

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN24FA164

METEOROLOGY

Specialist's Factual Report

July 12, 2024

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A. ACCIDENT

Location: Spicewood, Texas
Date: April 22, 2024
Time: 1826 central daylight time
2326 coordinated universal time (UTC)
Airplane: Longwill Neal K. Lancair Legacy FG; Registration: N550NL

B. METEOROLOGY SPECIALIST

Donald Eick
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National Transportation Safety Board
Washington, D.C.

C. SUMMARY

On April 22, 2024, about 1826 central daylight time (CDT), a Lancair Legacy FG airplane, N550NL, was destroyed when it was involved in an accident near Spicewood, Texas. The pilot was fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The airplane departed Garner Field Airport (UVA), Uvalde, Texas about 1721 and was destined for the Spicewood Airport (88R), Spicewood, Texas. The airplane overflew the airport and entered a left traffic pattern for runway 17 at 88R. The pilot made a go-around on his first approach, with the accident occurring on the second approach to the runway.

D. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's Senior Meteorologist was not on scene for this investigation and conducted the meteorology phase of the investigation remotely, collecting data 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 report documents the general weather products and forecasts over the region during the period and documents the pertinent meteorological parameters to the accident. All times are reported as CDT based upon the 24-hour clock, local time is -5 hours from UTC, and UTC=Z. Airport and 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. continental airports. Directions are referenced to true north and distances in nautical miles. Heights are in feet (ft) above mean sea level (msl) unless otherwise noted. Visibility is in statute miles and fractions of statute miles.

The accident location is based on the coordinates of latitude 30.47378°N and longitude 98.12143°W, at an elevation of about 830 ft.

E. FACTUAL INFORMATION

1.0 Synoptic Conditions

The synoptic or large-scale migratory weather systems influencing the area were documented using standard NWS charts issued by the National Center for Environmental Prediction (NCEP) and the WPC located in College Park, Maryland. These are the base products used in describing weather features and in the creation of forecasts and warnings. Reference to these charts and other products can be found in the Federal Aviation Administration (FAA) "Aviation Weather Handbook", FAA-H-8083-28¹.

1.1 Surface Analysis

The south central section of the NWS Surface Analysis Chart for 1900 CDT is included as figure 1 with the approximate accident site marked by a red star. The chart depicted multiple high-pressure systems over Tennessee, Alabama, Mississippi, and off Louisiana in the Gulf of Mexico with central pressures of 1021 to 1022-hectopascals (hPa), with a ridge extending west-southwestward across southeastern Texas. A north-to-south stationary front was depicted over Mexico to the southwest of the accident site. No surface boundaries were noted over Texas in the vicinity of the accident site.

The station models on the chart surrounding the accident site depicted southerly winds at 5 to 15 knots, clear skies, with temperatures near 70° Fahrenheit (F), with dew point temperatures near 45°F. No significant weather conditions were depicted restricting visibility over the region.

¹ <https://www.faa.gov/regulationspolicies/handbooksmanuals/aviation/faa-h-8083-28-aviation-weather-handbook>

