



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

February 12, 2020

Weather Study

METEOROLOGY

CEN20MA044

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A. ACCIDENT

Location: Lafayette, Louisiana
Date: December 28, 2019
Time: 0921 central standard time (1521 UTC)¹
Aircraft: Type – Piper PA 31T; Registration – N42CV

B. METEOROLOGIST

Mike Richards
Senior Meteorologist
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 central standard time (CST) for December 28, 2019 (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: 30.176111° north latitude, 92.007500° west longitude, at an elevation of about 35 feet.

D. WEATHER INFORMATION

1.0 Surface Observations

An Automated Surface Observing System (ASOS) was located at Lafayette Regional Airport/Paul Fournet Field (LFT²) in Lafayette, Louisiana, which was located about 2 miles north-northeast of the accident location at an elevation of about 40 feet and had a magnetic variation of about 1° east. Automated longline³ reports from KLFT during the times surrounding the accident time are presented here.

¹ UTC – abbreviation for Coordinated Universal Time

² The National Weather Service uses the 4-digit International Civil Aviation Organization (ICAO) format for station identifiers (as seen in the body of some formatted weather observations). This report uses the 3-digit International Air Transport Association format for station identification, which does not use the geographic designating digit (“K” for stations in the continental U.S. and “P” for U.S. stations in Alaska and the Pacific region) as found in the ICAO format.

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.

[0817 CST] SPECI KLFT 281417Z VRB03KT 2SM BR OVC002 19/19 A2996 RMK
AO2 T01940189=

[0831 CST] SPECI KLFT 281431Z VRB04KT 3/4SM BR OVC003 19/19 A2996 RMK
AO2 T01940189=

**[0853 CST] METAR KLFT 281453Z 12005KT 3/4SM BR VV002 19/19 A2997 RMK
AO2 SLP146 T01940189 53011=**

[0951 CST] SPECI KLFT 281551Z 15006KT 3/4SM BR VV002 20/19 A2997 RMK
AO2 ACFT MISHAP=

At 0853 CST, the LFT ASOS reported a wind from 120° at 5 knots, visibility 3/4 of a statute mile, mist, vertical visibility of 200 feet above ground level (agl), temperature of 19° Celsius (C) and a dew point temperature of 19°C, altimeter setting of 29.97 inches of mercury; remarks: station with a precipitation discriminator, sea level pressure of 1014.6 hectopascals (hPa), temperature of 19.4°C and a dew point temperature of 18.9°C, pressure increase of 1.1 hPa over the previous three hours.

2.0 Pilot Reports

Publicly disseminated pilot reports⁴ (PIREPs) made between 0800 and 1100 CST within about 50 miles of the accident location at or below 10,000 feet are presented here.

Prior to the accident, at 0830 CST a Beech 200 Super King Air aircraft over LFT reported overcast clouds at 200 feet.

Following the accident, at 1016 CST an Embraer ERJ-135 aircraft two miles northeast of LFT reported overcast clouds at 500 feet with cloud tops at 2,000 feet.

LFT UA /OV LFT/TM 1430/FLDURGD/TP BE20/SK OVC002

LFT UA /OV 2 NM NE LFT/TM 1616/FLDURD/TP E135/SK OVC005-TOPS020

LFT UA /OV 2NM SW LFT/TM 1624/FLDURC/TP E75L/SK OVC007

LFT UA /OV 2NM SW LFT/TM 1641/FLDURD/TP CRJ2/SK OVC007-TOPS020

LFT UA /OV LFT/TM 1659/FLDURGC/TP C510/SK BASES OVC008

LFT UA /OV 2NM SW LFT/TM 1700/FLDURC/TP E135/SK OVC010

⁴ These do not include pilot reports only broadcast via radio.

3.0 Upper Air Data

A High-Resolution Rapid Refresh (HRRR) model⁵ sounding (figure 1) for the accident site at 0900 CST was retrieved from the National Oceanic and Atmospheric Administration’s Air Resources Laboratory. Near the surface, the wind was from the southeast at seven knots and veered⁶ to a south wind of 24 knots near 3,500 feet. Calculations made by the Rawinsonde Observation Program (RAOB) indicated the potential for “light” low-level wind shear. A temperature inversion was noted between about 2,800 and 3,600 feet. The freezing level was at about 13,400 feet. The relative humidity was 96 percent or greater between the surface and about 3,000 feet. RAOB identified the potential for overcast clouds between about 350 and 3,000 feet.

