National Transportation Safety Board
Office of Aviation Safety
Washington, DC 20594

CEN23FA071

METEOROLOGY

Specialist's Factual Report

January 30, 2023

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A. ACCIDENT

Location: Galliano, Louisiana
Date: December 29, 2022
Time: 0834 central standard time
1434 coordinated universal time (UTC)
Helicopter: Bell 407; Registration: N595RL

B. METEOROLOGY SPECIALIST

Specialist Paul Suffern
National Transportation Safety Board
Washington, DC

C. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's Senior Meteorologist did not travel for this investigation, but gathered all data remotely. Data for this investigation was collected from official National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) sources including the Weather Prediction Center (WPC) and the National Center for Environmental Information (NCEI). This Specialist's Factual Report contains the meteorological factors pertinent to the weather surrounding the accident time. All times are central standard time (CST) and are based upon the 24-hour clock, where local time is -6 hours from UTC. Directions are referenced to true north and distances are in nautical miles. Heights are above mean sea level (msl) unless otherwise noted. Visibility is in statute miles and fractions of statute miles. NWS station identifiers use the standard International Civil Aviation Organization 4-letter station identifiers versus the International Air Transport Association 3-letter identifiers, which deletes the initial country code designator "K" for U.S. airports.

The accident site was located at approximate latitude 28.83167° N, longitude 89.55783° W, at sea level.

D. FACTUAL INFORMATION

1.0 Surface Observations

The area surrounding the accident site was documented using official Aviation Routine Weather Reports (METARs) and Special Reports (SPECIs). The following observations were taken from standard code and are provided in plain language. Figure 1 is a local sectional chart with the accident site and the closest weather reporting locations marked. A magnetic variation[1] of 1° west was indicated over the area.

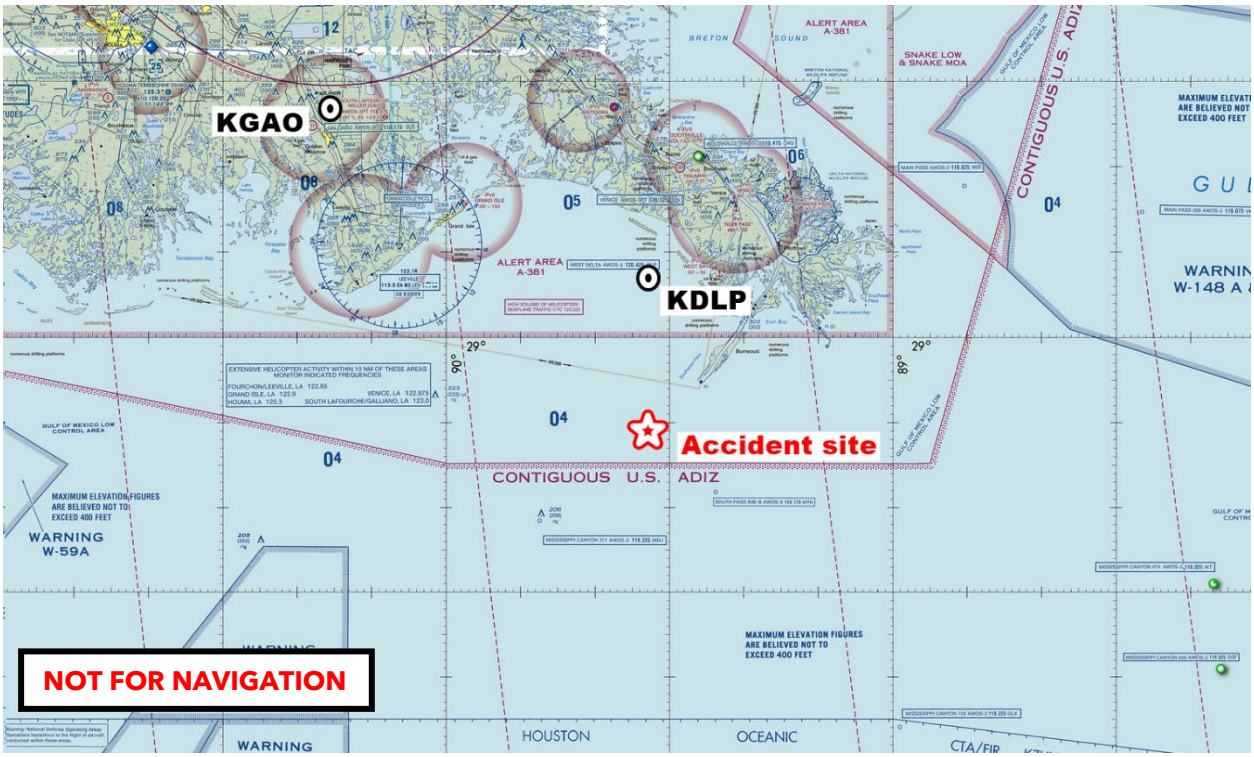

Figure 1. FAA sectional aeronautical chart of the accident area with the location of the accident site and surface observation sites.

