Aviation Investigation Final Report

Location:	Wayne, Nebraska	**Accident Number:**	CEN24FA327
Date & Time:	August 26, 2024, 09:31 Local	**Registration:**	N9626K
Aircraft:	Piper PA-28-140	**Aircraft Damage:**	Destroyed
Defining Event:	VFR encounter with IMC	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The non-instrument-rated pilot departed on a visual flight rules (VFR) cross-country flight in visual meteorological conditions. Flight track data indicated that the airplane departed and flew northeast for about 15 minutes at altitudes less than 1,000 ft above ground level (agl) before entering a right turn with varying altitude, heading, and ground speed changes. A witness near the accident site stated that the clouds were about 100 ft agl when he heard the airplane fly over his house. Shortly thereafter, he heard the engine sound increase; the airplane impacted the ground and a postimpact fire ensued. The last flight track data point indicated the airplane was 1,030 ft agl, heading north at a ground speed of 51 knots. The accident site was located about 1,000 ft north-northwest of the last data point, about 27 nautical miles from the departure airport.

The airplane impacted the ground in a steep descent and came to rest inverted. Postaccident examination of the airplane revealed no evidence of preimpact mechanical malfunctions or failures that would have precluded normal operation. The wreckage debris path and propeller damage signatures, in addition to the witness statement, were consistent with the engine producing power at the time of impact.

Review of weather information revealed conditions favorable for sustained, low-level cloud cover, but there were no AIRMETs in effect for instrument flight rules conditions. Although forecasts indicated few to scattered clouds around 600 ft agl, recorded weather conditions from the airport closest to the accident site indicated an overcast ceiling at 600 ft agl. Based on available weather information, it is likely that the accident pilot encountered instrument meteorological conditions shortly after takeoff. The pilot's friend stated that the pilot checked the weather on his tablet on the morning of the accident; however, there was no record of the pilot obtaining weather information from an access-controlled source such as Leidos Flight

Service or ForeFlight. Therefore, the extent of the pilot's preflight weather planning could not be determined.

The circumstances of the accident are consistent with the non-instrument-rated pilot's encounter with instrument meteorological conditions, which resulted in the loss of visual references, spatial disorientation, and loss of airplane control.

The pilot's postmortem toxicology results indicated he had used the sedating antihistamine medication diphenhydramine and may have been experiencing associated impairing effects at the time of the accident. It is possible that his diphenhydramine use might have increased his susceptibility to spatial disorientation. No blood was available for testing, and more specific conclusions about diphenhydramine effects could not be drawn from the toxicology results in tissue. Visual flight into instrument meteorological conditions by a non-instrument-rated pilot carries a high risk of spatial disorientation even in the absence of impairment. Overall, whether the pilot's use of diphenhydramine contributed to the accident could not be determined.

One laboratory detected ethanol at a high level in a brain tissue specimen, while another laboratory did not detect ethanol in brain or muscle tissue specimens. In the setting of extensive injuries, the detected ethanol likely was from postmortem sources, rather than alcohol consumption. It is unlikely that ethanol effects contributed to the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The non-instrument-rated pilot's encounter with instrument meteorological conditions, which resulted in spatial disorientation and a loss of control.

Findings

Personnel issues	Aircraft control - Pilot
Personnel issues	Spatial disorientation - Pilot
Environmental issues	Obscuration - Response/compensation
Environmental issues	Low ceiling - Contributed to outcome
Environmental issues	Below VFR minima - Decision related to condition
Personnel issues	Incorrect action selection - Pilot
Personnel issues	Total instrument experience - Pilot
Aircraft	Instrument flight capability - Capability exceeded

Factual Information

History of Flight

Enroute	VFR encounter with IMC (Defining event)
Enroute-cruise	Loss of control in flight
Enroute	Collision with terr/obj (non-CFIT)

