



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

May 18, 2021

Specialist's Report

METEOROLOGY

CEN21FA209

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A. ACCIDENT

Location: Hattiesburg, Mississippi
Date: May 4, 2021
Time: about 2302 central daylight time (0402 UTC on May 5, 2021)¹
Aircraft: Type – Mitsubishi MU2B-60; Registration – N322TA

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 daylight time (CDT) for May 4, 2021 (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: 31.291031° north latitude; 89.285544° west longitude at an elevation of about 165 feet.

This report provides information on weather conditions and forecasts applicable to the accident time and location.

D. WEATHER INFORMATION

1.0 Surface Observations

An Automated Surface Observing System (ASOS) was located at Hattiesburg Bobby L. Chain Municipal Airport (HBG), which was located two miles southeast of the accident location at an elevation of 150 feet and had a magnetic variation of about 1° west. Automated longline² reports from the HBG ASOS during the times surrounding the accident time are presented here.

¹ UTC – abbreviation for Coordinated Universal Time

² “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.

[2224 CDT] SPECI KHBG 050324Z AUTO 22004KT 10SM FEW006 BKN120 19/18
A2993 RMK AO2 LTG DSNT SE-SW RAB0257E06 P0000 T01890178=
[2248 CDT] SPECI KHBG 050348Z AUTO 30004KT 10SM BKN007 OVC120 19/18
A2995 RMK AO2 LTG DSNT SE RAB0257E06 P0000=
[2253 CDT] **METAR KHBG 050353Z AUTO 00000KT 10SM BKN007 OVC120
19/18 A2995 RMK AO2 LTG DSNT SE RAB0257E06 SLP138 P0000
T01940178=**
[2353 CDT] METAR KHBG 050453Z AUTO 19003KT 10SM OVC008 19/18 A2995
RMK AO2 SLP140 T01940183=

At 2253 CDT, HBG reported a calm wind, visibility 10 miles or greater, ceiling broken at 700 feet above ground level (agl), overcast clouds at 12,000 feet agl, temperature of 19° Celsius (C) and dew point temperature of 18°C, altimeter setting of 29.95 inches of mercury; Remarks included: lightning distant to the southeast, rain began at 2157 CDT and ended at 2206 CDT, trace amount of precipitation fell since 2153 CDT.

2.0 Pilot Reports

There were no pilot reports within 50 miles of the accident location and two hours of the accident time.

3.0 HRRR Model Sounding

A High-Resolution Rapid Refresh (HRRR) model³ sounding (figure 1) for the accident site at 2300 CDT using an elevation of 50 meters was retrieved from the National Oceanic and Atmospheric Administration's Air Resources Laboratory. The model sounding identified cloudy conditions between about 700 feet and 1,400 feet. From the surface to about 1,000 feet the wind was from the southeast at magnitudes not exceeding about 15 knots. Above 1,000 feet the wind veered to a southwest wind at about 15 knots at 2,300 feet. The RAOB identified "light" low level wind shear in a layer between near the surface and 720 feet and in a layer between about 1,100 and 2,300 feet. Light and moderate clear air turbulence was identified by RAOB below 4,000 feet.

³ 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.

