



# **National Transportation Safety Board**

**Office of Aviation Safety  
Washington, D.C. 20594-2000**

**February 12, 2016**

**WEATHER STUDY  
CEN16FA042**

## **A. Accident**

Location: Sandia Park, New Mexico

Date: November 16, 2015

Time: about 1300 mountain standard time (2000 UTC<sup>1</sup>)

Aircraft: Cessna 182G; N2440R

## **B. Meteorological Specialist**

Mike Richards

Senior Meteorologist

National Transportation Safety Board

Operational Factors Division, AS-30

Washington, DC 20594-2000

## **C. Details of the Investigation**

The National Transportation Safety Board's meteorological specialist did not travel in support of this accident investigation and gathered all weather data remotely. Unless otherwise noted, all times are in mountain standard time (MST) for November 16, 2015 (based upon the 24-hour clock), directions are referenced to true north, distances are in nautical miles and heights are above mean sea level (msl).

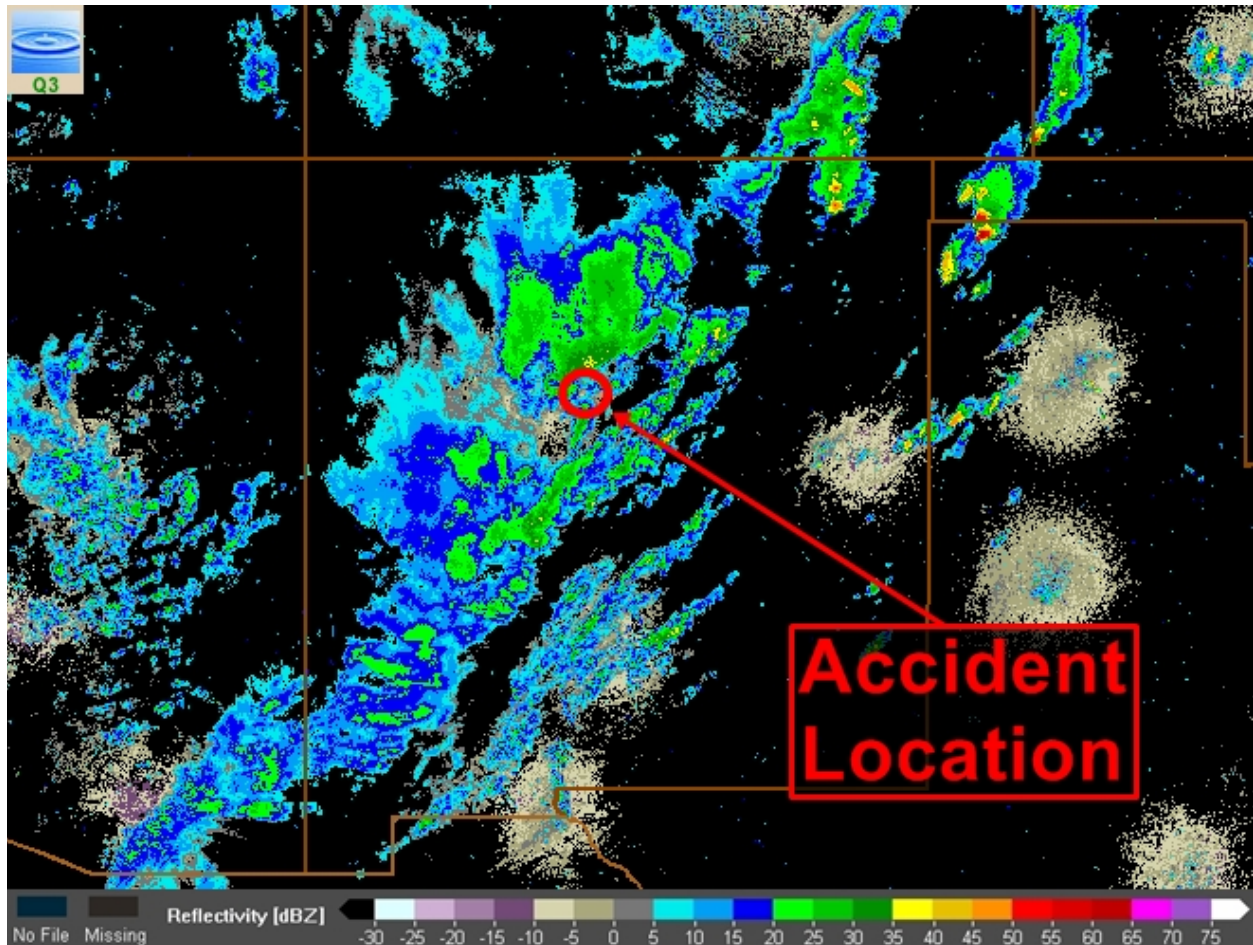
Coordinates used for the accident location: 35.16602° North latitude, 106.38415° West longitude, elevation of approximately 7,690 feet.

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<sup>1</sup> UTC – abbreviation for Coordinated Universal Time

## Regional Conditions

A WSR-88D regional radar composite reflectivity mosaic obtained from the National Mosaic and Multi-Sensor (NMQ) Project<sup>2</sup> at 1300 MST (figure 1) identified a wide area of light (and small areas of moderate) reflectivity values over the accident region.



