

Preliminary Narrative

Data Requested

Synoptic Conditions – The western section of the NWS Surface Analysis Chart for 1100 PDT (1800Z) is included as Figure 1 with the approximate accident site marked by the red star. The chart depicted a high pressure system at 1023-hectopascals (hPa) centered on the Nevada and Utah border and in the immediate vicinity of the accident site. A weak trough of low pressure was depicted over western Nevada into western Arizona. The station models surrounding the accident site depicted relatively clear skies, with temperatures in the mid 50's degrees Fahrenheit (°F), with dew point temperatures in the 20's °F. No significant weather was depicted over the general route of flight.

A review of the NWS Convective Outlook indicated no expected thunderstorms and the 12-hour Surface Prognostic Chart depicted no significant precipitation or boundaries over the route of flight.

Observations – the closest official weather reporting location was from Wendover Airport (KENV), Wendover, Utah, approximately 30 miles north-northeast of the accident site at an elevation of 4,237 ft. The airport had an Automated Weather Observation System (AWOS), which were not augmented by any human observer. The magnetic variation was 12.5° E based on the latest sectional chart. The following conditions were reported surrounding the period from 1056 through 1556 PDT:

METAR KENV 241756Z AUTO 14009KT 10SM CLR 13/M02 A3024 RMK AO2 SLP230 T01331017 10139 20061 58009

METAR KENV 241856Z AUTO 11008KT 10SM CLR 14/M03 A3023 RMK AO2 SLP225 T01441028

METAR KENV 241956Z AUTO 12010KT 10SM CLR 16/M03 A3020 RMK AO2 SLP217 T01561033

Accident

METAR KENV 242056Z AUTO 12011KT 10SM CLR 18/M03 A3018 RMK AO2 SLP209 T01781028 58016

METAR KENV 242156Z AUTO 11007KT 070V150 10SM OVC095 17/M03 A3018 RMK AO2 SLP208 T01721028

METAR KENV 242256Z AUTO 12008KT 10SM SCT090 18/M03 A3016 RMK AO2 SLP200 T01781028

Sounding – A NOAA High-Resolution Rapid Refresh (HRRR) numerical model sounding was run for data for 1300 PDT over the accident site coordinates. Figure 2 is the HRRR model sounding plotted on a standard Skew T log P diagram from the surface elevation estimated at 6,539 ft to approximately 21,000 ft. The model sounding estimated a surface temperature of 12° Celsius (C) (54° F), a dew point temperature of -10° C (14° F), with a 20% relative humidity, which indicated a density altitude of 7,341 ft. The lifted condensation level (LCL) was at 15,400 ft and the convective condensation level (CCL) at 17,880 ft. The freezing level was at 10,200 ft. The atmosphere below 12,500 ft was characterized as conditional unstable and supported strong thermals (marked in brown in the diagram).

The HRRR wind profile indicated generally west to northwest winds at 10 to 15 knots between 8,000 and 12,500 ft. Which over the higher terrain immediately west of the flight path would support a general downslope flow or downdrafts. The wind profile did not indicate any strong vertical wind shears below 12,500 ft to support any significant clear air turbulence (CAT) other than light turbulence.

The sounding wind profile did not indicate strong low-level winds over 25 knots near the mountain peaks, but did show little or no variation in wind direct with increasing wind speeds with height, which would generally support a weak mountain wave activity above 18,000 ft. The default mountain wave settings on the RAOB software used to analyze the sounding did not indicate any significant low-level turbulence over the accident site.

A review of the NWS Elko sounding for 1700 PDT also indicated a similar wind, temperature, and moisture profiles with the exception of support of a potential layer of clouds near 9,000 ft agl or 13,000 ft msl, and did not indicate any organized layers of significant turbulence.

Note - 12,500 ft was considered the limiting altitude based on the requirement for oxygen.

Satellite Imagery – The GOES-17 infrared and visible satellite imagery surrounding the period was downloaded and reviewed (Figure 3 and 4). The GOES-17 visible image at 2X magnification for 1301 PDT depicted clear skies over the accident site with a few scattered bands of fair weather cumulus clouds over northern Nevada and Utah.

A review of the moisture channel imagery detected no significant moisture channel darkening typically associated with mountain wave activity and turbulence.

Pilot Reports – A search of pilot reports or PIREPs indicated no reports over Nevada or Utah along the route of flight and only 2 reports in Arizona. No hazardous weather conditions or turbulence were reported over the route during the period.

