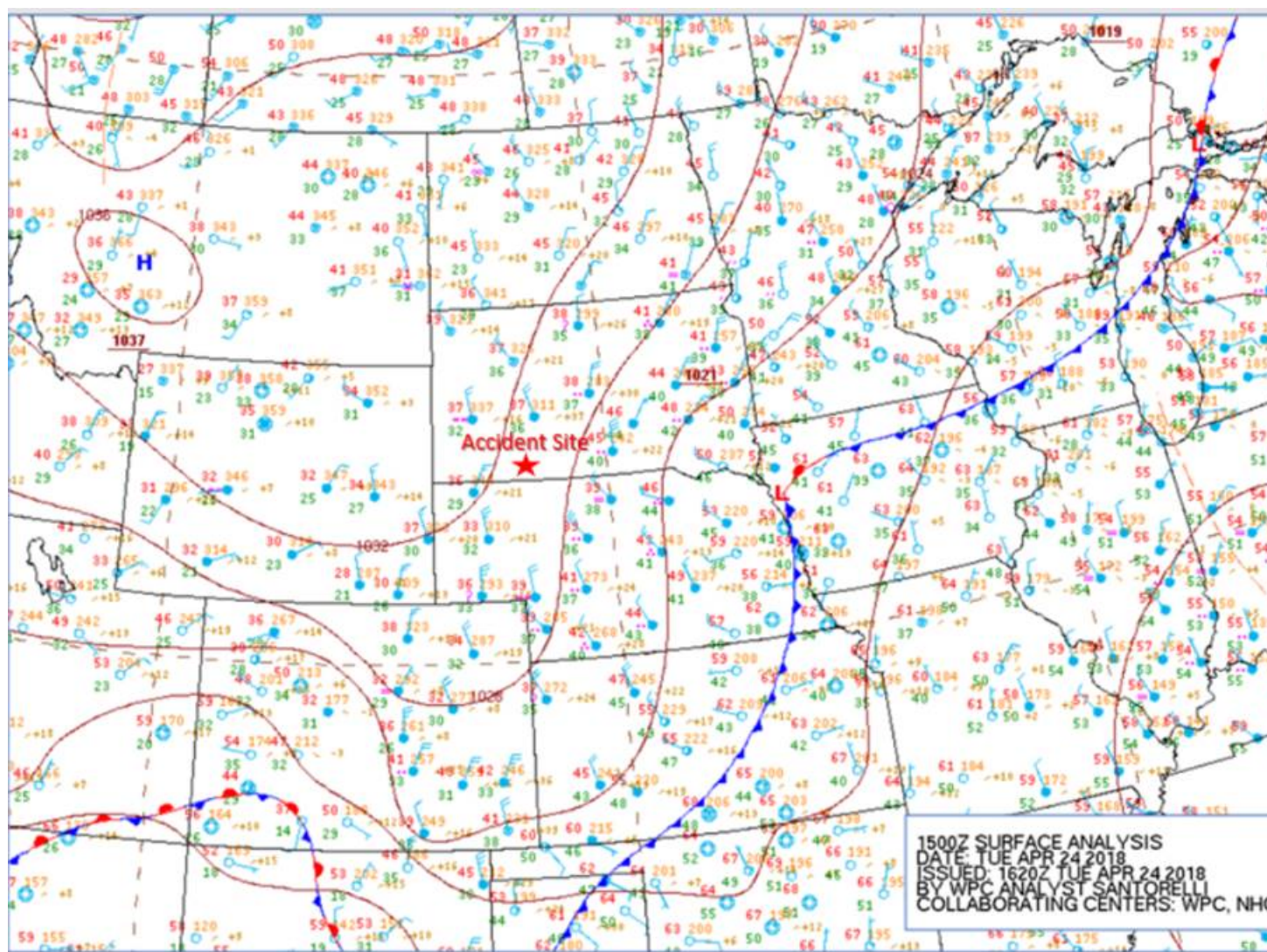


CEN18LA146 Weather Information

Synoptic Conditions – the NWS Surface Analysis Chart for 1500Z or 0900 MDT on April 24, 2018 indicated a frontal wave with a low-pressure system at 1021-hectopascals (hPa) over Iowa with a cold front extending southward and a stationary front eastward. A high-pressure system at 1037-hPa was located over Montana, which resulted in a relative strong pressure gradient over the Dakota's. The station models over South Dakota and Nebraska surrounding the accident site depicted generally north-northwest winds at 15 to 30 knots, overcast cloud cover, with temperatures in the mid 30's degrees Fahrenheit with temperature-dew point spreads of 5° F or less. Several stations reported light rain, light snow, and mist.

