

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN24FA170

METEOROLOGY

Specialist's Factual Report

June 5, 2024

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A. ACCIDENT

Location: Bristol, Indiana

Date: 30 April 2024

Time: 1418 eastern daylight time (1818 UTC¹)

Aircraft: Type - Ridenour Wendell Ray CH-601 HDS; Registration - N6271F

B. METEOROLOGY SPECIALIST

Mike Richards

Senior Meteorologist

Office of Aviation Safety

Operational Factors Division (AS-30)

National Transportation Safety Board

C. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's meteorological specialist did not travel in support of this accident investigation and gathered all weather data remotely. Unless otherwise noted, all times are in eastern daylight time for 30 April 2024 (based upon the 24-hour clock), directions are referenced to true north, distances are in nautical miles and heights are above mean sea level (msl). The accident site was located at about: 41.72703° north latitude; 85.84397° west longitude at an elevation of about 770 feet.

This report provides information on wind conditions and forecasts applicable to the accident flight.

D. WEATHER INFORMATION

1.0 Synoptic Conditions

A portion of the National Weather Service (NWS) Surface Analysis Chart for 1400 is presented in Figure 1. This section of the surface analysis chart identified a high-pressure center near the accident site. A warm front was identified crossing the Illinois/Indiana border southwest of the accident site. Station models in the accident region depicted light westerly winds and clear skies.

¹ UTC - abbreviation for Coordinated Universal Time

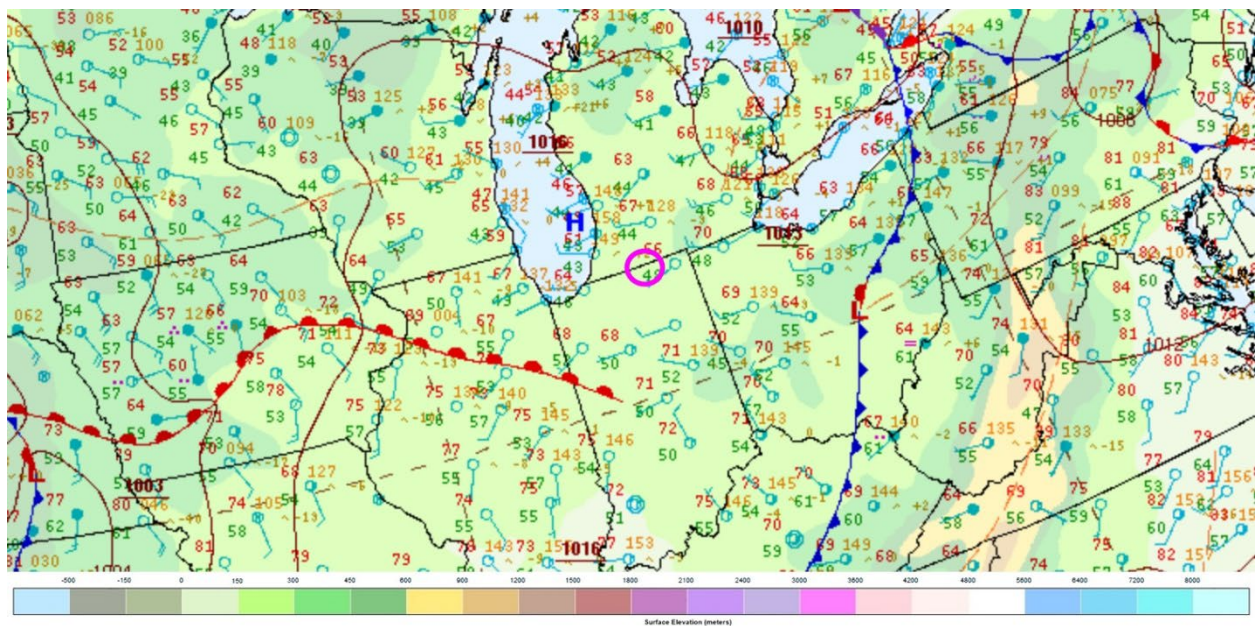


Figure 1 - NWS Surface Analysis Chart for 1400. Accident location is inside the pink circle.

2.0 Surface Observations

An Automated Weather Observing Station (AWOS) was located at Elkhart Municipal Airport (EKM²) in Elkhart, Indiana, which was located about 7 miles west of the accident site at an elevation of about 775 feet. It had a magnetic variation of about 5° west. Augmented longline³ reports from the EKM AWOS during the times surrounding the accident time are presented here.