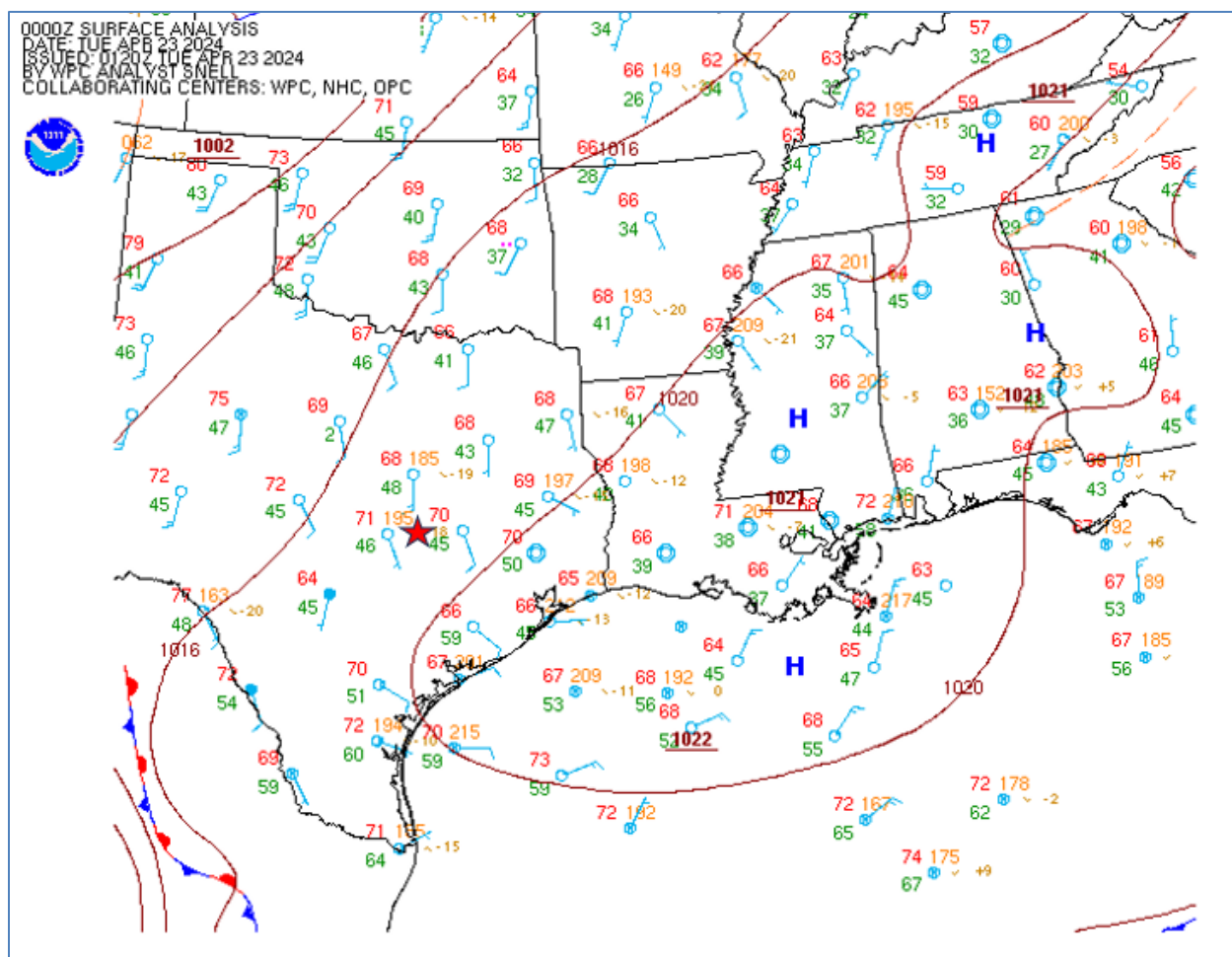


Figure 1 - South central section of the NWS Surface Analysis Chart for 1900 CDT with the approximate accident site marked by the red star.

1.2 Regional Composite radar image

The NWS Regional Composite Radar Mosaic for 1830 CDT is included as figure 2 with the approximate accident site marked by the red star. The imagery depicted no echoes associated with precipitation in the vicinity of the accident site. The closest echoes were located about 90 miles south-southeast of the accident site and extended from north of Victoria to Port O'Connor, Texas, and into the Gulf of Mexico.

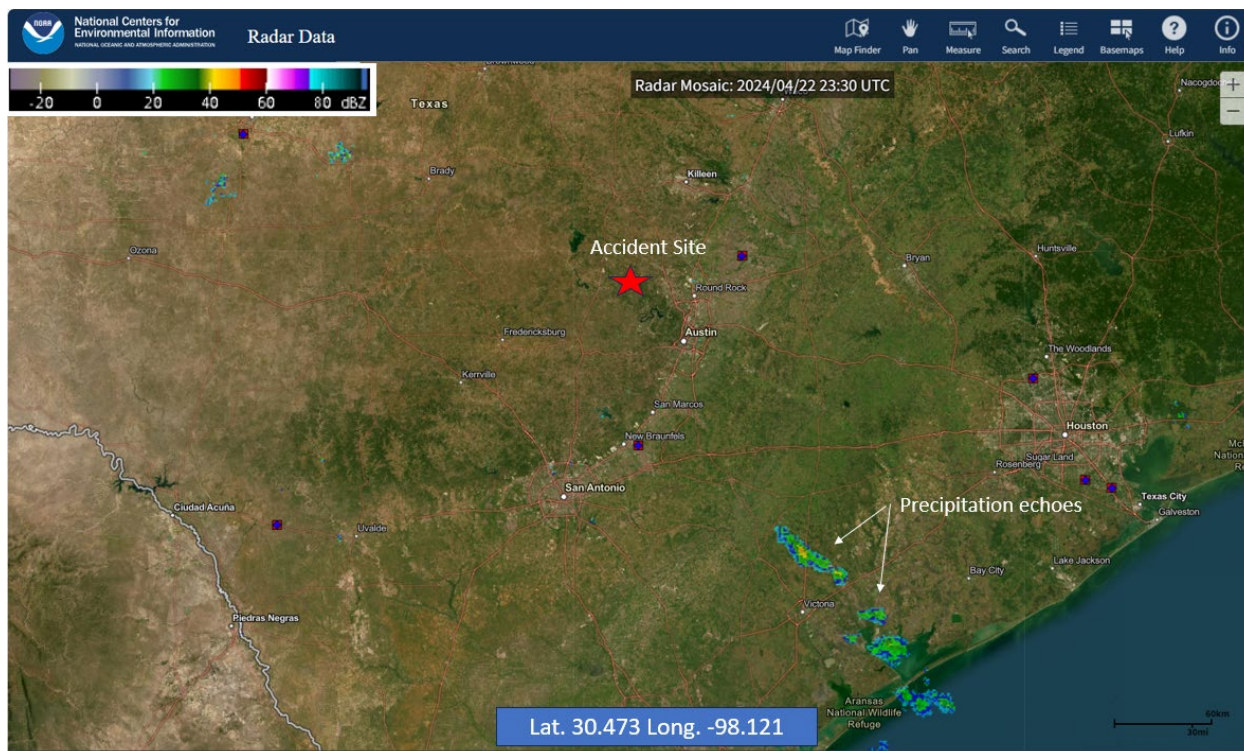


Figure 2 - NWS Regional Composite radar Mosaic for 1830 CDT over southeast Texas.