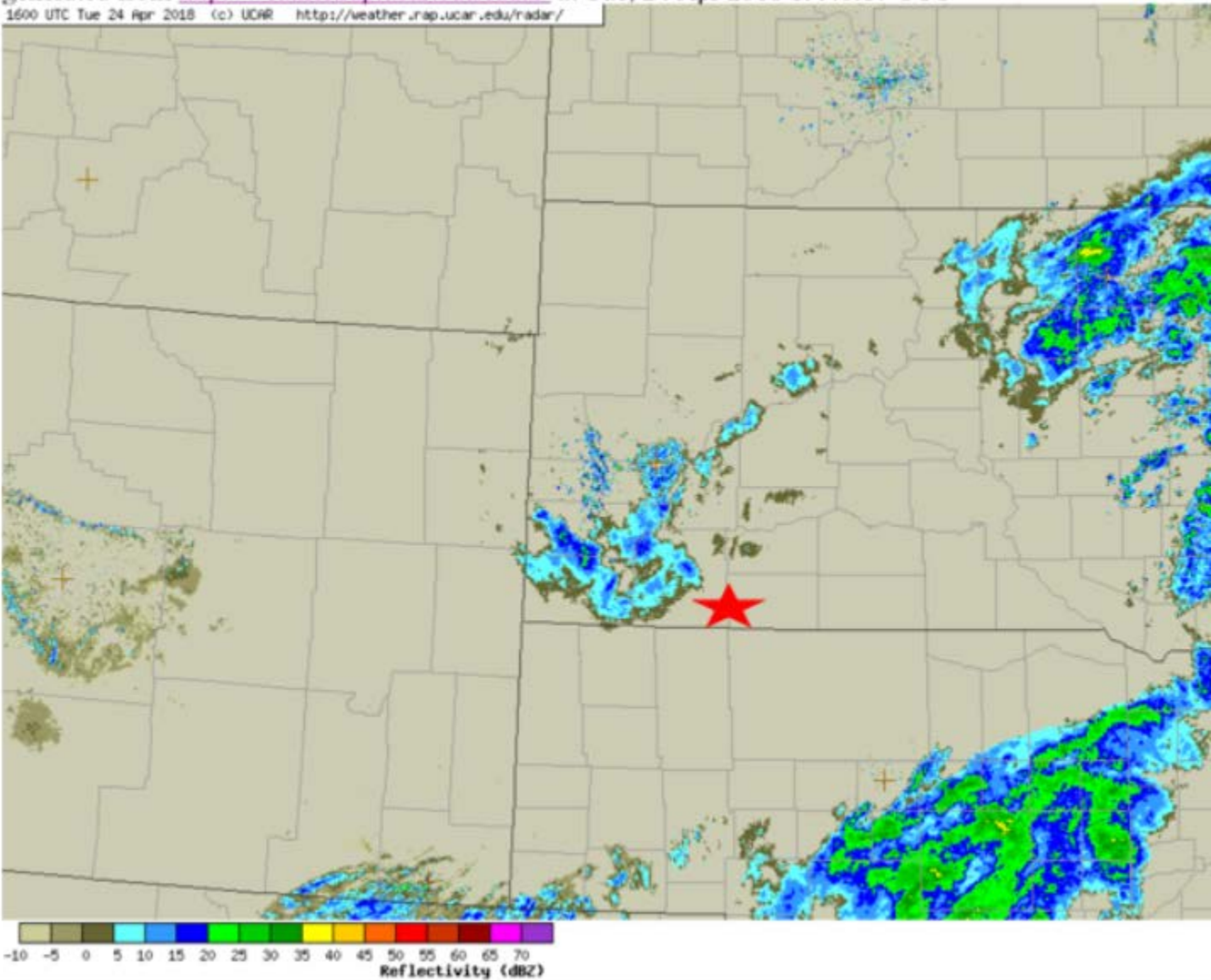
A review of the regional WSR-88D radar depicted a large area of echoes over eastern South Dakota into Nebraska with a small area of light intensity echoes near the destination west of the accident site, with no significant echoes over the accident site.