FLG UA /OV SEZ-FLG /TM 1553 /FL095 /TP C172 /TB LGT CHOP

SEZ UA /OV GEU-SEZ /TM 1553 /FL095 /TP C172 /TB NEG /RM SMTH

NWS Forecasts – The closest Terminal Aerodrome Forecast (TAF) was issued for Elko Regional Airport (KEKO), Elko, Nevada, located approximately 89 miles northwest of the accident site at an elevation of 5,140 ft. The forecast was as follows:

TAF KEKO 241720Z 2418/2518 VRB03KT P6SM FEW060 BKN080

FM241900 24009KT P6SM BKN090

FM242100 27010G20KT P6SM SCT080

FM250200 VRB05KT P6SM SKC

FM251700 24008KT P6SM SKC

Winds Aloft Data – the winds and temperature aloft forecast based on the NWS bulletin UBUS31 KWNO is included below for the route of flight. The forecast for 45,000 and 53,000 ft have been excluded.

WINDS ALOFT FORECASTS

DATA BASED ON 241200Z

VALID 241800Z FOR USE 1400-2100Z. TEMPS NEG ABV 24000

FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
PHX	9900	3609+18	3105+10	3017+05	2919-10	2931-23	303840	314149	305260
TUS		3009+19	3110+11	2914+05	2925-10	3032-23	303939	304449	305459
PRC			3408+09	3016+04	3030-11	3037-25	304140	314850	305661
BCE				3419-01	3040-14	3051-26	306342	307551	308262
ELY			3209+02	3224-03	3141-14	3055-26	296742	297951	298362
SLC		9900	9900-01	3210-07	3140-17	3055-29	307344	308653	308761
PIH		2508	2510-02	2713-09	2933-19	3050-31	306947	308055	306958

The forecast for Ely, Nevada, approximately 70 miles south of the accident site. The wind at 9,000 ft was forecast to be from 320° at 9 knots with a temperature of 2° C, at 12,000 ft the wind was from 320° at 24 knots with a temperature of -3° C.

Inflight Weather Advisories – the NWS Aviation Weather Center issued no SIGMETs, Convective SIGMETs, or AIRMETs that impacted the route of flight, and the NWS Center Weather Service Units (CWSUs) at Albuquerque (KZAB), Los Angeles (KZLA), and Salt lake City (KZLC) issued no Center Weather Advisories (CWA) or Meteorological Impact Statements (MIS) during the period on April 24, 2020.

