

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN23FA285

METEOROLOGY

Environmental Conditions

May 1, 2025

A. ACCIDENT

Location: Burlington, Colorado
Date: July 6, 2023
Time: 1330 mountain daylight time (MDT)
1930 coordinated universal time (UTC)
Airplane: Piper PA-60-601P *Aerostar*; Registration: N100PB

B. METEOROLOGY SPECIALIST

Donald Eick
NTSB Senior Meteorologist
National Transportation Safety Board
Washington, DC

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). All times are reported as mountain daylight time (EDT) based upon the 24-hour clock, local time is -6 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 site was located at latitude 39.049032°N and longitude 102.33752°W at an elevation of about 4,275 ft.

D. 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.

1.1 Surface Analysis

The central region of the NWS Surface Analysis Chart for 1200 MDT is included as figure 1 with the approximate accident site marked by the red star. The chart depicted a high-pressure system at 1023-hPa over Iowa with a ridge extending southwestward over Kansas. A small bubble high at 1018-hPa was located over central Colorado. This bubble high was associated with a cooler air associated with downdrafts associated with a dissipating area of convection that was moving eastward across the area earlier during the morning. A trough was located between the two high pressure systems extending over eastern Colorado and western Kansas. The accident site was located between the two high pressure systems and immediately west of the trough with general southeast winds of 10 knots.

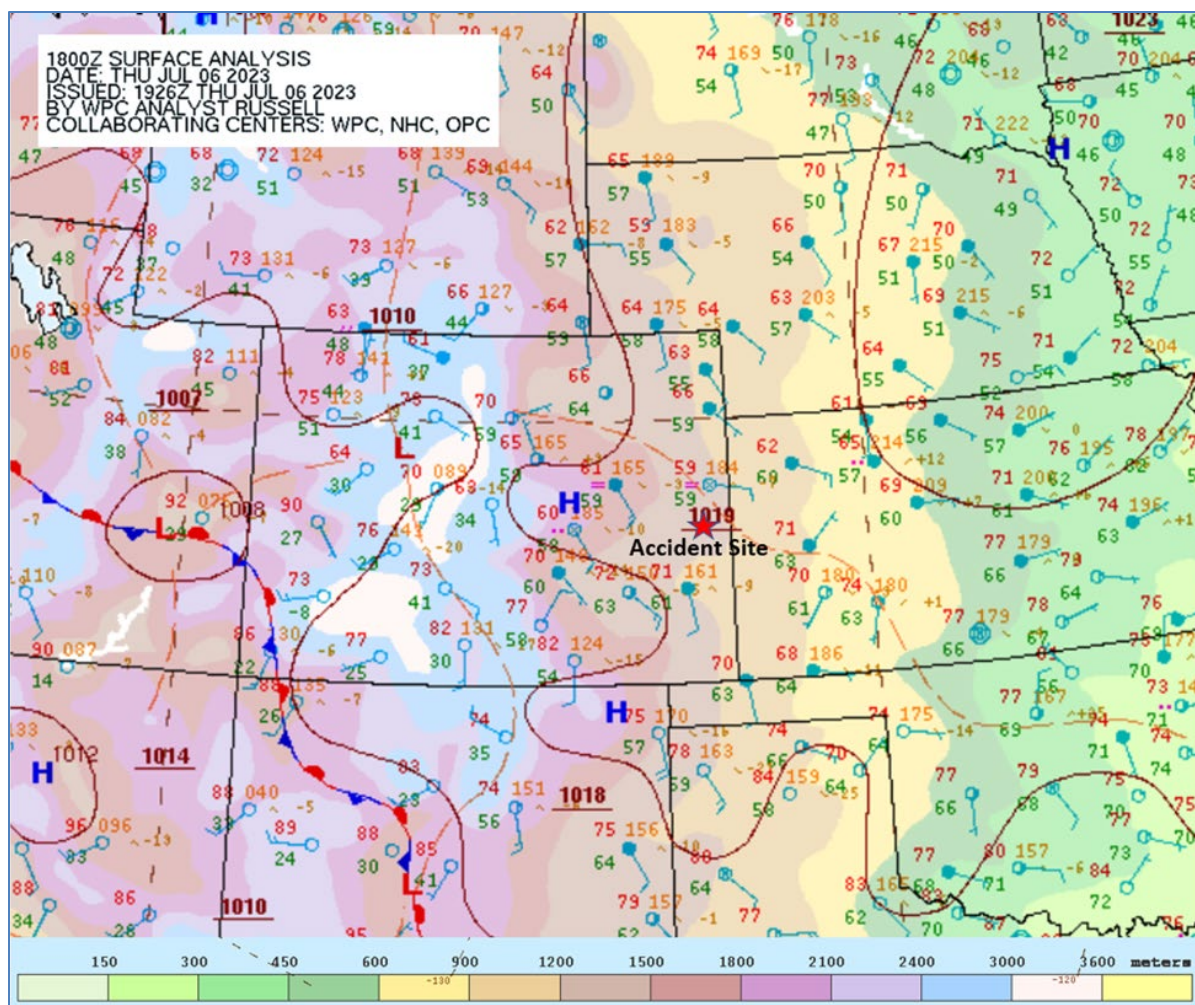


Figure 1 - NWS Surface Analysis Chart for 1200 MDT with the approximate accident site marked by the red star.

Several station models over eastern Colorado depicted visibility restricted in mist and light rain, with skies obscured and/or overcast cloud cover with temperature-dew point spreads of 2° Fahrenheit (F) or less. The station model for Burlington (KITR)¹, Colorado, immediately north of the accident site reporting the wind from east at 10 knots, fog, a surface based obscuration, with a temperature and dew point temperature of 59° Fahrenheit (F), and a sea-level pressure of 1018.4-hPa.

1.2 Regional Composite Radar Image

The NWS National Composite Radar Mosaic for 1330 MDT over the region is included as Figure 2 with the accident site noted by the red star. The image depicted several areas of light precipitation to the west and east of the accident site with no echoes within 50 miles of the accident site.