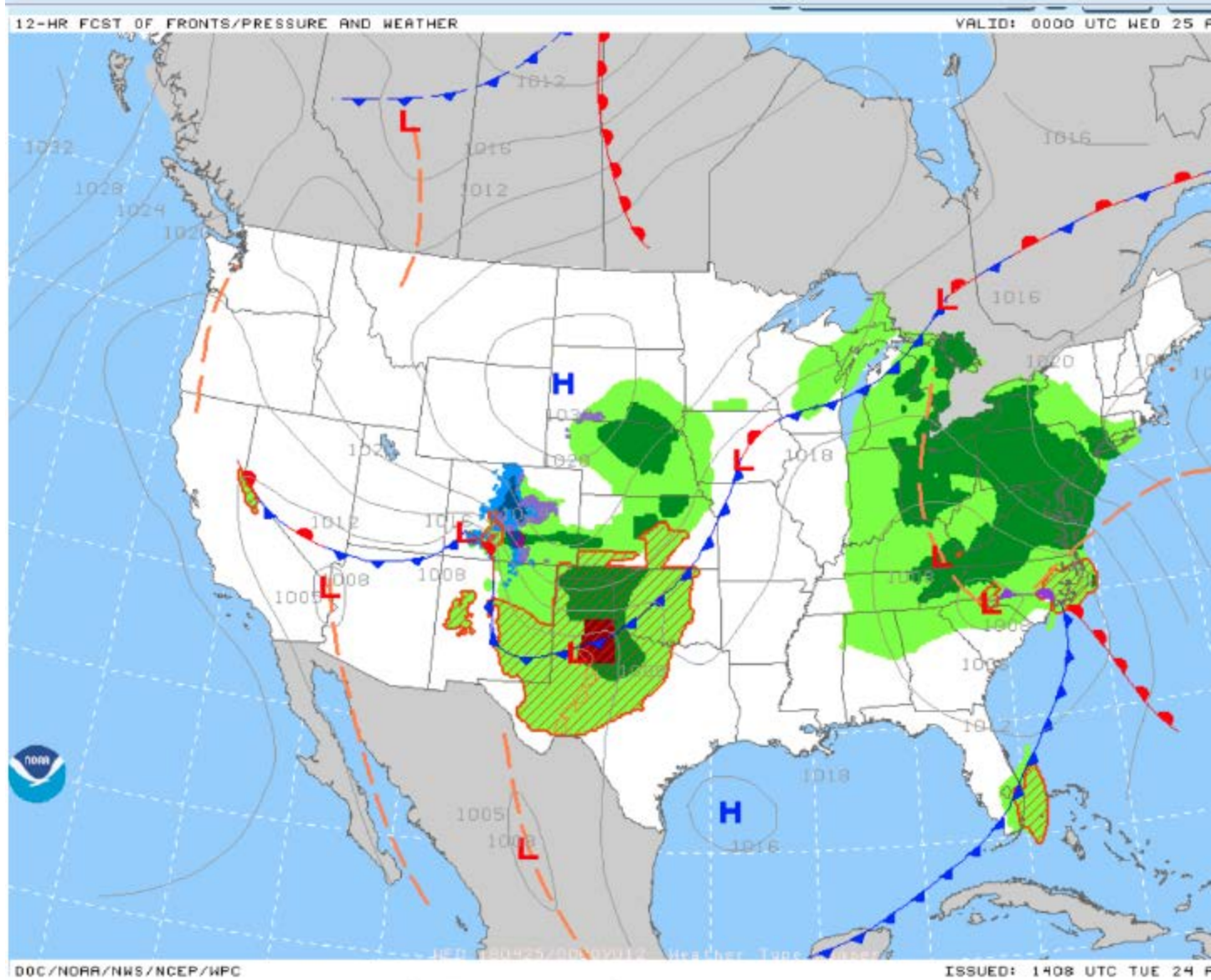
NEXRAD radar image(s) [KUDX N0R]

generated from <http://weather.rap.ucar.edu/radar/> at Tue, 24 Apr 2018 19:40:17 UTC

1600 UTC Tue 24 Apr 2018 (c) UCAR <http://weather.rap.ucar.edu/radar/>



The 12-hour Surface Prognostic chart current at the time indicated that an area of precipitation was expected over Nebraska and South Dakota related to the frontal wave.



Observations - The accident site was located about 19 miles east-northeast of Pine Ridge Airport (KIEN), Pine Ridge, South Dakota. The airport listed an elevation of 3,333 feet, and a magnetic variation of 10° W and had a Federally installed and maintained Automated Surface Observation System (ASOS). The following conditions were reported surrounding the time of the accident:

SPECI KIEN 241322Z AUTO 34014G23KT 10SM UP OVC009 02/01 A3041 RMK AO2 PK WND 36027/1304 RAE16UPB1258E00B16 CIG 008V013 P0000 T00170006

SPECI KIEN 241335Z AUTO 34012G24KT 6SM UP BR OVC010 01/01 A3042 RMK AO2 PK WND 36027/1304 RAE16UPB1258E00B16 CIG 008V013 P0000 T00110006

METAR KIEN 241352Z AUTO 35016G24KT 4SM -RA BR OVC010 02/01 A3042 RMK AO2 PK WND 36027/1304 RAE16B45UPB1258E00B16E39 SLP318 P0000 T00170006

METAR KIEN 241452Z AUTO 35015G22KT 5SM UP BR OVC012 02/01 A3043 RMK AO2 RAE10B36E37UPB1357E00B10 SLP325 P0000 60000 I3000 T00170006 51022