2.0 Surface Observations

The area surrounding the accident site was documented using official Aviation Routine Weather Reports (METAR) and Aviation Selected Special Weather Reports (SPECI). Cloud heights are reported above ground level (agl) in the following section. The magnetic variation over the area was estimated at 4° West based on the latest sectional chart for the area.

2.1 Spicewood, Texas

Spicewood Airport (88R), Spicewood, TX where the accident occurred lists an elevation of 830 ft. Other than a wind indicator or a wind sock the airport has no other weather reporting system. The primary asphalt runway 17/35 is 4,185 ft long by 38 ft wide. The true heading of runway 17 was 179°.

2.2 Largo Vista, Texas

The closest official weather reporting site to the accident site was from Rusty Allen Airport (KRYW) located about 8 miles east in Largo Vista, TX, at an elevation of 1,230 ft. The airport had an Automated Weather Observation System (AWOS) which

broadcasted conditions locally on 119.375 VHF and disseminated the conditions longline every 20-minutes on Federal Aviation Administration (FAA) and NWS weather circuits to users. The following conditions were issued surrounding the period:

Weather observation for KRYW at 1815 CDT, automated, wind from 180° at 6 knots gusting to 14 knots, wind variable from 140° to 220°, visibility 10 miles or more, scattered clouds at 6,000 ft agl, temperature 21°Celsius (C) (69°F), dew point 8°C (46°F), and altimeter 30.12 inches of mercury (inHg). Remarks: automated observation system with a precipitation discriminator, temperature 20.7°C, dew point 7.7°C.

Weather observation for KRYW at 1835 CDT, automated, wind from 170° at 6 knots gusting to 15 knots, visibility 10 miles or more, sky clear below 12,000 ft agl, temperature 21°C (69°F), dew point 7°C (45°F), and altimeter 30.11 inHg. Remarks: automated observation system with a precipitation discriminator, temperature 20.6°C, dew point 7.4°C.

The raw observations surrounding the period from 1700 through 1900 CDT were as follows with time referenced to UTC.

METAR KRYW 222115Z AUTO 18004KT 10SM CLR 22/07 A3014 RMK AO2 T02160069=

METAR KRYW 222235Z AUTO 17006KT 10SM SCT060 21/07 A3012 RMK AO2 T02100074=

METAR KRYW 222255Z AUTO 18006KT 10SM SCT060 21/08 A3012 RMK AO2 T02060075=

METAR KRYW 222315Z AUTO 18006G14KT 140V220 10SM SCT060 21/08 A3012 RMK AO2 T02070077=

Accident 2326Z

METAR KRYW 222335Z AUTO 17006G15KT 10SM CLR 21/07 A3011 RMK AO2 T02060074=

METAR KRYW 222355Z AUTO 17005G15KT 10SM CLR 20/07 A3011 RMK AO2 T02020071 10223 20187=

2.3 Horseshoe Bay, Texas

The next closest weather reporting station to the accident site was from Horseshoe Bay Resort Airport (KDZB), Horseshoe Bay, TX located about 13 miles west of the accident site at an elevation of 1,093 ft. The airport had an AWOS and broadcasted line of site on 119.775 VFR and longline every 20-minutes. The following conditions were reported surrounding the time of the accident.

Weather observation for KDZB at 1815 CDT, automated, wind from 180° at 10 knots gusting to 15 knots, visibility 10 miles or more, sky clear below 12,000 ft agl, temperature 23°C (73°F), dew point 8°C (47°F), and altimeter 30.10 inHg. Remarks: automated observation system with a precipitation discriminator, temperature 22.6°C, dew point 8.1°C.

The raw observations surrounding the period from 1700 through 1900 CDT were as follows:

METAR KDZB 222215Z AUTO 18008KT 10SM OVC060 22/08 A3011 RMK AO2 T02230079=

METAR KDZB 222235Z AUTO 15007G14KT 10SM BKN060 23/08 A3010 RMK AO2 T02300077=

METAR KDZB 222255Z AUTO 17007KT 10SM CLR 23/08 A3010 RMK AO2 T02300082=

METAR KDZB 222315Z AUTO 18010G15KT 10SM CLR 23/08 A3010 RMK AO2 T02260081=

Accident 2326Z

METAR KDZB 222335Z AUTO 18008G14KT 10SM CLR 22/08 A3009 RMK AO2 T02230080=

METAR KDZB 222355Z AUTO 17009G15KT 10SM CLR 22/07 A3009 RMK AO2 T02190073 10232
20200=

2.4 Burnet, Texas

The next closest reporting site was from Burnt Municipal Airport (KBMQ), Burnet, TX, located about 17 miles north of the accident site at an elevation of 1,283 ft. The airport had an Automated Surface Observation System (ASOS) which broadcasted conditions locally on 119.925 VHF and hourly with specials as required. The conditions reported surrounding the period were as follows:

Weather observation for KBMQ at 1753 CDT, automated, wind from 170° at 9 knots gusting to 18 knots, visibility 10 miles or more, ceiling overcast at 6,000 ft agl, temperature 22°C (71°F), dew point 8°C (47°F), and altimeter 30.11 inHg. Remarks: automated observation system with a precipitation discriminator, sea level pressure 1018.7-hPa, temperature 21.7°C, dew point 8.3°C.