**Figure 1** – NMQ NEXRAD mosaic from 1300 MST.

## Surface Observations

An official surface observation station was located at Albuquerque International Sunport Airport (ABQ) in Albuquerque, New Mexico, which was located about 16 miles southwest of the accident location at an elevation of 5,355 feet. Human-augmented reports from ABQ during the times surrounding the accident time are presented here:

[1222 MST] SPECI KABQ 161922Z 28021G33KT 10SM -RA FEW003 SCT009  
OVC028 03/01 A2964 RMK AO2 PK WND 26036/1900 LTG DSNT SE  
AND S MTNS OBSC NE-SE P0002 T00330006=

<sup>2</sup>The NMQ project is a joint initiative between the National Severe Storms Laboratory, Federal Aviation Administration, National Weather Service/Office of Hydrologic Development, the Office of Climate, Water and Weather Services and the University of Oklahoma Cooperative Institute in Mesoscale Meteorological Studies.

[1241 MST] SPECI KABQ 161941Z 29017G22KT 10SM FEW004 BKN031 OVC041  
04/01 A2962 RMK AO2 PK WND 26036/1900 RAE23 MTNS OBSC NE-  
SE P0002 T00390006=

[1252 MST] **METAR KABQ 161952Z 29021G27KT 10SM FEW005 BKN041  
OVC110 04/M01 A2962 RMK AO2 PK WND 26036/1900 RAE23  
SLP010 MTNS OBSC NE-SE P0002 T00441006=**

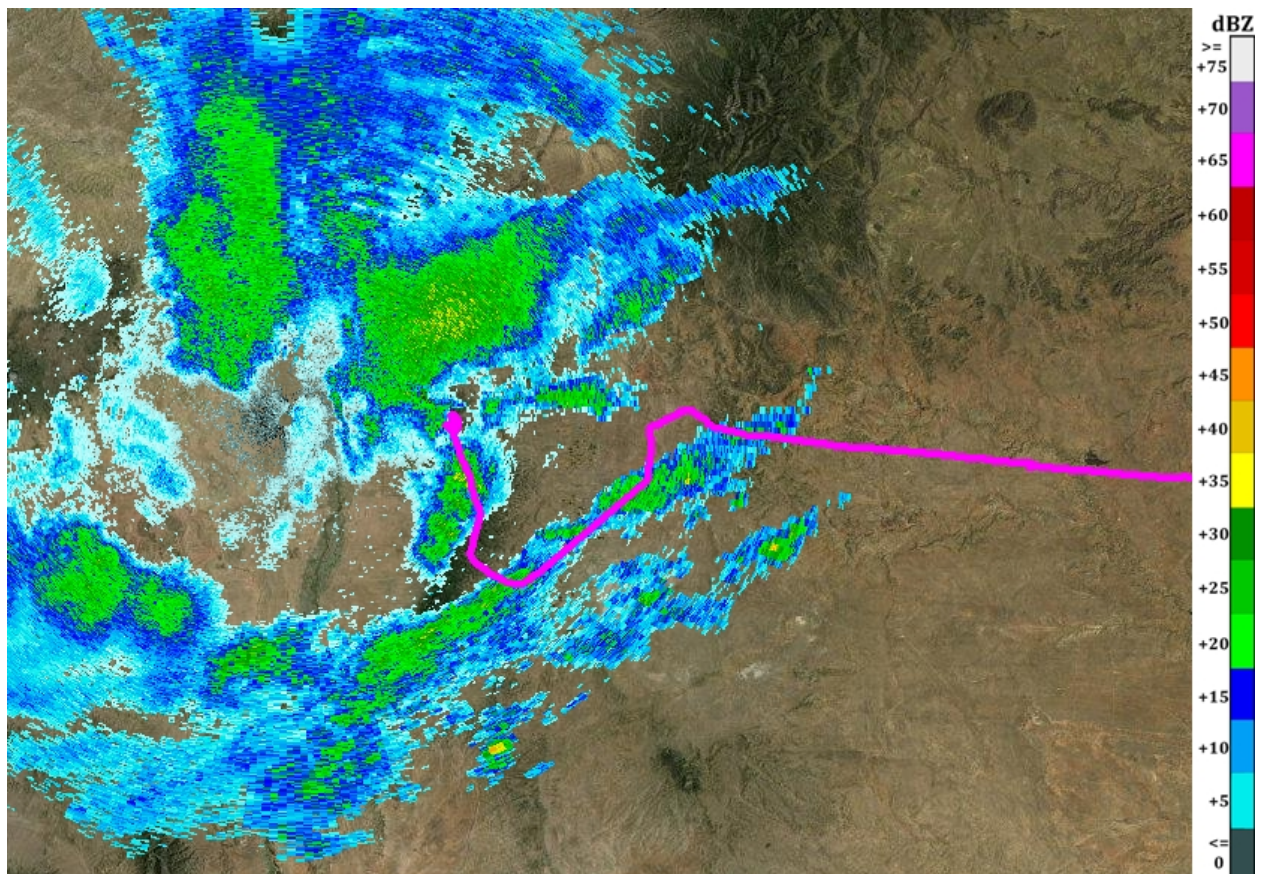
[1352 MST] METAR KABQ 162052Z 32007KT 290V350 6SM -SN BKN046 OVC055  
04/M02 A2962 RMK AO2 PK WND 30030/1955 RAB35E36SNB36  
SLP009 MTNS OBSC NE-SE P0000 60007 T00441017 51008=

At 1252 MST, ABQ reported a wind from 290° 21 knots with gusts to 27 knots, visibility of 10 statute miles or greater, few clouds at 500 feet above ground level (agl), ceiling broken at 4,100 feet agl, overcast cloud base at 11,000 feet agl, temperature of 4° Celsius (C) and a dew point temperature of -1°C, altimeter setting of 29.62 inches of mercury; remarks included: station with a precipitation discriminator, peak wind of 36 knots from 260° occurred at 1200 MST, rain ended at 1223 MST, mountains obscured to the northeast through southeast.