ACCIDENT 1545Z

METAR KIEN 241552Z AUTO 36011G20KT 6SM UP BR OVC013 02/01 A3045 RMK AO2 SLP330 P0000 T00170006

SPECI KIEN 241644Z AUTO 35014KT 10SM SCT016 BKN025 OVC030 03/01 A3046 RMK AO2 UPE19 P0000 T00280011

METAR KIEN 241652Z AUTO 36013G21KT 9SM -SN BKN016 OVC028 02/01 A3046 RMK AO2 UPE19SNB50 SLP334 P0000 T00220006

SPECI KIEN 241745Z AUTO 35011KT 10SM UP BKN013 BKN019 OVC028 03/01 A3045 RMK AO2 UPB1659SNE1659 P0000 T00280011

Weather conditions reported prior to the accident at 0852 MDT indicated an automated observation, wind from 350° at 15 knots gusting to 22 knots, 5 miles visibility in unknown precipitation and mist, ceiling overcast at 1,200 feet agl, temperature 2° C, dew point 1° C, altimeter 30.43 inches of mercury (Hg). Remarks: automated observation system, rain ended at 0810 and began 0835 and ended at 0837, unknown precipitation began at 0757 ended at 0800 and began at 0810 MDT, sea level pressure 1032.5-hPa, hourly precipitation less than 0.01-inch, temperature 1.7° C, dew point 0.6° C.

Weather conditions reported prior to the accident at 0952 MDT indicated an automated observation, wind from 360° at 11 knots gusting to 20 knots, 6 miles visibility in unknown precipitation and mist, ceiling overcast at 1,300 feet agl, temperature 2° Celsius (C), dew point 1° C, altimeter 30.45 inches of Hg. Remarks: automated observation system, sea level pressure 1033.0-hPa, hourly precipitation less than 0.01-inch, temperature 1.7° C, dew point 0.6° C.

Note – UP Weather code, the current ASOS/AWOS systems have a known limitation in its capability to detect and report freezing drizzle, snow pellets, and other types of freezing precipitation.

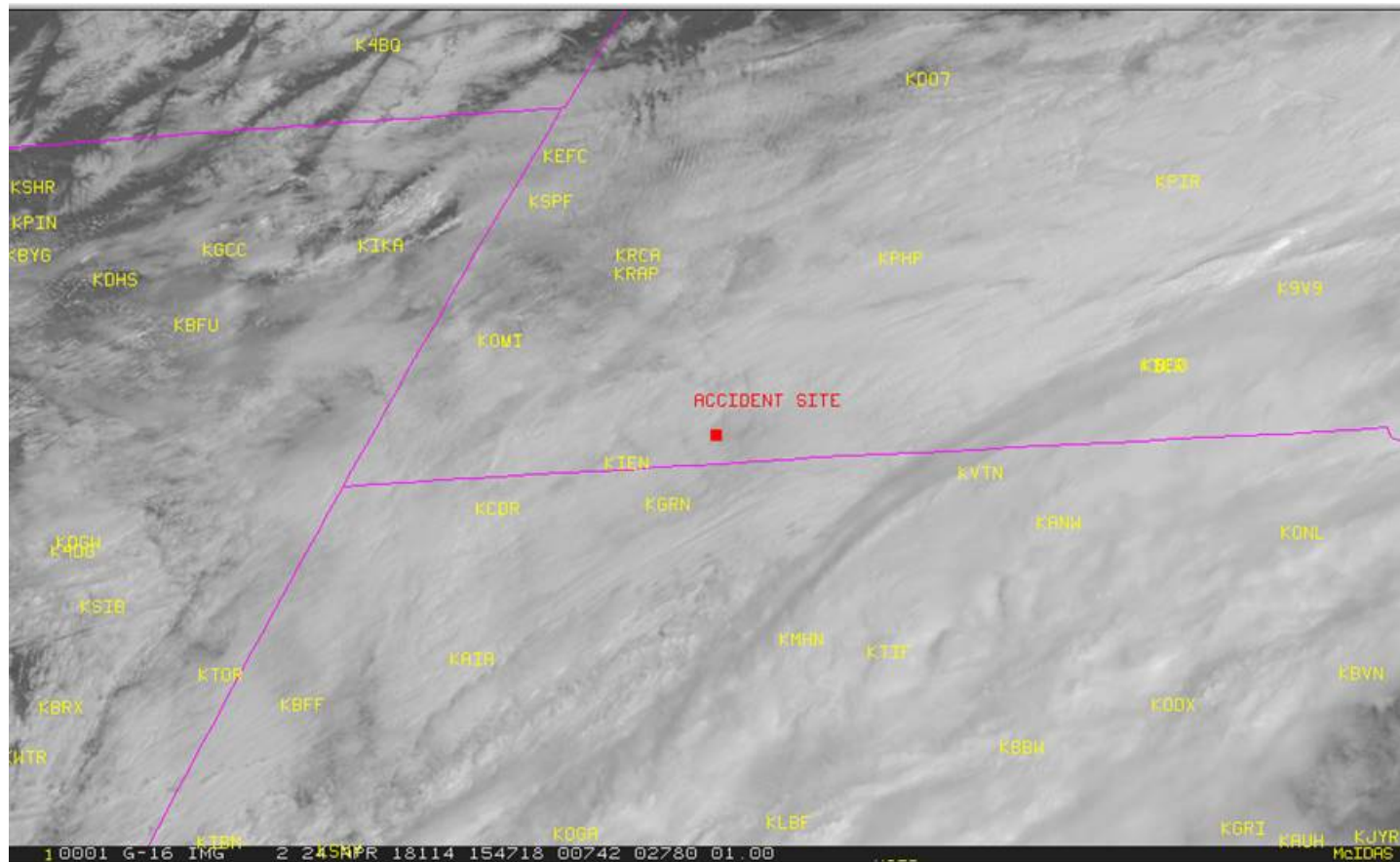
Pilot Reports – recorded within 100 miles of the accident site:

RAP UA /OV RAP080040/TM 1355/FL050/TP C310/TA M03/IC /LGT-MOD MX/RM ZDV/FD

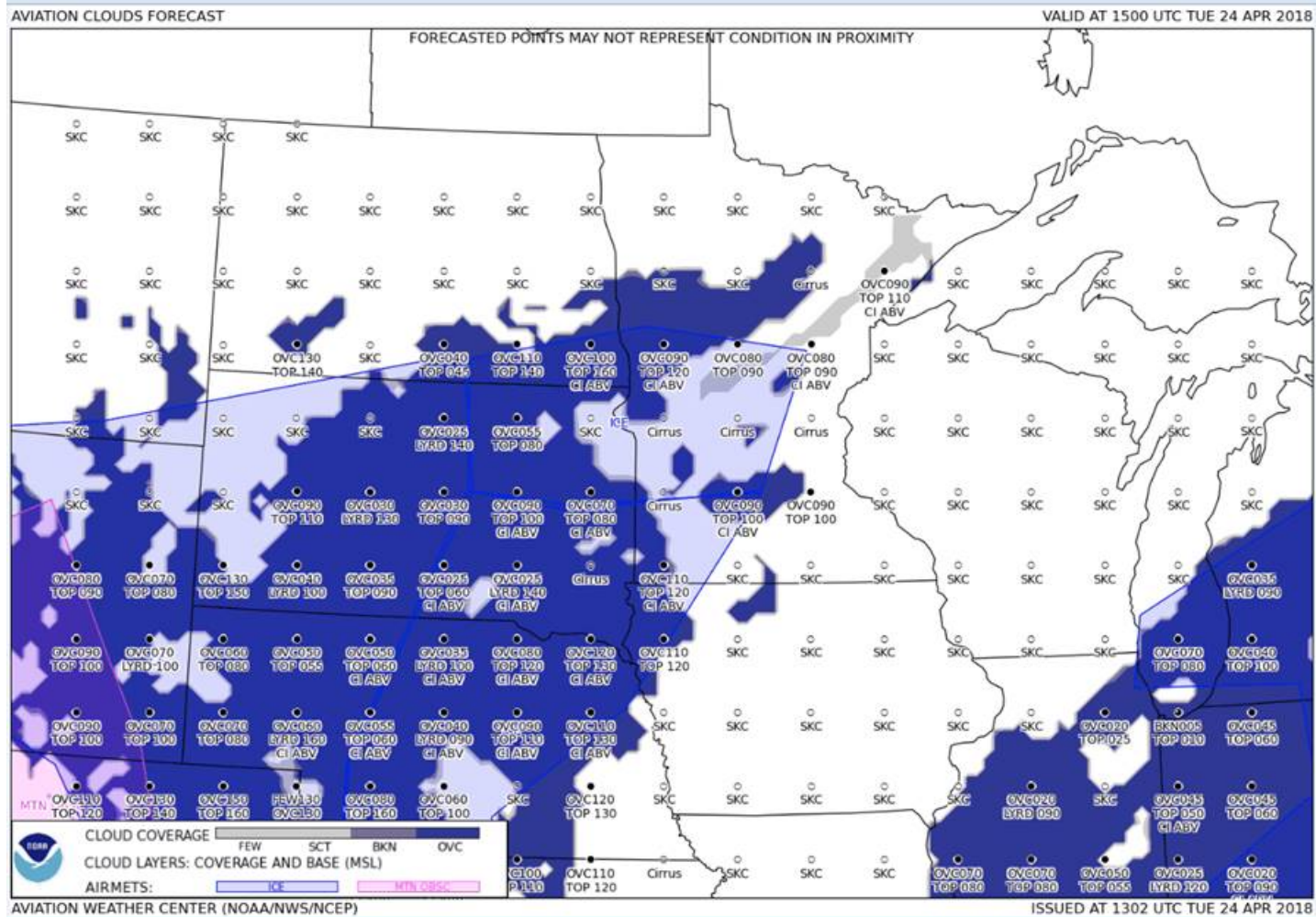
IEN UA /OV IEN050030/TM 1605/FL060/TP C303/IC UNKN/RM AIRCRAFT COULD NOT HOLD ATL. ZDV