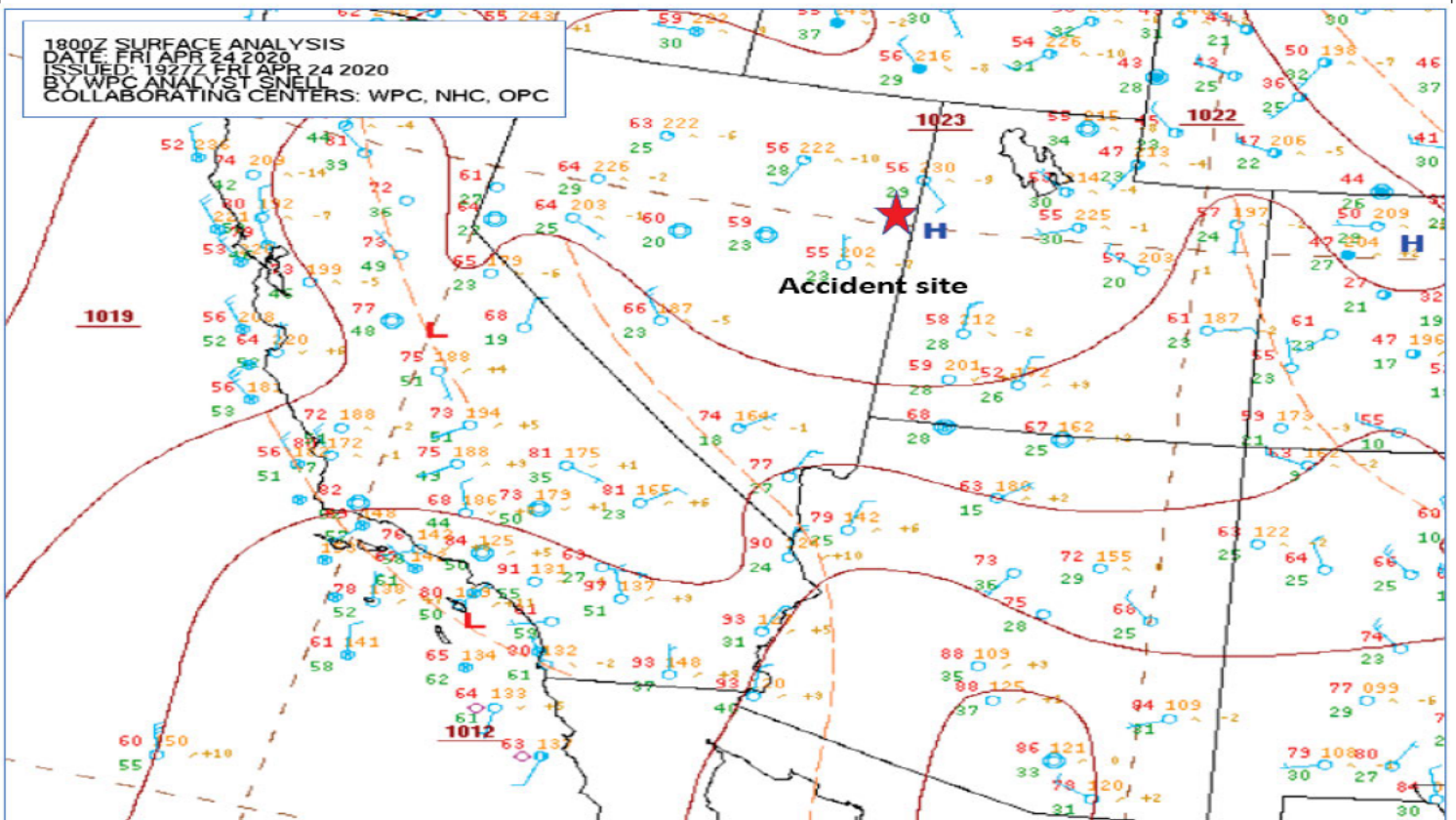
Preliminary Analysis



Additional Details



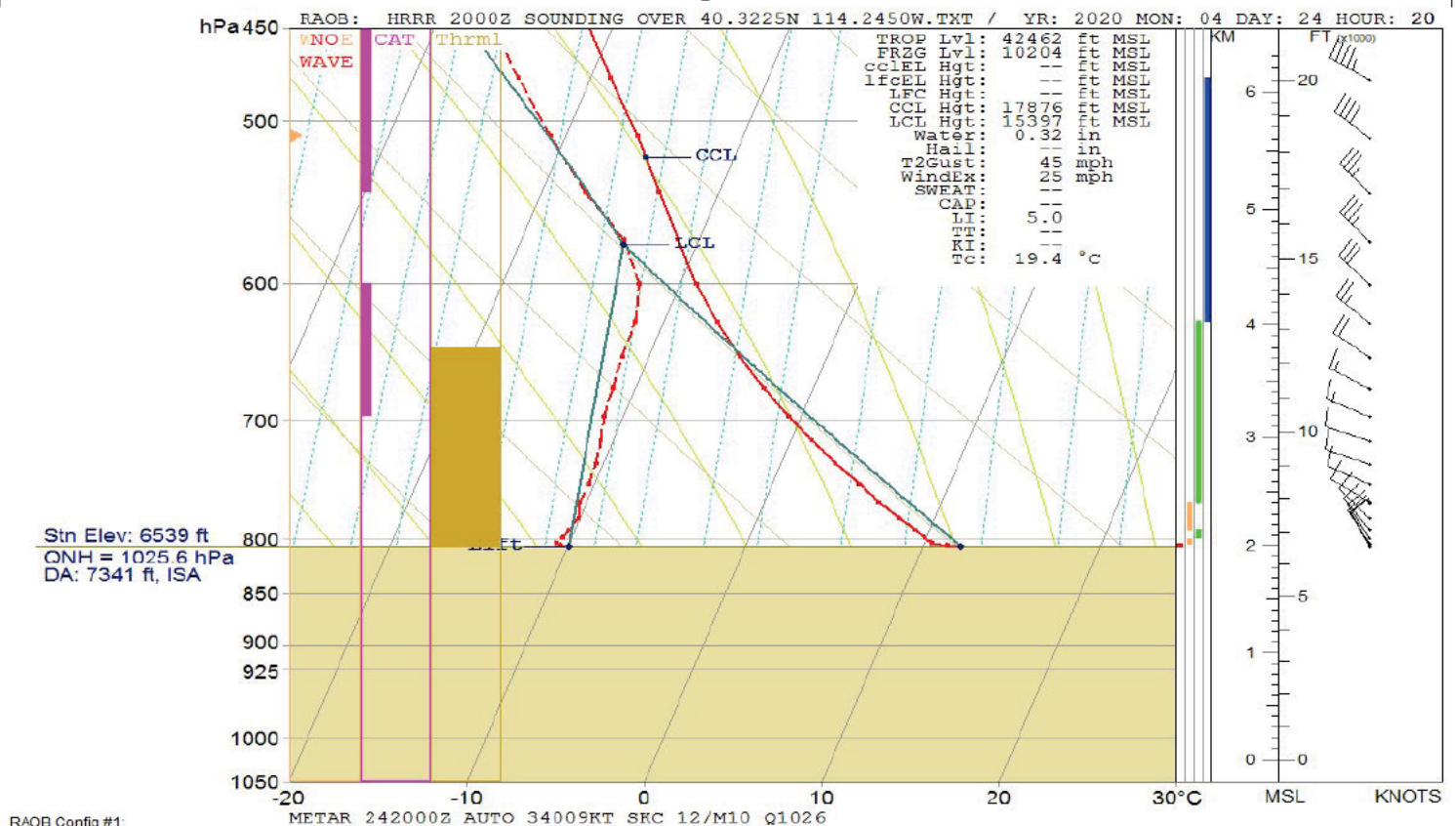
Figure 1



Caption

The western section of the NWS Surface Analysis Chart for 1100 PDT with the approximate accident site marked by the red star.

