

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR25LA080

METEOROLOGY

Environmental Conditions

December 2, 2025

A. ACCIDENT

Location: Round Mountain, Nevada
Date: January 2, 2025
Time: 1230 Pacific standard time (PST)
2030 coordinated universal time (UTC)
Airplane: Piper PA-32-300 Saratoga Registration: N4151R

B. METEOROLOGY SPECIALIST

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C. DETAILS OF THE INVESTIGATION

The meteorology phase of the investigation was conducted 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 Specialist's Factual Report contains the meteorological factors pertinent to the weather surrounding the accident time. All times are reported as Pacific standard time (PST) which is -8 hours from coordinated universal time (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 site coordinates were documented at latitude 38.76744° N and longitude 116.93259° W at an elevation of approximately 7,280 ft on the northeastern face of Mount Jefferson with a peak elevation of 11,000 ft.

D. FACTUAL INFORMATION

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-8083-28A.

1.0 Synoptic Conditions

The NWS Surface Analysis Chart for 1300 PST (2100Z) with the approximate accident site marked by a red star is included as figure 1. The chart depicted a high pressure system over the Utah and the Arizona boarder at 1025-hectopascals (hPa) with another high over southern California at 1022-hPa to the south of the departure location. A low pressure system at 1016-hPa was located over the Nevada and California border near Reno associated with a thermal low, with no surface boundaries. The station models over the general route of flight depicted general light winds clear skies over most of Nevada with no boundaries in the vicinity of the accident site.