The raw observations between 1430 and 1900 CDT were as follows:

METAR KBMQ 221953Z AUTO 17006KT 10SM CLR 21/07 A3019 RMK AO2 SLP214 T02060067=

METAR KBMQ 222053Z AUTO 18007KT 150V220 10SM CLR 22/08 A3016 RMK AO2 SLP204
T02170078 56028=

METAR KBMQ 222153Z AUTO 13007G15KT 110V170 10SM BKN060 21/08 A3012 RMK AO2 SLP192
T02110083=

**METAR KBMQ 22253Z AUTO 17009G18KT 10SM OVC060 22/08 A3011 RMK AO2 SLP187
T02170083=**

Accident 2326Z

METAR KBMQ 222353Z AUTO 10SM CLR 21/09 A3010 RMK AO2 SLP183 T02110094 10222 20183
56020=

2.5 NWS Aviation Weather Center METAR Display

The NWS Aviation Weather Center's METAR display for 1830 CDT is included as figure 3 with the accident location noted by the red star. The regional radar and surface features are also overlaid for the period. The image depicted VFR conditions prevailing over the area with southerly winds of 5 to 10 knots with gusts to about 18 knots over the area.

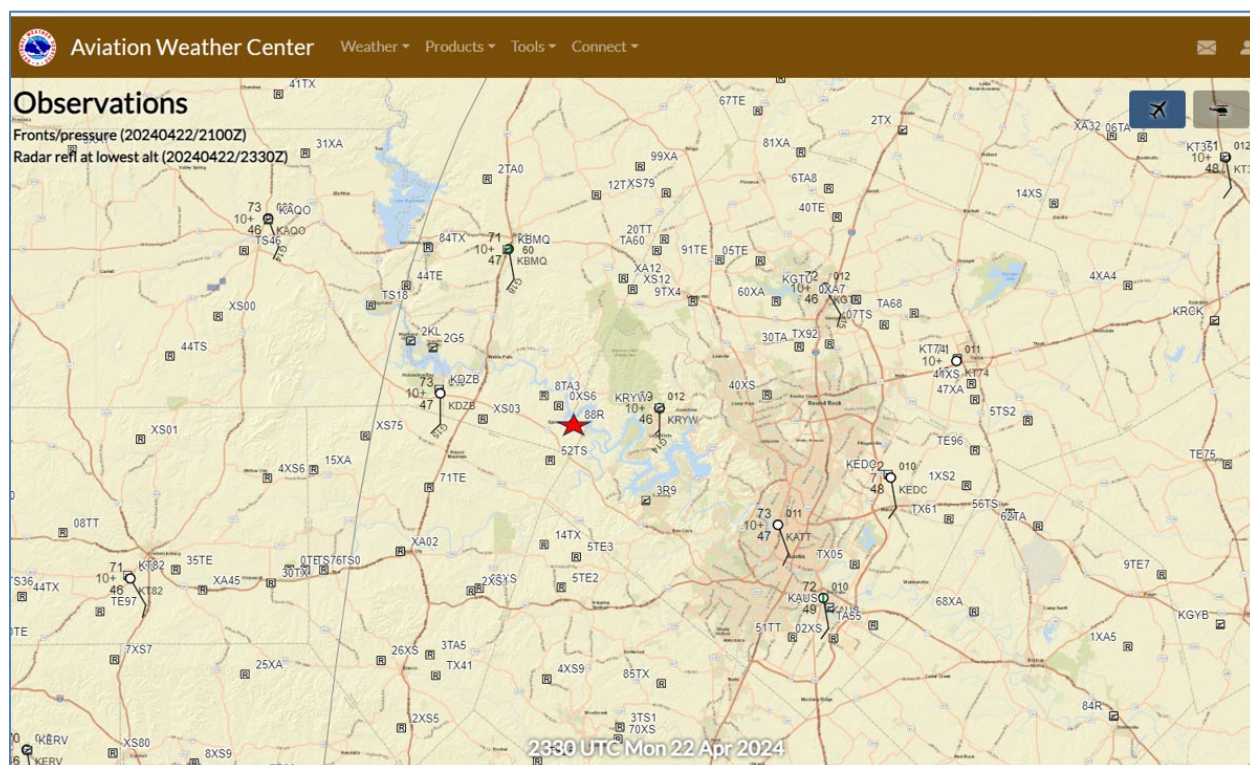


Figure 3 - NWS Aviation Weather Center's METAR display for 1830 CDT with the accident site marked by the red star and the regional radar for the period overlaid.

3.0 MesoWest

A review of the University of Utah's MesoWest site² of NWS and Remote Automated Weather Stations (RAWS)³ over the area is included as figure 4 depicting the winds by barbs and the gusts (white box) value in miles per hour (mph) over the area for 1830 CDT. The image depicted general southerly winds with wind gusts from 11 to 21 mph over the area at the time.

