the accident

site, which also indicated the potential of LLWS near the destination airport; however, the controller did not provide this information to the pilot, nor did he solicit PIREP information from the pilot.

Based on published Federal Aviation Administration guidance for controllers and the widespread adverse weather conditions in the vicinity of the accident site, the controller should have both solicited PIREP information from the pilot and disseminated information from previous PIREPs to him; this would have provided the pilot with more complete information about the conditions to expect during the approach and landing at the destination.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: An encounter with a downburst during an instrument approach, which resulted in a loss of control at low altitude. Contributing to the accident was the air traffic controller's failure to solicit and disseminate pilot reports from arriving and departing aircraft in order to provide pilots with current and useful weather information near the airport.

Findings

Personnel issues	Aircraft control - Pilot
Environmental issues	Convective turbulence - Effect on operation
Personnel issues	Forgotten action/omission - ATC personnel

Factual Information

History of Flight

Approach-IFR initial approach	Altitude deviation
Maneuvering-low-alt flying	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On April 7, 2017, about 1048 Pacific daylight time, a Piper PA-46-310P, N123SB, was destroyed when it impacted terrain near Harrisburg, Oregon, during an instrument approach to Mahlon Sweet Field Airport (EUG), Eugene, Oregon. The pilot and three passengers were fatally injured. The airplane was registered to and operated by Park City Aviation, LLC under the provisions of Title 14 *Code of Federal Regulations* Part 91. Instrument meteorological conditions prevailed and an instrument flight rules flight plan was filed for the personal flight, which originated from Van Nuys Airport (VNY), Van Nuys, California, at 0727.

Data from an onboard Appareo Stratus 2S indicated that the airplane took off from VNY at 0721:37 and leveled off at its cruise altitude of 14,200 ft GPS altitude on a generally direct route toward EUG.

At 1019, the pilot began a descent consistent with arrival in the EUG terminal area. During the approach to EUG, the pilot was in radar contact with the Cascade Approach/Eugene Tower control facility. Review of air traffic control communications revealed that, at 1038:24, the controller instructed the pilot to descend to 4,000 ft mean sea level (msl) and to expect the ILS RWY16L approach. About two minutes later, the controller advised the pilot of an area of moderate to heavy precipitation at his 11-to-2'o-clock position. He asked the pilot to verify that he had received the current weather observation at the airport; the pilot confirmed that he had. Shortly thereafter, the pilot reported that the airplane was in heavy precipitation and requested vectors to the localizer and a descent to 2,000 ft msl. By 10:43:48, the airplane passed east of EUG, descending through 3,573 ft as it was being vectored for the approach at EUG. At this time, the recorded pitch attitude was about 3.5° nose down. At 1045, Cascade Approach advised the pilot of heavy to extreme precipitation in the area. Between 1046:36 and 1047:04, the airplane turned west at an altitude about 1,870 ft, and the groundspeed changed from 144 knots to 75 knots. At 1047:41, the recorded pitch angle began to increase as the pilot began to turn left at an altitude of 1,923 ft. At 1047:49, the recorded left bank angle was 42° and the recorded pitch angle was 13.6° nose up, as the airplane turned through a heading of 205°. At 1047:56, the recorded left bank angle reached 95°, with a pitch attitude of 35° nose down. The airplane descended through 1,125 ft with a nose-down pitch attitude of 30° and a left bank angle of about 70°. Shortly thereafter, the airplane briefly rolled wings-level before entering a right roll. As the airplane continued to descend, the right bank increased to 173° and the pitch angle reached 66° nose-down. At 1048:12, the groundspeed decreased to 0, consistent with ground impact. At 1048:13, the controller advised the pilot to maintain 2,000 ft msl until he intercepted the glideslope and cleared him for the approach. The pilot acknowledged the clearance. About 13 seconds later, the controller requested that the pilot check his altitude and instructed him to climb and maintain 2,000 ft msl. The pilot did not respond. The controller then issued the pilot multiple low altitude alerts and attempted to contact him on guard frequency; there were no further communications from the accident airplane. (NOTED: slight time discrepancy between

Appareo Stratus and ATC clocks)

A witness located about 1/2 mile from the accident site, heard a loud engine noise and observed the airplane flying above her house toward the north. A second later, the engine went completely quiet. She continued to watch the airplane as it descended before it disappeared from her sight behind a tree line.