On August 26, 2024, about 0931 central daylight time, a Piper PA-28-140 airplane, N9626K, was destroyed when it was involved in an accident near Wayne, Nebraska. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the manager of the fixed base operator (FBO) at Norfolk Regional Airport (OFK), Norfolk, Nebraska, the pilot arrived in the accident airplane sometime between 1100 and 1200 on Friday, August 23. The airplane was stored in a hangar over the weekend and the pilot returned Monday morning (the day of the accident). The FBO manager stated that the pilot obtained fuel from the self-serve pump before departure. A copy of the fuel receipt showed that the pilot purchased 25 gallons of 100LL aviation gasoline. No fuel quality issues were reported.

According to the friend the pilot was visiting for the weekend, the pilot seemed rested and reviewed weather on one of his tablets before they left for the airport on the morning of the accident.

Flight track information for the accident flight was derived from PASSUR OpsVue NextGen track data (OpsVue), a multi-sensor flight tracking system that integrates FAA radar, ADS-B, airport surface surveillance, and flight plan data. Altitude information may vary by several hundred feet and should be considered approximate; however, altitude trends and rates of climb and descent are considered reliable. The first data point showed the airplane about 4 nautical miles northeast of OFK at 0916:52, at an altitude about 2,450 ft above mean sea level (about 875 ft above ground level [agl]) on a northeasterly heading (see figure 1).

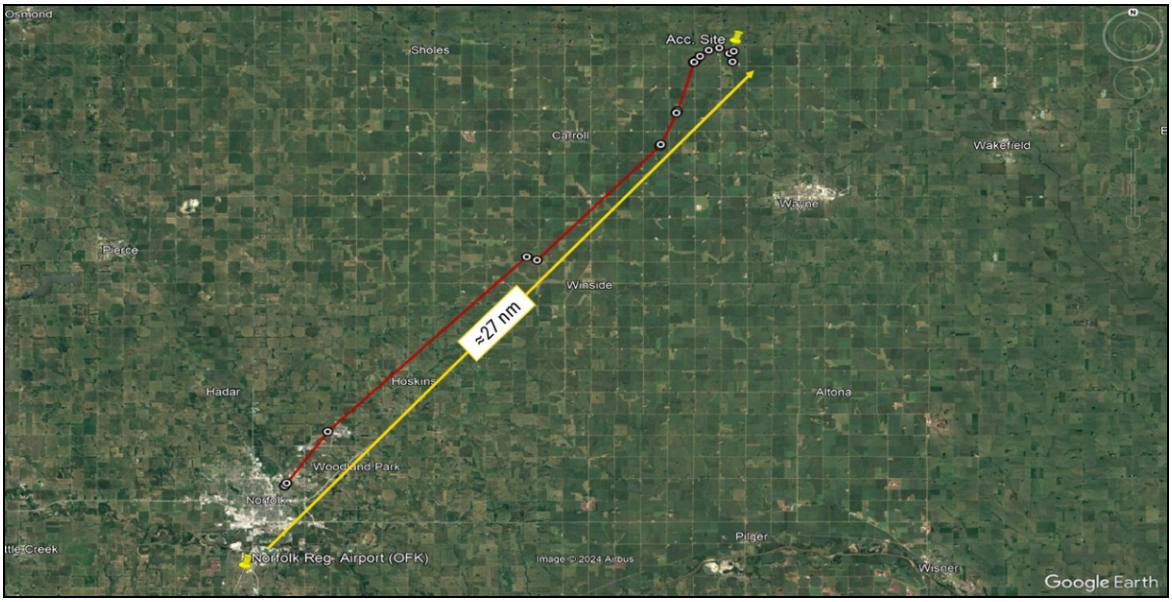

Figure 1. OpsVue flight track data.