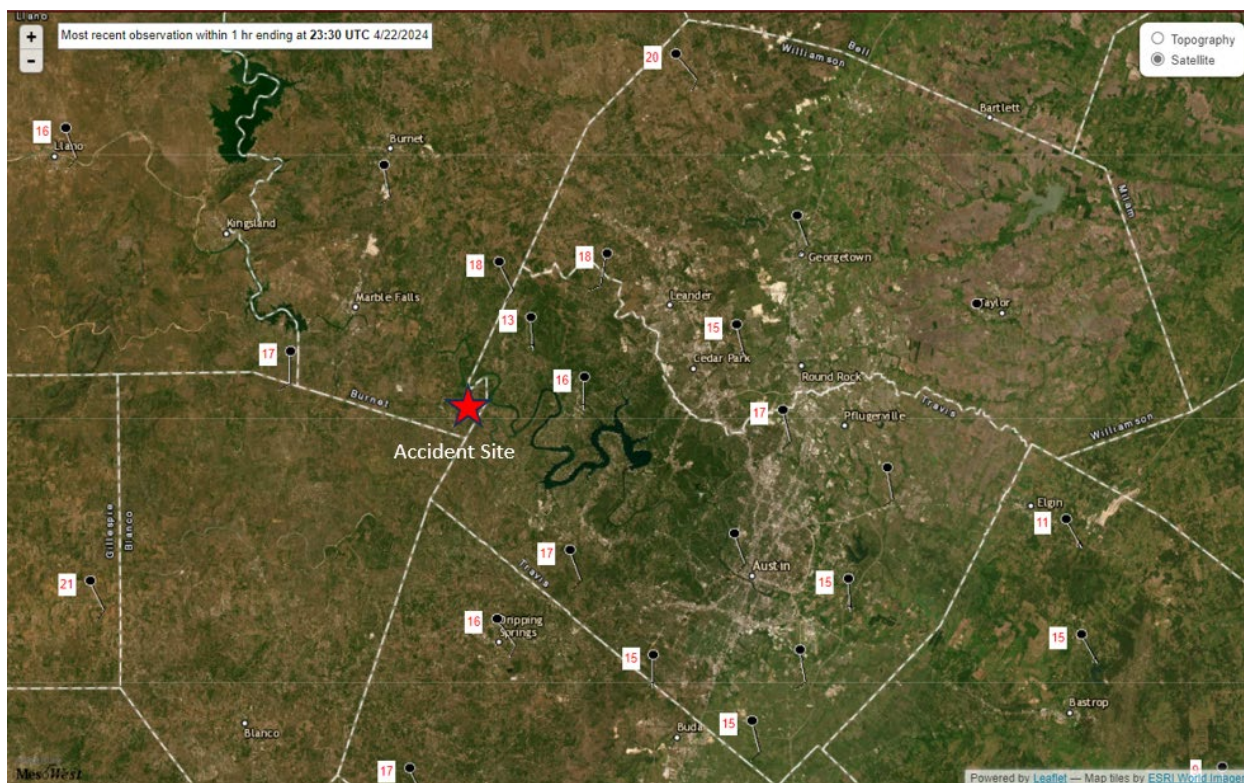


Figure 4 - MesoWest depiction of the wind field and gusts in MPH over the area at 1830 CDT.

4.0 Upper Air Sounding

A High-Resolution Rapid Refresh (HRRR)⁴ numerical model was obtained from the NOAA Air Resource Laboratory for 1800 CDT over the closest grid point⁵ to the accident site. The model data was then plotted on a standard Skew T/log P diagram⁶

² <https://mesowest.utah.edu/>

³ RAWS weather stations are portable and are used by local land management and forestry services.

⁴ The HRRR is a NOAA real-time 3 kilometer (km) resolution, hourly-updated, cloud-resolving, convection-allowing atmospheric model, initialized by 3 km grids with 3 km radar assimilation. Radar data is assimilated in the HRRR every 15 minutes over a 1-hour period.

⁵ Grid point was at latitude 30.47°N and longitude 98.12°W.

⁶ Skew T log P diagram - is a standard meteorological plot or thermodynamic diagram using temperature and the logarithmic of pressure as coordinates, used to display winds, temperature, dew

from the surface to 450-hectopascals or about 20,000 ft using the RAOB Analysis software⁷ and is depicted as figure 5.