Another witness, who was located about 1.2 miles from the accident site, observed the airplane flying in a northerly direction above the treetops. The airplane then entered a near-vertical nose dive and disappeared behind a tree line.

Pilot Information

Certificate:	Commercial	**Age:**	67,Male
Airplane Rating(s):	Single-engine sea; Multi-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	February 2, 2017
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 5060 hours (Total, all aircraft), 4890 hours (Pilot In Command, all aircraft), 109 hours (Last 90 days, all aircraft)		

Passenger Information

Certificate:		**Age:**	42,Male
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	37,Female
Airplane Rating(s):		**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	17,Male
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

The pilot held a commercial pilot certificate with airplane single-engine land, multi-engine land, and instrument ratings. The pilot was issued a second-class Federal Aviation Administration (FAA) airman medical certificate on February 2, 2017, with the limitation that he must wear corrective lenses. On the application for that medical certificate, the pilot reported 5,025 total hours of flight experience of which 45 hours were in the previous six months. The pilot's digital logbook, dated February 8, 2017, indicated that he had accumulated a total of 5,060 flight hours, with about 163 hours in the accident airplane make and model, and 25 hours of instrument time in the preceding 6 months. His total instrument flight experience could not be determined.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N123SB
Model/Series:	PA 46-310P 310P	**Aircraft Category:**	Airplane
Year of Manufacture:	1984	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	46-8508023
Landing Gear Type:	Tricycle	**Seats:**	
Date/Type of Last Inspection:	January 24, 2017 100 hour	**Certified Max Gross Wt.:**	4101 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3681.72 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:		**Engine Model/Series:**	TSIO-520BE2F
Registered Owner:	On file	**Rated Power:**	310 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The six-seat, single-engine, low-wing, retractable landing gear airplane, serial number 46-8508023, was manufactured in 1984. It was powered by a Continental Motors, Inc., TSIO-520-BE2F reciprocating engine, serial number 273821-R, rated at 310 horsepower. The airplane was also equipped with a Hartzell two-bladed constant speed propeller, model F8052. A review of maintenance records showed that the most recent annual inspection was completed January 24, 2017, at a total aircraft time of 3,681.72 hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KEUG,373 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	10:54 Local	**Direction from Accident Site:**	190°
Lowest Cloud Condition:	Few / 2400 ft AGL	**Visibility**	7 miles
Lowest Ceiling:	Overcast / 3500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	18 knots / 26 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.51 inches Hg	**Temperature/Dew Point:**	8°C / 7°C
Precipitation and Obscuration:	Light - None - Rain		
Departure Point:	VAN NUYS, CA (VNY)	**Type of Flight Plan Filed:**	IFR
Destination:	EUGENE, OR (OG32)	**Type of Clearance:**	IFR
Departure Time:	07:22 Local	**Type of Airspace:**	

A National Transportation Safety Board (NTSB) staff meteorologist prepared a factual report for the area and time surrounding the accident.

The Storm Prediction Center (SPC) issued Day 1 Convective Outlook at 0917, predicting areas of general thunderstorms for the accident site during the day of the accident.

An Automated Surface Observing System (ASOS) located at EUG reported at 1054 wind from 200° at 18 knots with gusts to 26 knots, 7 miles visibility, light rain, few clouds at 2,400 ft above ground level (agl), overcast ceiling at 3,500 ft agl, temperature 8°C, dew point 7°C, and an altimeter setting of 29.51 inches of mercury. The observations from EUG indicated that surface wind gusts to 35 knots were observed around the accident time with marginal visual flight rules (VFR) to VFR ceiling conditions.

