Aviation Investigation Final Report

Location:	Whitesville, Kentucky	**Accident Number:**	ERA23FA380
Date & Time:	September 27, 2023, 22:49 Local	**Registration:**	N3079M
Aircraft:	Piper PA28	**Aircraft Damage:**	Destroyed
Defining Event:	Aircraft structural failure	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

According to the operator, the flight instructor and student pilot were on a night cross-country flight. The purpose of the flight was to satisfy the student pilot's night flight training requirements before completing a private pilot practical examination, and it was their first time flying together. The outbound leg of the trip was uneventful, and the accident occurred during the return leg of the trip.

The flight instructor had obtained a weather briefing for the accident flight from an online commercial source. The briefing included a convective SIGMET that was active for the accident location and time. It warned of an area of severe thunderstorms with cloud tops to 42,000 ft, hail of up to 1.25 inches in diameter, and wind gusts of up to 50 knots (kts). Additional weather information was compared to a screen capture that the flight instructor posted to social media about 34 minutes before the accident (while the flight was enroute). Based on the airplane's position at the time of the screen capture, the weather radar information depicted was about 10 minutes old. Given this information, it is likely that the flight instructor was aware that convective weather was in the vicinity of the planned route of flight but was not aware of the latency of the weather radar information and continued on-course in an attempt to fly past the approaching convective weather.

According to ADS-B data and air traffic control (ATC) voice communications, the flight instructor contacted ATC about 30 minutes after posting the screen capture to social media, or 5 minutes prior before the accident. At that time the controller advised of heavy- to- extreme precipitation at the airplane's nine o'clock position. ADS-B data showed that the airplane continued its northwesterly course and about 2 minutes later, the flight instructor requested an instrument flight rules clearance. The controller issued the clearance and provided an easterly radar vector to assist the flight in getting out of the weather. The flight instructor stated to the controller that the airplane was "getting blown around like crazy," and the airplane's flight track

showed a turn to the northwest followed by a right circling turn. The controller reiterated the heading of 090°, and the flight instructor responded that they were in “pretty extreme turbulence.” The flight track showed a continuing right descending turn, and no further communications were received from the flight instructor. The airplane’s last ADS-B position was at an altitude of 2,200 ft and about 1,000 ft northwest of the wreckage debris field, which spanned 25 acres in a hilly, densely wooded area.

Postaccident examination of the wreckage did not reveal any evidence of any preimpact mechanical malfunctions or failures of the airframe or the engine. Overall, the distribution of the wreckage was consistent with an in-flight breakup. Based on the evidence, after the airplane encountered forecast severe convective weather conditions, the airplane’s structural limitations were exceeded, which resulted in an inflight breakup.

Probable Cause and Findings

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

The flight instructor’s improper decision to continue flight into a known area of thunderstorms, which resulted in an in-flight breakup.

Findings

Personnel issues	Decision making/judgment - Instructor/check pilot
Environmental issues	Thunderstorm - Decision related to condition
Aircraft	(general) - Capability exceeded

Factual Information

History of Flight

Enroute	Windshear or thunderstorm
Enroute	Aircraft structural failure (Defining event)

On September 27, 2023, about 2249 central daylight time, a Piper PA-28-161, N3079M, was destroyed when it was involved in an accident near Whitesville, Kentucky. The flight instructor and student pilot were fatally injured. The airplane was operated by Eagle Flight Academy as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to the operator and the student pilot's regular flight instructor, the accident flight instructor and student pilot were on the return portion of a night cross-country flight. The purpose of the flight was to satisfy the student pilot's night flight training requirements before completing a private pilot practical examination. The accident flight was also the student pilot and accident flight instructor's first time flying together.

ADS-B data indicated that the airplane departed Bowling Green-Woodhurst Airport (BWG), Bowling Green, Kentucky, around 2155. The airplane climbed to 4,500 ft msl and proceeded on a northwesterly course toward Owensboro/Daviess County Regional Airport (OWB), Owensboro, Kentucky, on a visual flight rules flight plan. A post to the flight instructor's social media account at 2215 (about 34 minutes before the accident) depicted an annotated image from a mobile-device-based aviation navigation tool. The image depicted the airplane's current position northwest of Bowling Green, Kentucky, along with the planned route of flight to OWB. Weather radar imagery was also displayed in the image, which had been annotated with a circle around the flight track and nearby weather radar returns. Figure 1 shows a screen capture of the flight instructor's social media post.