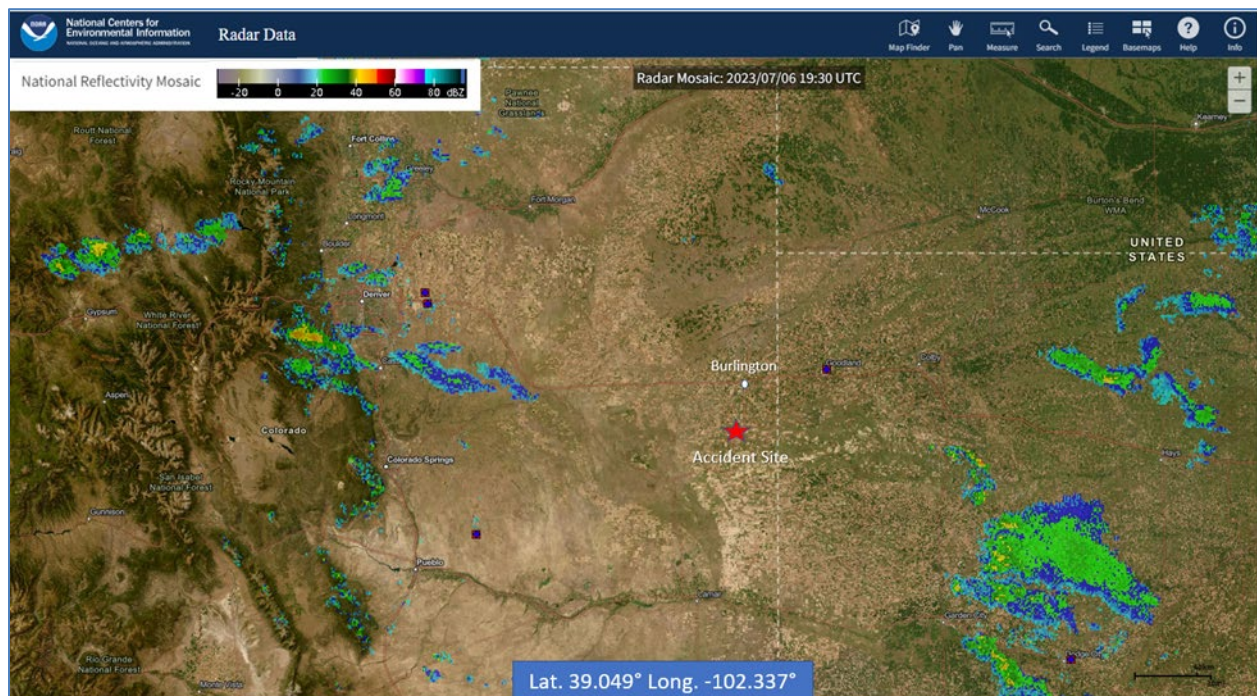


Figure 2 - NWS National Composite Radar Mosaic for 1330 MDT with the accident site marked by the red star.

¹ The observation for KITR for 1753Z which the chart was based reported a wind from 100° at 10 knots, visibility ¼ mile in dense fog, vertical visibility of 200 ft (sky obscured), temperature and dewpoint 59°F (15°C) and a sea-level pressure of 1018.4-hPa.

2.0 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 6°W based on the latest sectional chart for the area.

2.1 Burlington, Colorado

The closest official weather reporting site to the accident site was from the departure site of Kit Carson County Airport (KITR), Burlington, Colorado, located about 13 miles north at an elevation of 4,218 ft. The airport had an Automated Surface Observation System (ASOS) which issued observations locally on 135.225 VHF and issued observations hourly with specials as needed. The ASOS was not augmented by any human observer. The following conditions were reported immediately surrounding the time of the accident, with cloud heights reported above ground level (agl).

Special weather observation for KITR 1302 MDT, automated, wind from 140° at 13 knots, visibility 8 miles, ceiling broken at 1,600 ft, overcast at 2,100 ft, temperature 17° Celsius (C), dew point temperature 16°C, altimeter 30.15 inches of mercury (inHg). Remarks: automated station with a precipitation discriminator, temperature 17.2°C, dew point 15.6°C.

Weather observation for KITR 1353 MDT, automated, wind from 130° at 14 knots, visibility 10 miles or more, a few clouds at 1,000 ft, ceiling overcast at 1,800 ft, temperature 19°C, dew point temperature 16°C, altimeter 30.13 inHg. Remarks: automated station with a precipitation discriminator, sea-level pressure 1016.2-hPa, temperature 18.9°C, dew point 15.6°C.

The general flight categories² and raw observations disseminated longline between about 0600 through 1700 MDT were as follows:

² As defined by the NWS and the FAA Aeronautical Information Manual (AIM) section 7-1-7 defines the following general flight categories:

- Low Instrument Flight Rules (LIFR*) - ceiling below 500 ft agl and/or visibility less than 1 statute mile.
- Instrument Flight Rules (IFR) - ceiling between 500 to below 1,000 feet agl and/or visibility 1 to less than 3 miles.
- Marginal Visual Flight Rules (MVFR**) - ceiling from 1,000 to 3,000 ft agl and/or visibility 3 to 5 miles.
- Visual Flight Rules (VFR) - ceiling greater 3,000 ft agl and visibility greater than 5 miles.

* By definition, IFR is a ceiling less than 1,000 ft agl and/or visibility less than 3 miles while LIFR is a sub-category of IFR. ** MVFR is a subset of VFR.