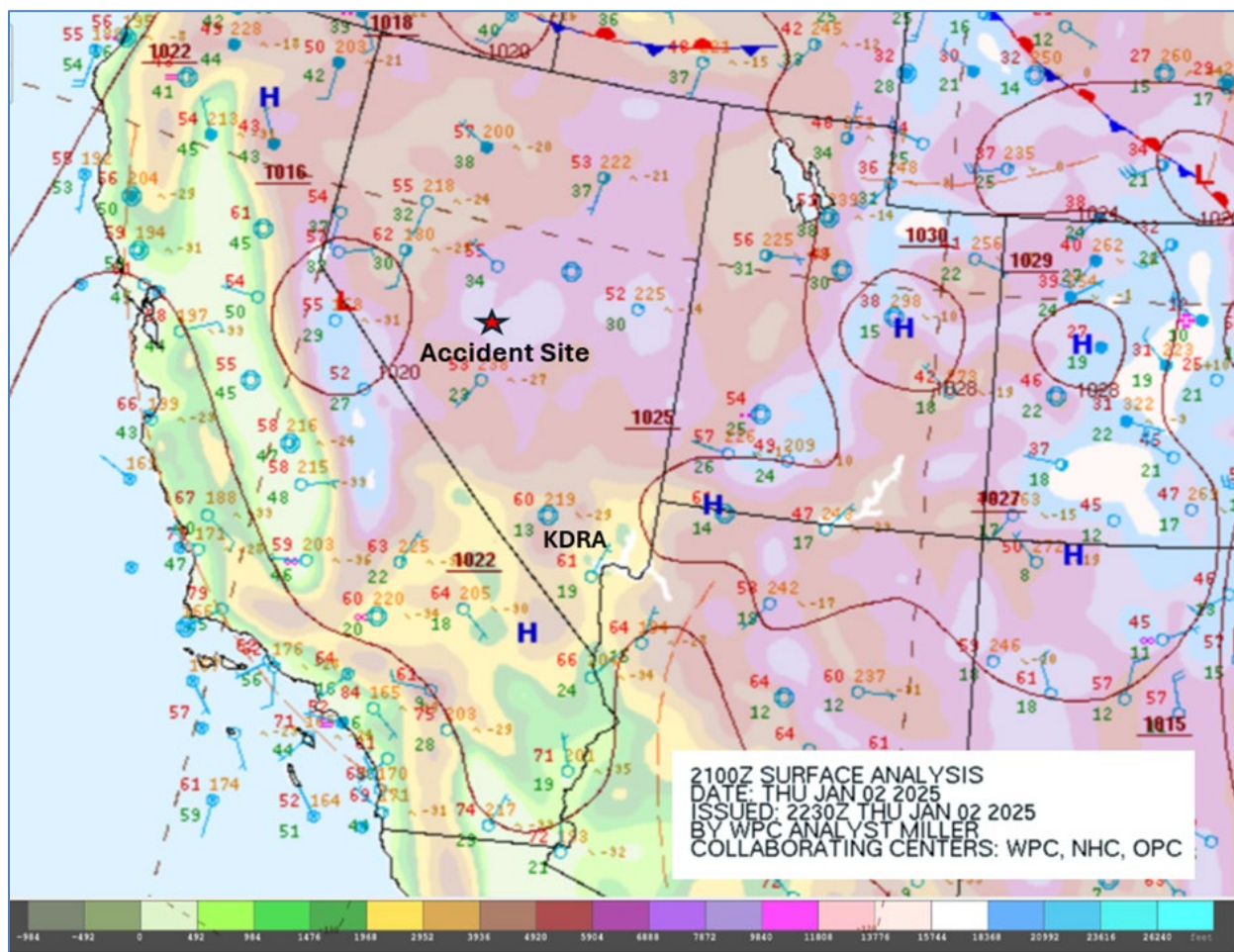


Figure 1 - NWS Surface Analysis Chart for 1300 PST with the approximate accident site marked by the red star.

A review of the NWS National Composite Radar Mosaic for 1230 PST is included as figure 2 and depicted no significant meteorological echoes over the region surrounding the period.

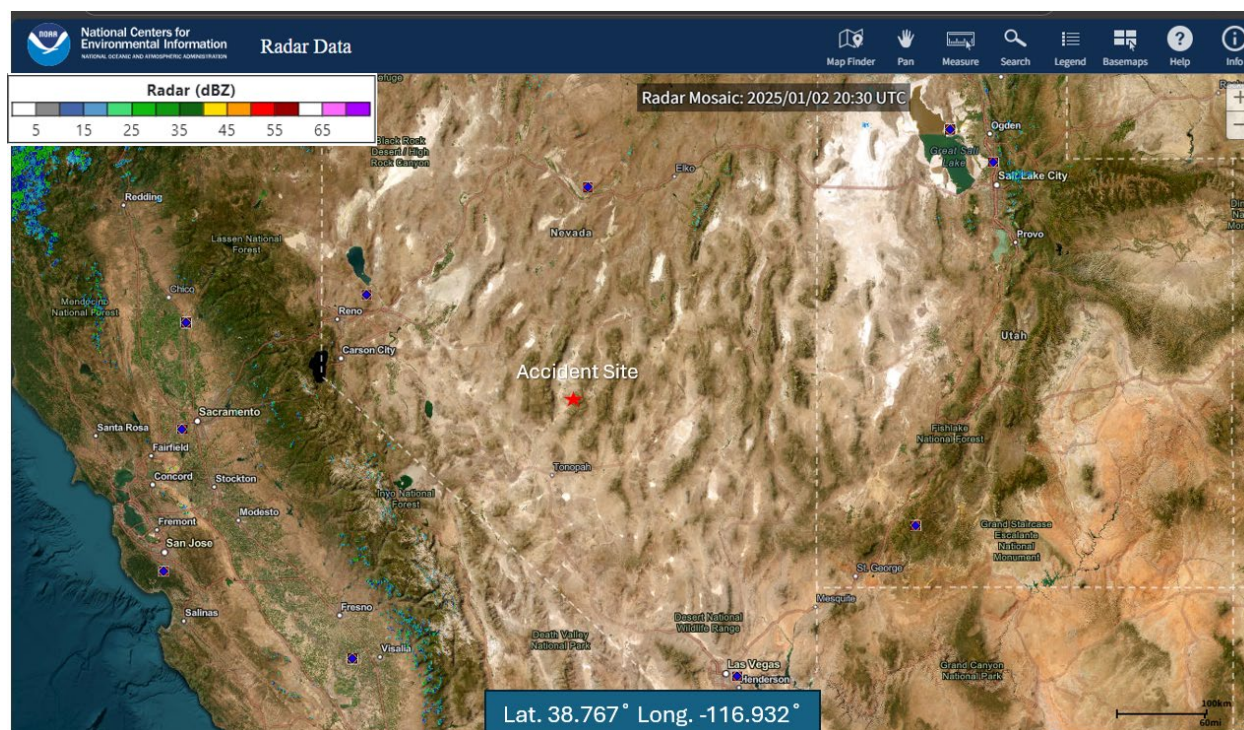


Figure 2 - National Composite Radar Mosaic over the region at 1230 PST with the approximate accident site marked by the red star.