RAP UA /OV RAP130030/TM 1755/FL114/TP EA50/TA M10/IC LGT CLR

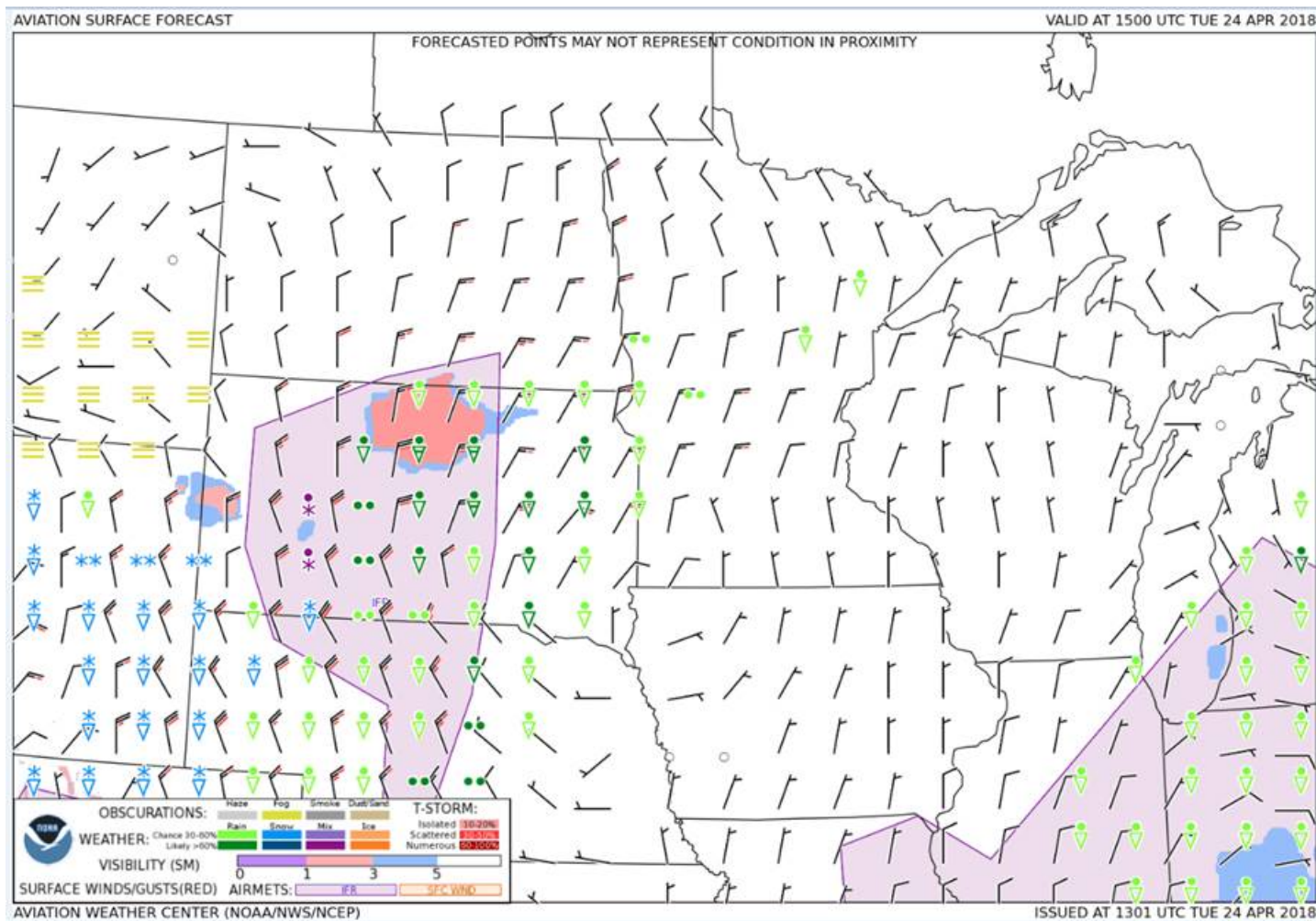
Satellite Imagery – the GOES-16 visible image at 1547Z or 0947 MDT is included below and depicted cloud tops near 16,000 feet over the accident site (marked in red)



Graphic Aviation Forecast (GFA) current at the time issued at 0700 MDT and valid for 0900 MDT is included below and depicted the AIRMET Zulu for icing in light blue. The dark blue represents overcast cloud cover, which was expected at 4,000 feet layered to 10,000 feet in the vicinity of the destination and the accident site.