## **Weather Radar**

WSR-88D Level-II weather radar imagery from Albuquerque, New Mexico (KABX), is presented in figure 2. KABX was located approximately 22 miles west of the accident site at an elevation of about 5,870 feet. Assuming standard refraction and considering the 0.95° beam width for the WSR-88D radar beam, the KLSX 1.81° tilt would have “seen” altitudes between about 14,600 and 19,600 feet above msl at the accident location.

The KABX 1.81° imagery presents light values of reflectivity along the final portions of the accident aircraft’s flight (though the aircraft’s altitude is not known).



**Figure 2** – KABX 1.81° Level-II reflectivity product from 1259:22 MST. Accident aircraft flight path noted by pink line.

### **Upper Air Data**

A North American Mesoscale (NAM) model sounding (figure 3) for the accident location at 1300 MST was retrieved from the National Oceanic and Atmospheric Administration's Air Resources Laboratory. The wind between the surface and about 10,000 feet was from the northwest at about 20 knots. At about 11,500 feet the wind was from the west at about 15 knots. Above this level the wind was from the south-southwest with increasing magnitudes with height. At about 15,500 feet the wind was 44 knots. The Rawinsonde Observation Program (RAOB) identified the potential for significant icing between the surface and about 17,000 feet.



|      |                 |       |      |    |        |
|------|-----------------|-------|------|----|--------|
| 2038 | 35.027/-106.659 | 7500  | 305° | 21 | -1.4°  |
| 2038 | 35.027/-106.669 | 7850  | 297° | 20 | -2.3°  |
| 2038 | 35.027/-106.679 | 8280  | 288° | 22 | -3.4°  |
| 2038 | 35.027/-106.689 | 8820  | 283° | 31 | -4.4°  |
| 2038 | 35.027/-106.689 | 9450  | 277° | 39 | -5.4°  |
| 2038 | 35.027/-106.699 | 10000 | 272° | 36 | -5.9°  |
| 2039 | 35.027/-106.729 | 10610 | 259° | 23 | -6.8°  |
| 2039 | 35.027/-106.759 | 11600 | 233° | 19 | -7.8°  |
| 2039 | 35.047/-106.789 | 12670 | 212° | 22 | -9.8°  |
| 2040 | 35.047/-106.819 | 13790 | 201° | 30 | -10.9° |
| 2040 | 35.047/-106.859 | 14850 | 206° | 39 | -13.1° |
| 2040 | 35.047/-106.889 | 15470 | 204° | 38 | -15.1° |
| 2041 | 35.047/-106.929 | 16700 | 215° | 44 | -17.6° |
| 2041 | 35.067/-106.959 | 17900 | 205° | 52 | -20.5° |
| 2041 | 35.067/-106.989 | 18870 | 206° | 58 | -22.5° |
| 2042 | 35.067/-107.029 | 19990 | 209° | 65 | -24.5° |

**Table 1** – AMDAR meteorological data received from AC#11111

| <u>Time</u> | <u>Latitude/Longitude</u> | <u>Altitude</u> | <u>W-Dir</u> | <u>W-Mag</u> | <u>Temp</u> |
|-------------|---------------------------|-----------------|--------------|--------------|-------------|
| 2029        | 35.049/-106.599           | 5600            | 319°         | 5            | 3.6°        |
| 2029        | 35.049/-106.599           | 5610            | 312°         | 5            | 3.6°        |
| 2029        | 35.049/-106.589           | 5620            | 303°         | 6            | 3.8°        |
| 2029        | 35.049/-106.589           | 5620            | 292°         | 8            | 4.1°        |
| 2029        | 35.049/-106.609           | 5730            | 342°         | 7            | 3.6°        |
| 2029        | 35.049/-106.619           | 5960            | 351°         | 8            | 3.0°        |
| 2029        | 35.049/-106.629           | 6670            | 345°         | 10           | 1.3°        |
| 2030        | 35.049/-106.639           | 7000            | 312°         | 13           | 0.3°        |
| 2030        | 35.049/-106.639           | 7220            | 009°         | 17           | -0.8°       |
| 2030        | 35.049/-106.649           | 7380            | 286°         | 15           | -1.4°       |
| 2030        | 35.059/-106.649           | 7520            | 279°         | 15           | -1.5°       |
| 2030        | 35.059/-106.659           | 7590            | 289°         | 21           | -2.0°       |
| 2030        | 35.069/-106.669           | 8030            | 289°         | 30           | -2.8°       |
| 2030        | 35.069/-106.669           | 8510            | 285°         | 28           | -3.3°       |
| 2030        | 35.079/-106.679           | 8750            | 284°         | 31           | -4.0°       |
| 2030        | 35.079/-106.679           | 9230            | 279°         | 40           | -5.8°       |
| 2031        | 35.099/-106.699           | 9570            | 263°         | 39           | -5.9°       |
| 2031        | 35.119/-106.719           | 10280           | 261°         | 24           | -6.5°       |
| 2031        | 35.139/-106.729           | 10610           | 258°         | 34           | -8.0°       |
| 2032        | 35.169/-106.739           | 11400           | 252°         | 36           | -9.9°       |
| 2032        | 35.199/-106.749           | 12260           | 242°         | 32           | -11.8°      |
| 2032        | 35.229/-106.759           | 13030           | 230°         | 25           | -12.5°      |
| 2033        | 35.259/-106.779           | 13700           | 215°         | 20           | -13.9°      |
| 2033        | 35.279/-106.799           | 14290           | 201°         | 24           | -14.8°      |
| 2033        | 35.309/-106.819           | 14940           | 201°         | 30           | -15.3°      |
| 2034        | 35.339/-106.849           | 15600           | 205°         | 34           | -15.8°      |
| 2034        | 35.359/-106.869           | 16360           | 207°         | 32           | -17.7°      |
| 2034        | 35.389/-106.899           | 17170           | 208°         | 31           | -19.3°      |
| 2035        | 35.419/-106.919           | 17930           | 209°         | 31           | -21.0°      |