Figure 1 - Screen capture of a post to the flight instructor's social media account. Note the airplane's current position (blue airplane icon), the planned route of flight (magenta line), the depicted weather radar imagery, and entire area circled in red.

According to ATC voice communication information provided by the Federal Aviation Administration (FAA), the pilot contacted ATC at 2244 and the controller advised the flight of heavy to extreme precipitation at the airplane's nine o'clock position. ADS-B data showed that the airplane continued its northwesterly course; about 2 minutes later, the flight instructor requested an instrument flight rules clearance. The controller issued the clearance and provided an easterly radar vector to assist the flight in getting out of the weather. The flight instructor stated to the controller that the airplane was "getting blown around like crazy," and the airplane's flight track showed a turn to the northwest followed by a right circling turn. The controller reiterated the heading of 090°, and the flight instructor responded that they were in "pretty extreme turbulence." The flight track showed a continuing right descending turn, and no further communications were received from the flight instructor. The airplane's last ADS-B position, at 2249, was at an altitude of 2,200 ft and about 1,000 ft northwest of the wreckage debris field, which spanned 25 acres in a hilly, densely wooded area.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	22,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	September 3, 2020
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 447 hours (Total, all aircraft), 150 hours (Last 90 days, all aircraft), 56 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	Student	**Age:**	18,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	September 22, 2022
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	37 hours (Total, all aircraft), 37 hours (Total, this make and model), 9 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft)		

The flight instructor received his initial flight instructor certificate about 5 months before the accident, on April 10, 2023. According to his pilot logbook and FAA records, at the time of the accident he had accrued about 447 hours of total flight experience. Of the total hours, 20 hours were at night and 6.6 hours were in actual instrument meteorological conditions.

According to the operator, the student pilot had accrued about 37 hours of total flight experience.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N3079M
Model/Series:	PA28 161	**Aircraft Category:**	Airplane
Year of Manufacture:	1977	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28-7816336
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	September 2, 2023 100 hour	**Certified Max Gross Wt.:**	2325 lbs
Time Since Last Inspection:	29 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4974 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed	**Engine Model/Series:**	O-320-D3G
Registered Owner:	EAGLE FLIGHT ACADEMY LLC	**Rated Power:**	160 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	OWB,403 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	22:52 Local	**Direction from Accident Site:**	298°
Lowest Cloud Condition:	Few / 2500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 5500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots / 20 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	19°C / 16°C
Precipitation and Obscuration:	Moderate - Thunderstorm - Rain		
Departure Point:	Bowling Green, KY (BWG)	**Type of Flight Plan Filed:**	VFR
Destination:	Owensburg, KY (OWB)	**Type of Clearance:**	VFR
Departure Time:	21:55 Local	**Type of Airspace:**	Class E

Review of data from ForeFlight revealed that the flight instructor obtained a weather briefing for the accident flight. The briefing included a convective SIGMET that was active for the accident location and time. It warned of an area of severe thunderstorms with cloud tops to 42,000 ft, hail up to 1.25 inches in diameter, and wind gusts of up to 50 kts. The convective SIGMET area was moving from 280° at 15 knots. Convective SIGMETs implied severe or

greater turbulence, severe icing, and low-level wind shear. For more information, see the Meteorology Specialist's Factual Report in the public docket for this investigation.

Additional information from ForeFlight was compared to the flight instructor's screen capture (figure 1). The information revealed that the weather radar image was from internet sources and not Flight Information Services – Broadcast (as might be available to aircraft flying within ADS-B coverage and being equipped to receive such broadcasts). Based on the airplane's position at the time of the screen capture, the weather radar information depicted was about 10 minutes old.

Figure 2 depicts the airplane's ground track (white) and the Louisville, Kentucky WSR-88D weather radar base reflectivity product. The weather radar image represents a sweep that was initiated at 2245, while the circled portion of the airplane's flight path represents its position at 2236.