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). Wind is reported referenced to true north, and cloud heights are reported above ground level (agl) in the following section. The magnetic variation over the area was estimated at 12°E based on the latest sectional chart for the area.

2.1 Tonopah, Nevada

The closest weather reporting location to the accident site was from Tonopah Airport (KTPH), Tonopah, NV located about 44 miles south of the accident site at an elevation of 5,430 ft. The airport had an Automated Surface Observation System (ASOS), which broadcasted line of site on 118.875 VHF and longline hourly with specials as required. The following conditions were reported at the time of the accident.

Weather observation for KTPH at 1256 PST, automated, wind from 210° at 4 knots, visibility 10 miles or more, sky clear below 12,000 ft, temperature 12°C (53°F), dew point temperature -5°C (23°F), altimeter setting 30.25 inHg. Remarks: automated observation system with a precipitation discriminator, sea-level pressure 1023.8-hPa, temperature 11.7°C, dew point -5.0°C, 3-hour pressure tendency risen 2.7-hPa, maintenance indicator on (\$).

The raw observations surrounding the time of the accident were as follows:

METAR KTPH 021656Z AUTO 01008KT 10SM CLR 03/M08 A3034 RMK AO2 SLP281 T00281083=

METAR KTPH 021756Z AUTO 00000KT 10SM CLR 06/M08 A3034 RMK AO2 SLP278 T00611078 10061
21056 51010=

METAR KTPH 021856Z AUTO VRB04KT 10SM CLR 09/M08 A3032 RMK AO2 SLP267 T00891078 \$=

METAR KTPH 021956Z AUTO 00000KT 10SM CLR 11/M07 A3028 RMK AO2 SLP249 T01061072 \$=

Accident 2030Z

METAR KTPH 022056Z AUTO 21004KT 10SM CLR 12/M05 A3025 RMK AO2 SLP238 T01171050 58027
\$=

METAR KTPH 022156Z AUTO 15004KT 10SM CLR 13/M03 A3023 RMK AO2 SLP227 T01331033 \$=

METAR KTPH 022256Z AUTO 16005KT 10SM CLR 14/M03 A3022 RMK AO2 SLP223 T01391033 \$=

METAR KTPH 022356Z AUTO 12003KT 10SM CLR 13/M01 A3022 RMK AO2 SLP225 T01331011 10139
20061 56007 \$=

2.2 Las Vegas, Nevada

The airplane departed from North Las Vegas Airport (KVGT), which was located about 178 miles south of the accident site-listed an elevation of 2,205 ft. The airport had an ASOS which broadcasted locally on 118.05 VHF and issued observations hourly with specials as required and was augmented by air traffic controllers under a Limited Aviation Weather Reporting System (LAWRS). The accident site was located about 36 miles east-southeast of the accident site.

METAR KVGT 021553Z 00000KT 10SM CLR 05/M07 A3028 RMK AO2 SLP279 T00501067=

METAR KVGT 021653Z 00000KT 10SM CLR 09/M06 A3030 RMK AO2 SLP282 T00941061=

METAR KVGT 021753Z 08003KT 10SM CLR 11/M06 A3031 RMK AO2 SLP284 T01061056 10106
20033 51013=

Departed 1851Z

METAR KVGZ 021853Z 00000KT 10SM CLR 12/M06 A3029 RMK AO2 SLP278 T01171061=
METAR KVGZ 021953Z 09003KT 10SM CLR 14/M05 A3025 RMK AO2 SLP263 T01391050=
METAR KVGZ 022053Z 00000KT 10SM CLR 14/M04 A3022 RMK AO2 SLP250 T01441044 58028=
METAR KVGZ 022153Z 13005KT 10SM CLR 16/M03 A3019 RMK AO2 SLP242 T01561033=
METAR KVGZ 022253Z 10004KT 10SM CLR 16/M03 A3018 RMK AO2 SLP239 T01611033=
METAR KVGZ 022353Z 00000KT 10SM CLR 16/M03 A3018 RMK AO2 SLP236 T01611028 10167
20106 56012=

2.3 MesoWest

A search of Remote Automated Weather Stations (RAWS) over Nevada provided a station about 20 miles south of the accident site at Quima peak (TQIN2), at latitude 38.48667°N and longitude 117.095°W, at an elevation of 9,784 ft. At 1211 PST the station reported a temperature of 51°F, a dew point temperature of 29°F, with a relative humidity of 43%, and a wind from 230° at 4 knots and a peak wind of 10 knots recorded during the hour.