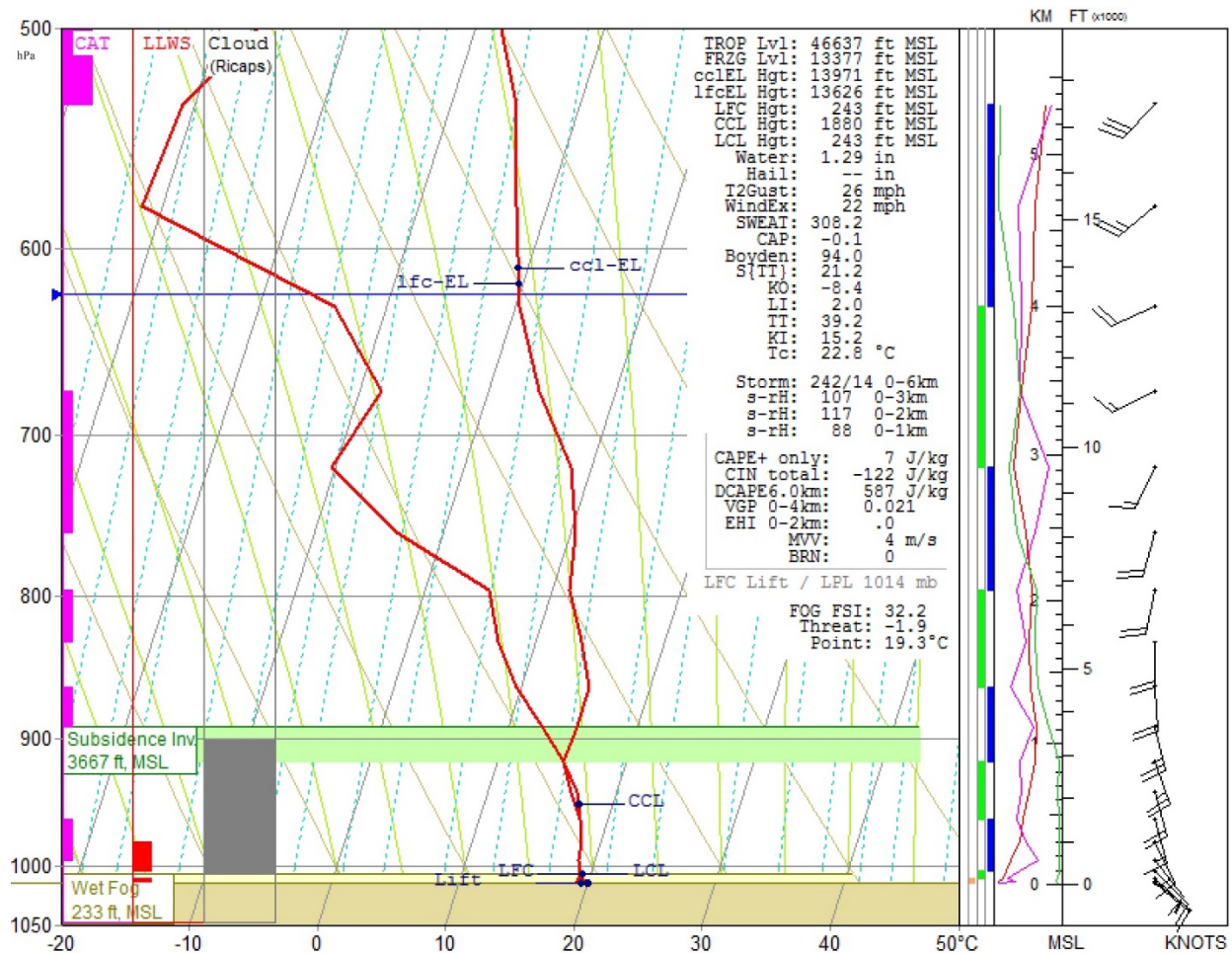


Figure 1 – HRRR model sounding data in SkewT/LogP format for 0900 CST at the accident site, surface to 500 hPa.

⁵ 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.

⁶ A veering wind’s wind barbs turns clock-wise with increasing height.