The GFA surface wind and weather with a plot of AIRMET Sierra for IFR conditions valid at the time is included below. A mixture of rain and snow was expected over the region with NNW winds at 20 knots gusting to 30 knots.



Inflight Weather Advisories – The NWS Aviation Weather Center (AWC) had the following advisories current at the time:

WAUS43 KNCI 240845

WA3S

-CHIS WA 240845

AIRMET SIERRA UPDT 1 FOR IFR AND MTN OBSCN VALID UNTIL 241500

.

AIRMET IFR...ND SD NE KS

FROM 70W FAR TO 60ESE PIR TO 30SW ONL TO 50ESE LBF TO 20WSW HLC

TO 40N LBF TO 40E BFF TO 40SE SNY TO BFF TO 70SW RAP TO 70SW DIK

TO 30SSW BIS TO 70W FAR

CIG BLW 010/VIS BLW 3SM PCPN/BR. CONDS CONTG BYD 15Z ENDG 18-21Z.

WAUS43 KPCI 240845

WA3T

-CHIT WA 240845

AIRMET TANGO UPDT 1 FOR TURB AND LLWS VALID UNTIL 241500

.

AIRMET TURB...ND SD NE KS MN IA MO

FROM 30N INL TO 50NW DLH TO RWF TO 30ENE DSM TO 20NW MCI TO 40E

LAA TO GLD TO 70SW RAP TO 50NNW ISN TO 30N INL

MOD TURB BTN FL220 AND FL390. CONDS CONTG BYD 15Z THRU 21Z.

.

AIRMET TURB...ND SD NE KS

FROM 30NE DIK TO 20N ABR TO 70SSW PIR TO 20ESE MCK TO GLD TO 70SW RAP TO 60WSW DIK TO 30NE DIK

MOD TURB BLW 100. CONDS CONTG BYD 15Z THRU 21Z.

WAUS43 KPCI 240845

WA3Z

-CHIZ WA 240845

AIRMET ZULU UPDT 1 FOR ICE AND FRZLVL VALID UNTIL 241500

.

AIRMET ICE...ND SD MN WI LS

FROM INL TO 70WSW YQT TO 40WSW MSP TO 70SSE ABR TO 40E PIR TO

50ESE BIS TO 40NW BIS TO 40ENE GFK TO INL

MOD ICE BTN 050 AND FL180. CONDS CONTG BYD 15Z ENDG 15-18Z.

.

AIRMET ICE...SD NE KS MN IA

FROM 40WSW MSP TO 50NW OVR TO 40ESE OBH TO 50WNW SLN TO 50WSW ICT
TO 50SE GCK TO 60SE LAA TO GLD TO BFF TO 40E PIR TO 70SSE ABR TO 40WSW MSP
MOD ICE BTN FRZLVL AND FL210. FRZLVL 070-120. CONDS CONTG BYD 15Z THRU 21Z.

AIRMET ICE...ND SD NE

FROM 40NW BIS TO 50ESE BIS TO 40E PIR TO BFF TO 70SW RAP TO 60W DIK TO 40NW BIS
MOD ICE BLW 160. CONDS CONTG BYD 15Z THRU 21Z.

Winds and Temperature Aloft Forecast

WINDS ALOFT FORECASTS

DATA BASED ON 240600Z

VALID 241200Z FOR USE 0800-1500Z. TEMPS NEG ABV 24000

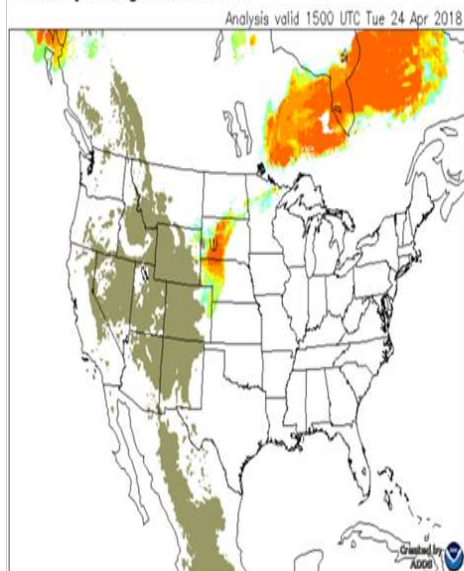
FT	3000	6000	9000	12000	18000	24000	30000	34000	39000
ABR	0435	1614+02	1716-02	2017-07	2611-21	2528-32	255547	255757	263956
PIR		2111+05	1916+00	2121-05	2526-20	2553-31	255547	255056	264257
RAP		0144-04	3528-07	3317-08	2819-21	2545-32	255747	254653	263555
BFF		3531	3323-03	2920-07	2538-18	2556-30	256146	265153	265057