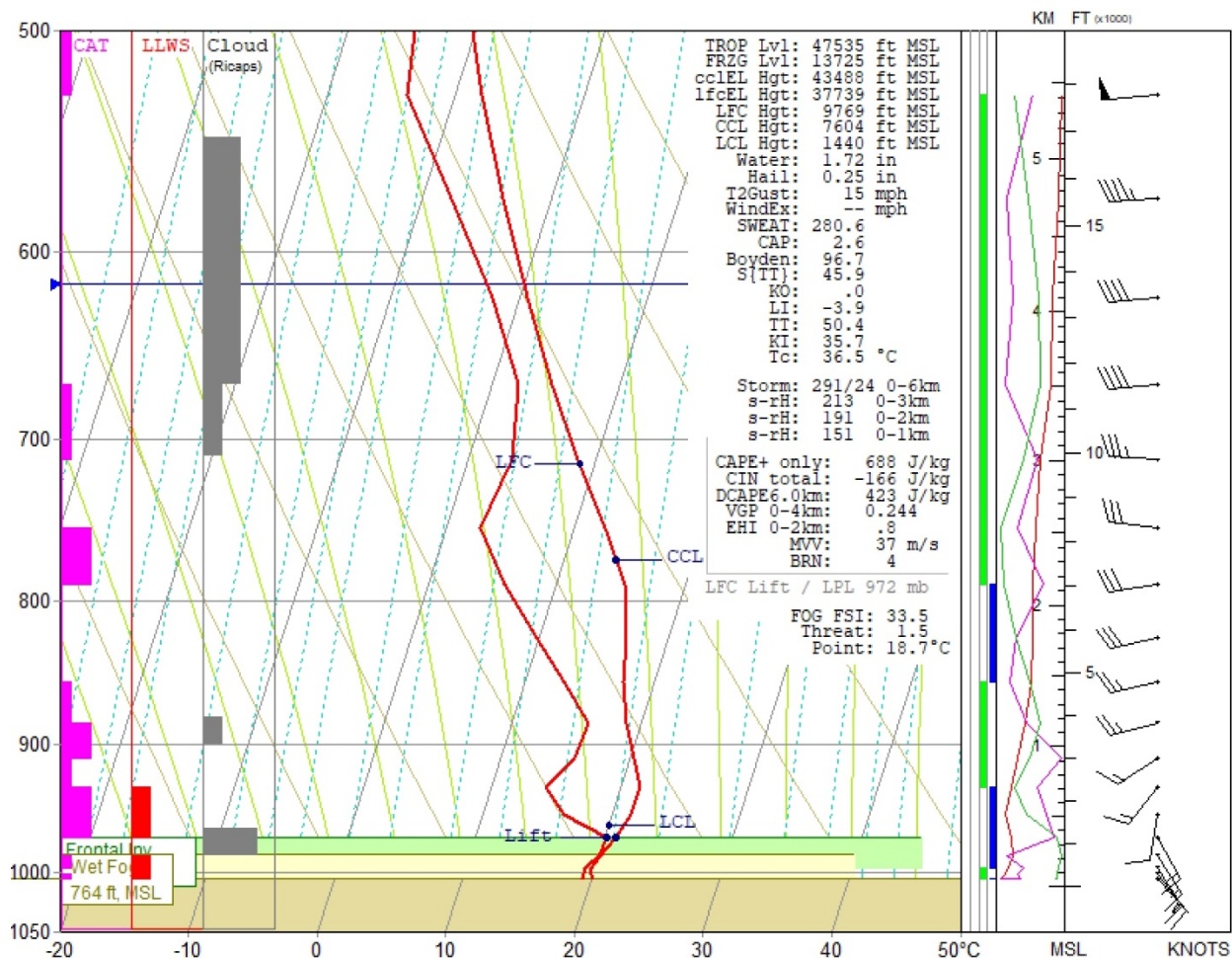


Figure 1 – HRRR model sounding data in SkewT/LogP format for 2300 CDT at the accident site, surface to 500 hectopascals.

4.0 Weather Radar

The WSR-88D⁴ Level-II weather radar imagery from the KMOB site is presented in figure 2. KMOB was located approximately 66 miles southeast of the accident location at an elevation of about 290 feet. Assuming standard refraction and considering the 0.95° beam width⁵ for the WSR-88D radar beam, the KMOB 0.437° tilt would have “seen” altitudes above the accident location of between about 2,900 and 9,600 feet.

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

⁵ Here we define the angular width of the radar beam as the region of transmitted energy that is bounded by one-half the maximum power. The maximum power lies along the beam centerline and decreases outward.