|      |                 |       |      |    |        |
|------|-----------------|-------|------|----|--------|
| 2035 | 35.449/-106.939 | 18550 | 205° | 36 | -22.7° |
| 2035 | 35.479/-106.969 | 19040 | 201° | 42 | -23.5° |
| 2036 | 35.509/-106.989 | 19500 | 205° | 48 | -24.5° |
| 2036 | 35.539/-107.019 | 20020 | 207° | 51 | -26.0° |

**Table 2** – AMDAR meteorological data received from AC#8497

## **Pilot Reports**

Publicly disseminated pilot reports<sup>5</sup> made within two hours of the accident time at or below FL200<sup>6</sup> within the 100 miles of ABQ are presented here:

ABQ UA /OV ABQ060015 /TM 1910 /FL130 /TP MD90 /TB MOD 130-120 /RM DURD=

DMN UA /OV DMN/TM 1929/FL150/TP BE55/TB MOD TURB=

ABQ UA /OV ABQ107025/TM 2017/FL150/TP MD82/TA -12/IC MODERATE RIM/RM FL: 150-200 ...ZAB/FDCS=

DMN UA /OV DUG090070 /TM 2110 /FL200 /TP C27J /TA M22 /TB LGT CHOP /IC NEG=

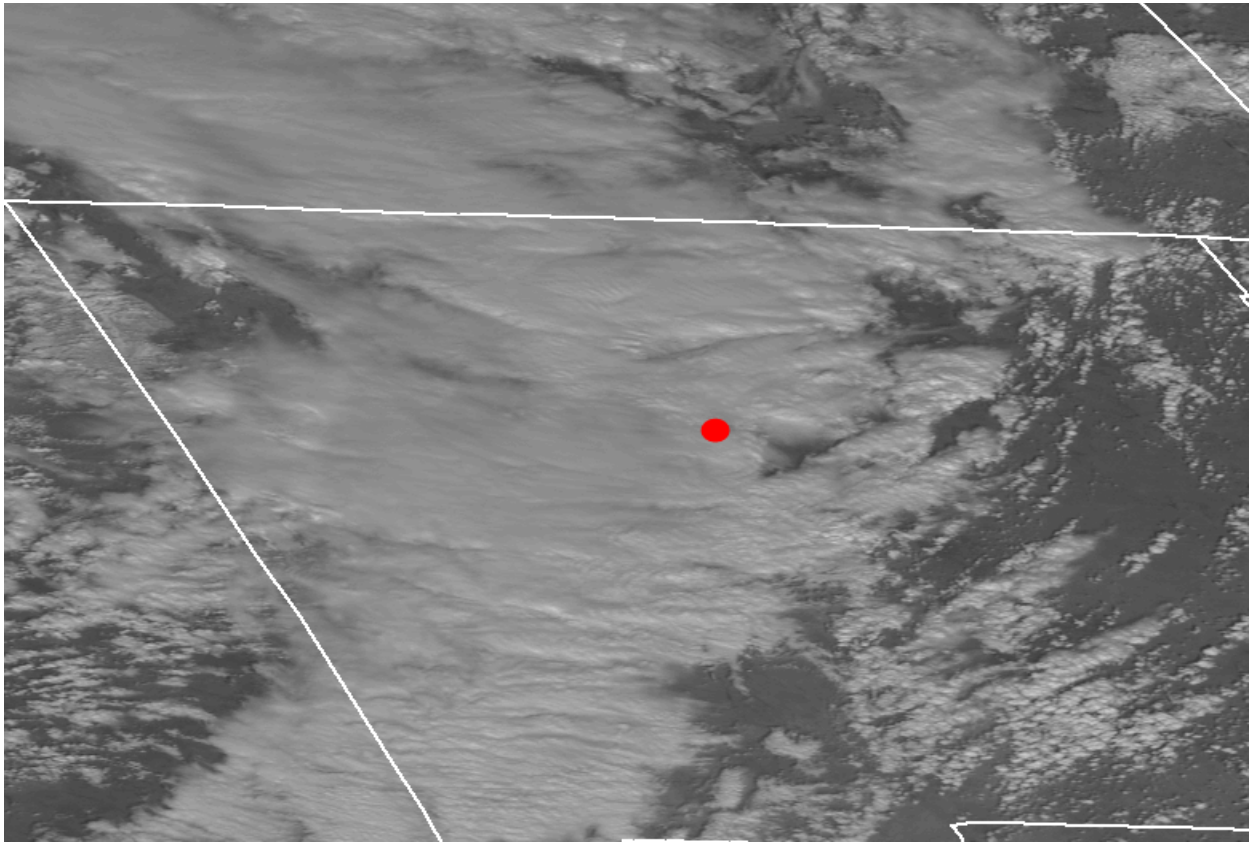
ONM UA /OV ONM075010/TM 2125/FL120/TP V22/TA -12/IC MOD MIXED/RM ZAB FDCS=

## **Satellite Imagery**

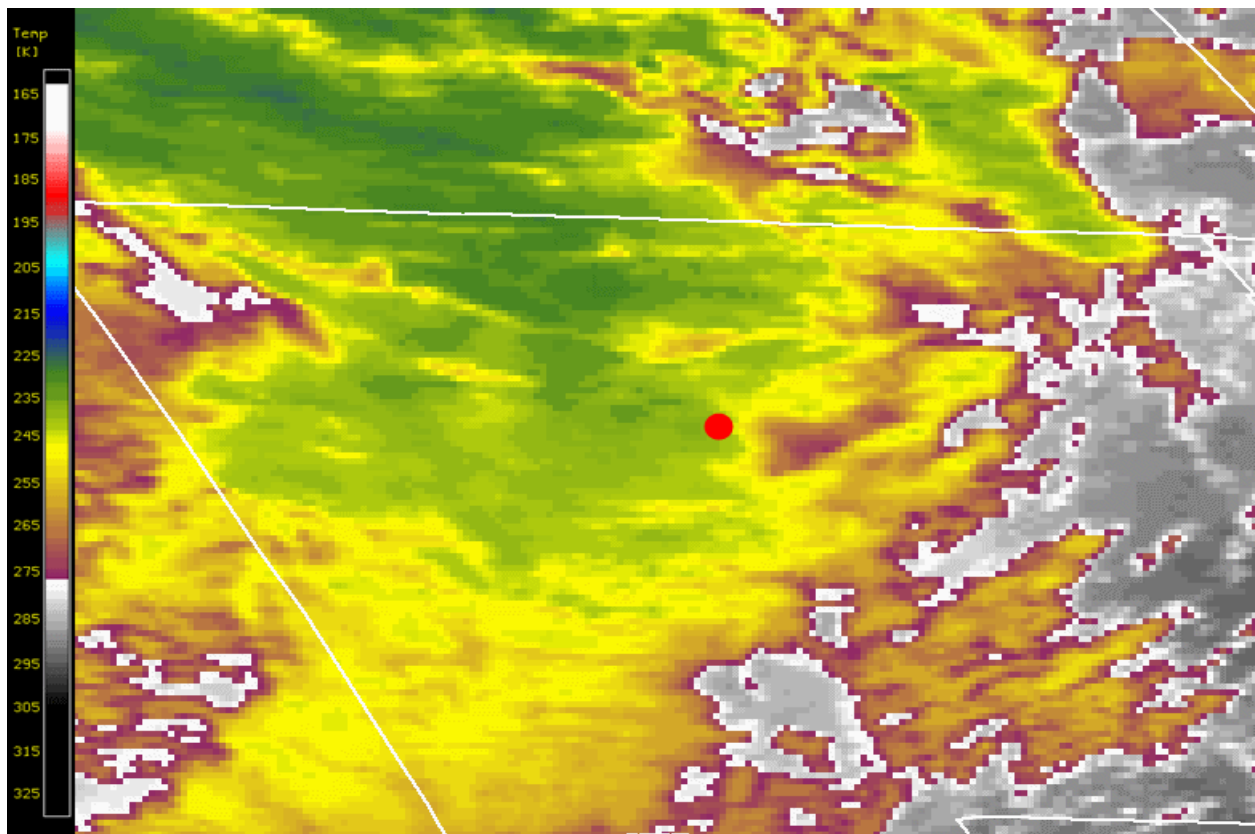
Geostationary Operational Environmental Satellite (GOES)-15 visible (0.63μm) and infrared (10.7μm) data were obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison. Imagery from 1300 MST is presented in figures 4 and 5. The GOES-15 visible imagery identified cloudy conditions over the accident location, with infrared cloud-top temperatures of about -39°C over the accident site. When considering the NAM model sounding, -39°C corresponded to a cloud top height of approximately 28,000 feet. The cloud-top temperatures did vary in region, with some satellite-derived temperatures reaching 0°C, suggesting cloud top heights from 28,000 feet to near ground level (or possibly below higher tops of terrain in the Albuquerque region). It should be noted these figures have not been corrected for any parallax error.

<sup>5</sup> Only pilot reports with the WMO header UBNM\*\* were considered.

<sup>6</sup> Flight Level (FL) - standard nominal altitude of an aircraft, in hundreds of feet. This altitude is calculated from the International standard atmosphere using 1013.25 hPa (29.92 in Hg) for surface pressure.