Current Icing Products

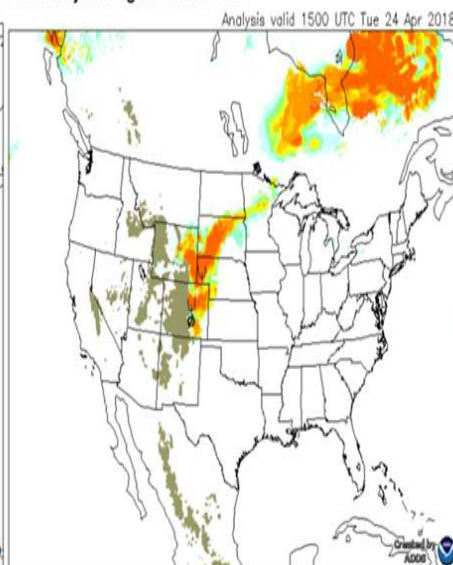
The NWS Aviation Weather Center (AWC) Current Icing Products (CIP analysis products which were available online for preflight briefing were as follows:

Probability of Icing at 5,000 ft, 7,000 ft, and 9,000 ft are as follows: the probability indicated a greater than 75% probability of icing over South Dakota from below 5,000 ft through 9,000 ft

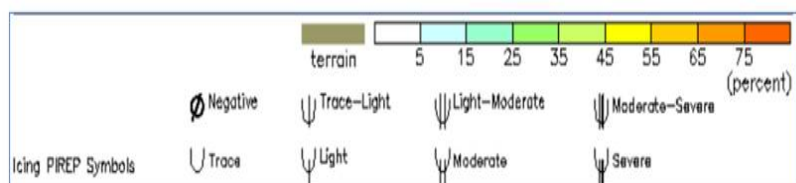
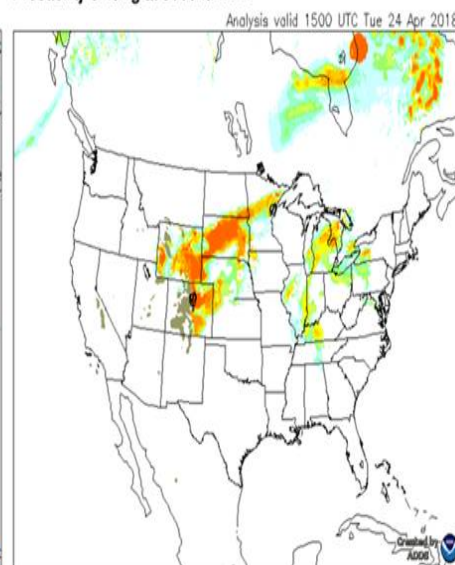
Probability of icing at 5000 ft. MSL



Probability of icing at 7000 ft. MSL



Probability of icing at 9000 ft. MSL

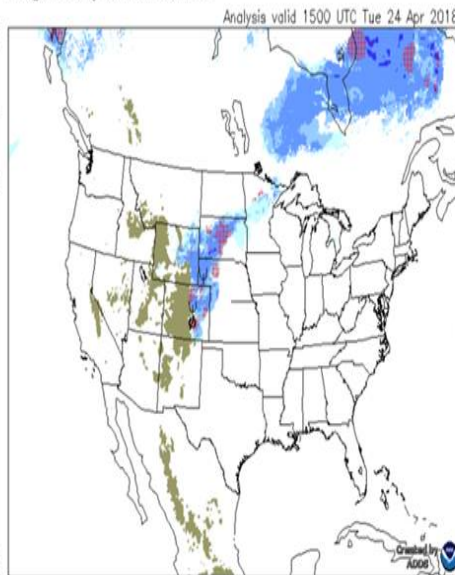


The Icing Intensity was depicted as light to moderate intensity, with a high threat of Supercooled Large Droplets (SLD) at 5,000 ft and 7,000 ft over the region.

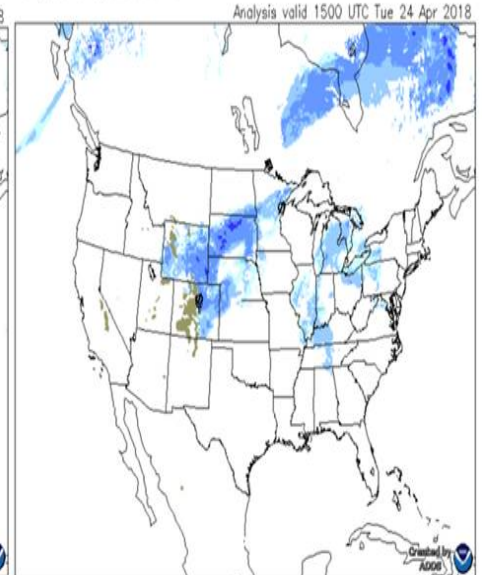
Icing severity at 5000 ft. MSL



Icing severity at 7000 ft. MSL



Icing severity at 9000 ft. MSL



SLD threat

terrain

None

Trace

Light

Moderate

Heavy