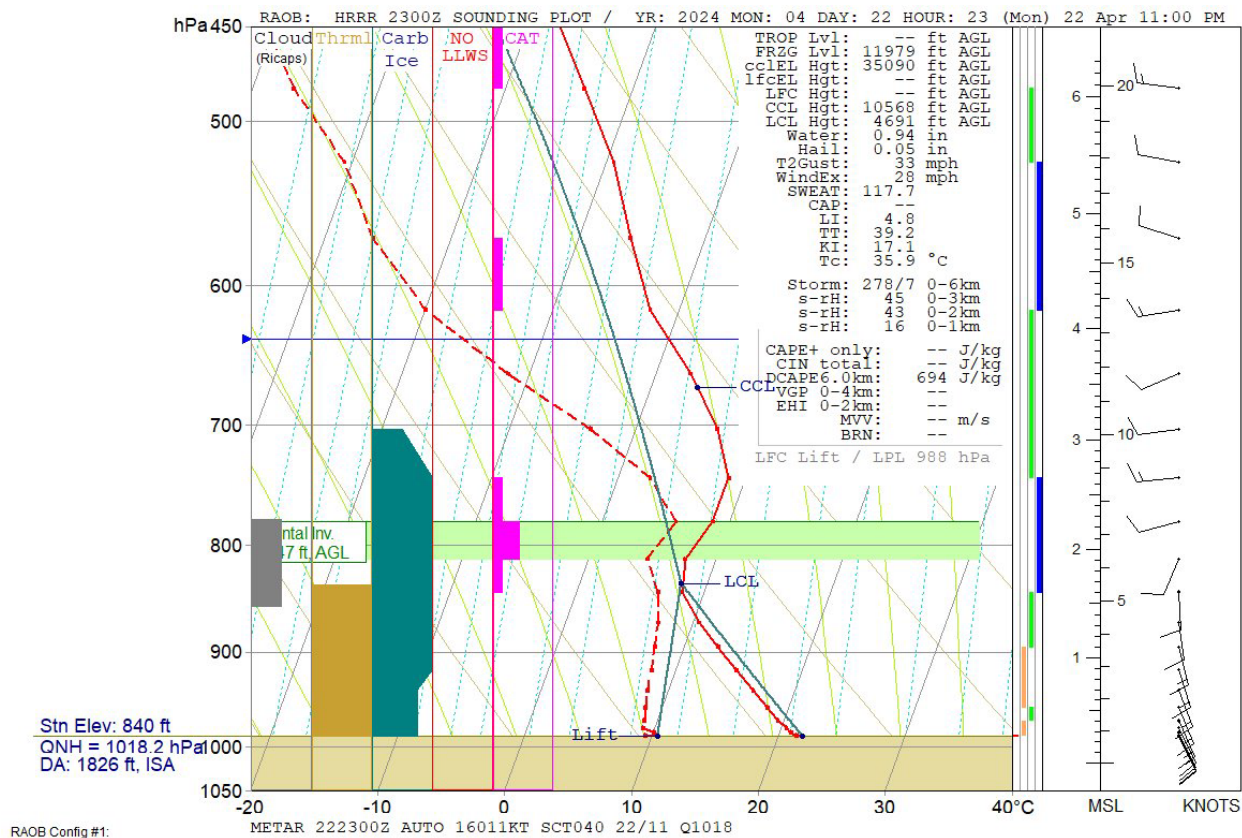


Figure 5 - High-Resolution Rapid Refresh (HRRR) numerical model sounding for 1800 CDT over the closest grid point to the accident site.

Sounding depicted an elevation of 840 ft over the grid point with a near surface temperature of 21.9°C (71°F), a dew point temperature of 10.5°C (50°F), with a relative humidity of 48%, which resulted in a density altitude near 1,826 ft. The lifted condensation level (LCL) or approximate base of clouds was at 4,691 ft agl, with an inversion above the LCL to about 8,000 ft. The atmosphere was characterized as stable with a Lifted Index (LI) of 4.8, a K-Index of 17.2, and no positive convective available potential energy (CAPE) values. The freezing level was at approximately 12,800 ft. The sounding supported dry thermals (mustard shade on left axis) from the surface through 5,000 ft and a moderate risk of carburetor type icing (dark green bar) from the surface through 3,000 ft, and increasing to a severe risk of carburetor icing between 3,000 ft and 9,000 ft.

point, and various indices used to define the vertical structure of the atmosphere.

⁷ RAOB -The Complete RAwinsonde OBservation program is an interactive sounding analysis program developed by Eosonde Research Services (ERS) previously known as Environmental Research Services, The Villages, Florida.

The sounding wind profile indicated a near surface wind from 160° at 11 knots at the surface with winds veering to the west above 5,000 ft. A low-level wind maximum was identified at 1,740 ft with wind from 160° at 14 knots. The sounding wind profile did not indicate any significant vertical wind shears below 5,000 ft to suggest any low-level wind shear or significant turbulence.

A table of the sounding parameters from the surface to 13,000 ft is included below, with the height, pressure (Pres), temperature (T), dew point temperature (Td), relative humidity (RH), wind direction and speed, and derived clear air turbulence (CAT), low-level wind shear (LLWS) and icing type and intensity.

Height (ft msl)	Pres (hPa)	T (°C)	Td (°C)	RH (%)	Wind (deg kt)	CAT (FAA)	LLWS (FAA)
840	988	21.9	10.5	48	156/ 11		
869	987	21.4	9.5	47	156/ 11		
955	984	20.9	10.1	50	156/ 12		
1099	979	20.4	9.1	48	157/ 13		
1331	971	19.5	9.0	51	158/ 13		
1740	957	18.3	8.7	53	159/ 14		
2273	939	16.7	8.4	58	161/ 13		
2904	918	14.8	8.1	64	164/ 13		
3607	895	12.7	7.7	72	167/ 13		
4354	871	10.5	7.3	81	173/ 12		
5277	842	8.3	6.4	88	178/ 12	LGT	
6261	812	7.6	4.6	81	202/ 10	MDT	
7387	779	8.7	5.8	82	254/ 11	LGT	
8710	742	8.7	2.5	65	264/ 15		
10171	703	6.4	-3.6	49	261/ 12		

5.0 Satellite Imagery

The NOAA Geostationary Operational Environmental Satellites number 16 (GOES-16) infrared and visible satellite data were obtained from an archive at the Space Science Engineering Center (SSEC) at the University of Wisconsin-Madison in Madison, WI, and processed using the Man-computer Interactive Data Access System (McIDAS) software. The infrared band 12 imagery at a wavelength 10.3 μm provided a spatial resolution of 2 kilometers (km), while the visible band 2 imagery at a wavelength of 0.64 μm provided a spatial resolution of 0.5 km.

