



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

April 11, 2019

Weather Study

METEOROLOGY

CEN19LA054

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A. ACCIDENT

Location: Uvalde, Texas
Date: January 12, 2019
Time: about 1130 central standard time (1730 UTC)¹
Airplane: CL-600-2A12; N813WT

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 January 12, 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).

Coordinates used for the accident location: 29.4614778° north latitude, 100.1142944° west longitude, at an elevation of about 1,295 feet (these are the coordinates and elevation for Ox Ranch Airport in Uvalde, Texas).

D. WEATHER INFORMATION

1.0 Surface Observations

An Automated Weather Observing System was located at Garner Field Airport (UVA)² in Uvalde, Texas, and was located about 25 miles southeast of the accident location at an elevation of 942 feet. Automated reports from UVA 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.

[1115 CST] METAR KUVA 121715Z AUTO 33011G14KT 10SM CLR 16/07 A3018
RMK AO2 T01560068=

**[1135 CST] METAR KUVA 121735Z AUTO 32011KT 10SM CLR 16/06 A3018
RMK AO2 T01580061=**

[1155 CST] METAR KUVA 121755Z AUTO 34012KT 10SM CLR 17/06 A3017 RMK
AO2 T01660062 10166 20102=

[1215 CST] METAR KUVA 121815Z AUTO 33013KT 10SM CLR 17/06 A3016 RMK
AO2 T01710059=

At 1135 CST, UVA reported a wind from 320° at 11 knots, visibility of 10 statute miles or greater, sky condition clear below 12,000 feet above ground level (agl), temperature of 16° Celsius (C) and a dew point temperature of 6°C, altimeter setting of 30.18 inches of mercury; remarks: station with a precipitation discriminator, temperature of 15.8°C and dew point temperature of 6.1°C.

A weather observing system of unknown type was located at Laughlin Air Force Base Auxiliary Number 1 (T70) in Spofford, Texas, which was located about 28 miles southwest of the accident location at an elevation of 1,004 feet. Automated reports from T70 during the times surrounding the accident time are presented here.

[0858 CST] METAR KT70 121458Z AUTO 33010KT 10SM CLR 11/10 A3010 RMK
AO2 SLP190 T01050103 52033 \$=

[0958 CST] METAR KT70 121558Z AUTO 34016G20KT 10SM CLR 13/07 A3013
RMK AO2 SLP200 T01300073 \$=

**[1058 CST] METAR KT70 121658Z AUTO 34016KT 10SM CLR 15/06 A3015 RMK
AO2 SLP207 T01520059 \$=**

[1158 CST] METAR KT70 121758Z AUTO 34016KT 10SM CLR 17/05 A3013 RMK
AO2 SLP199 T01690046 10169 20101 50012 \$=

At 1058 CST, T70 reported a wind at from 340° at 16 knots, visibility of 10 statute miles or greater, sky condition clear below 12,000 feet agl, temperature of 15°C and a dew point temperature of 6°C, altimeter setting of 30.15 inches of mercury; remarks included: station with a precipitation discriminator, sea level pressure of 1020.7 hectopascals (hPa), temperature of 15.2°C and dew point temperature of 5.9°C, maintenance needed on the system.

Unofficial meteorological reporting station KCPT2 (data courtesy of MesoWest³) was located about 21 miles west-northwest of the accident site at an elevation of about 1,600 feet. Calibration, maintenance and siting standards of this instrument, as well as the overall quality of the data, are

³ <https://mesowest.utah.edu>

not known. Reporting of certain parameters⁴ from KCPT2 (rounded to nearest whole numbers) during the times surrounding the accident time are presented here (time in CST):

<u>Time</u>	<u>Temp</u>	<u>D_Temp</u>	<u>RH</u>	<u>W_Mag</u>	<u>W_Dir</u>	<u>G_Mag</u>
1000	52	40	63	16	354°	23
1100	56	38	52	14	359°	24
1200	59	38	45	12	320°	21
1300	60	37	42	13	320°	24

2.0 Upper Air Data

A High-Resolution Rapid Refresh (HRRR) model⁵ sounding (figure 1) for the accident site at 1200 CST was retrieved from the National Oceanic and Atmospheric Administration's Air Resources Laboratory. Near the surface, the wind was from the north-northwest at 15 knots and increased in magnitude and backed with height to a northwest wind of about 35 knots near 4,000 feet. Calculations made by the Rawinsonde OBservation Program indicated the potential for light low level wind shear (LLWS) near the surface.