LIFR SPECI KTR 061244Z AUTO 14005KT 1/4SM VCTS FG VV002 14/14 A3022 RMK AO2 LTG DSNT N AND NW T01440139=

LIFR METAR KTR 061253Z AUTO 13007KT 1/2SM VCTS FG VV002 14/14 A3021 RMK AO2 LTG DSNT N AND NE SLP194 T01440139=

LIFR SPECI KTR 061307Z AUTO 12008KT 1/2SM FG VV002 14/14 A3019 RMK AO2 LTG DSNT NE PRESFR T01440144=

LIFR SPECI KTR 061315Z AUTO 14011KT 1/4SM FG VV002 14/14 A3018 RMK AO2 LTG DSNT NE PRESFR T01440139=

LIFR METAR KTR 061353Z AUTO 15014KT 1/4SM FG VV002 15/14 A3017 RMK AO2 SLP180 T01500144=

LIFR SPECI KTR 061438Z AUTO 17012KT 3/4SM BR VV002 15/15 A3021 RMK AO2 LTG DSNT N AND NE T01500150=

LIFR METAR KTR 061453Z AUTO 17013KT 1 1/2SM BR OVC002 16/15 A3019 RMK AO2 LTG DSNT NE AND NW SLP188 T01560150 55006=

LIFR SPECI KTR 061501Z AUTO 17013KT 3SM BR OVC002 16/15 A3019 RMK AO2 LTG DSNT NW-NE T01560150=

LIFR SPECI KTR 061544Z AUTO 09006KT 8SM OVC004 16/15 A3022 RMK AO2 LTG DSNT N AND NE T01560150=

IFR METAR KTR 061553Z AUTO 10008KT 10SM OVC005 16/15 A3020 RMK AO2 LTG DSNT NE CIG 004V009 PRESFR SLP190 T01610150=

LIFR SPECI KTR 061649Z AUTO 08011KT 1 3/4SM BR BKN003 OVC007 16/14 A3018 RMK AO2=

LIFR METAR KTR 061653Z AUTO 08014KT 3/4SM BR BKN003 OVC008 14/13 A3017 RMK AO2 SLP184 T01440133=

LIFR SPECI KTR 061704Z AUTO 09011G19KT 1/4SM FG VV001 14/14 A3017 RMK AO2 T01440139=

LIFR METAR KTR 061753Z AUTO 10010KT 1/4SM FG VV002 15/15 A3017 RMK AO2 SLP184 T01500150 10172 20144 58007=

LIFR SPECI KTR 061801Z AUTO 11010KT 1SM BR VV002 16/15 A3017 RMK AO2 T01560150=

LIFR SPECI KTR 061804Z AUTO 12010KT 3SM BR OVC002 16/15 A3017 RMK AO2 T01560150=

MVFR SPECI KTR 061823Z AUTO 12010KT 7SM SCT002 OVC013 16/15 A3017 RMK AO2 T01610150=

MVFR METAR KTR 061853Z AUTO 14012KT 7SM OVC014 17/16 A3016 RMK AO2 SLP174 T01720156=

MVFR SPECI KTR 061902Z AUTO 14013KT 8SM BKN016 OVC021 17/16 A3015 RMK AO2 T01720156=

Accident 1930Z

MVFR METAR KTR 061953Z AUTO 13014KT 10SM FEW010 OVC018 19/16 A3013 RMK AO2 SLP162 T01890156=

MVFR SPECI KTR 062022Z AUTO 15012G21KT 10SM BKN014 OVC028 21/16 A3012 RMK AO2 T02060161=

VFR METAR KTR 062053Z AUTO 16014KT 10SM SCT016 BKN036 21/16 A3011 RMK AO2 SLP156 T02110161 57019=

MVFR SPECI KTR 062135Z AUTO 14013KT 10SM SCT015 BKN027 OVC033 20/16 A3010 RMK AO2 T02000161=

MVFR METAR KTR 062153Z AUTO 14014KT 10SM BKN013 OVC018 20/16 A3009 RMK AO2 SLP149 T02000161=

MVFR SPECI KTR 062244Z AUTO 14016G23KT 10SM BKN015 22/17 A3006 RMK AO2 T02170167=

A review of the observation indicated that LIFR conditions prevailed over the area during the morning due to low visibilities in fog and mist with low ceilings, which lifted gradually within the hour of the accident to MVFR conditions.

2.2 NWS Aviation Weather Center Observation

A depiction of the NWS Aviation Weather Center's METAR display for 1330 MDT with the approximate accident site marked by the red star is included as figure 4. The chart depicted general MVFR to IFR conditions (reported at KAFF, KFLY, KCOS, and KCWN) over central and eastern Colorado.

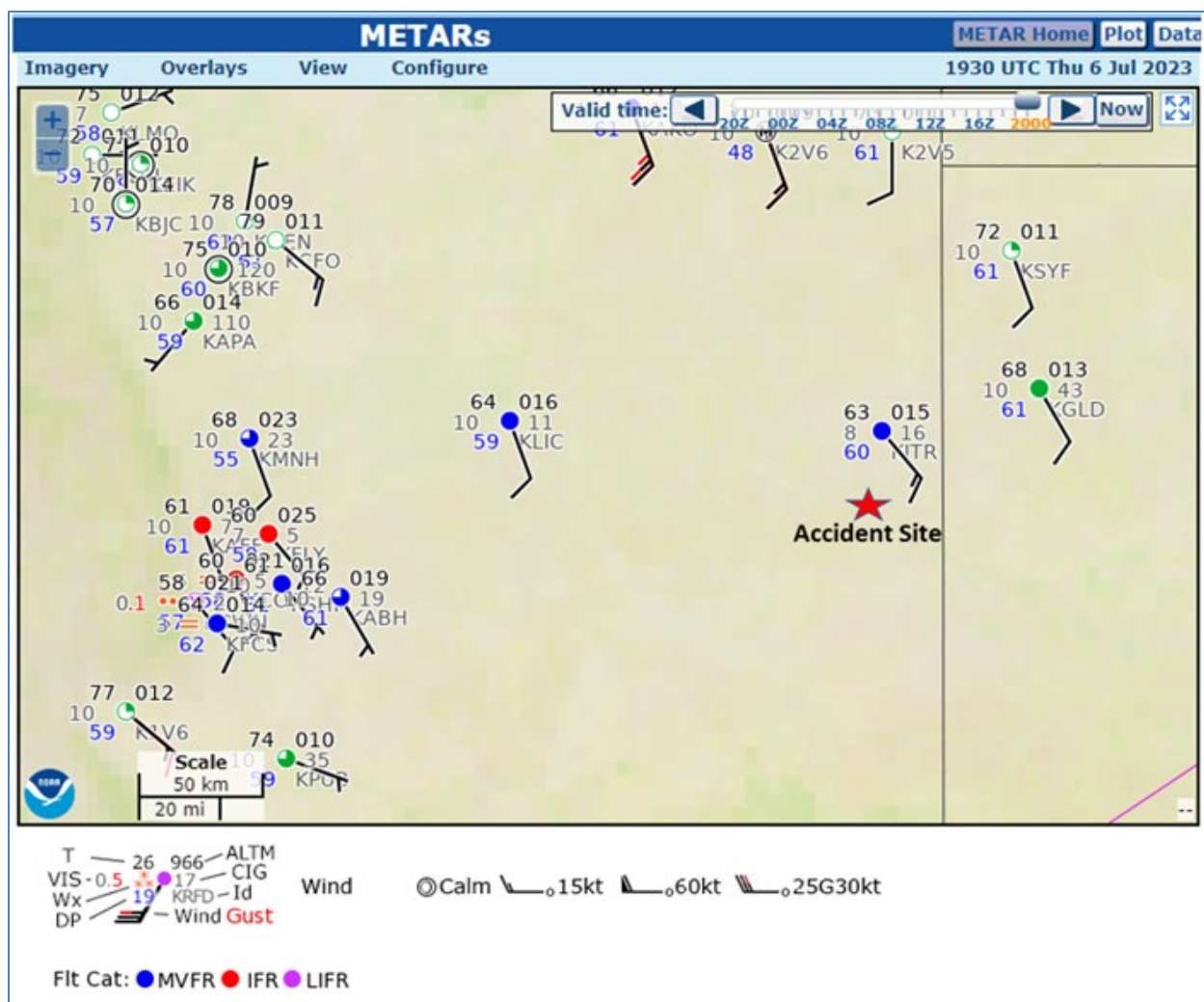


Figure 3 - NWS Aviation Weather Center's depiction of the observations at 1330 MDT with the accident site marked by the red star.

3.0 Sounding

A High-Resolution Rapid Refresh (HRRR)³ numerical model was obtained from the NOAA Air Resource Laboratory for 1300 MDT over the closest grid point to the accident site and plotted on a standard Skew T log P diagram⁴ using the RAOB Analysis

³ 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.

⁴ 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 point, and various indices used to define the vertical structure of the atmosphere.