The airplane continued on a northeasterly heading at altitudes between 2,450 ft and 2,100 ft above mean sea level (msl). Between 0928:21 to 0928:27, the airplane descended about 800 ft to an altitude about 90 ft agl. The next data point was about one minute later at an altitude about 2,325 ft msl. Shortly thereafter, the airplane turned right and proceeded to make varying altitude, heading, and ground speed changes. During this right turn, the airplane flew over the residence of a pilot-rated witness, who stated that the clouds were about 100 ft agl at the time he heard the airplane fly by.

The witness then heard the airplane a second time, during which the engine sound become very loud, followed by a large “pop” and then silence. He subsequently observed a black plume of smoke, which he used to locate the accident site. The last flight track data point showed an altitude about 2,550 ft msl (1,030 ft agl), a heading of 013°, and a groundspeed of 51 knots. The accident site was located about 1,000 ft north-northwest of the last data point (see figure 2).

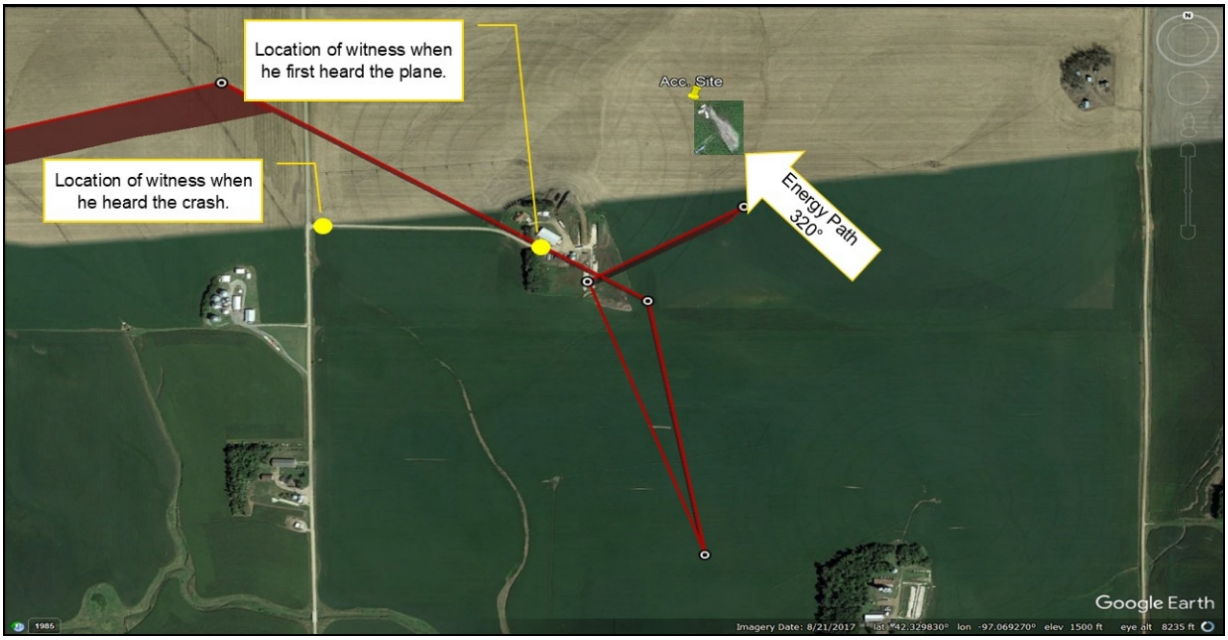

Figure 2. Witness location & accident site in relation to OpsVue flight track data.

Pilot Information

Certificate:	Private	**Age:**	79,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	BasicMed	**Last FAA Medical Exam:**	April 25, 2022
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	672 hours (Total, all aircraft)		

According to the FAA, the pilot reported 672 hours of total flight experience at his most recent FAA medical examination, dated July 9, 2020. The pilot's medical certificate expired for all classes in 2022. The pilot completed a BasicMed course, most recently on May 25, 2022, and reported completing a Comprehensive Medical Examination Checklist (CMEC), most recently on April 25, 2022. His BasicMed course was not current as of the accident date. The pilot did not possess current medical certification or BasicMed qualifications at the time of the accident.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N9626K
Model/Series:	PA-28-140	**Aircraft Category:**	Airplane
Year of Manufacture:	1976	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28-7625186
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	April 1, 2024 Annual	**Certified Max Gross Wt.:**	2150 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3876 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	O-360-D3G
Registered Owner:	On file	**Rated Power:**	160 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