⁴ Temp=temperature (°Fahrenheit[F]); D_Temp=dew point temperature (°F); RH=relative humidity (%); W_Mag=average wind magnitude (miles-per-hour[mph]); W_Dir=average wind direction (true); G_Mag=gust wind magnitude (mph)

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.

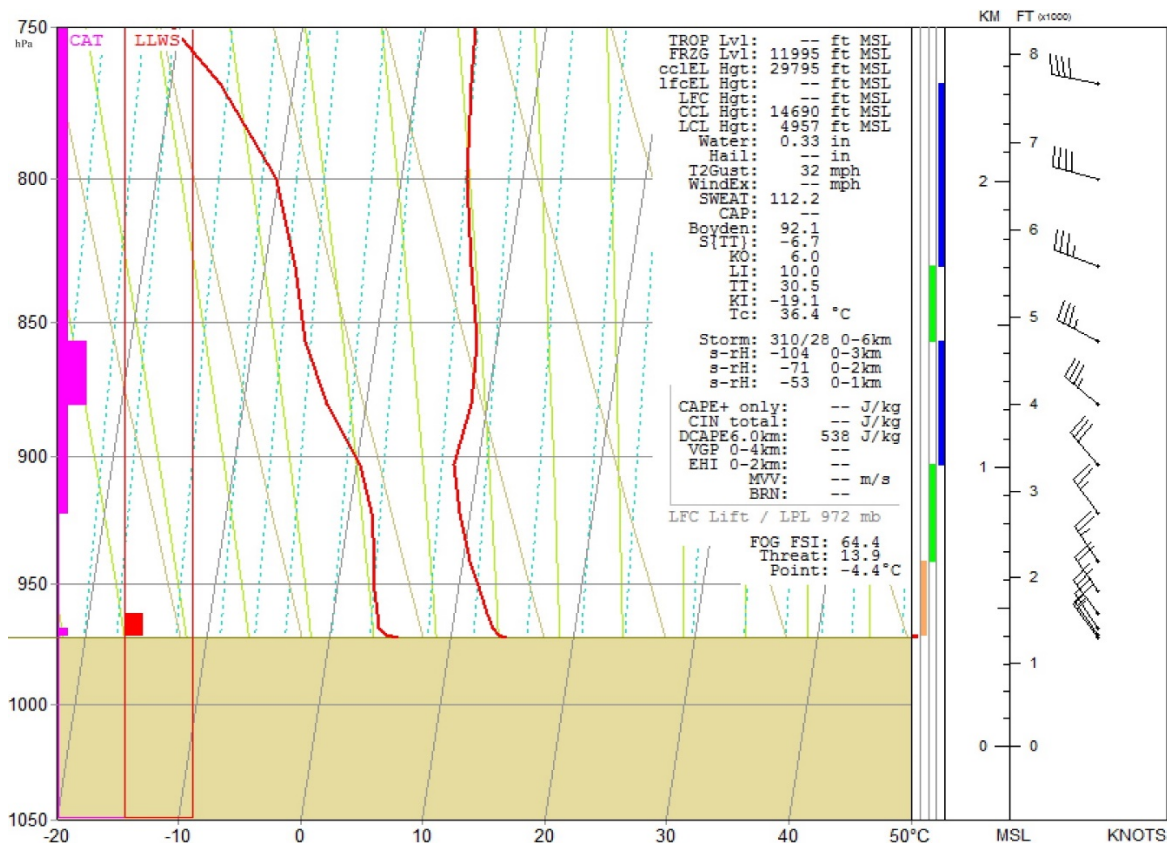


Figure 1 – HRRR model sounding data in SkewT/LogP format for 1200 CST at the accident site, surface to 750 hPa.