3.0 Sounding

A High-Resolution Rapid Refresh (HRRR) numerical model data were obtained from the NOAA Air Resources Laboratory's Real-time Environmental Applications and Display sYstem (READY) archive for 1200 MST for the nearest grid point (Lat. 38.77°N, Long. -116.93°W) to the accident site. The data was then plotted on a standard Skew T/log P diagram using the RAOB Analysis software from the surface to 450-hPa or about 20,000 ft and is included as figure 3.

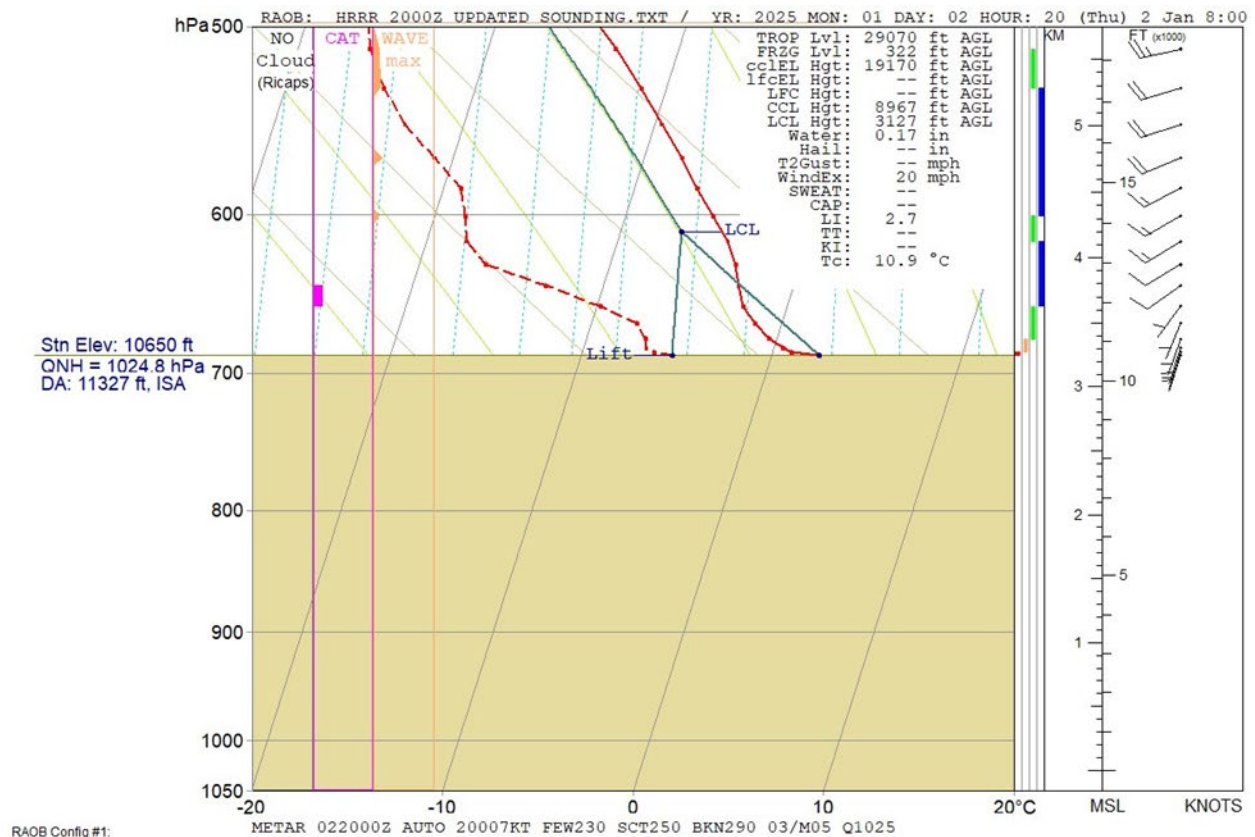


Figure 3 - NOAA HRRR numerical model sounding for 1200 PST over the closest grid point to the accident site.