[1315] KEKM 301715Z 26009G17KT 10SM CLR 18/09 A2996 RMK AO2 T01820089 \$

[1335] KEKM 301735Z 27008KT 10SM CLR 18/09 A2996 RMK AO2 T01840090 \$

² This report uses the 3-digit International Air Transport Association format for airport identification, which does not use the geographic designating digit (e.g., "K" for stations in the continental U.S. and "P" for U.S. stations in Alaska and the Pacific region) as found in the 4-digit International Civil Aviation Organization (ICAO) identifier format. Weather observations from airports in this report are referenced by their reporting station's identifier (using ICAO format that includes the geographic designating digit), not by the airport at which the reporting station is located.

³ "Longline" refers to the dissemination of weather observations with the intent that they are available in near-real time to national databases (effectively, the whole world) and accessible to the general global public from a large number of vendors. This does not include public accessibility to observations from a reporting station's Very High Frequency (VHF; line-of-site) or telephone broadcast, where applicable. Longline-dissemination of weather observations is the primary vehicle through which the general global public has access to surface weather observations, particularly outside of the aviation community.

[1355] KEKM 301755Z 28014G19KT 10SM CLR 19/09 A2996 RMK AO2 T01870088 \$

[1415] KEKM 301815Z 28009KT 250V310 10SM CLR 19/09 A2996 RMK AO2 WSHFT 1804 T01880087 \$

[1435] KEKM 301835Z 29010KT 10SM CLR 19/09 A2996 RMK AO2 WSHFT 1804 T01940090 \$

[1455] KEKM 301855Z 27013KT 10SM CLR 20/08 A2996 RMK AO2 T01950083 \$

[1515] KEKM 301915Z 27009KT 10SM CLR 20/08 A2995 RMK AO2 T01980081 \$

At 1355, the EKM AWOS reported a wind from 280° at 14 knots with gusts to 19 knots, visibility 10 statute miles or greater, clear skies, temperature of 19°C and dew point temperature of 9°C, altimeter setting of 29.96 inches of mercury; Remarks: automated station with a precipitation discriminator, temperature of 18.7°C and dew point temperature of 8.8°C, maintenance needed on the system.

At 1415, the EKM AWOS reported a wind from 280° at 9 knots, wind variable between 250° and 310°, visibility 10 statute miles or greater, clear skies, temperature of 19°C and dew point temperature of 9°C, altimeter setting of 29.96 inches of mercury; Remarks: automated station with a precipitation discriminator, wind shift at 1404, temperature of 18.8°C and dew point temperature of 8.7°C, maintenance needed on the system.

At 1435, the EKM AWOS reported a wind from 290° at 10 knots, visibility 10 statute miles or greater, clear skies, temperature of 19°C and dew point temperature of 9°C, altimeter setting of 29.96 inches of mercury; Remarks: automated station with a precipitation discriminator, wind shift at 1404, temperature of 19.4°C and dew point temperature of 9.0°C, maintenance needed on the system.

3.0 Weather Radar

WSR-88D⁴ Level-II base reflectivity weather radar imagery from the Fort Wayne, Indiana, site (KIWX) valid for the times surrounding the accident time did not reveal any pertinent meteorological echoes across the accident region.

Figure 2 presents a Velocity-Azimuth Display (VAD) wind profile⁵ for above KIWX for times surrounding the accident time. The KIWX VAD wind profile revealed the wind below 7,000 feet remained between 15-25 knots from the west to west-northwest.

⁴ Weather Surveillance Radar 88 Doppler (WSR-88D)

⁵ VAD wind profile - A plot of horizontal winds as a function of height above a Doppler Radar. The display is plotted with height as the vertical axis and time as the horizontal axis which then depicts the change

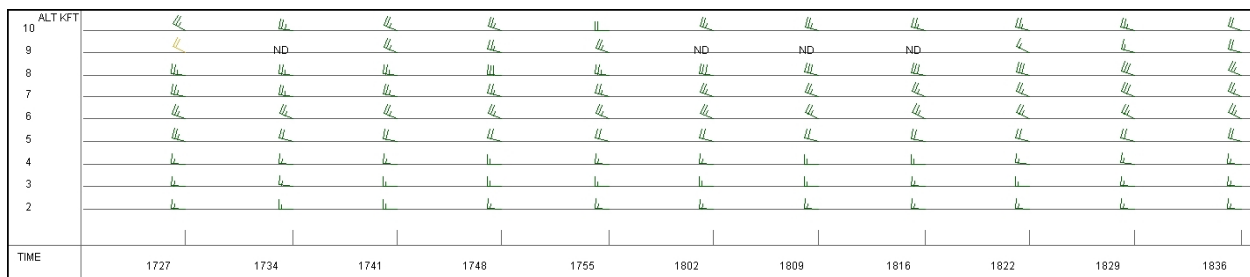


Figure 2 - KIWX VAD wind profile for times surrounding the accident time (in UTC).