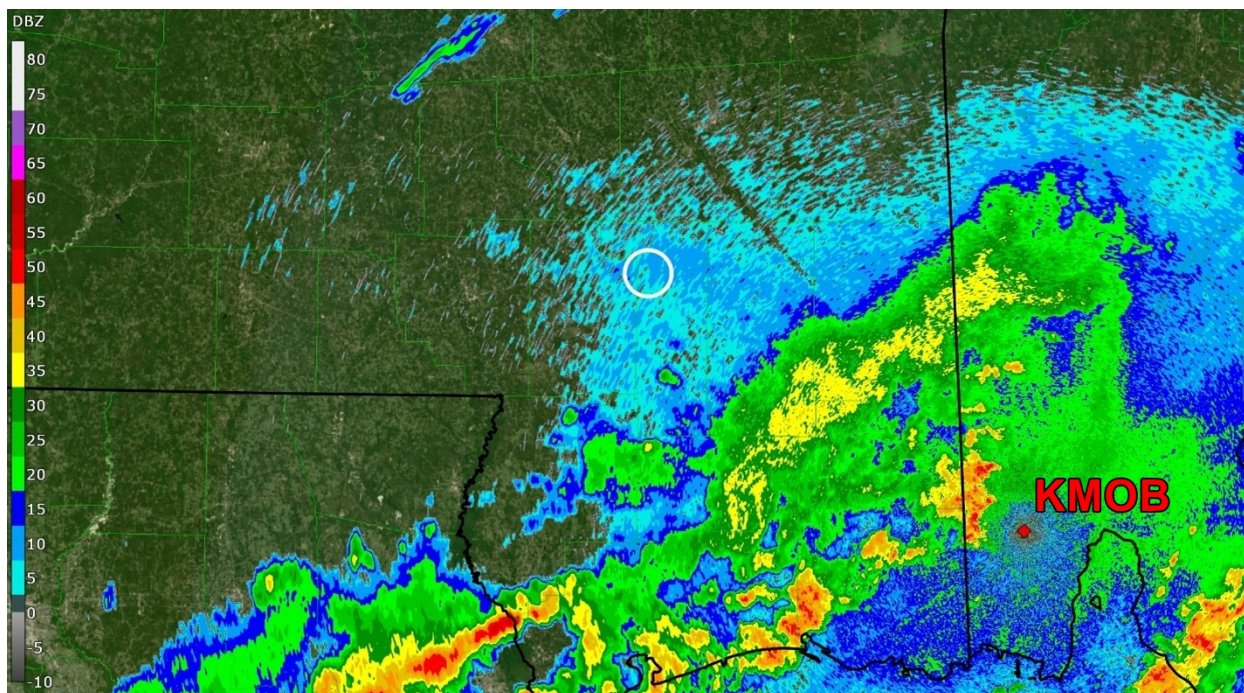


Figure 2 – KMOB 0.48° Level-II reflectivity product from a sweep initiated at 2302:57 CDT. Accident location marked by the white circle.

5.0 Terminal Aerodrome Forecasts

The National Weather Service issued Terminal Aerodrome Forecasts (TAFs) for HBG and these TAFs were valid for the accident site. The following TAF was issued for HBG at 1830 CDT and was active for the accident time. For the accident time it forecast: a wind from 190° at 6 knots, visibility greater than 6 statute miles, rain showers within 5 miles of the airport and ceiling broken at 1,300 feet agl. Prior to that time thunderstorms were expected to impact the terminal area.

TAF KHBG 042330Z 0500/0524 32009KT 4SM -TSRA OVC022CB
 FM050300 **19006KT P6SM VCSH BKN013**
 FM050900 33005KT P6SM OVC009
 FM051100 35006KT 2SM BR OVC004
 FM051500 34008KT 6SM BR OVC007
 FM051700 36008KT P6SM OVC015=

6.0 Satellite Imagery

Geostationary Operational Environmental Satellite (GOES)-16 infrared (10.3μm) data were obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison. An image from 2301 CDT is presented in figure 3. The GOES-16 infrared brightness temperatures over the accident location were -52°C, which corresponded to a height of about 38,000 feet in the HRRR model sounding (not depicted in figure 1).