The HRRR sounding depicted an elevation of 10,650 ft over the grid point with a near surface temperature of 2.5°C (36.5°F), a dew point temperature of -5.2°C (22.6°F), a relative humidity of 67%, a pressure of 688-hPa (20.32-inHg) or a QNH of 1024.8 hPa, which resulted in a density altitude of 11,327 ft. The sounding depicted the lifted condensation level (LCL) at 3,127 ft agl (13,777 ft msl), and a convective condensation level (CCL) at 8,967 ft agl (19,617 ft msl). The precipitable water content was 0.17 inches. The freezing level was identified at 322 ft agl or 10,972 ft msl. The atmosphere was characterized as stable with a Lifted index (LI) of 2.7 and no positive convective available potential energy (CAPE) values. The sounding also supported thermals from the surface through 2,000 ft agl.

The wind profile depicted a near surface wind from the south from 200° at 7 knots with the wind veering to the west-southwest with height. The mean 0 to 6 km (or 18,000 ft) steering wind was from 260° at 26 knots. The RAOB Analysis program indicated no vertical wind shears to support any significant Clear Air Turbulence (CAT) below 18,000 ft. The RAOB Analysis program did support light mountain wave conditions above 14,000 ft supporting a threat of light turbulence.

The HRRR sounding parameters below 18,000 ft of height, pressure (Pres), temperature (T), dew point temperature (Td), relative humidity (RH), wind direction and

speed, clear air turbulence (CAT), low-level wind shear (LLWS) and mountain wave potential.

Height (ft-msl)	Pres (hPa)	T (°C)	Td (°C)	RH (%)	Wind (dir/kts)	CAT (FAA)	LLWS (FAA)	Icing (USAF)	Wave (nm -fpm-max)
10650	688	2.5	-5.2	57	196/ 7				
10727	686	1.0	-6.2	59	196/ 7				
10843	683	0.5	-6.7	58	197/ 7				
11075	677	-0.4	-6.9	61	198/ 7				
11465	667	-1.4	-7.6	63	201/ 7				
11899	656	-2.3	-9.8	56	215/ 7	LGT			
12420	643	-2.9	-13.0	46	232/ 10				
12951	630	-3.4	-16.5	36	237/ 12				
13533	616	-4.2	-17.9	34	237/ 14				
14169	601	-5.4	-18.4	35	238/ 16				2.44 158 LIGHT
14862	585	-6.7	-19.1	37	241/ 17				
15616	568	-8.0	-21.0	34	246/ 19				2.77 251 LIGHT
16435	550	-9.6	-23.1	32	250/ 21				
17323	531	-11.3	-24.8	32	253/ 22				3.60 233 LIGHT
18286	511	-13.3	-26.2	33	256/ 23				4.08 197 LIGHT

4.0 Satellite Imagery

The NOAA Geostationary Operational Environmental Satellite number 18 (GOES-18) infrared, visible, and low-level water vapor imagery were reviewed surrounding the period. Figures 4 and 5 are the GOES-18 infrared and visible image for 1230 PST respectively with the infrared image at 4X magnification with a standard MB temperature enhancement curve applied and the visible at 2X magnification. The image depicted a layer of high thin cirrus clouds over central Nevada, which are barely visible in the visible imagery. No low to mid-level clouds were observed over the region to restrict visibility during the period and the mountain tops were not obscured over the region at the time of the accident.