4.0 Satellite Imagery

Geostationary Operational Environmental Satellite (GOES)-16 “visible” (0.64 μm) and infrared (10.3 μm) data were obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison. Imagery from 0921 CST is presented in figures 2 and 3. The visible imagery depict clouds over the accident region. Infrared cloud-top temperatures were about 9°C over the accident location at the accident time. Considering the HRRR sounding, this cloud top temperature corresponded to cloud top heights of about 9,000 feet.

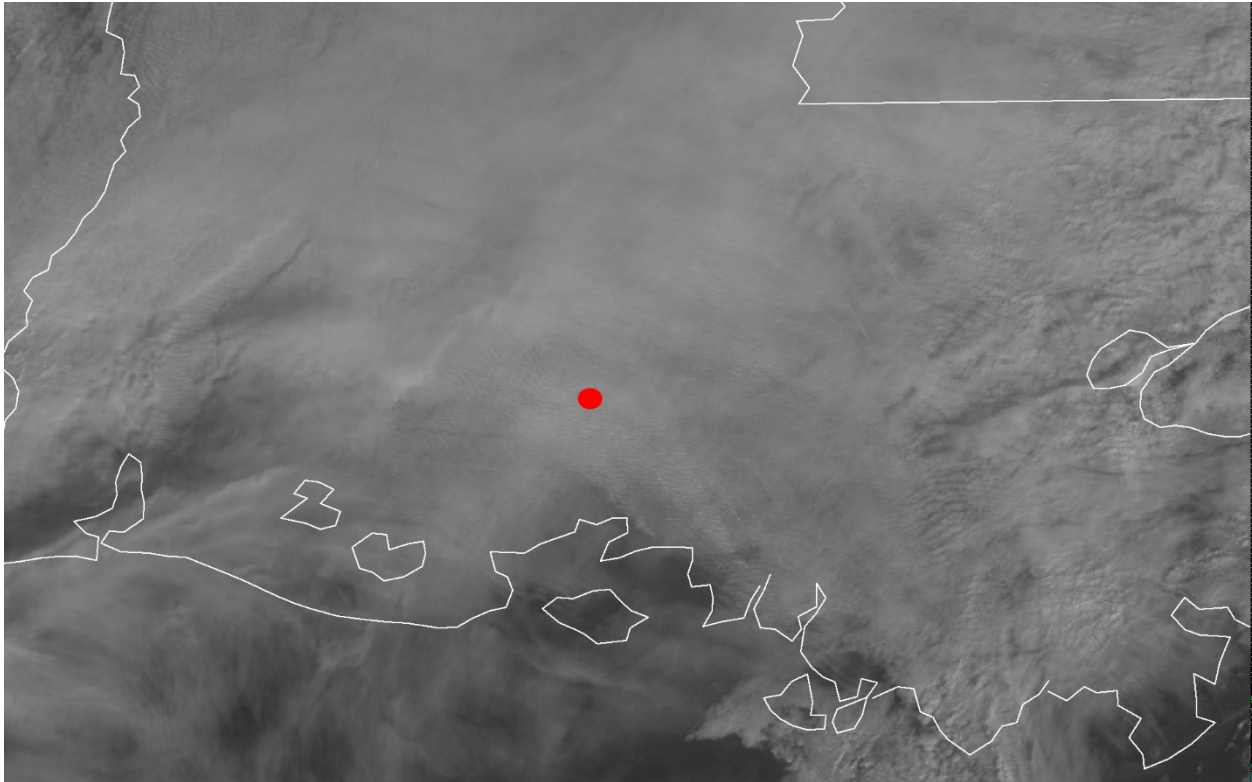


Figure 2 – GOES-16 visible imagery from 0921 CST. Accident location denoted by red dot. This image has not been corrected for any parallax error.