A High-Resolution Rapid Refresh (HRRR) model sounding for the accident site at 1100 indicated a conditionally unstable environment from the surface through 4,500 ft msl, a possibility of low-level wind shear (LLWS) between the surface and 1,000 ft msl, and a possibility of clear-air turbulence in two layers between the surface and 9,000 ft msl.

Several pilot reports (PIREPs) were made near EUG around the time of the accident, which included base and top cloud information, LLWS on approach to Redmond, Oregon, and icing conditions above 6,000 ft; however, none of these PIREPs were given to the accident pilot, nor did the controller solicit a PIREP from the pilot during the approach.

The visible satellite data imagery indicated cloud cover above the accident site at the time of the accident, with cumuliform cloud cover moving from southwest to northeast. The clouds were expanding in coverage above the accident site at the time of the accident, consistent with rain shower growth and strong updrafts and downdrafts.

AIRMET advisories Sierra and Tango, issued for the area of the accident site at the time of the accident, warned of mountain obscuration conditions in clouds and precipitation, moderate turbulence below 16,000 ft msl, and LLWS conditions.

An area forecast issued at 0345 and valid at the time of the accident forecast a broken ceiling at 6,000 ft agl, with layered clouds through 24,000 ft, moderate rain, and a south wind gusting to 45 knots. A Terminal Aerodrome Forecast (TAF) issued at 0917 forecast wind from 180° at 15 knots with gusts to 25 knots, greater than 6 miles visibility, light rain showers, broken ceiling at 2,000 ft agl, and overcast skies at 5,000 ft agl. The 1020 TAF forecast wind from 180° at 25 knots with gusts to 35 knots, greater than 6 miles visibility, light rain showers, scattered clouds at 2,500 ft agl, broken ceiling at 3,500 ft agl, and overcast skies at 4,000 ft agl.

The local NWS Office in Portland, Oregon, issued a wind advisory at 0727 and valid through 1700, to warn of a south wind of 25 to 35 mph with gusts as high as 60 mph at the surface. A similar wind advisory was issued at 0240, warning of the gusty south winds between 0700 and 1700 for the accident site and the surrounding area.

The pilot obtained weather information through ForeFlight and Leidos graphics and texts at 0416 and 0417. In the ForeFlight graphical and text weather briefing, the pilot received AIRMETs Sierra and Tango. All were valid along the route or at the intended destination. The pilot also received the Area Forecast, the SPC Day 1 Convective Outlook, and the winds aloft forecast, with no urgent PIREPs along the route of flight before 0417. The 0354 surface observation at EUG included temperature 11°C, dew point 7°C, altimeter 29.92 inches of mercury, peak wind from 180° at 37 knots at 0357, rain ended at 0349, sea level pressure 891 hPa, and a one-hour precipitation total of 0.01in.

The pilot did not receive an official weather brief through Direct User Access Terminal Service (DUATS), voice Lockheed Martin Flight Service (LMFS) or Leidos. It is unknown if the accident pilot checked or received additional weather information before or during the accident flight.

Several hours after the accident, the NTSB investigator-in-charge (IIC) observed a 140-ft-by-150-ft area of disturbed, flattened tall grass located about 450 ft southwest of the accident site. That was the only area in the field where tall grass had been flattened. Images of the grass were provided to NWS personnel, who estimated that it would take greater than 35-knot winds to lay over tall grass as the images indicated. The NWS indicated that a microburst or bow echo type of outflow event could not be ruled out.

The complete weather report is in the public docket for this accident.

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:**	44.292499,-123.18222(est)

The airplane impacted terrain about 12 miles north of EUG at an elevation about 276 ft.