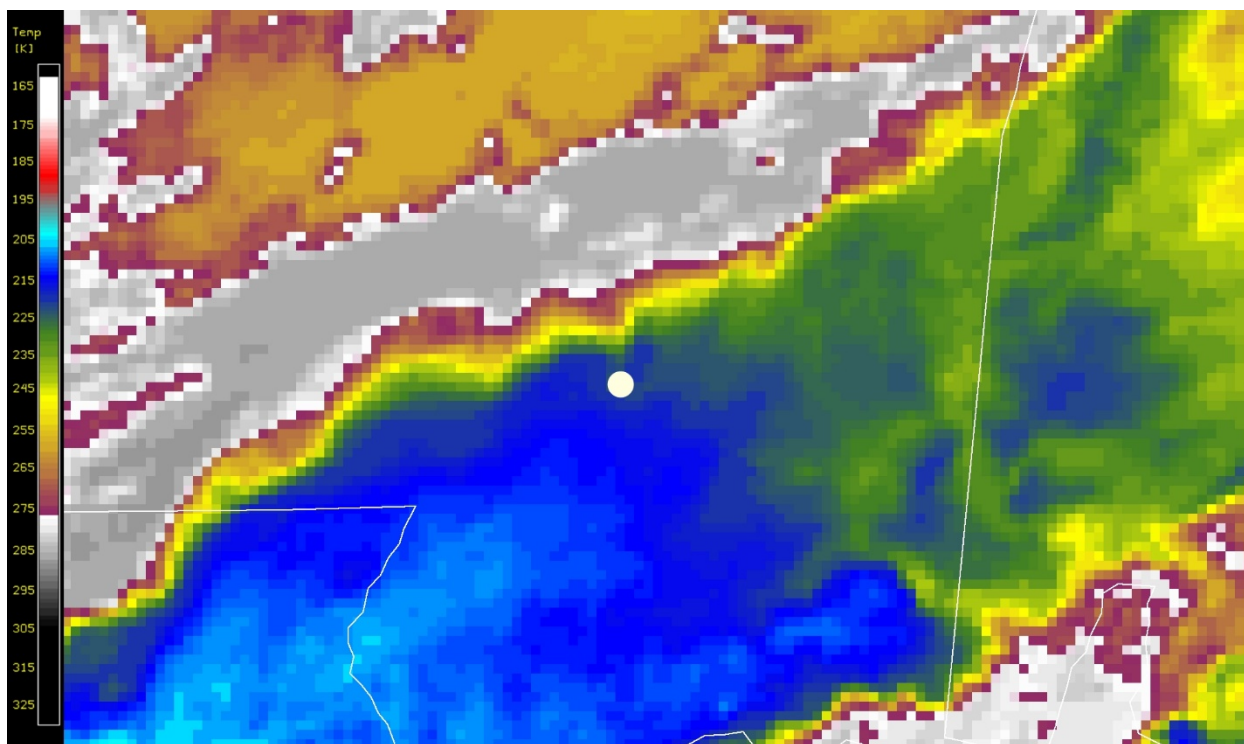


Figure 3 – GOES-16 infrared brightness temperature imagery from 2301 CDT. Accident location is denoted by the white circle. This image has not been corrected for any parallax error.

7.0 Area Forecast Discussion

Presented here is the “Aviation” section of the Area Forecast Discussion issued at 2001 CDT by the NWS Weather Forecast Office in Jackson, Mississippi.

*FXUS64 KJAN 050101 AAA
AFDJAN
Area Forecast Discussion...UPDATED
National Weather Service Jackson MS
801 PM CDT Tue May 4 2021*

.AVIATION...

00Z TAF discussion:

The threat for storms have decreased from NW-SE this evening. Outside of lingering light rain at HBG/PIB, which is bringing down the visibility, VFR cigs with mid-high clouds are the norm & ongoing. MVFR/IFR flight cats/cigs are expected areawide tonight in the wake, mainly b/w 05/02-05Z at GLH, GWO & GTR, & b/w 05/03-08Z at JAN, HKS, MEI, PIB & HBG. Some LIFR cigs can't be ruled out in some of the central-SE TAF sites just before daybreak, while some brief MVFR-IFR drops in vis are possible as well. Vis will quickly improve after 05/15Z, with slow improvement to at

least MVFR flight cats/cigs by midday-early Wed. afternoon. Winds will shift from southerly to N/NNW behind the front. /DC/

8.0 AIRMETs below FL180

At 2145 CDT, the NWS Aviation Weather Center (AWC) issued the following Airmen's Meteorological Information (AIRMET) advisory for IFR conditions⁶ that was active for the accident site at the accident time.

*WAUS44 KKCI 050245
WA4S
-DFWS WA 050245
AIRMET SIERRA FOR IFR AND MTN OBSCN VALID UNTIL 050900*

*.
AIRMET IFR...AR TN LA MS AL AND CSTL WTRS
FROM HNV TO GQO TO 50SW PZD TO 40W CEW TO 130ESE LEV TO 100WSW LEV
TO 20SSW LSU TO 40SW AEX TO 20NNW SQS TO 30WNW DYP TO HNV CIG BLW
010/VIS BLW 3SM PCPN/BR. CONDS CONTG BYD 09Z THRU 15Z.*

9.0 SIGMETs

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

At 2255, the NWS AWC issued the following Convective SIGMET that was active for the accident location at the accident time.

*WSUS32 KKCI 050355
SIGC
-MKCC WST 050355
CONVECTIVE SIGMET 8C
VALID UNTIL 0555Z
FL AL MS LA AND CSTL WTRS
FROM 30NNE MGM-40SSW LGC-60S CEW-80SSW LSU-30WSW LSU-30NNE MGM
AREA SEV EMBD TS MOV FROM 25035KT. TOPS ABV FL450.
HAIL TO 1 IN...WIND GUSTS TO 50KT POSS.*

⁶ Instrument Flight Rule (IFR) conditions - ceiling less than 1,000 feet agl and/or visibility less than three statute miles.

10.0 CWSU Products

There were no Center Weather Advisories or Meteorological Impact Statements issued by the NWS Center Weather Service Units (CWSU) at the Houston and Memphis Air Route Traffic Control Centers that were active for the accident location at the accident time.

Submitted by:

Mike Richards
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