4.0 HRRR Model Sounding

A High-Resolution Rapid Refresh (HRRR) model⁶ sounding for near⁷ the accident site at 1400 using an elevation of 775 feet was retrieved from the National Oceanic and Atmospheric Administration's (NOAA) Air Resources Laboratory and analyzed by the RAOB program. The RAOB-calculated wind profile at intervals of 250 feet for altitudes between 1,000 and 7,000 feet is presented here, where wind magnitude is in knots.

Altitude	Wind Direction	Wind Magnitude
1000	279°	13
1250	278°	14
1500	278°	14
1750	277°	15
2000	276°	15
2250	276°	15
2500	276°	15
2750	275°	15
3000	275°	16
3250	274°	16
3500	274°	16
3750	274°	17
4000	274°	17
4250	274°	17
4500	276°	19
4750	279°	21
5000	281°	24

in wind with time at various heights.

⁶ The HRRR is a NOAA real-time three-kilometer resolution, hourly-updated, cloud-resolving, convection-allowing atmospheric model, initialized by three-kilometer grids with three-kilometer radar assimilation. Radar data is assimilated in the HRRR every 15 minutes over a one-hour period.

⁷ Coordinates used for the model were latitude: 41.73°N; longitude: 85.84°W.

5250	284°	25
5500	286°	27
5750	288°	28
6000	291°	29
6250	292°	29
6500	293°	28
6750	293°	28
7000	294°	27

5.0 Pilot Reports

The only longline-disseminated pilot report⁸ (PIREP) reported between 1200 and 1600 within 50 miles of the accident location is presented here.

FWA UA /OV 5 S ANQ/TM 1944/FL085/TP P28A/TB MOD TURB

6.0 Terminal Aerodrome Forecasts

The closest NWS Terminal Aerodrome Forecast (TAF) site to the accident location was South Bend International Airport (SBN), which was located about 21 miles west of the accident site at an elevation of about 800 feet. According to NWS Instruction 10-813: "A NWS TAF consists of the expected meteorological conditions significant to aviation at an airport for a specified time period. For the U.S., this is the area within five (5) statute miles (SM) of the center of an airport's runway complex."⁹

At 1327, a TAF was issued for SBN that forecasted for the accident time: a wind from 290° at 11 knots, visibility greater than 6 statute miles and sky clear.

*TAF KSBN 301727Z 3018/0118 **29011KT P6SM SKC**
 FM302300 24005KT P6SM SKC
 FM010600 18010KT P6SM BKN200
 FM011200 22011G19KT P6SM BKN040
 FM011500 25013G23KT P6SM SCT050=*

⁸ These do not include pilot reports only broadcast via radio or made by other means that are not then distributed longline.

⁹ www.nws.noaa.gov/directives/sym/pd01008013curr.pdf

7.0 Area Forecast Discussion

The NWS Northern Indiana Weather Forecast Offices issued the following the following Aviation section of an Area Forecast Discussion at 1323.

FXUS63 KIWX 101723

AFDIWX

Area Forecast Discussion

National Weather Service Northern Indiana

123 PM EDT Wed Apr 10 2024

.AVIATION /18Z TAFS THROUGH 18Z THURSDAY/...

Issued at 113 PM EDT Wed Apr 10 2024

VFR conditions continue through at least 00Z this evening, and then the next weather system moves up from the south with widespread rain. Ceilings at both terminals will drop to MVFR and then IFR overnight and into Thursday. Visibility should stay in the MVFR range, but could go lower in heavy rain. There could also be some thunder on Thursday, especially near KFWA, but confidence is too low to include in the TAF at this time.

Winds at KSBN will be easterly and then back to northerly and become gusty as the trough axis moves into the region tomorrow. At KFWA, easterly winds should veer to the southeast ahead of the passage of the surface low before going northwesterly, but there is still some uncertainty in the exact path of the low track, so this may be subject to change.

Submitted by:

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