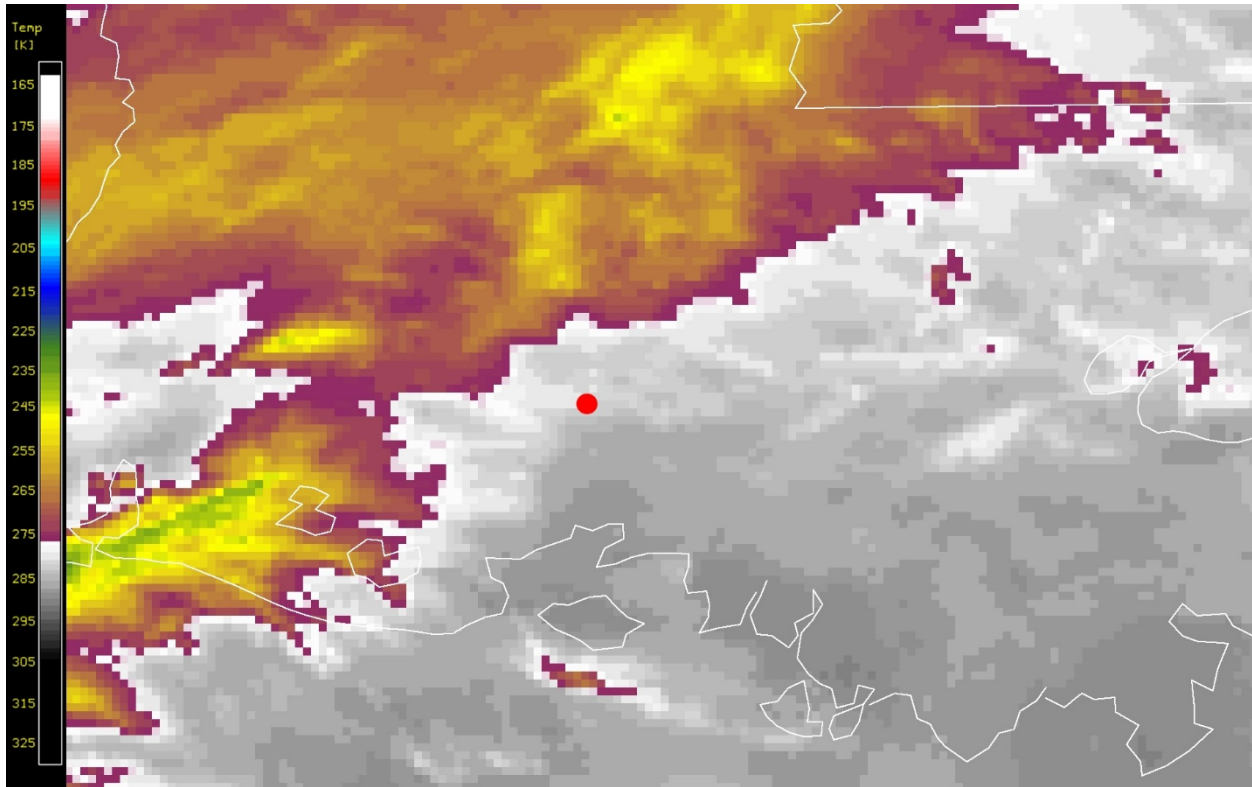


Figure 3 – GOES-16 infrared imagery (brightness temperatures in degrees Kelvin) from 0921 CST. Accident location denoted by red dot. This image has not been corrected for any parallax error.

5.0 Weather Radar

A review of weather radar imagery revealed no pertinent meteorological radar returns near the accident location at the accident time.

6.0 Area Forecast Discussion

Presented here is the “Aviation” section of the Area Forecast Discussion (AFD) issued by the National Weather Service (NWS) Weather Forecast Office (WFO) in Lake Charles, Louisiana (LCH), at 0535 CST. This AFD discussed low ceilings across the region.

*FXUS64 KLCH 281135
AFDLCH
Area Forecast Discussion
National Weather Service Lake Charles LA
535 AM CST Sat Dec 28 2019
.AVIATION...*

Sfc obs indicate LIFR or lower ceilings prevailing across the entire forecast area while most locations are seeing MVFR or lower visibilities...expect these conditions to linger into mid-morning before some improvement with the onset of daytime heating. Expect the srn terminals to maintain MVFR ceilings through the day while KAEX is progged to break into VFR by mid-day. Regional 88Ds show some light returns mainly to our east which are progged by latest high res runs to remain there...have inserted VCSH mentions for later in the day at most locations as a few showers look possible given moist profiles and perhaps some weak lift from approaching disturbance aloft. Best chance for precip comes late tonight at the wrn terminals with the approach of the sfc trof.

7.0 Terminal Aerodrome Forecasts

Presented here are the two most recent LFT TAFs issued by LCH prior to the accident time.

At 0700 CST a TAF was issued for LFT that forecasted for the accident time: wind from 110° at 6 knots, visibility of four statute miles, mist, ceiling overcast at 300 feet agl.