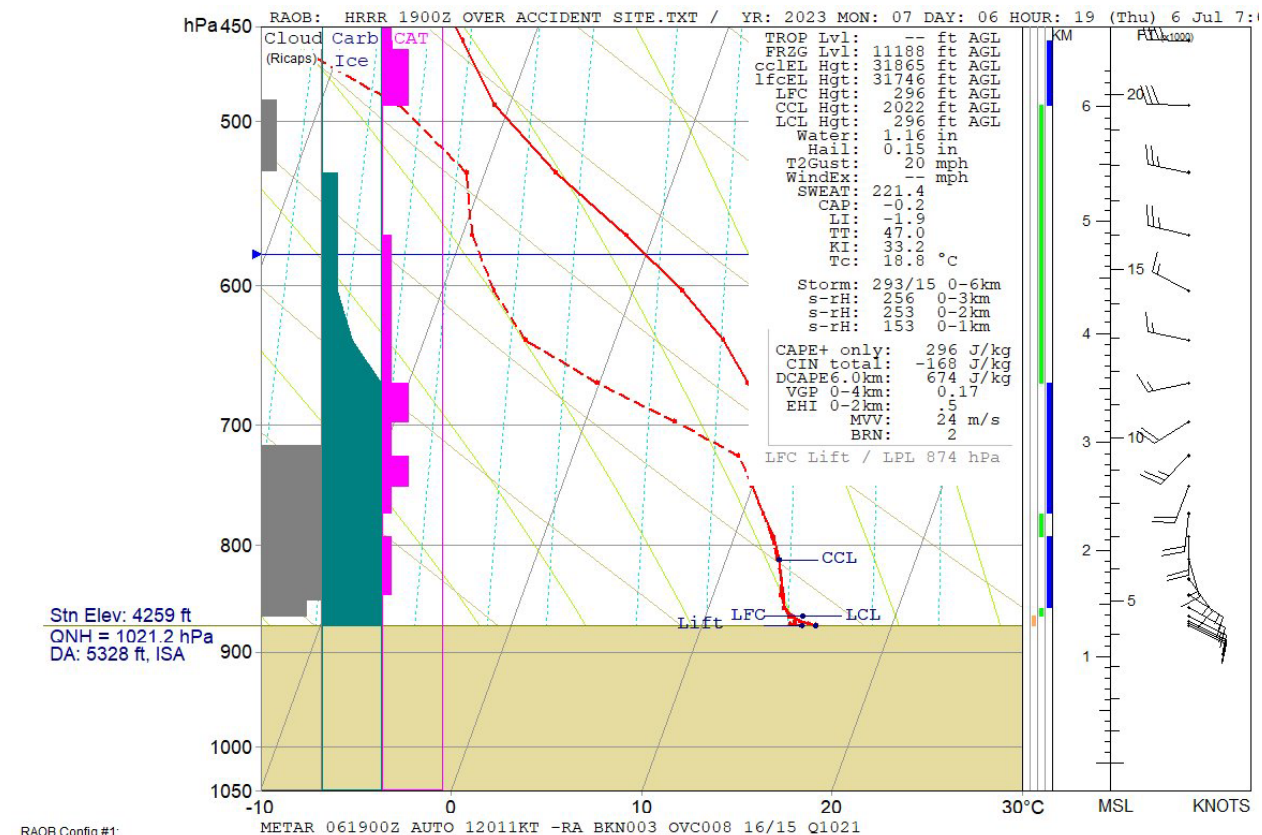


Figure 4 - NOAA ARL High-Resolution Rapid Refresh (HRRR) numerical model for 1300 MDT over the closest grid point to the accident site.

The HRRR sounding for 1300 MDT depicted a station elevation of 4,259 ft over the grid point with a near surface temperature of 16°C (61°F), a dew point temperature of 15°C (60°F), a relative humidity of 96%, with an estimated density altitude of 5,328 ft. The lifted condensation level (LCL) and level of free convection (LFC) were identified at 296 ft agl, with the convective condensation level (CCL) at 2,022 ft agl. The RAOB Analysis program supported a ceiling broken at 300 ft agl, overcast at 800 ft with stratiform clouds from the LCL with tops near 10,000 ft, with a higher layer of altocumulus (AC) clouds between 15,600 ft through 20,000 ft. The precipitable water content was 1.16 inches. The freezing level was identified at about 15,500 ft. The atmosphere was characterized as conditionally unstable with a lifted index (LI) of -1.9 and a convective available potential energy of 296 Joules/kilogram, which supported the development of convections with sufficient lifting and afternoon heating. The HRRR

⁵ 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.

sounding also indicated a high potential for carburetor or induction system icing from the surface through 12,000 ft (indicated in green on left axis) due to the favorable temperature and moisture profile.

The HRRR sounding wind profile indicated a surface wind from the southeast at 10 knots veering to the west with height, with wind speeds gradually increasing with height. The mean 0 to 6 kilometer mean wind was from 260° at 20 knots.

A table of the HRRR sounding parameters of height, pressure, temperature (T), dew point temperature (Td), relative humidity (RH%), wind direction and speed, and derived clear air turbulence (CAT), low-level wind shear (LLWS), icing, and mountain wave potential are included below to about 18,000 ft.

Height (ft msl)	Pres (hPa)	T (°C)	Td (°C)	RH (%)	Wind (dir/kts)	CAT (FAA)	LLWS (FAA)	Icing (USAF)	Mountain Wave (nm fpm max)
4259	874	16.0	15.3	96	120/ 11		LIGHT		
4323	872	15.6	14.6	94	120/ 10		LIGHT		
4387	870	15.1	14.8	98	120/ 12				
4548	865	14.6	14.4	99	120/ 13				
4806	857	14.0	14.0	100	120/ 14				
5198	845	13.7	13.6	99	125/ 14	LGT	LIGHT		
5695	830	13.3	13.3	100	145/ 15	LGT			
6302	812	12.8	12.7	99	165/ 16	LGT			
6991	792	12.1	12.0	99	180/ 19				
7695	772	11.1	11.1	100	190/ 21	LGT			
8525	749	10.0	10.0	100	200/ 22	MDT			
9453	724	9.4	8.7	95	225/ 23	LGT			
10490	697	9.3	4.7	73	235/ 20	MDT			2.27 401 LIGHT
11645	668	7.8	-0.1	57	255/ 17	LGT			
12927	637	5.7	-4.7	47	280/ 15	LGT			2.47 319 LIGHT
14392	603	2.6	-7.3	48	300/ 17	LGT			3.19 324 LIGHT
16015	567	-1.4	-9.5	54	285/ 23				5.84 432 LIGHT
17814	529	-6.3	-11.0	69	280/ 27				

4.0 Satellite Imagery

The NOAA Geostationary Operational Environmental Satellite number 16 (GOES-16) infrared and visible imagery were obtained from an archive at the Space Science Engineering Center (SSEC) at the University of Wisconsin-Madison in Madison, Wisconsin, and processed using the Man-computer Interactive Data Access System (McIDAS) software. The infrared band 13 imagery at a wavelength of 10.3 microns (μm) provided a resolution of 2 kilometers (1 NM), while the visible band 2 imagery at 0.64 μm provided a resolution of 0.5 km (0.25 nm).