3.0 Weather Radar

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

The Velocity-Azimuth Display (VAD) wind profile⁶ for the times surrounding the accident time from the WSR-88D weather radar located about 30 miles east of Del Rio, Texas (KDFX), and about 14 miles southwest of the accident site at an elevation of about 1,200 feet, was reviewed. The VAD wind profile indicated that the wind was from the north-northwest at 20 knots at 2,000 and 3,000 feet above KDFX around the accident time. At 3,000 and 4,000 feet above KDFX the wind was from the north-northwest at 25 knots and from the northwest at 25 knots, respectively.

⁶ 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 in wind with time at various heights.

4.0 Pilot Reports

There were no publicly disseminated pilot reports⁷ (PIREPs) made between 0900 and 1400 CST within 100 miles of the accident site.

5.0 Area Forecast Discussion

Area Forecast Discussions (AFD) were issued by the National Weather Service Weather Forecast Office in New Braunfels, Texas. Presented here are the “Aviation” sections of the AFDs issued at 0527 and 1200 CST.

*FXUS64 KEWX 121127
AFDEWX
Area Forecast Discussion
National Weather Service Austin/San Antonio TX
527 AM CST Sat Jan 12 2019*

*.AVIATION...
Conditions to continue to improve across South-Central Texas as drier air filters into the area. Winds will shift later this morning to the northwest and speeds this afternoon will be near 15 knots. Speeds will lessen once again after sunset with VFR conditions continuing tonight.*

*FXUS64 KEWX 121800
AFDEWX
Area Forecast Discussion
National Weather Service Austin/San Antonio TX
1200 PM CST Sat Jan 12 2019*

*.AVIATION...
MVFR/VFR clouds at FEW015-035 linger across the Hill Country and Central Texas, including KAUS this afternoon. Otherwise, VFR SKC, then VFR SCT-BKN060-080 forms overnight into Sunday. Northwesterly winds at 10 to 17 KTs with a few higher gusts this afternoon become northerly at 4 to 9 KTs tonight, then turn northeasterly on Sunday at 7 to 11 KTs, except easterly at KDRT.*

6.0 Terminal Aerodrome Forecasts

There were no Terminal Aerodrome Forecast (TAF) sites within 20 miles of the accident location.

⁷ Only pilot reports with the WMO header UBTX** were considered. Pilot reports publicly-disseminated only over radio were not captured.

7.0 AIRMETs for Turbulence and LLWS

An Airmen's Meteorological Information (AIRMET) Tango was active for moderate turbulence below 16,000 feet for a region that included the accident site at the accident time.

WAUS44 KPCI 120845

WA4T

-DFWT WA 120845

AIRMET TANGO UPDT 1 FOR TURB AND LLWS VALID UNTIL 121500

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AIRMET TURB...OK TX AR TN LA MS KS MO IL IN KY AND CSTL WTRS
FROM 30ENE PXV TO 60ESE BWG TO 50NW MSL TO 50SSW MEI TO 60SW LEV
TO 120SSW LCH TO 80E BRO TO 20W BRO TO 50WNW DLF TO 70SSE MRF TO
ELP TO INK TO 30SW TXO TO 20NNW OSW TO 20SW BUM TO 30ENE PXV
MOD TURB BLW 160. CONDS CONTG BYD 15Z THRU 21Z.*

8.0 SIGMETs

There were no convective or non-convective Significant Meteorological Information (SIGMET) advisories active for the accident aircraft's route of flight and the accident location.

9.0 CWSU Products

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

Submitted by:

Mike Richards
Senior Meteorologist

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