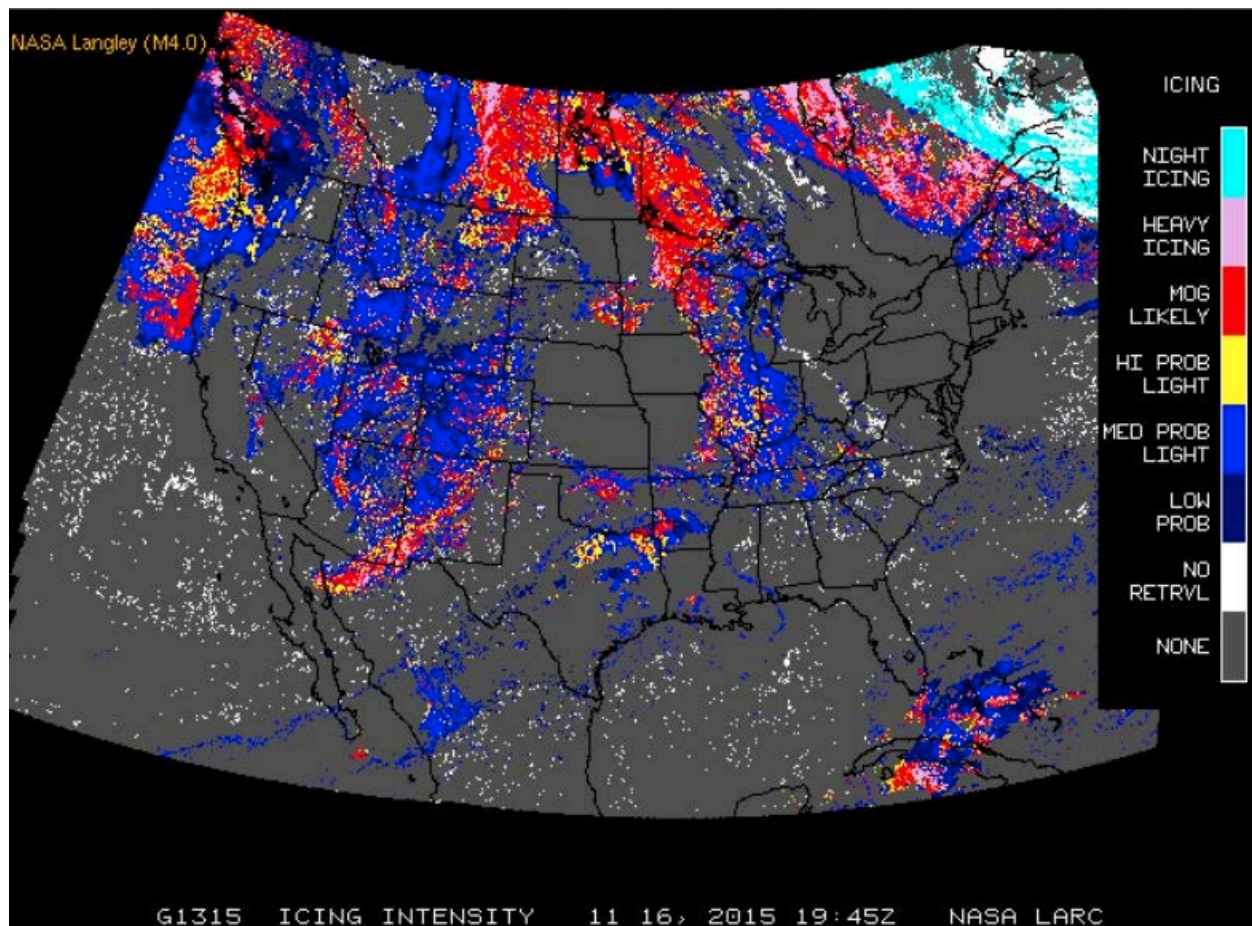


**Figure 4** – GOES-15 0.62  $\mu\text{m}$  (visible) imagery from 1300 MST. Red dot denotes accident location.



**Figure 5** – GOES-15 10.7  $\mu\text{m}$  (infrared) color-enhanced imagery from 1300 MST. Red dot denotes accident location.

Figure 6 presents results from an icing intensity algorithm produced by the National Aeronautics and Space Administration's (NASA) Langley Research Center (LaRC)<sup>7</sup> applied to GOES satellite data for 1245 MST. This algorithm gives a likelihood of "moderate or greater" icing in the accident area.



**Figure 6** – NASA LaRC GOES icing intensity for 1245 MST.

### **Area Forecast**

An Area Forecast that included the state of New Mexico was issued at 0445 MST by the Aviation Weather Center in Kansas City, Missouri. Cloud heights are above msl. The portion of the Area Forecast directed toward the New Mexico mountains and west (for the northern portion of the state) forecasted for the accident time: broken clouds between 9,000 and 10,000 feet, broken clouds at 13,000 feet, widely scattered light rain showers.

FAUS45 KPCI 161145  
FA5W  
\_SLCC FA 161145  
SYNOPSIS AND VFR CLDS/WX

<sup>7</sup> Courtesy of Dr. William Smith Jr.

SYNOPSIS VALID UNTIL 170600  
CLDS/WX VALID UNTIL 170000...OTLK VALID 170000-170600  
ID MT WY NV UT CO AZ NM

.  
SEE AIRMET SIERRA FOR IFR CONDS AND MTN OBSCN.  
TS IMPLY SEV OR GTR TURB SEV ICE LLWS AND IFR CONDS.  
NON MSL HGTS DENOTED BY AGL OR CIG.

.  
SYNOPSIS...ALF...DEEP UPR TROF EXTDS FM ERN WA-NW NV TO LOW  
SRN NV..CONTG INTO SRN CA. BY 06Z TROF WL EXTND FM ERN MT-ERN  
WY TO UPR LOW S CNTRL CO..COMTG TO SW NM. STG NLY FLOW EXTDS  
FM WRN WA TO CNTRL CA AND STG SWLY FLOW EXTDS FM SW AZ  
INTO NM.  
SFC...CDFNT EXTDS FM ERN MT TO LOW ERN UT..CONTG TO SE AZ. BY  
00Z CDFNT WL MOV TO ERN ND TO DEEP LOW NW KS..CONTG TO SW TX.