GOES-16 infrared image for 1331 MDT at 4X magnification

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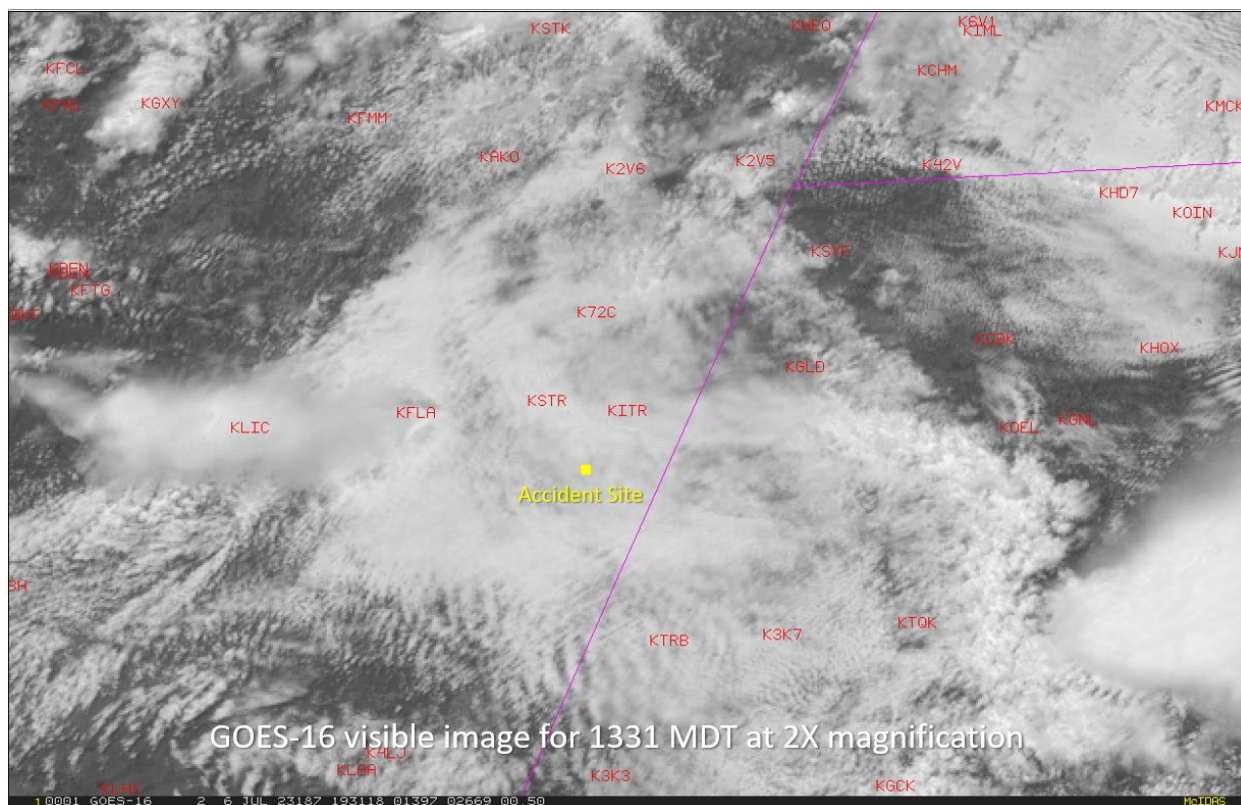


Figure 6 - GOES-16 visible image for 1331 MDT at 2X magnification with the accident site marked by the yellow square.

5.0 Pilot Weather Reports

A search of pilot reports (PIREPs) in the national database between 1000 through 1800 MDT within 60 miles of the accident site resulted in no reports.

6.0 NWS Forecasts

The NWS Goodland (KGLD), Kansas, Weather Forecast Office (WFO) was responsible for the local weather forecast and weather warning for the area. While the NWS AWC were responsible for the aviation products documented below.

6.1 Terminal Aerodrome Forecasts

The closest NWS Terminal Aerodrome Forecast (TAF) to the accident site was for Renner Field/Goodland Municipal Airport (KGLD), Goodland, Kansas, located about 28 miles east of the accident site at an elevation of 3,658 ft. TAFs are a concise statement of the expected meteorological conditions significant to aviation for a specific period typically 24-hours and are valid for 5 statute miles from the airport's runway complex (terminal). While not valid over the accident site, pilots and several

flight planning systems provide the closest TAF for a more precise breakdown in wind, sky conditions, and weather other the area. The forecast issued at 1120 MDT for KGLD was as follows, with the blue type valid for the period of the accident.

*TAF KGLD 061720Z 0618/0718 16011KT 2SM BR VCSH OVC008
FM062000 15013G20KT P6SM VCTS BKN015CB
FM070300 13011G25KT 6SM BR VCTS OVC020CB
FM070800 15010KT P6SM VCTS BKN004CB
FM071100 17009KT P6SM SCT002*

The forecast valid from 1200 through 1400 MDT for KGLD expected IFR conditions to prevail with a wind from 160° at 11 knots, visibility 2 miles in mist, with showers in the vicinity, ceiling overcast at 800 ft agl.

6.2 Area Forecast Discussion

The NWS Aviation Forecast Discussions (AFD) are issued by each WFO to describe the short-term weather conditions within their region with an aviation section that includes the general conditions as they relate to the creation of the TAF. These are useful for additional aviation-related issues that cannot be encoded into the TAF and provide some reasoning behind the forecast. The NWS KGLD issued the following Area Forecast Discussion (AFD) at 1132 MDT describing the conditions over the area.

*FXUS63 KGLD 061732
AFDGLD*

*Area Forecast Discussion
National Weather Service Goodland KS
1132 AM MDT Thu Jul 6 2023*

*.SHORT TERM...(Today and tonight)
Issued at 248 AM MDT Thu Jul 6 2023*

For the short term period, fairly active weather is expected including the possibility of significant severe weather today.

Through the overnight hours, a complex of storms has moved through SW Kansas while a few lingering showers have moved through the Tri-State area. Also, fog has developed across parts of East-Central Colorado. Currently, expecting some of that fog to move in far Eastern Colorado and maybe just past the Colorado border as ceilings remain low across the area and easterly surface winds continue.

The morning through the early afternoon hours is forecasted to see cloud cover and low ceilings persist with the possibility for a few showers and sprinkles due to the saturated near surface air mass. The afternoon will then see the area warm enough and have some drier air move over aloft that the cloud cover may begin to break. Highs are forecasted to be in the 70's as long as the clouds break partially.

This evening and into the overnight hours is when things get a bit interesting and uncertain. There is a chance that very little storm activity develops if the cloud cover persists and the CAP holds. In this case, there would be a few decaying showers over western portions of the area with most of the stronger storms staying in SW Kansas. However, most guidance is favoring for storms to develop along the Front Range and Palmer Divide as an upper shortwave moves through that then move east/southeast into the area. Guidance is forecasting an environment in Eastern Colorado that could support deep moist convection and supercells with dewpoints above 60, PWATS near 1.5 inches, CAPE potentially greater than 2000 J/KG (both MLCAPE and MUCAPE) and effective shear above 50kts. This would allow for large to very large hail, especially for counties along the Colorado border where instability is forecasted to be greatest and lapse rates steepest. The more unstable conditions could be further east with more of the area at risk of very large hail if the cloud cover breaks earlier than forecasted. Guidance is suggesting that any supercells that form initially will likely cluster given a relatively right mover motion of 10kts. If the slower motion prevails and the storms remain a cluster, heavy accumulating rain is forecast and flash flooding will be a concern. If the storms gust out and become cold pool dominate, there could be a swath of severe winds with gusts around 60-85 mph. If all this wasn't enough, there is the potential for multiple tornadoes. Certain guidance hodographs such as the HRRR show a strong, veering low level wind profile that allows for 1km effective shear to reach around 25 kts and 0-3 km SRH to reach 300+. Adding to this is a fairly saturated air mass and heavy rain potential that will help lower LCLs fairly quickly. In this scenario, especially if multiple supercells form, a few tornadoes would be possible.