[1] Magnetic variation – The angle (at a particular location) between magnetic north and true north. Latest measurement taken from https://skyvector.com/

West Delta 27A (KDLP) had the closest official weather station to the accident site. KDLP had an Automated Weather Observing System (AWOS[2]) and longline[3] reports were not augmented. The KDLP AWOS[4] was located approximately 17 miles north of the accident site (figure 1), at an elevation of 224 feet (ft), and issued the following observations surrounding the period of the accident:[5]

[0655 CST] METAR KDLP 291255Z AUTO 16013KT OVC080 05/M02 A3006 RMK A01=

[0715 CST] METAR KDLP 291315Z AUTO 16012KT OVC080 04/M02 A3006 RMK A01=

[0735 CST] METAR KDLP 291335Z AUTO 16012KT OVC080 04/M04 A3007 RMK A01=

[0755 CST] METAR KDLP 291355Z AUTO 15012KT BKN080 02/M06 A3008 RMK A01=

[0810 CST] METAR KDLP 291410Z AUTO 15012KT BKN085 03/M04 A3009 RMK A01=

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[0835 CST] METAR KDLP 291435Z AUTO 14012KT SCT085 01/M07 A3009 RMK A01=

[0855 CST] METAR KDLP 291455Z AUTO 14013KT FEW085 05/M03 A3010 RMK A01=

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[2] AWOS – Automated Weather Observing System is equipped with meteorological instruments to typically observe and report temperature, dewpoint, wind speed and direction, visibility, cloud coverage and ceiling up to 12,000 feet, and altimeter setting. AWOS are maintained by the FAA. Certain AWOS may have different reporting or observational equipment.

[3] "Longline" refers to the dissemination of weather observations with the intent that they are available in near-real time to national databases 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 weather observations are distributed.

[4] MESOWEST STATION INTERFACE (utah.edu)

[5] The bold sections of products in this report are intended to highlight the text that directly reference the weather conditions that affected the accident region around the accident time. The local times in this section next to the METARs are provided for quick reference between UTC and local times.

The bold type observations decoded in plain language were as follows:

KDLP weather at 0810 CST, automated, wind from 150° at 12 knots, broken ceiling at 8,500 ft above ground level (agl), temperature of 3° Celsius (C), dew point temperature -4°C, and an altimeter setting of 30.09 inches of mercury (inHg). Remarks, automated station without a precipitation discriminator.

KDLP weather at 0835 CST, automated, wind from 140° at 12 knots, scattered clouds at 8,500 ft agl, temperature of 1°C, dew point temperature -7°C, and an altimeter setting of 30.09 inHg. Remarks, automated station without a precipitation discriminator.

South Lafourche Leonard Miller Jr. Airport (KGAO) was the departure airport. KGAO also had an AWOS and longline reports that were not augmented. The KGAO AWOS was located approximately 52 miles northwest of the accident site (figure 1), at an elevation of 0 ft, and issued the following observations surrounding the period of the accident:

[0655 CST] METAR KGAO 291255Z AUTO 11004KT 10SM SCT031 SCT042 OVC060 18/17 A3015 RMK AO2 T01820165=

[0715 CST] METAR KGAO 291315Z AUTO 12004KT 10SM BKN060 OVC100 18/16 A3015 RMK AO2 T01800163=

[0735 CST] METAR KGAO 291335Z AUTO 12003KT 10SM SCT060 OVC110 18/16 A3016 RMK AO2 T01800164=

[0755 CST] METAR KGAO 291355Z AUTO 11003KT 10SM SCT060 SCT110 18/16 A3017 RMK AO2 T01800164=

[0815 CST] METAR KGAO 291415Z AUTO 11005KT 10SM BKN110 19/17 A3017 RMK AO2 T01900168=

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[0835 CST] METAR KGAO 291435Z AUTO 12006KT 10SM OVC120 20/18 A3017 RMK AO2 T02030175=

[0855 CST] METAR KGAO 291455Z AUTO 12006KT 10SM SCT120 21/17 A3018 RMK AO2 T02080174=

The bold type observations decoded in plain language were as follows:

KGAO weather at 0815 CST, automated, wind from 110° at 5 knots, 10 miles visibility or greater, broken ceiling at 11,000 ft agl, temperature of 19°C, dew point temperature 17°C, and an altimeter setting of 30.17 inHg. Remarks, automated station with a precipitation discriminator, temperature 19.0°C, dew point temperature 16.8°C.