The wreckage debris path was oriented on a magnetic heading about 001° and was about 93 ft in length; the main wreckage was oriented on a heading about 010° magnetic. The first identified point of contact (FIPC) was characterized by a 22-ft-by-35-ft area of disturbed soil that resembled a silhouette of an airplane, consistent with impact in a level attitude. Visible evidence of the landing gear impact was present. Both the left and right ailerons were separated from the fuselage and located within the area of the FIPC. All three landing gear were separated; both left and right landing gear were located resting adjacent to each other on their respective sides of the fuselage, about 75 ft from the FIPC. The main wreckage comprised of the engine, fuselage, both wings, and the empennage. The wreckage exhibited significant impact damage. As a result of the impact sequence, the cabin area was displaced, with significant compression of the fuselage structure into the area of the two front seats. The engine cowling was found open and crushed backward toward the windshield. Both the forward and side windows were shattered.

The propeller was found attached to the engine. One blade was straight and the other was bent backward about 90°, consistent with the blade impacting the ground. The engine was covered with dirt.

The instrument panel exhibited impact damage, with multiple instruments displaced from the panel. Flight instruments on the right side of the instrument panel were readable; the airspeed indicator indicated 100 knots, the altimeter indicated about 2,700 ft with a Kollsman setting of 29.5 in, the vertical speed indictor indicated about 2,200 ft per minute rate of climb, the heading indicator indicated 312°, and the inclinometer on a turn-and-slip indicator was in its right-most position. Throttle, propeller and mixture levers were found in a full forward position.

Both wings remained partially attached to the fuselage at their roots. The left and right flaps remained attached to their respective wings. The empennage remained partially attached to the fuselage. The rudder and both horizontal stabilizers remained attached to the empennage. All major structural components of the airplane were located at the accident site.

Examination of the airframe, engine, and system components revealed no evidence of preimpact mechanical malfunction that would have precluded normal operation. The complete engine and airframe examination report is appended to this accident in the public docket.

Medical and Pathological Information

The Office of the State Medical Examiner at Linn County, Clackamas, Oregon, completed an autopsy on the pilot and concluded that the cause of death was multiple blunt force traumatic injuries.

The Federal Aviation Administration's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology testing on specimens from the pilot. The results of the testing were negative for ethanol and listed drugs.

Additional Information

An Apple iPad Mini 3, a Garmin Aera 796, and an Appareo Stratus 2S were located at the accident site and sent to the NTSB Vehicle Recorders Laboratory for download. Due to extensive damage, no data was recovered from the iPad. The Garmin Aera user interface was inoperative, and only the startup screen was documented. No further information was obtained from the device. The Appareo Stratus 2S recorded the accident flight; data were recovered using the Foreflight application.

The FAA's Advisory Circular AC 00-6B, "Aviation Weather" describes many weather hazards, including downbursts and microbursts. Section 19.6.3 states,

Downbursts can create hazardous conditions for pilots and have been responsible for many low-level wind shear accidents. Smaller, shorter-lived downbursts are called microbursts. A downburst is especially dangerous to airplanes when it is encountered when climbing for takeoff or approaching to land. During this phase, the aircraft is operating at relatively slow speeds. A major change of wind velocity can lead to loss of lift and a crash.

FAA Order JO 7110.65, Air Traffic Control, prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services. Chapter 2, Section 6, Weather Information, states that, "Timely dissemination of PIREPs alerts pilots to significant weather reports." Paragraph 2-6-2 a. states:

Solicit PIREPs when requested, deemed necessary or any of the following conditions exists or is forecast for the area of your jurisdiction:

1. Ceilings at or below 5,000 feet. These PIREPs must include cloud base/top reports when feasible. When providing approach control services, ensure that at least one descent/climb-out PIREP, including cloud base(s), top(s), and other related phenomena, is obtained each hour.

2. Visibility (surface or aloft) at or less than 5 miles.

3. Thunderstorms and related phenomena.

4. Turbulence of moderate degree or greater.

5. Icing of light degree or greater.

6. Wind shear.

Administrative Information

Investigator In Charge (IIC):	Smith, Maja
Additional Participating Persons:	Erik Ramseyer; FSDO; Hillsboro, OR Kevin Marpert; FSDO; Hillsboro, OR Charlie Little; Piper Chris Lang; CMI
Original Publish Date:	August 15, 2018
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=94971