.  
NM

**MTNS AND W...**

**NRN SXNS...BKN070-090 BKN130 TOPS FL180. SCT -SHRA. 19Z**  
**BKN090-100 BKN130. WDLY SCT -SHRA. OTLK...MVFR CIG SHSN.**  
SRN SXNS...BKN080-100 TOPS 150. ISOL -SHRA. BECMG 1821  
SCT100-120. WND WLY G35KT. OTLK...VFR WND.  
PLAINS...SCT-BKN060-070 TOPS 100. TIL 14Z OCNL VIS 3-5SM BR.  
BECMG 1821 SCT100-120. WND WLY G40KT. OTLK...VFR WND.

**Aviation Section of the Area Forecast Discussion**

An Area Forecast Discussion (AFD) was issued at 1057 MST by the NWS Albuquerque Weather Forecast Office (WFO). The aviation portion of the AFD is presented here:

FXUS65 KABQ 161757 AAC  
AFDABQ  
AREA FORECAST DISCUSSION...UPDATED  
NATIONAL WEATHER SERVICE ALBUQUERQUE NM  
1057 AM MST MON NOV 16 2015  
.AVIATION...

**18Z TAF CYCLE**

STRONG COLD FRONT JUST MOVED THRU KSAF/KABQ AS OF THIS  
WRITING. PRECIP SHOULD GRADUALLY CHANGE FROM RA TO SN OVER  
THE NEXT FEW HOURS ACROSS THE CENTRAL VALLEYS. SN WILL  
PREVAIL ACROSS THE WEST...THOUGH RA MAY MIX IN AT KFMN. CIGS  
WILL CONTINUE TO WAFFLE BETWEEN VFR AND IFR AS BANDS OF  
SHOWERS MOVE THRU. ALSO A FEW TS ARE NOT OUT OF THE  
QUESTION. MT OBSCURATIONS LIKELY. FRONT WILL CONTINUE TO  
BLAST EASTWARD THIS AFTN. SOUTHWEST WINDS AHEAD OF THE  
FRONT WILL CONTINUE TO VEER TO THE WEST. GUSTS NEAR 30-35KT  
LIKELY ALONG/WEST OF THE RIO GRANDE VALLEY...WHERE GUSTS

NEAR 45-50KT LIKELY ALONG/EAST OF THE CENTRAL MTN CHAIN.  
PRECIP WILL CONTINUE ACROSS NORTHERN NM THRU THE OVERNIGHT  
HOURS...BUT MOST TAF SITES WILL START TO CLEAR OUT EARLY TUE  
MORNING.

## AIRMETs

Airmen's Meteorological Information (AIRMET) advisories for moderate icing, moderate turbulence, instrument flight rules (IFR) conditions and mountain obscuration were active over the accident site at the accident time. The accident site was located very close to the boundary of the aforementioned AIRMET for IFR conditions.

WAUS45 KPCI 161730 AAA  
WA5T  
-SLCT WA 161730 AMD  
AIRMET TANGO UPDT 5 FOR TURB VALID UNTIL 162100

.  
AIRMET TURB...WY UT CO AZ NM  
FROM 50W RAP TO 70SW RAP TO BFF TO GLD TO 50W LBL TO 30ESE TBE  
TO INK TO ELP TO 50S TUS TO BZA TO EED TO 20N MTU TO 50W RAP  
**MOD TURB BTN FL180 AND FL410.** CONDS CONTG BYD 21Z THRU 03Z.

.  
AIRMET TURB...WY NV UT CO AZ NM  
FROM 70SSE LKV TO 20WNW ILC TO HVE TO LAR TO SNY TO GLD TO  
50W LBL TO 30ESE TBE TO INK TO ELP TO 50S TUS TO 80WSW TUS TO  
BZA TO EED TO 40SSW FMG TO 70SSE LKV  
**MOD TURB BLW FL180.** CONDS CONTG BYD 21Z THRU 03Z.

WAUS45 KPCI 161445  
WA5S  
-SLCS WA 161445  
AIRMET SIERRA UPDT 2 FOR IFR AND MTN OBSCN VALID UNTIL 162100

.  
AIRMET IFR...ID WY NV UT CO AZ NM  
FROM 40N BOY TO 50ESE DDY TO 30ESE PUB TO 20E TBE TO 30S CIM TO  
ABQ TO 50SSW SJN TO EED TO ELY TO 70SSW LKT TO DBS TO 30NE JAC  
TO 40N BOY  
**CIG BLW 010/VIS BLW 3SM PCPN/BR.** CONDS CONTG BYD 21Z THRU 03Z.

.  
AIRMET MTN OBSCN...ID MT WY NV UT CO AZ NM  
FROM 50SW YXC TO 40S YQL TO 20WNW SHR TO CYS TO TBE TO ELP TO  
50S TUS TO PHX TO EED TO ELY TO 50SE REO TO 50SW YXC  
**MTNS OBSC BY CLDS/PCPN.** CONDS DVLPG 15-18Z. CONDS CONTG BYD  
21Z THRU 03Z.

WAUS45 KPCI 161445

WA5Z

-SLCZ WA 161445

AIRMET ZULU UPDT 2 FOR ICE AND FRZLVL VALID UNTIL 162100

.