According to airplane maintenance records, the airplane accrued a total of 79.2 hours between January 2019 and April 2024. Another airplane owner who shared hangar space with the accident pilot stated that he had flown with the pilot in the accident airplane a week or two before the accident and reported no issues. He stated that the airplane was old, but well maintained.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KLCG,1424 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	09:55 Local	**Direction from Accident Site:**	143°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 600 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / None	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	310°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.06 inches Hg	**Temperature/Dew Point:**	25°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Norfolk, NE (OFK)	**Type of Flight Plan Filed:**	None
Destination:	Buffalo, MN (CFE)	**Type of Clearance:**	None
Departure Time:	09:10 Local	**Type of Airspace:**	Class E

At 0856, the recorded weather at OFK included wind from 300° at 11 knots, 10 miles visibility or greater, scattered clouds at 1,100 ft agl, temperature 77°F, dew point 70°F, and an altimeter setting of 30.07 inches of mercury (inHg).

Wayne Municipal Airport (LCG), Wayne, Nebraska, was the closest weather station to the accident site. At 0915, the recorded weather included wind from 280° at 7 knots, 10 miles visibility or greater, overcast ceiling at 800 ft agl, temperature 75°F, dew point 73°F, and an altimeter setting of 30.07 inHg. At 0935, the wind was from 290° at 7 knots, visibility was 10 miles or greater, and there was an overcast ceiling at 600 ft agl.

The National Weather Service (NWS) Surface Analysis Chart depicted a low-pressure system (cold front) in the area of the accident site. The NWS Storm Prediction Center (SPC) Constant Pressure Charts for 0700 indicated low- and mid-level troughs at 925- through 700-hPa northeast and southwest of the accident site

The NWS Aviation Weather Center Graphical Forecasts for Aviation (GFA) surface forecasts applicable at 0700 and 1000 for the accident site indicated VFR surface visibilities with no chance of precipitation and a west wind of 5 to 10 knots. The GFA cloud forecast applicable to the accident site for 0700 indicated cirrus clouds. The GFA cloud forecast for 1000 indicated few to scattered clouds at 2,300 ft with cirrus clouds above.

The NWS area forecast issued at 0634 stated that patchy fog had developed in northeast Nebraska, but predicted that it would not move south to OFK, about 30 miles southwest of the accident site, before dissipating by 1000. The wind was generally from the south at 5 to 10

knots and predicted to turn westerly over the course of the day. Strong or severe thunderstorms were predicted to develop in central Nebraska in the evening.

The weather forecast did not include any AIRMETs for instrument flight rules (IFR) conditions.

A High-Resolution Rapid Refresh (HRRR) model sounding at 0900 identified an unstable and conditionally unstable environment from the surface through 500 ft agl, then a stable layer between 500 ft agl and 5,250 ft msl. The Rawinsonde Observation (RAOB) program indicated a cloud layer between 300 ft agl through 1,500 ft agl with another cloud layer starting at 13,500 ft. The top of a subsidence inversion was indicated at 4,400 ft.

Satellite visible imagery at 0931 indicated cloud cover above the accident site, with one layer of cloud cover moving southward across the accident site at the accident time, and another layer of cloud cover above, moving from southwest to northeast.

The NWS Weather Surveillance Radar base reflectivity images for the 0.53° elevation scans initiated at times between 0928 and about 0935 depicted reflectivity values between 0 and 15 dBZ above the accident site at the accident time with no movement of the reflectivity values above the accident site. Based on the correlation coefficient data, these base reflectivity targets were not precipitation targets, but anomalous propagation (false echoes).