KGAO weather at 0835 CST, automated, wind from 120° at 6 knots, 10 miles visibility or greater, overcast ceiling at 12,000 ft agl, temperature of 20°C, dew point temperature 18°C, and an altimeter setting of 30.17 inHg. Remarks, automated station with a precipitation discriminator, temperature 20.3°C, dew point temperature 17.5°C.

The observations from KDLP and KGAO AWOSs surrounding the accident time indicated VFR[6] conditions prevailed with winds to 12 knots.

Additional weather information was available from Southwest Pass (BURL1)[7] maritime weather station located 8 miles northeast of the accident site (figure 2) and BURL1 weather observations can be found in attachment 1. Another observation site was the Louisiana Offshore Oil Port Station LOPL1[8] which was located 25 miles west of the accident site (figure 2). The anemometer for LOPL1 was located 57.9 meters (m) above sea level with the barometer located 40.5 m above sea level with additional observational data found in attachment 2. At the accident time the winds at BURL1 were as high as 17 knots and at LOPL1 the winds were at 18 knots.

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[6] The NWS and the FAA Aeronautical Information Manual (AIM) section 7-1-7 defines the following general flight categories:

- Low Instrument Flight Rules (LIFR*) – ceiling below 500 ft above ground level (agl) and/or visibility less than 1 statute mile.
- Instrument Flight Rules (IFR) – ceiling between 500 to below 1,000 feet agl and/or visibility 1 to less than 3 miles.
- Marginal Visual Flight Rules (MVFR**) – ceiling from 1,000 to 3,000 ft agl and/or visibility 3 to 5 miles.
- Visual Flight Rules (VFR) – ceiling greater 3,000 ft agl and visibility greater than 5 miles.

* By definition, IFR is a ceiling less than 1,000 ft agl and/or visibility less than 3 miles while LIFR is a sub-category of IFR.

**By definition, VFR is a ceiling greater than or equal to 3,000 ft agl and visibility greater than 5 miles while MVFR is a sub-category of VFR.

[7] MESOWEST STATION INTERFACE (utah.edu)

[8] NDBC - Station LOPL1 Recent Data (noaa.gov)

Figure 2. Google Earth map with the location of the accident site and surface observation sites.

2.0 Winds Aloft Data

A High-Resolution Rapid Refresh (HRRR) model[9] sounding was created[10] for the approximate accident site coordinates for 0900 CST. The HRRR sounding was plotted on a standard Skew-T Log P diagram[11] using the RAOB[12] software package and the full set of weather information is included as attachment 3. The sounding depicted an elevation of sea level over the grid point with a near surface temperature of 20.2°C, a dew point temperature of 16.9°C, with a relative humidity of 81%, and a near surface wind from 136° at 14 knots.

[9] 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.
[10] HRRR sounding was created using NOAA Air Resource Laboratory: READY Archived Meteorology (noaa.gov).
[11] Skew T log P diagram – is a standard meteorological plot using temperature and the logarithmic of pressure as coordinates, used to display winds, temperature, dew point, and various indices used to define the vertical structure of the atmosphere.
[12] RAOB – (The complete Rawinsonde Observation program) is an interactive sounding analysis program developed by Eosonde Research Services, The Villages, Florida.

3.0 Astronomical Data

The astronomical data obtained for the accident site on December 29, 2022, indicated the following:

SUN	
Begin civil twilight	0625 CST
Sunrise	0650 CST
Accident time	**0834 CST**[13]
Sun transit	1200 CST
Sunset	1710 CST
End civil twilight	1736 CST

At the time of the accident the Sun was located at an altitude of 18.13° and azimuth of 130.76°.

E. LIST OF ATTACHMENTS

Attachment 1 – BURL1 observations surrounding the accident time

Attachment 2 – LOPL1 observations surrounding the accident time

Attachment 3 – HRRR winds aloft information

Submitted by:

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[13] Inserted accident time for reference and context.