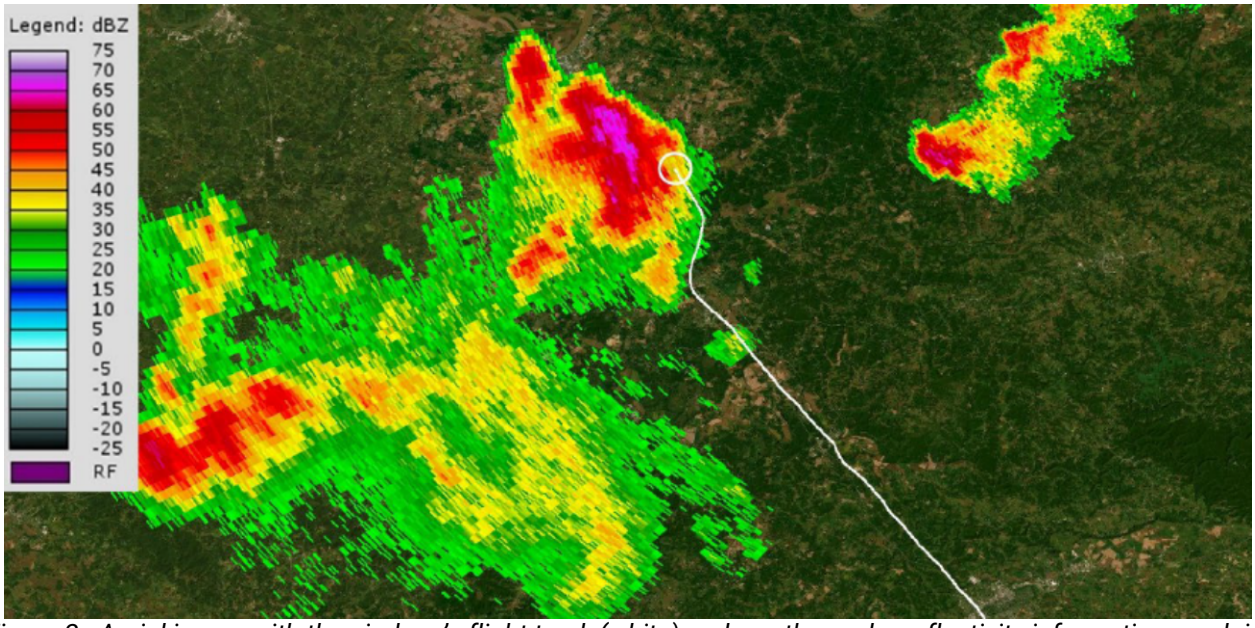

Figure 2 - Aerial image with the airplane's flight track (white) and weather radar reflectivity information overlaid.

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	37.634366,-86.890423

All major components of the airplane, except for the left portion of the stabilator, were located in the debris field. The fuselage was separated aft of the rear seat, and the forward fuselage, including the cockpit, engine, and right wing, were located together in the most westerly portion of the debris field. The left wing, with aileron attached, was separated from the fuselage, and was located about 800 ft east of the forward fuselage. The flap was separated from the wing and located in the debris field. The right wing remained attached to the forward fuselage and was upside down with aileron and flap attached. The empennage with vertical stabilizer intact was located over a ridge about 200 ft north of the forward fuselage. The rudder was torn diagonally from top to bottom, with the lower portion remaining attached to the vertical stabilizer and the upper portion separated and located near the empennage in the debris field. The stabilator was torn chordwise just outboard of the hinges. The right side of the stabilator was located about 1,500 ft away from the forward fuselage in the most eastern edge of the debris field.

The wreckage was recovered to a salvage facility for further examination. The left wing's interior ribs exhibited signatures consistent with the aileron bellcrank having been pulled from its mount and drawn through the wing to the inboard end. The aileron bellcrank was broken with the balance cable arm remaining attached to the balance cable. The balance cable was continuous to the right wing. The remainder of the bellcrank was not located. The right-wing aileron cables remained attached to the bellcrank and the bellcrank remained attached to the wing.