A search of archived information indicated that the accident pilot did not request weather information from Leidos Flight Service, nor did he have an account with ForeFlight. An acquaintance of the pilot recalled that the pilot used the Avare weather app for preflight planning and weather information.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	42.334419,-97.067471

The accident site was located in a cornfield about 27 nautical miles northeast of OFK at an elevation of 1,557 ft msl. The corn was 6- to 8-ft-tall and the soil was soft from rain and irrigation the night prior. The airplane impacted in a 30° nose-down attitude on a magnetic heading about 320° (see figure 3). The initial point of impact consisted of cut cornstalks followed by an 8-ft-long by 12- to 18-inch-deep crater that contained fragments of lower fuselage structure. Imprints of the wing leading edges were visible in the dirt to the left and right of the crater. Fragments of left wingtip components were found toward the end of the left

wing imprint. Fragments of airplane components were present throughout the 98 ft leading up to the main wreckage.

The airplane came to rest inverted and oriented opposite the direction of the energy path, with the right wing laying on top of the lower fuselage. Main landing gear components separated from the airplane and were located 20 to 30 ft beyond the main wreckage. All major components of the airplane were accounted for at the accident site. The firewall, instrument panel, and cabin were mostly consumed by a post-impact fire. The two-blade aluminum propeller separated from the engine. Blade A was bent and twisted, and the outboard 1/3 of the blade was fracture-separated and was not located. Blade B was twisted and exhibited some thermal discoloration near the blade tip.

Postaccident examination of the airframe, engine, and propeller revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