So with all of this, there is the possibility for a significant severe weather day with all hazards possible mainly favoring counties from Kit Carson to Gove and south. There are a few uncertainties this morning such as how the cloud cover will hold, where the storms will initially develop in Colorado and how strong the flow will be over the area so the severe threat is not guaranteed. Will need to watch through the day and see how things set up. The current forecasted scenario is storms forming along the Front Range and Palmer Divide and moving east during the evening hours (6-11pm MT) through the area mainly near and south of I-70. These storms could initially be supercells and the largest hail would favor western portions of the area. The storms would then cluster and be more of a wind threat and flooding threat for parts of Western Kansas. Also, the current forecast calls for a few storms and maybe supercells moving in from the northeast during the early evening hours that could be severe. However, the severe intensity may be slightly lower as guidance suggest instability will be a bit lower across northern portions of the area.

Going into tomorrow and Saturday, the overall pattern will be similar with cloud cover burning off earlier in the day and an upper shortwave moving through the area in the northwest flow during the afternoon hours. Confidence decreases with each day as there will be some dependencies on the prior days (especially if a slow moving MCS develops Thursday night). But otherwise, temperatures are forecasted to remain below normal in the upper 70's and low 80's. Storms and severe storms will be possible during the afternoon and evening hours each day with Eastern Colorado having the highest chances for storms.

.AVIATION...(For the 18Z TAFS through 18Z Friday afternoon)

Issued at 1121 AM MDT Thu Jul 6 2023

For KGLD... LIFR/IFR conditions at the terminal are expected to improve as we move into the afternoon hours. Ceilings are expected to improve to MVFR as more showers and storms begin to build over Eastern Colorado. There may be a brief period of VFR

conditions mainly between 19Z and 23Z depending on how quickly storms develop and move within the vicinity of the terminal. Storms are then forecasted to move near the terminal and to the south of it during the evening hours around 02-10Z. The storms could be severe with large hail, damaging wind gusts, and heavy rainfall. After that, the air will be saturated which will allow ceilings to lower to IFR/LIFR levels. There is also potential for fog once again during the early morning hours on Friday; however, confidence is not currently high enough to include in the current TAFs.

For KMCK... Mainly MVFR to VFR ceilings are forecasted through the afternoon as showers move over Northwest Kansas and impact the vicinity of the terminal. Ceilings are expected to lift briefly during the late afternoon to early evening hours before falling again overnight as storms move south of the terminal and the air saturates. KMCK is expected to be on the northern extent of any showers/storms that impact the area; however, it is possible they could be impacted mainly between 03Z to 11Z Friday. Hazards include heavy rainfall, damaging wind gusts, and large hail.

.GLD WATCHES/WARNINGS/ADVISORIES...

KS...NONE.

CO...NONE.

NE...NONE.

6.3 Graphic Forecast for Aviation

The NWS Graphic Forecast for Aviation (GFA) is a graphical depiction of surface wind, thunderstorms, precipitation, color-coded general flight categories, and cloud cover bases and tops reported in msl heights, from graphical output from the NWS National Digital Forecast Database (NDFD) with the Graphic-Airmen's Meteorological Information (G-AIRMET) for IFR conditions, mountain obscuration, icing conditions, and strong surface wind overlaid. The GFA provides a forecast for the enroute phase of flight and for locations without a TAF. The GFA is available at the NWS AWC website and through other weather briefing services. The following information was retrieved from the AWC's GFA archive.

Figure 7 is the NWS AWC GFA Ceiling and Visibility display for 1330 MDT with the approximate accident site marked by the red star. The image depicted an area of LIFR conditions extending over the accident site, with an area of IFR conditions and MVFR conditions extending over central Colorado into western Kansas.

Figure 8 is the NWS AWC GFA Cloud depiction for 1330 MDT with the approximate accident site marked by the red star. The image depicted overcast clouds at 4,500 ft msl (275 ft agl based on accident site elevation) with tops to 25,000 ft.

Figures 9 and 10 are the 3-hour GFA forecasts issued at 1001 MDT with the approximate location of the accident site. The image depicted the forecast conditions valid for 1200 MDT through 1500 MDT. Graphic-AIRMET Sierra for IFR conditions is overlaid on the surface forecast with visibilities between 3 to 5 miles, and ceilings less than 1,000 ft agl depicted over the accident site.

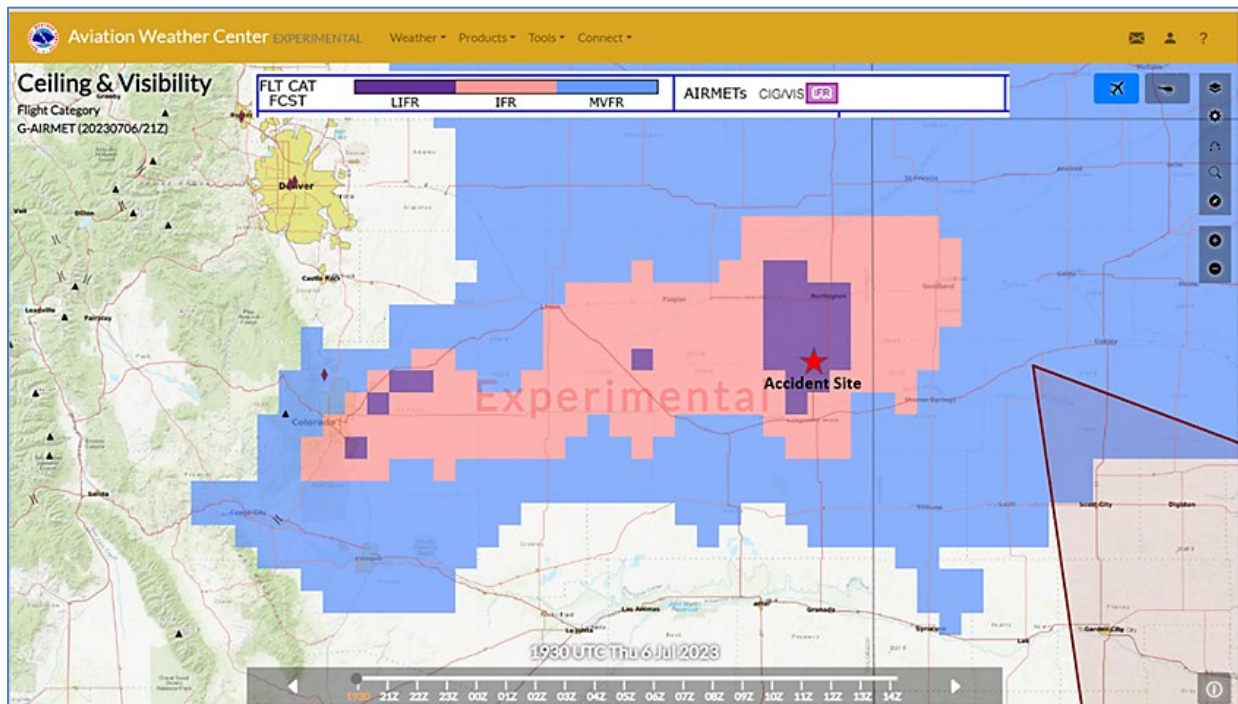


Figure 7 - NWS AWC Graphic Forecast for Aviation (GFA) Ceiling and Visibility depiction for 1330 MDT with the approximate accident site marked by the red star. LIFR conditions depicted over the accident site at the time of the image with IFR conditions extending west and east of the area.