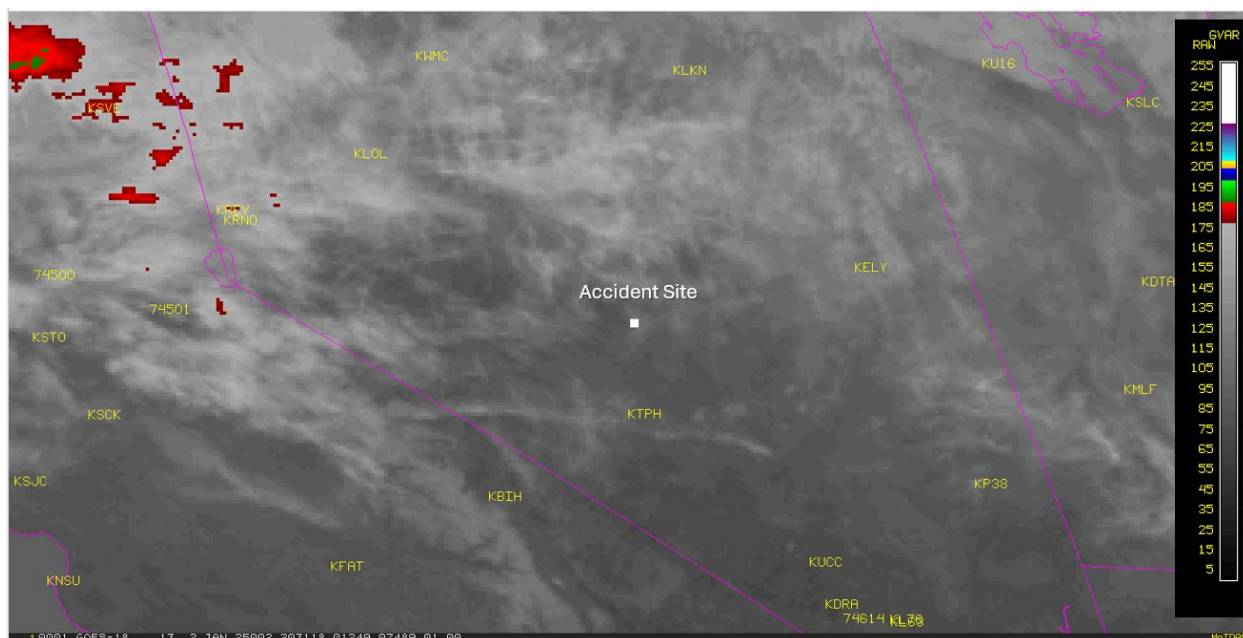


Figure 4 - GOES-18 infrared image at 1230 PST at 4X magnification with the accident site noted.

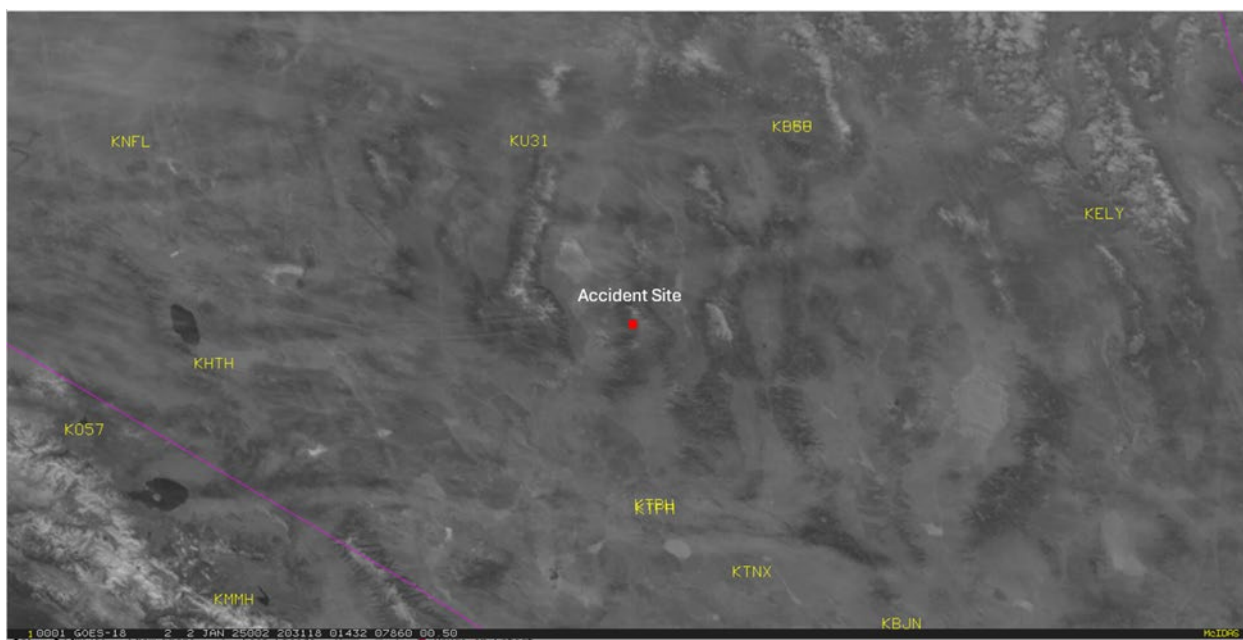


Figure 5 - GOES-18 visible image for 1230 PST at 2X magnification with the accident site marked by the red square.

5.0 Pilot Weather Reports

There were no pilot weather reports or PIREPS reported in the National database withing 100 miles of the accident site surrounding the period.