KLFT 281300Z 2813/2912 11006KT 4SM BR OVC003
TEMPO 2813/2814 1/2SM FG
FM281600 15010KT P6SM SCT005 OVC009
FM281900 16010KT P6SM SCT007 OVC015
FM290000 18006KT 6SM BR VCSH OVC009
FM290700 18006KT 6SM BR OVC005=

At 0905 CST a TAF was issued for LFT that forecasted for the accident time: wind from 110° at 6 knots, visibility of 3/4 of a statute mile, mist, ceiling overcast at 200 feet agl; temporary conditions⁷ between 0900 and 1000 CST: visibility of two statute miles, mist, scattered clouds at 200 feet agl, ceiling overcast at 700 feet agl.

KLFT 281505Z 2815/2912 11006KT 3/4SM BR OVC002
TEMPO 2815/2816 2SM BR SCT002 OVC007
FM281600 15010KT P6SM SCT005 OVC009
FM281900 16010KT P6SM SCT007 OVC015
FM290000 18006KT 6SM BR VCSH OVC009
FM290700 18006KT 6SM BR OVC005=

⁷ Temporary conditions - fluctuations to forecast conditions which are expected to last less than one hour in each instance and, in the aggregate, to cover less than half of the indicated period.

8.0 Graphical Forecasts for Aviation

The Graphical Forecasts for Aviation (GFA) are intended to provide the necessary aviation weather information to give users a complete picture of the weather that might impact flight in the continental United States. Hourly model data and forecasts, including information on clouds, flight category, precipitation, icing, turbulence, wind, and other output from the NWS are available, however only certain imagery are archived by the NWS.

The following images (figures 4-5) depict GFA forecast information on sky condition, icing, mountain obscuration, instrument flight rule (IFR)⁸ condition and surface wind Graphical-Airmen’s Meteorological Information (G-AIRMET) advisories, surface visibility, surface wind, precipitation, and other obscurations and hazards, valid for a time near the accident time.