Examination of the engine revealed that the fixed-pitch propeller remained attached to the crankshaft propeller flange, and both propeller blades appeared straight. The engine displayed impact damage. The starter ring gear was impact fractured into several pieces, and the alternator was attached to the front of the engine by one bolt. The carburetor was impact separated at the bowl. Suction and compression were observed on all cylinders when the propeller was rotated by hand. Valvetrain continuity was confirmed throughout the engine and all rocker arms moved when the crankshaft was rotated. No anomalies were noted during examination of the engine cylinders with a lighted borescope. Both magnetos were tightly installed and once removed and rotated using an electric drill spark was produced at each ignition lead point. Liquid consistent in odor and color with 100LL aviation fuel drained from the boost pump when the filter cover was removed. Examination of the engine did not reveal any preaccident anomalies or malfunctions that would have precluded normal operation.

Medical and Pathological Information

An autopsy was conducted on the pilots by the Western Kentucky Office of The Medical Examiner, Madisonville, Kentucky. The cause of death for both was “multiple blunt force trauma.” Toxicological testing of the pilots’ specimens was conducted by the FAA Office of Forensic Sciences, Oklahoma City, Oklahoma. The results were negative for the flight instructor. For the student pilot, the results were positive for ethanol, propanol, and Cetirizine. Although ethanol was detected, putrefaction was noted as yes, consistent with postmortem production of ethanol. Cetirizine is an over-the-counter antihistamine commonly used to treat allergy symptoms. Cetirizine can have sedating effects; however, the investigation could not determine if the student pilot was impaired by Cetirizine.

Preventing Similar Accidents

In-Cockpit NEXRAD Mosaic Imagery (SA-017)

The Problem

Weather radar "mosaic" imagery created from Next Generation Radar (NEXRAD) data is available to pilots in the cockpit via the flight information service-broadcast (FIS-B) and private satellite weather service providers. A mosaic image presents radar data from multiple radar ground sites on a single image on the cockpit display. When a mosaic image is updated, it may not contain new information from each ground site. The age indicator associated with the mosaic image on the cockpit display **does not** show the age of the actual weather conditions as detected by the NEXRAD network. Instead, the age indicator displays the age of the mosaic image created by the service provider. Weather conditions depicted on the mosaic image will **ALWAYS be older than the age indicated on the display**. Due to latencies inherent in processes used to detect and deliver the NEXRAD data from the ground site to the service provider, as well as the time intervals used for the mosaic-creation process set by the service provider, NEXRAD data can age significantly by the time the mosaic image is created.

Although such situations are not believed to be typical, in extreme latency and mosaic-creation scenarios, the actual age of the oldest NEXRAD data in the mosaic can **EXCEED** the age indication in the cockpit by **15 to 20 minutes**. Even small time differences between the age indicator and actual conditions can be important for safety of flight, especially when considering fast-moving weather hazards, quickly developing weather scenarios, and/or fast-

moving aircraft. The general issue of latency with in-cockpit NEXRAD is discussed in pilots' guides, in industry literature, and on service providers' websites. However, the NTSB has not found that such guidance contains details about the potential time difference between the age indicator and actual conditions.

What can you do?

- Remember that the in-cockpit NEXRAD display depicts where the weather **WAS**, not where it **IS**. The age indicator does not show the age of the actual weather conditions but rather the age of the mosaic image. The actual weather conditions could be up to 15 to 20 minutes OLDER than the age indicated on the display. You should consider this potential delay when using in-cockpit NEXRAD capabilities, as the movement and/or intensification of weather could adversely affect safety of flight.
- Understand that the common perception of a “5-minute latency” with radar data is not always correct.
- Get your preflight weather briefing! Having in-cockpit weather capabilities does not circumvent the need for a complete weather briefing before takeoff.
- Use all appropriate sources of weather information to make in-flight decisions.
- Let your fellow pilots know about the limitations of in-cockpit NEXRAD.

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-017.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):	Gretz, Robert
Additional Participating Persons:	Jonathon Hirsch; Piper Aircraft; Vero Beach, FL Stephen Travis; FAA/FSDO; Louisville, KY David Harsanyi; Lycoming Engines; Williamsport, PA
Original Publish Date:	September 3, 2025
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=193156

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

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.