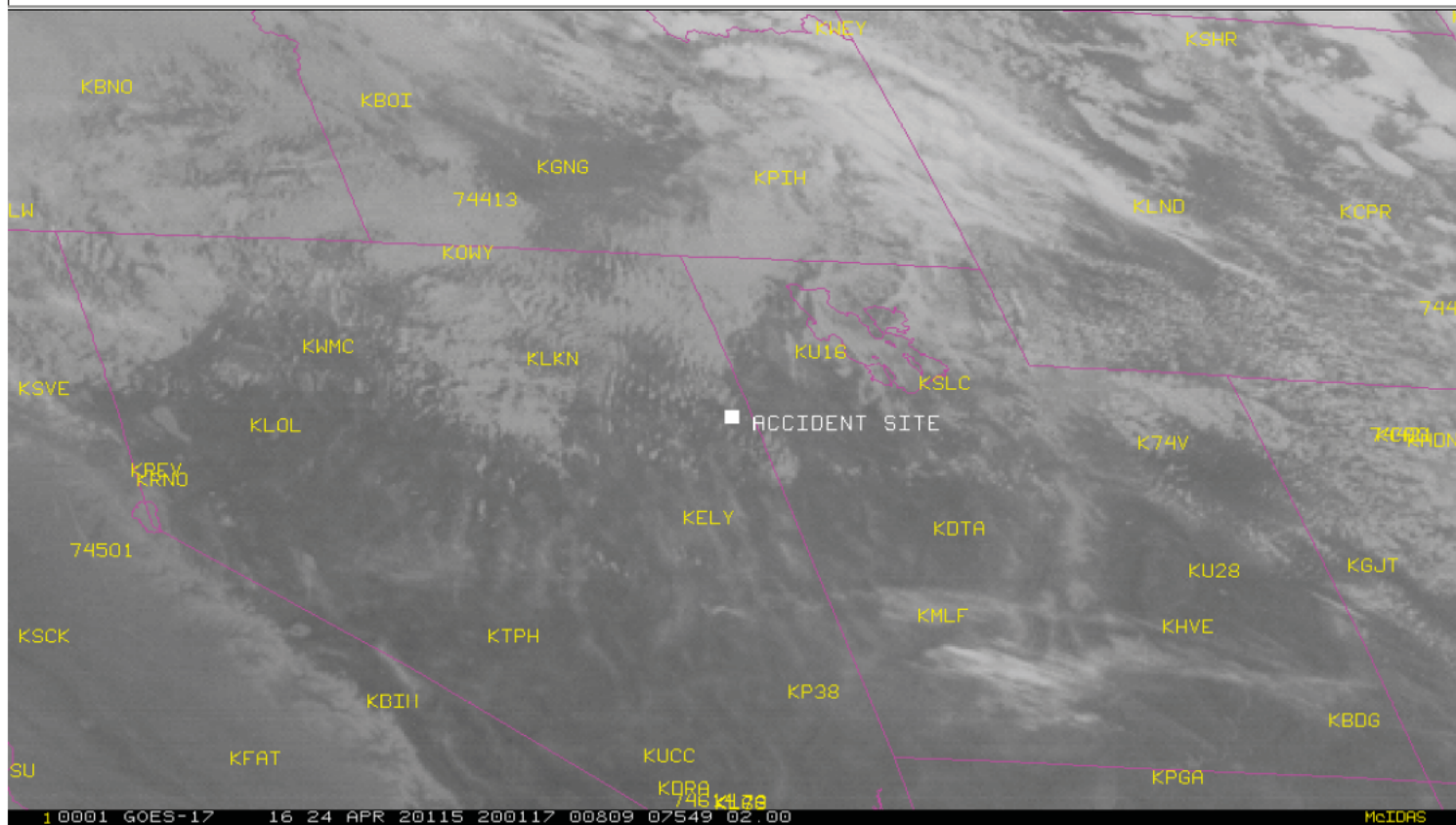
Figure 2



Caption

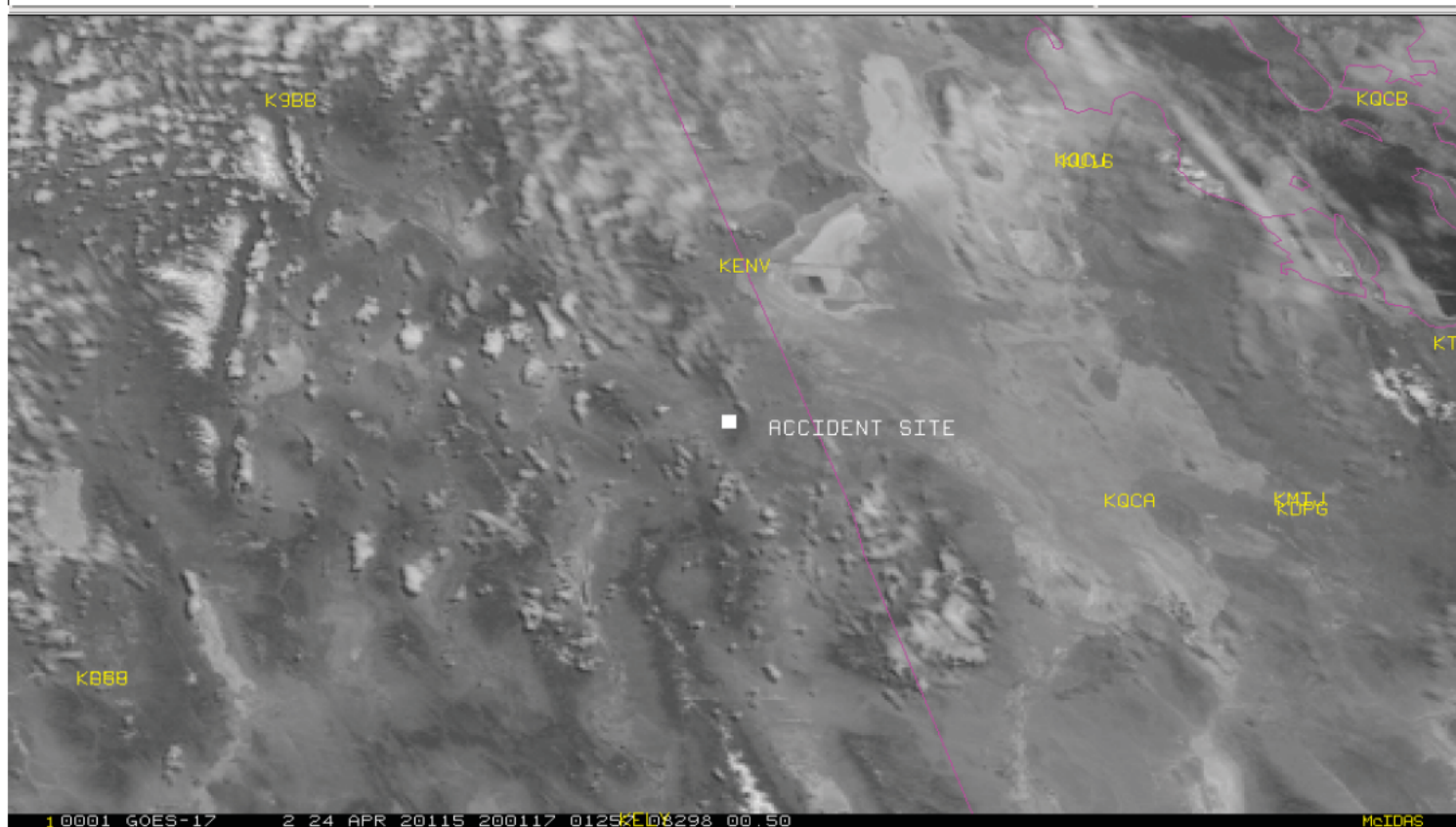
HRRR numerical model sounding for 1300 PDT over the accident site

Figure 3



Caption GOES-17 infrared image for 1301 PDT at 2X magnification with the accident site marked by the white square

Figure 4



Caption High resolution image of the GOES-17 visible image at 2X magnification for 1301 PDT