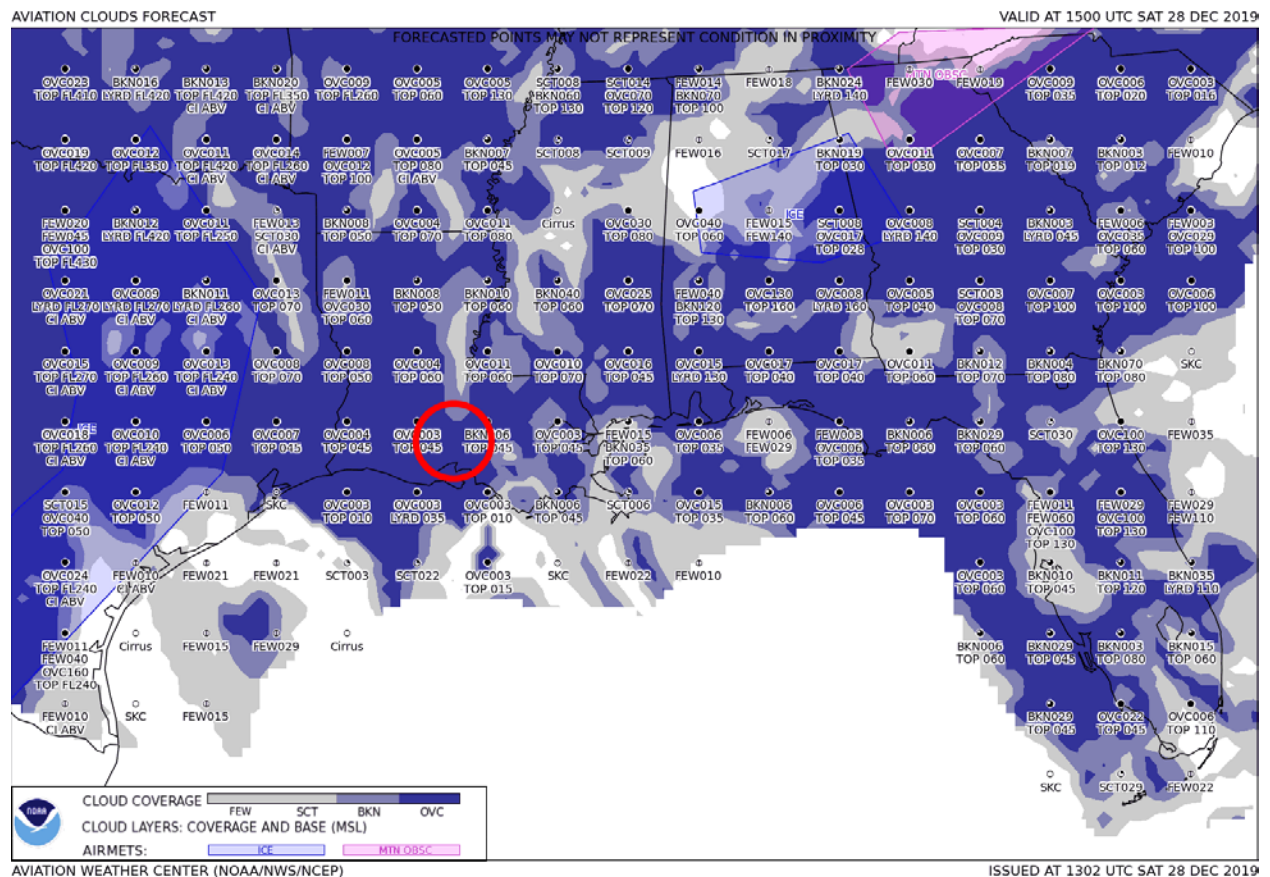


Figure 4 – GFA forecast imagery depicting sky condition and icing and mountain obscuration AIRMETs. Issued about 0700 CST and valid for 0900 CST. This GFA forecast imagery depicted overcast sky conditions over the accident region with both cloud bases broken at 600 feet above msl and cloud bases overcast at 300 feet above msl noted near the accident site. Cloud tops were identified as being at 4,500 feet above msl in the accident area. The accident location is located within the red circle.

⁸ IFR conditions - Ceilings less than 1,000 feet agl and/or visibility less than three statute miles.