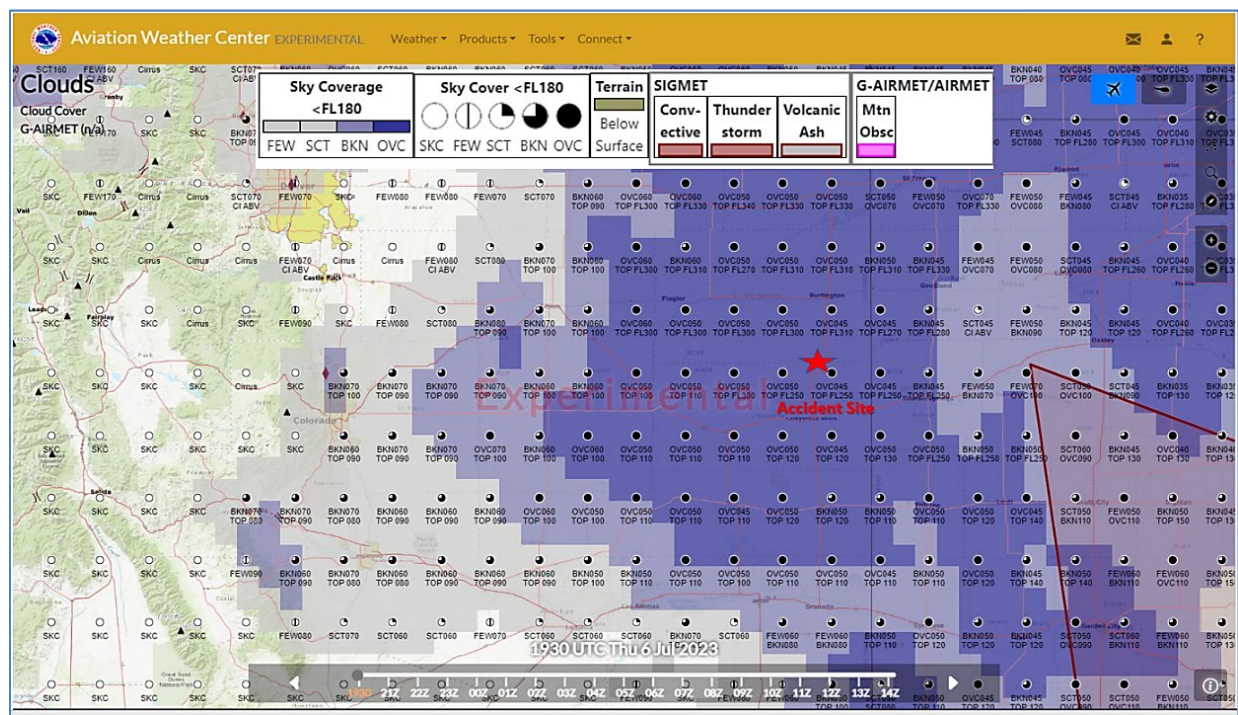


Figure 8 - NWS AWC Graphic Forecast for Aviation (GFA) Cloud Forecast for 1330 MDT with the approximate accident site marked by the red star.

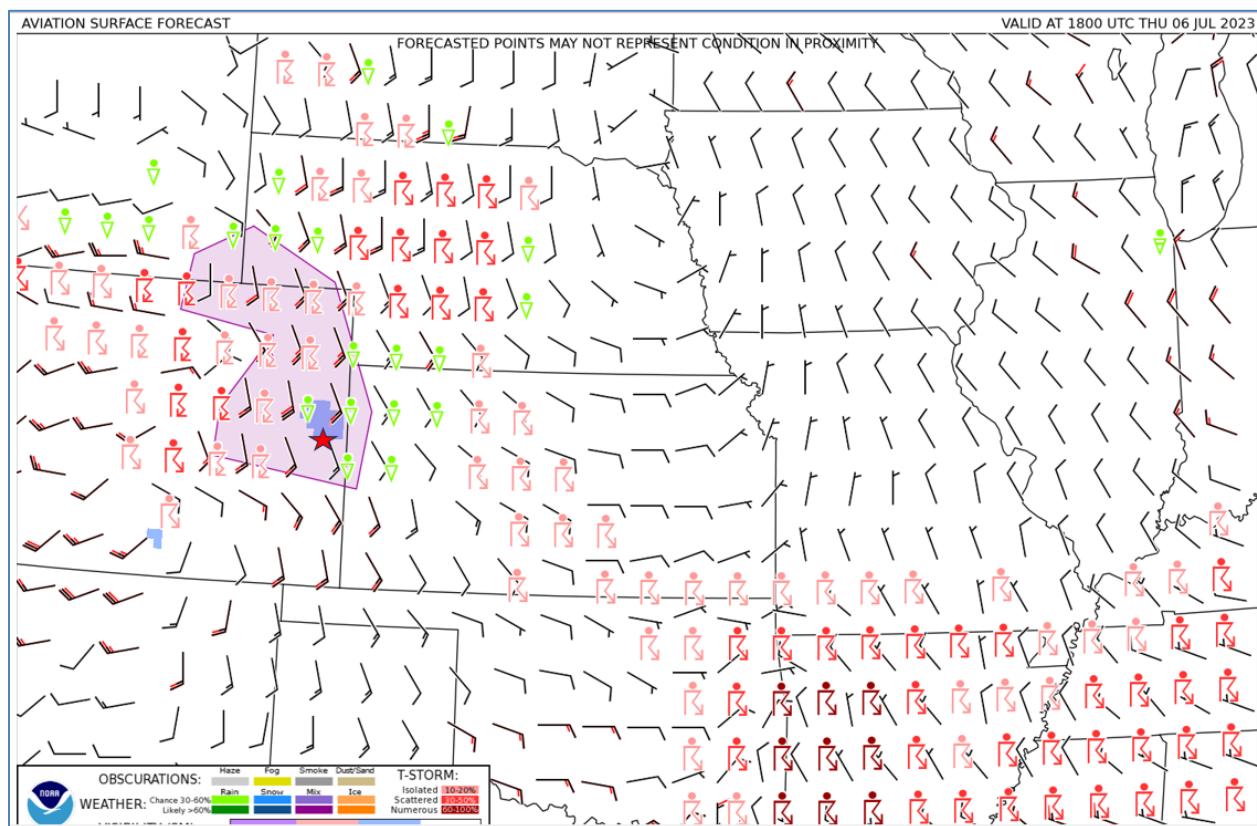


Figure 9 - NWS 3-hour Graphic Forecast for Aviation (GFA) valid for 1200 MDT with the approximate accident site marked by the red star. Graphic-AIRMET Sierra for IFR conditions overlaid on the forecast.