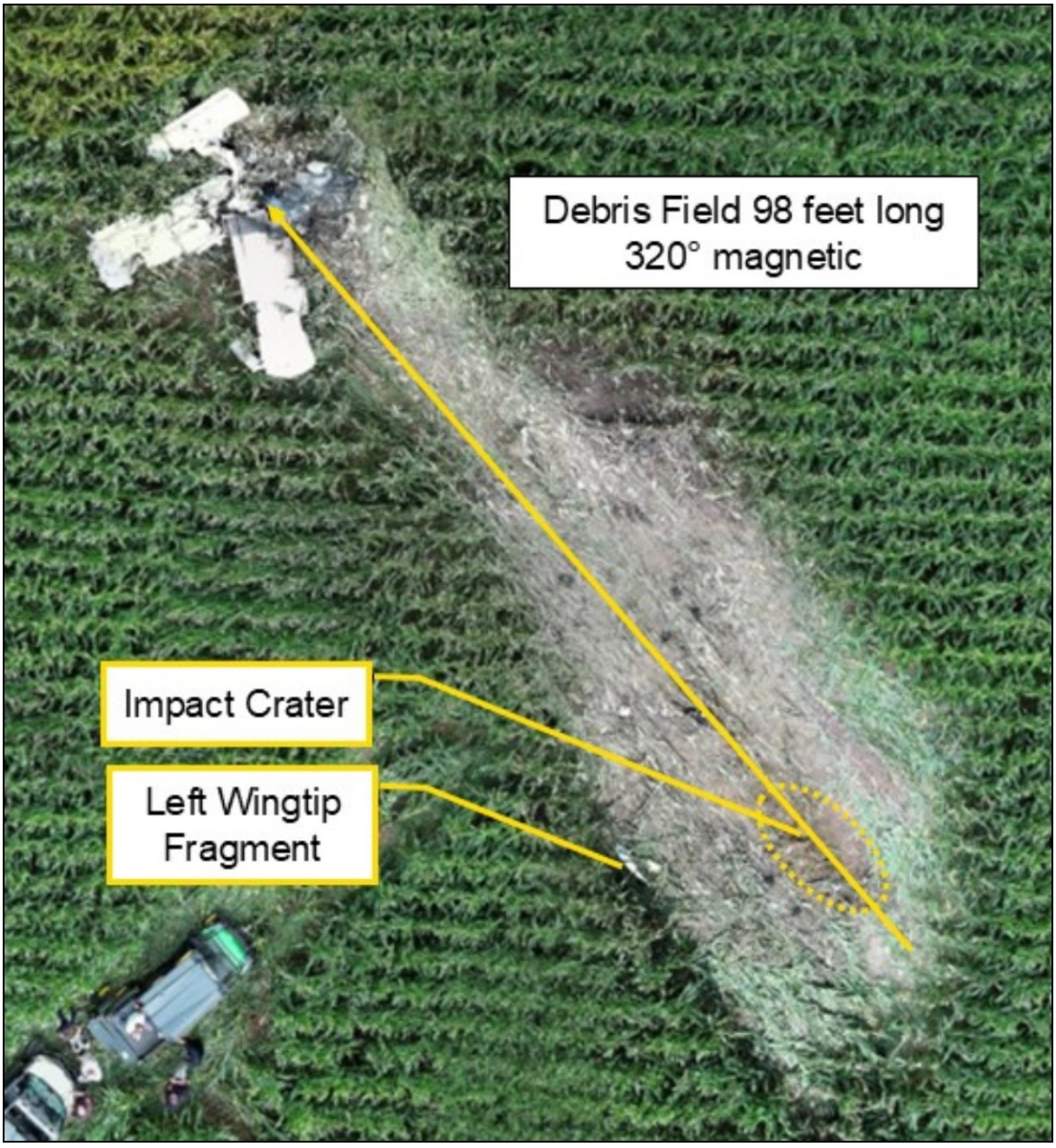

Figure 3. Accident site.

A Bendix King AV8OR was located in the wreckage. The AV8OR is a portable GPS unit capable of storing tracklog data, including latitude, longitude, date, time, GPS altitude, and ground speed information. The SD card was removed from the unit and sent to the NTSB Vehicle Recorder Laboratory for data extraction. Data from January 2, 2005, through August 10, 2024, were extracted; however there was no data pertinent to the accident on the device.

Medical and Pathological Information

Physicians Laboratory Services, Omaha, Nebraska, performed the pilot's autopsy, as authorized by the Wayne County Attorney. Due to the condition of the remains, autopsy evaluation for natural disease was severely limited. Postmortem toxicological testing performed by Axis Forensic Toxicology at the request of Physicians Laboratory Services identified ethanol at 0.102 g/hg and diphenhydramine at 193 ng/g in brain tissue. Postmortem toxicological testing performed by the FAA Forensic Sciences Laboratory found diphenhydramine, loratadine, and desloratadine in brain and muscle tissue. FAA testing did not detect ethanol in brain or muscle tissue. No blood was available for toxicological testing.

Ethanol is the intoxicating alcohol in beer, wine, and liquor, and if consumed, can impair judgment, psychomotor performance, cognition, and vigilance. FAA regulation imposes strict limits on flying after consuming ethanol, including a prohibition on piloting a civil aircraft while having a blood ethanol level of 0.04 g/dl or greater. When ethanol is consumed and absorbed into circulation, it distributes relatively evenly throughout the water in a person's body tissues and fluids after death. Postmortem ethanol production is made more likely by extensive traumatic injury

Diphenhydramine (sometimes marketed as Benadryl) is a sedating antihistamine medication widely available over the counter in multiple sleep aids and cold and allergy products. Diphenhydramine can cause cognitive and psychomotor slowing and drowsiness and often carries a warning about driving and operating machinery. Diphenhydramine can affect the vestibular system, and it is possible that the drug might increase susceptibility to spatial disorientation. The FAA states that pilots should not fly within 60 hours of using diphenhydramine, to allow time for it to be cleared from circulation. Diphenhydramine may undergo significant postmortem redistribution.