6.0 Weather Forecasts

6.1 Terminal Aerodrome Report

The Terminal Aerodrome Forecast (TAF) is a forecast for usually 24 hours of winds, visibility, weather, and cloud cover at specific times. The forecast is valid for a 5 - statute mile radius surrounding the airport. The forecast for KTPH and KVGT issued during the period were as follows.

*TAF KTPH 021720Z 0218/0318 35008KT P6SM SKC
FM022100 18005KT P6SM SKC
FM030400 VRB06KT P6SM SKC=*

*TAF KVGT 021720Z 0218/0318 VRB05KT P6SM FEW250
FM022000 12005KT P6SM SCT250
FM030300 31006KT P6SM SCT200
FM031500 VRB05KT P6SM FEW150 BKN200=*

Both forecasts expected surface winds under 10 knots, visibility unrestricted, and skies clear or scattered high cirrus clouds at 25,000 ft agl, with no significant weather expected during the period.

6.2 Area Forecast Discussion

The NWS Las Vegas Weather Forecast Office (WFO) issued the following area or aviation forecast discussion at 1230 PST for the region.

*FXUS65 KVEF 022030
AFDVEF*

*Area Forecast Discussion
National Weather Service Las Vegas NV
1230 PM PST Thu Jan 2 2025*

.SYNOPSIS...Temperatures remain near or above normal for the next week or so as passing systems bring periods of increased winds. Best chance for impactful winds appears to be next Tuesday, especially in the lower Colorado River Valley. Light precipitation is possible Friday night and again Tuesday in the Sierra and northern fringes of the area, but otherwise we stay dry.

.AVIATION...For Harry Reid...Low impact weather will continue tonight through Friday. No operationally significant clouds, winds, or weather expected through Friday. Winds will favor diurnal trends and will remain under 8KT through the period.

For the rest of southern Nevada, northwest Arizona and southeast California...Breezy north winds are expected again this afternoon at KIFP. Winds here will be lower than

previous days, but gusts to around 25KT are still expected. North to northeast winds will slowly diminish after sunset, remaining over 10KT through around 06Z before finally dropping below 10KT tonight and continuing through Friday morning. Elsewhere, winds will be under 10KT and follow typical wind patterns. Winds along the Sierra Crest will increase Friday with gusts of 40-50KT, and southwesterly gusts of 20-30 KT can be expected Friday in the Spring Mountains. No operationally significant clouds or weather expected through Friday.

6.3 Winds and Temperatures Aloft Forecast

The NWS Winds and Temperature Aloft forecast based on the FBUS31 KWNO bulletin issued at 1157 PST for Las Vegas (LAS), Bishop, CA (BIH), Reno (RNO), Ely (ELY), and Battle Mountain (BAM) over the region were as follows.

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FBUS31 KWNO 021957
FD1US1
- DATA BASED ON 021800Z
VALID 030000Z FOR USE 2000-0300Z. TEMPS NEG ABV 24000

FT 3000    6000    9000    12000    18000    24000    30000    34000    39000
-LAS      1406+12 1611+06 2111+00 2517-13 2626-27 272543 283552 283962
-BIH      9900    1813+05 2113+00 2322-13 2532-26 263543 263752 264560
-RNO      1610    2113+04 2221-02 2328-15 2338-28 265043 255553 256060
-ELY              2107+02 2518-01 2629-15 2734-28 274244 285454 285763
-BAM              2416+03 2521-02 2627-15 2637-28 264944 276154 276662
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The forecast winds for LAS at 9,000 ft were from 160° at 11 knots with a temperature of 6°C, and for 12,000 ft were from 210° at 11 knots with a temperature of 0°C. For BIH the wind at 9,000 ft were from 180° at 13 knots with a temperature of 5°C, and for 12,000 ft from 210° at 13 knots with a temperature of 0°C.

7.0 Inflight Weather Advisories

A review of the NWS Inflight Weather Advisories indicated that there were no SIGMETs, Convective SIGMETs, Center Weather Advisories (CWAs) current over the area surrounding the period. The NWS did have a series of AIRMETs current over a portion of northern Nevada during the period with none over the accident site.

8.0 Astronomical Conditions

The United States Naval Observatory's website provided the following astronomical conditions over the accident site on the day of the accident.

<u>SUN</u>	<u>Time</u>
Begin Civil Twilight	0636
Sunrise	0706
Upper Transit	1152
<i>Accident</i>	<i>1230</i>
Sunset	1638
End Civil Twilight	1708

Submitted by:

Donald Eick
Senior Meteorologist