The GOES-16 visible imagery at 1826 CDT at 2X magnification is included as figure 6. The image depicted clear skies over the accident site with several scattered areas of clouds northeast and southwest of the area. The clouds were consistent with those associated with stratocumulus type clouds with limited vertical development. No

defined cumulonimbus clouds associated with thunderstorms were indicated over the area.

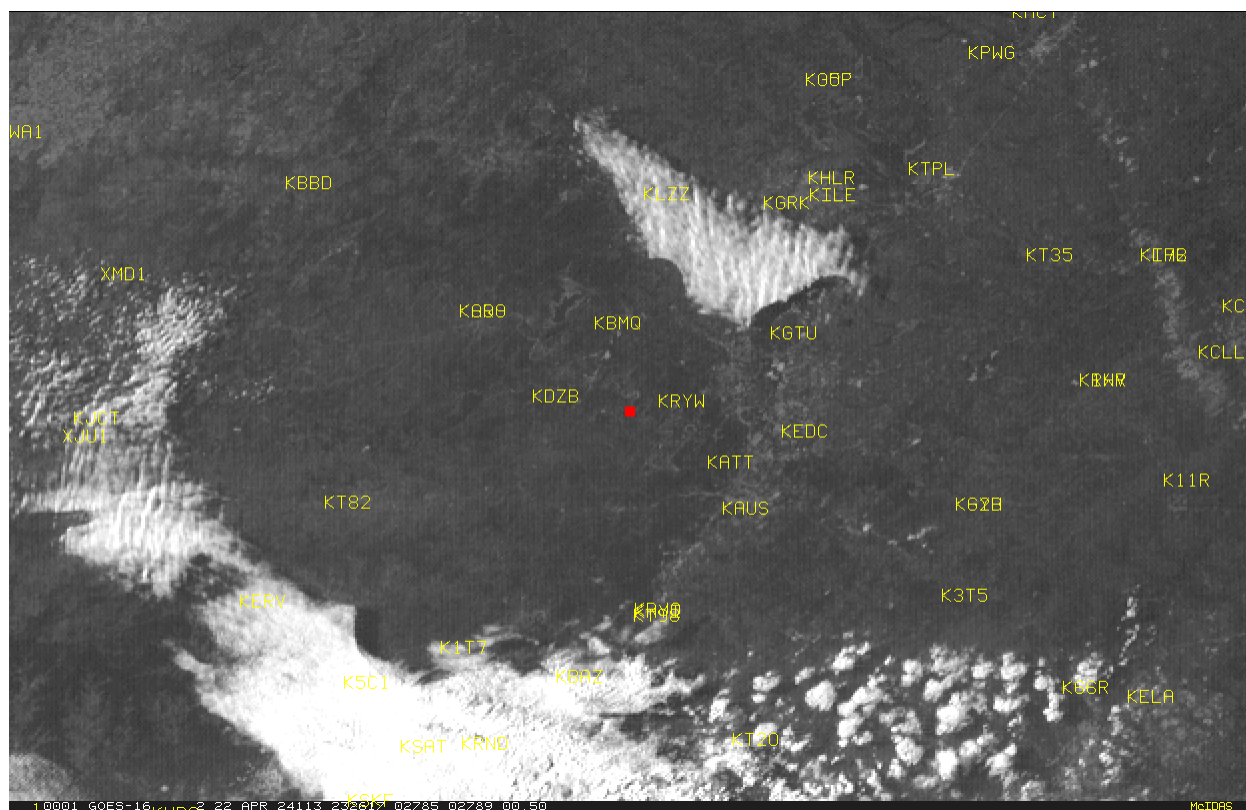


Figure 6 - GOES-16 visible image for 1826 CDT at 2 X magnification with the accident site in red.

6.0 Pilot Reports

A search of the pilot reports or PIREPs in the national database between 1700 and 2200 CDT within 100 miles of the accident coordinates resulted in no reports in the national database.

7.0 NWS Forecasts

The NWS Austin/San Antonio (KEWX) Weather Forecast Office (WFO) was responsible for the local weather forecasts and weather warnings for the area.

7.1 Terminal Aerodrome Forecast

The closest NWS Terminal Aerodrome Forecast (TAF) was issued for Austin-Bergstrom International Airport (KAUS), Austin, TX located about 25 miles southeast of the accident site. TAFs are issued for a 5 statute mile radius of the airport center point,

with specific forecast for winds, visibility, weather, sky conditions, and low-level wind shear conditions as required. TAFs are basically issued every 6-hours with amendments as changing conditions are expected. While not current for 88R, pilots and other weather briefing systems will often pull the closest TAF to provide an approximate description of the conditions over the area. The TAF current for KAUS during the period was as follows:

TAF KAUS 221720Z 2218/2324 11007KT P6SM FEW250

FM222100 15008KT P6SM FEW250

FM230400 18007KT P6SM FEW030

FM231200 18007KT P6SM BKN022

FM231700 18012KT P6SM BKN035=

AMD TAF KAUS 222113Z 2221/2324 15009KT P6SM FEW200

FM230400 18007KT P6SM FEW030

FM231200 18007KT P6SM BKN022

FM231700 18012KTP6SM BKN035=

The TAF issued at 1220 CDT for KAUS expected a surface wind from 150° at 8 knots during the period, with a few clouds at 25,000 ft agl. There was no inclusion of any low-level wind shear below 2,000 ft in the forecast. The forecast was amended at 1613 CDT with the wind at 150° at 9 knots.