Loratadine is a non-sedating antihistamine medication that is available without a prescription and commonly is used to treat allergy symptoms. Desloratadine is an active metabolite of loratadine and is available as a prescription medication with similar uses as loratadine. Loratadine and desloratadine are not typically impairing.

Additional Information

Spatial Disorientation

The FAA's Pilot's Handbook of Aeronautical Knowledge contained the following guidance:

> *Under normal flight conditions, when there is a visual reference to the horizon and ground, the sensory system in the inner ear helps to identify the pitch, roll, and yaw movements of the airplane. When visual contact with the horizon is lost, the vestibular system becomes unreliable. Without visual references outside the airplane, there are many situations where combinations of normal motions and forces can create convincing illusions that are difficult to overcome.*
>
> *A rapid acceleration, such as experienced during takeoff, stimulates the otolith organs in the same way as tilting the head backwards. This action may create what is known as the 'somatogravic illusion' of being in a nose-up attitude, especially in conditions with poor visual references. The disoriented pilot may push the aircraft into a nose-low or dive attitude.*

The FAA's Airplane Flying Handbook (FAA-H-8083-3) described hazards associated with flying when visual references, such as the ground or horizon, are obscured:

> *The vestibular sense (motion sensing by the inner ear) in particular tends to confuse the pilot. Because of inertia, the sensory areas of the inner ear cannot detect slight changes in the attitude of the airplane, nor can they accurately sense attitude changes that occur at a uniform rate over a period of time. On the other hand, false sensations are often generated; leading the pilot to believe the attitude of the airplane has changed when in fact, it has not. These false sensations result in the pilot experiencing spatial disorientation.*

The FAA's publication, "Spatial Disorientation Visual Illusions" (OK-11-1550), provided guidance on the prevention of spatial disorientation. One of the preventive measures was "when flying at night or in reduced visibility, use and rely on your flight instruments." The publication stated the following:

> *If you experience a visual illusion during flight (most pilots do at one time or another), have confidence in your instruments and ignore all conflicting signals your body gives you. Accidents usually happen as a result of a pilot's indecision to rely on the instruments.*

Preventing Similar Accidents

Reduced Visual References Require Vigilance (SA-020)

The Problem

About two-thirds of general aviation accidents that occur in reduced visibility weather conditions are fatal. The accidents can involve pilot spatial disorientation or controlled flight into terrain. Even in visual weather conditions, flights at night over areas with limited ground lighting (which provides few visual ground references) can be challenging.

What can you do?

- Obtain an official preflight weather briefing, and use all appropriate sources of weather information to make timely in-flight decisions. Other weather sources and in-cockpit weather equipment can supplement official information.
- Refuse to allow external pressures, such as the desire to save time or money or the fear of disappointing passengers, to influence you to attempt or continue a flight in conditions in which you are not comfortable.
- Be honest with yourself about your skill limitations. Plan ahead with cancellation or diversion alternatives. Brief passengers about the alternatives before the flight.
- Seek training to ensure that you are proficient and fully understand the features and limitations of the equipment in your aircraft, particularly how to use all features of the avionics, autopilot systems, and weather information resources.
- Don’t allow a situation to become dangerous before deciding to act. Be honest with air traffic controllers about your situation, and explain it to them if you need help.
- Remember that, when flying at night, even visual weather conditions can be challenging. Remote areas with limited ground lighting provide limited visual references cues for pilots, which can be disorienting or render rising terrain visually imperceptible. When planning a night VFR flight, use topographic references to familiarize yourself with surrounding terrain. Consider following instrument procedures if you are instrument rated or avoiding areas with limited ground lighting (such as remote or mountainous areas) if you are not.
- Manage distractions: Many accidents result when a pilot is distracted momentarily from the primary task of flying.

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-020.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Miller, Bradley
Additional Participating Persons:	Brandon Bennett; Federal Aviation Administration; Lincoln, NE John Hirsch; Piper Aircraft David Harsanyi; Lycoming
Original Publish Date:	September 18, 2026
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=195002

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The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available here.