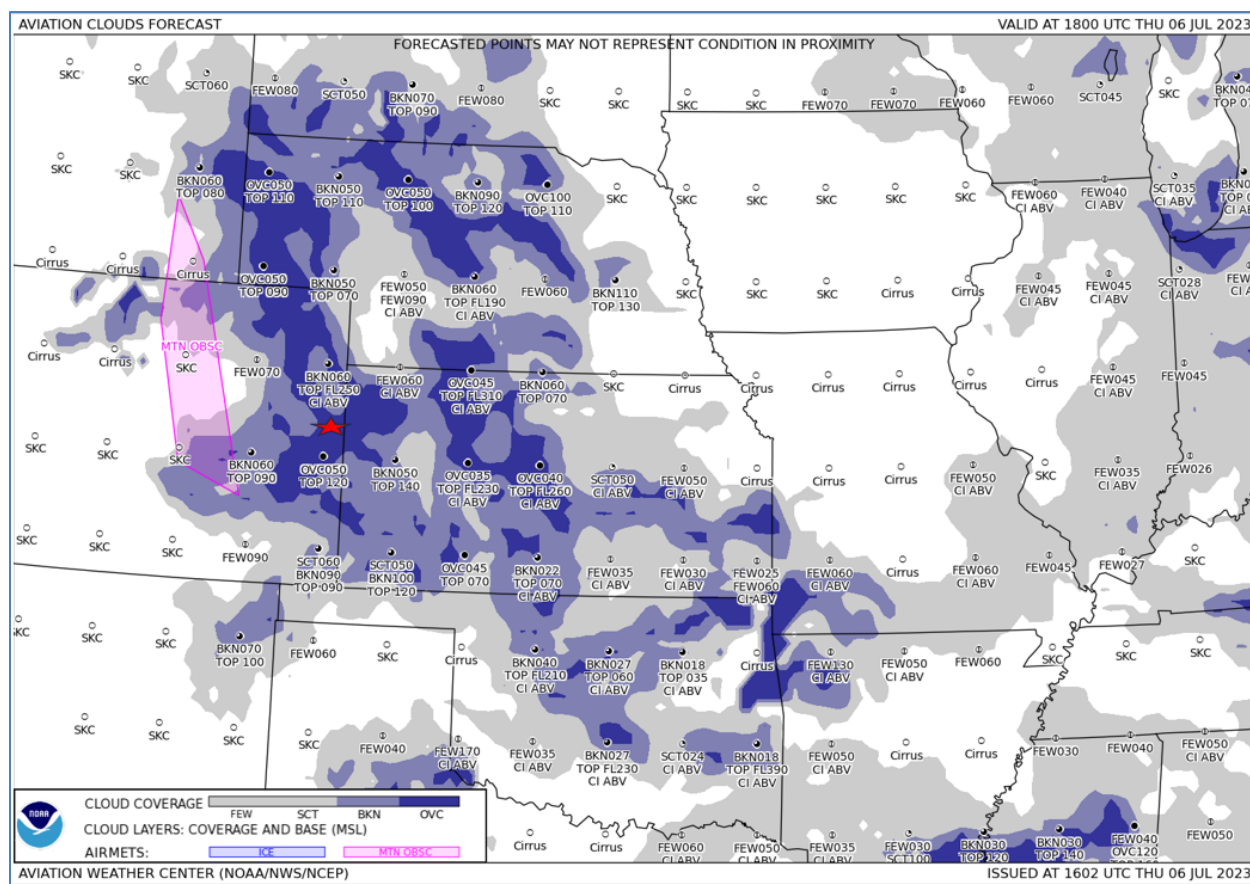


Figure 10 - NWS 3-hour Graphic Forecast for Aviation Cloud Forecast valid for 1200 MDT with the approximate accident site marked by the red star.

7.0 NWS Inflight Weather Advisories

Inflight Aviation Weather Advisories are forecasts that advise en route aircraft of the development of potentially hazardous weather. They are issued by the NWS AWC, as well as from the 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 Airmen's Meteorological Information (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.

A review of the NWS database indicated that there were no SIGMETs, Convective SIGMETs, Center Weather Advisories (CWA) during the period over Colorado extending over the accident site. The NWS did have several AIRMETs current

for the region, with AIRMET Sierra current for IFR conditions extending over the accident site during the period.

AIRMET SIERRA - IFR CONDITIONS

WAUS45 KPCI 061445

WA55

-SLCS WA 061445

AIRMET SIERRA UPDT 3 FOR IFR AND MTN OBSCN VALID UNTIL 062100

.

AIRMET IFR...MT WY CO NM

**FROM 60NE CZI TO 50WNW RAP TO 70SW RAP TO GLD TO 40ENE LAA TO
60NW AMA TO 30WSW CIM TO 40W PUB TO 40N LAR TO 30WSW DDY TO 60NE CZI
CIG BLW 010/VIS BLW 3SM BR. CONDS ENDG 18-21Z.**

.

AIRMET MTN OBSCN...WY CO NM

FROM 50SE DDY TO 20NNE CYS TO TBE TO 20W TCC TO FTI TO 60W PUB
TO 50WSW DEN TO 60S DDY TO 50SE DDY
MTNS OBSC BY CLDS/BR. CONDS ENDG 18-21Z.

AIRMET TANGO - TURBULENCE

WAUS45 KPCI 061445

WA5T

-SLCT WA 061445

AIRMET TANGO UPDT 2 FOR TURB VALID UNTIL 062100

.

AIRMET TURB...ID WY NV UT CO

FROM 70SW DDY TO 20ENE DEN TO 30ENE DBL TO 50W CHE TO 30NNW MTU
TO 50SSE BAM TO 40N BAM TO 70SW DDY
MOD TURB BLW 160. CONDS ENDG 18Z.

.

AIRMET TURB...NV UT CO AZ NM

FROM 20ENE DEN TO FTI TO SJN TO EED TO 40NNW PGS TO 20NE DBL TO 20ENE DEN
MOD TURB BLW FL180. CONDS DVLPG 16-18Z. CONDS CONTG BYD 21Z ENDG 01-03Z.

AIRMET ZULU - ICING

WAUS45 KPCI 061445

WA5Z

-SLCZ WA 061445

AIRMET ZULU UPDT 2 FOR ICE AND FRZLVL VALID UNTIL 062100

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NO SGFNT ICE EXP OUTSIDE OF CNVTV ACT.

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FRZLVL...RANGING FROM 100-185 ACRS AREA

120 ALG 40NE GEG-40ESE LWT-100SE MLS

160 ALG 70SSE FMG-50WSW ELY-20W PUB-20N TBE-50SE TBE

8.0 Preflight Weather Briefing

A search of the FAA Automated Flight Service Station (AFSS) provider Leidos indicated that they, and no other 3rd party user of the Lockheed Flight Planning System (LFS) had any contact with the pilot of N100PB on July 6, 2023. A separate search from ForeFlight also indicated they had no contact with the pilot. It is therefore unknown what if any the pilot may have used to familiarize himself with the weather conditions before departure as required by Federal Aviation Regulations 91.103 Preflight Action.

Submitted by:

Donald Eick
Senior Meteorologist