7.2 Area Forecast Discussion

The NWS KEWX WFO Area Forecast Discussion (AFD) current during the period was issued at 1337 CDT and was as follows:

FXUS64 KEWX 221837

AFDEWX

Area Forecast Discussion

National Weather Service Austin/San Antonio TX

137 PM CDT Mon Apr 22 2024

...New SHORT TERM, LONG TERM...

.SHORT TERM...

(Tonight through Tuesday night)

Issued at 138 PM CDT Mon Apr 22 2024

Fair weather conditions will continue through the short term period as upper level ridging slowly builds in from the west and surface high pressure gradually moves to the east. The eastward moving high will bring an increase in low level moisture tonight through Tuesday with morning low stratus making a return by sunrise tomorrow as dewpoints climb back into the 60s. Clouds will likely burn off across western areas by mid-day

whereas they will struggle to do so across eastern areas with at least partly cloudy skies remaining. Therefore, temperatures in the 80s can be expected along the Rio Grande with mainly 70s elsewhere. Lows then only fall into the 60s to near 70 Tuesday night with cloud cover building back in.

.AVIATION...

(18Z TAFS)

Issued at 1212 PM CDT Mon Apr 22 2024

VFR conditions will remain in place this afternoon with a few mid and upper level clouds across the region. S-SE surface winds will continue to draw moisture into the region through the period which will lead to the development of widespread MVFR stratus tonight into Tuesday morning. This stratus should start to lift and scatter some towards the end of the period.

.EWX WATCHES/WARNINGS/ADVISORIES...

None.

7.3 Zone Forecast

Spicewood, Texas is in Burnet, County, TX. The Zone forecast issued for the period for the general forecast conditions was as follows during the period.

FPUS54 KEWX 220634

ZFPEWX

Zone Forecast Product for South Central Texas

National Weather Service Austin/San Antonio TX

134 AM CDT Mon Apr 22 2024

TXZ172-220745-

Burnet- Including the city of Burnet

134 AM CDT Mon Apr 22 2024

.TODAY...Partly cloudy this morning, then clearing. Highs in the lower 70s. East winds 5 to 10 mph, becoming southeast this afternoon.

.TONIGHT...Clear in the evening, then becoming partly cloudy. Lows in the mid 50s. South winds 10 to 15 mph.

FPUS54 KEWX 221838

ZFPEWX

Zone Forecast Product for South Central Texas

National Weather Service Austin/San Antonio TX

138 PM CDT Mon Apr 22 2024

TXZ172-230745-

Burnet- Including the city of Burnet

138 PM CDT Mon Apr 22 2024

.TONIGHT...Clear this evening, then becoming partly cloudy. Not as cool with lows in the mid 50s. South winds 10 to 15 mph.

.TUESDAY...Mostly cloudy in the morning, then becoming partly cloudy. Highs in the upper 70s. South winds 10 to 15 mph with gusts up to 25 mph.

.TUESDAY NIGHT...Mostly clear in the evening, then becoming mostly cloudy. Lows in the mid 60s. South winds 10 to 15 mph with gusts up to 25 mph.

8.0 NWS Inflight Weather Advisories

In-flight Aviation Weather Advisories are forecasts that advise en route aircraft of the development of potentially hazardous weather. Inflight aviation weather advisories in the conterminous U.S. are issued by the NWS AWC, as well as from the Center Weather Service Units (CWSU) at the various Air Route Traffic Control Centers (ARTCCs). There are four basic types of inflight aviation weather advisories: the Significant Meteorological Information (SIGMET), the Convective SIGMET, the Graphic-AIRMET, and the Center Weather Advisory (CWA). Inflight advisories serve to notify en-route pilots of the possibility of encountering hazardous flying conditions that may not have been forecast at the time of the preflight briefing. Whether or not the condition described is potentially hazardous to a particular flight is for the pilot to evaluate based on experience and the operational limits of the aircraft. Once issued they are broadcast by FAA air traffic controllers upon issuance and available on inflight weather broadcasts.

Surrounding the period there were no SIGMETs, Convective SIGMETs, CWA's or Graphic-AIRMETs current over the area for any thunderstorms, moderate turbulence, LLWS, or instrument meteorological conditions (IMC).

9.0 Astronomical Conditions

The astronomical data was obtained from the United States Naval Observatory's website⁸ and provided the following astronomical conditions for Spicewood, TX on April 22, 2024. The time of the accident has been included in bold blue type for reference.

<u>SUN</u>	<u>Time (CDT)</u>
Begin Civil Twilight	0632
Sunrise	0657
Upper Transit	1331

⁸ <https://aa.usno.navy.mil/data/index>

Accident

Sunset
End Civil Twilight

1826

2005
2030

At the time of the accident the sun was 20° above the horizon at an azimuth of 273°.

Submitted by:

Donald Eick
NTSB Senior Meteorologist