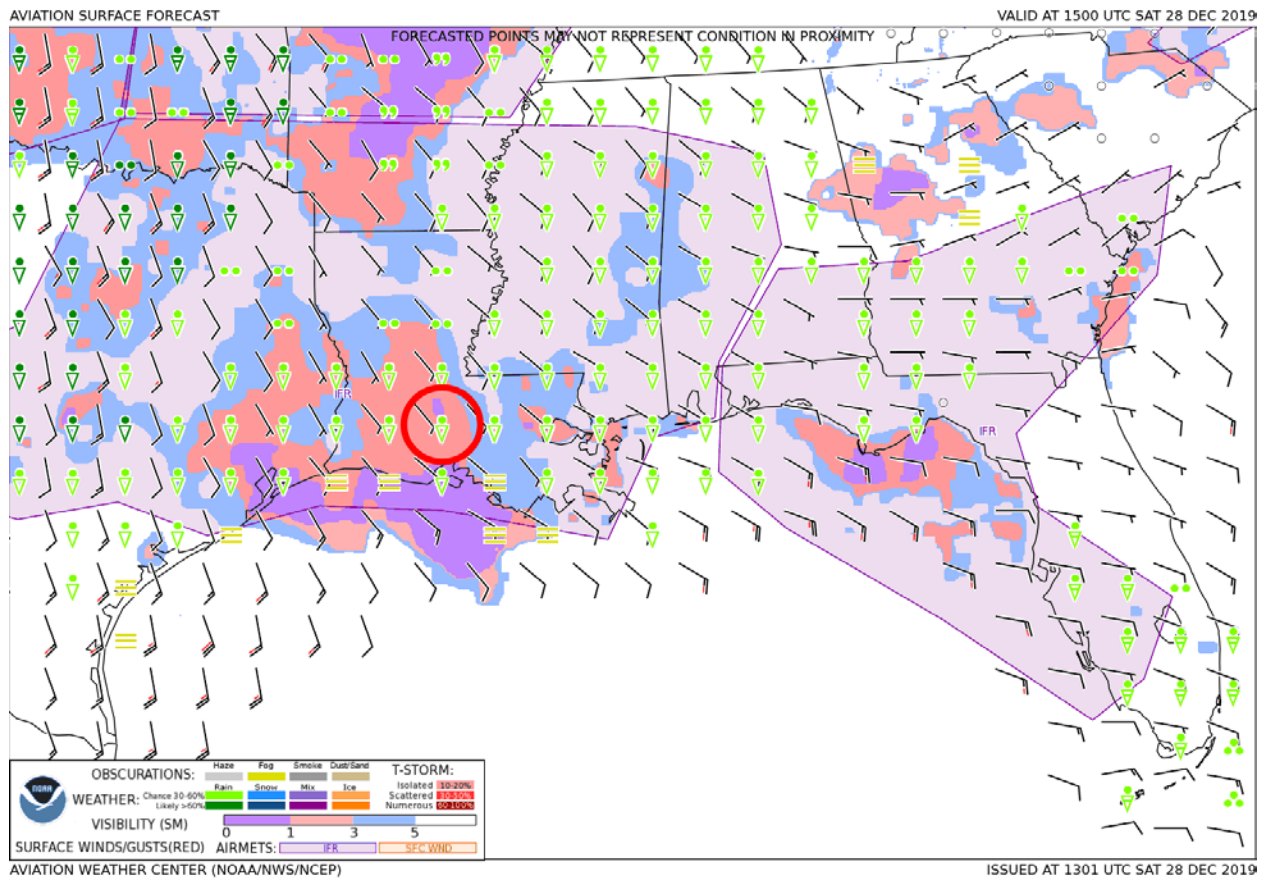


Figure 5 – GFA forecast imagery depicting IFR conditions and surface wind G-AIRMETS, surface visibility, surface wind, precipitation, and other obscurations and hazards. Issued about 0700 CST and valid for 0900 CST. This GFA forecast imagery depicted surface visibilities as being between both 1 to 3 statute miles and 0 and 1 statute mile near the accident location. A southeasterly surface wind of 5 knots was depicted across the accident region with a thirty to sixty percent chance of light rain showers identified close to the accident location. A G-AIRMET for IFR conditions was active over the accident region. The accident location is located within the red circle.

9.0 AIRMETS

At 0845 CST, an AIRMET SIERRA was issued by the NWS Aviation Weather Center for IFR conditions in mist and fog, for an area that included the accident location.

WAUS44 KKCI 281445
 WA4S
 -DFWS WA 281445
 AIRMET SIERRA UPDT 5 FOR IFR VALID UNTIL 282100

AIRMET IFR...TX AR TN LA MS AL AND CSTL WTRS
 FROM 50WSW MSL TO 40WNW ATL TO 50SW PZD TO 40W CEW TO 90SSE SJI

TO 60SE LEV TO 120SSW LCH TO 30ESE PSX TO 50SE LRD TO 60NW LRD
TO 50SE CWK TO 50WSW MSL
CIG BLW 010/VIS BLW 3SM BR/FG. CONDS CONTG BYD 21Z THRU 03Z.

10.0 SIGMETs

There were no convective or non-convective Significant Meteorological Information (SIGMET) advisories active for the accident location at the accident time.

11.0 CWSU Products

The NWS Center Weather Service Unit (CWSU) at the Houston Air Route Traffic Control Center (ZHU) issued several Center Weather Advisories (CWA) for low IFR (LIFR) conditions^{9,10} that were active for the accident location at times surrounding but not including the accident time.

At 0718 CST the ZHU CWSU issued the following CWA, which was valid until 0915 CST.

FAUS21 KZHU 281318
ZHU1 CWA 281315
ZHU CWA 102 VALID UNTIL 281515
FROM 25SW ACT-MCB-50E LEV-40W CRP-25SW ACT
AREA OF LIFR CONDS...CIGS AOB 005/VIS AOB 1SM BR/FG. CONDS EXP TO
SLWLY IMPR AFT 1500Z.

At 0931 CST the ZHU CWSU issued the following CWA, which was valid until 1115 CST.

FAUS21 KZHU 281531
ZHU1 CWA 281515
ZHU CWA 103 VALID UNTIL 281715
FROM 25SW ACT-MCB-LEV-PSX-25SW ACT
AREA OF LIFR CONDS...CIGS AOB 005/VIS AOB 1SM BR/FG. CONDS EXP TO
SLWLY IMPR THRU PD.

12.0 Flight Service

Leidos provided NTSB staff with three documents that outlined weather information retrieved by a third party vendor for a "Route Standard Briefing at Dec 28, 1336Z for N42CV KLFT to KPDK." These documents can be found in the NTSB's docket for this accident.

⁹ LIFR conditions - Ceilings less than 500 feet agl and/or visibility less than one statute miles.

¹⁰ The CWAs advised of ceilings at or below 500 feet agl and visibilities at or below one statute mile.

Submitted by:

Mike Richards
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