AIRMET ICE...ID MT WY NV UT CO AZ NM CA

FROM 70NE GGW TO 60NW RAP TO 70SW RAP TO BFF TO GLD TO 20SE  
TBE TO TCC TO 40NW CME TO ELP TO 40SSW TUS TO 50ENE TRM TO HEC  
TO BTY TO LKT TO 40SSE YQL TO 70NE GGW

**MOD ICE BTN FRZLVL AND FL220.** FRZLVL SFC-100. CONDS CONTG  
BYD 21Z THRU 03Z.

### **SIGMETs**

There were no convective or non-convective Significant Meteorological Information (SIGMET) advisories active for the accident location at the accident time.

### **CWSU Products**

There were no Center Weather Advisories or Meteorological Impact Statements issued by the Center Weather Service Unit (CWSU) at the Albuquerque Air Route Traffic Control Center that were active within the accident region at the accident time.

### **Additional NWS Products**

At 0540 MST, the NWS Albuquerque WFO issued the following wind advisory that included the Sandia Mountains.

WWUS75 KABQ 161240

NPWABQ

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE ALBUQUERQUE NM

540 AM MST MON NOV 16 2015

...STRONG TO DAMAGING WINDS EXPECTED TODAY...

.WINDS WILL PERSISTENTLY INCREASE AS THE DAY PROGRESSES.  
STRONG WIND WILL DEVELOP BY MID TO LATE MORNING...AND  
CONTINUE THROUGH THE AFTERNOON HOURS. THE STRONGEST WINDS  
WILL LIKELY ARRIVE WITH A STRONG COLD FRONT AS IT SWEEPS  
ACROSS THE AREA FROM WEST TO EAST. COOLER TEMPERATURES  
BEHIND THE FRONT COMBINED WITH THE STRONG WINDS WILL MAKE  
IT FEEL EVEN COLDER.

NMZ521>524-533>539-170000-

/O.CON.KABQ.WI.Y.0022.151116T1500Z-151117T0200Z/

SANDIA/MANZANO MOUNTAINS- ESTANCIA VALLEY- CENTRAL  
HIGHLANDS- SOUTH CENTRAL HIGHLANDS-GUADALUPE COUNTY-

QUAY COUNTY-CURRY COUNTY- ROOSEVELT COUNTY-DE BACA  
COUNTY-CHAVES COUNTY PLAINS- EASTERN LINCOLN COUNTY-

540 AM MST MON NOV 16 2015

...WIND ADVISORY REMAINS IN EFFECT UNTIL 7 PM MST THIS  
EVENING...

- \* LOCATION...THIS INCLUDES THE SANDIA AND MANZANO  
MOUNTAINS...AS WELL AS MUCH OF THE EAST CENTRAL AND  
SOUTHEAST PLAINS ALONG AND SOUTH OF INTERSTATE 40.
- \* WINDS...SOUTHWEST 25 TO 35 MPH WITH GUSTS NEAR 50 MPH...  
BECOMING WESTERLY IN THE AFTERNOON.
- \* TIMING...WINDS WILL INCREASE BY MID MORNING...PEAK DURING  
THE MID TO LATE AFTERNOON HOURS...BEFORE SLOWLY  
DECREASING IN THE EVENING. THE STRONGEST GUSTS WILL LIKELY  
OCCUR WITH THE PASSAGE OF A COLD FRONT.
- \* VISIBILITY...NO WIDESPREAD VISIBILITY RESTRICTIONS ARE  
EXPECTED.
- \* LOCAL IMPACTS...DANGEROUS CROSS WINDS ARE EXPECTED ON  
NORTH TO SOUTH ORIENTED ROADWAYS. HIGH PROFILE VEHICLES  
WILL BE ESPECIALLY SUSCEPTIBLE TO THE DANGERS OF CROSS  
WINDS. IN ADDITION...WIND CHILLS WILL RAPIDLY DROP INTO THE  
20S AND 30S AFTER THE PASSAGE OF THE COLD FRONT.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

MOTORISTS SHOULD EXERCISE CAUTION WHILE TRAVELLING. SUDDEN  
GUSTS OF WIND MAY CAUSE YOU TO LOSE CONTROL OF YOUR  
VEHICLE. EXTRA ATTENTION SHOULD BE GIVEN TO CROSS WINDS.

## **Lightning**

Total lightning data from the Earth Networks Total Lightning Network did not identify the presence of any lightning in the accident area between 1230 and 1315 MST.

## **Pre-Flight Weather Briefing**

Lockheed Martin Flight Service (LMFS) indicated that LMFS and both DUAT vendors had no contact with N2440R on November 16, 2015. It is unknown if the pilot of N2440R received pre-flight weather information from another source.

## **Astronomical Data**

The astronomical data obtained from the United States Naval Observatory for 35° 10' north latitude and 106° 23' west longitude, indicated the following:

### **SUN**

|         |          |
|---------|----------|
| Sunrise | 0641 MST |
| Sunset  | 1659 MST |

### **MOON**

|          |          |
|----------|----------|
| Moonrise | 1048 MST |
| Moonset  | 2133 MST |

## **Additional Information**

Current Icing Potential (CIP) products, including icing severity, icing potential and supercooled liquid droplet (SLD) potential was provided by the National Center for Atmospheric Research's (NCAR) Research Applications Laboratory.<sup>8</sup> These data includes CIP products for every 500 feet between 7,000 and 15,000 feet msl applicable to 1308 MST. These data are presented in Attachment 1 to this report.

*Submitted by: Mike Richards  
NTSB, AS-30*

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<sup>8</sup> Courtesy of Mr. Daniel Adriaansen.