



# **National Transportation Safety Board**

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

**February 12, 2015**

**WEATHER STUDY  
WPR15FA088**

## **A. Accident**

Location: Mountain Pass, California

Date: January 20, 2015

Time: about 2005 Pacific standard time (0405 UTC<sup>1</sup> on January 21, 2015)

Aircraft: Beech 36, registration: N999CJ

## **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**

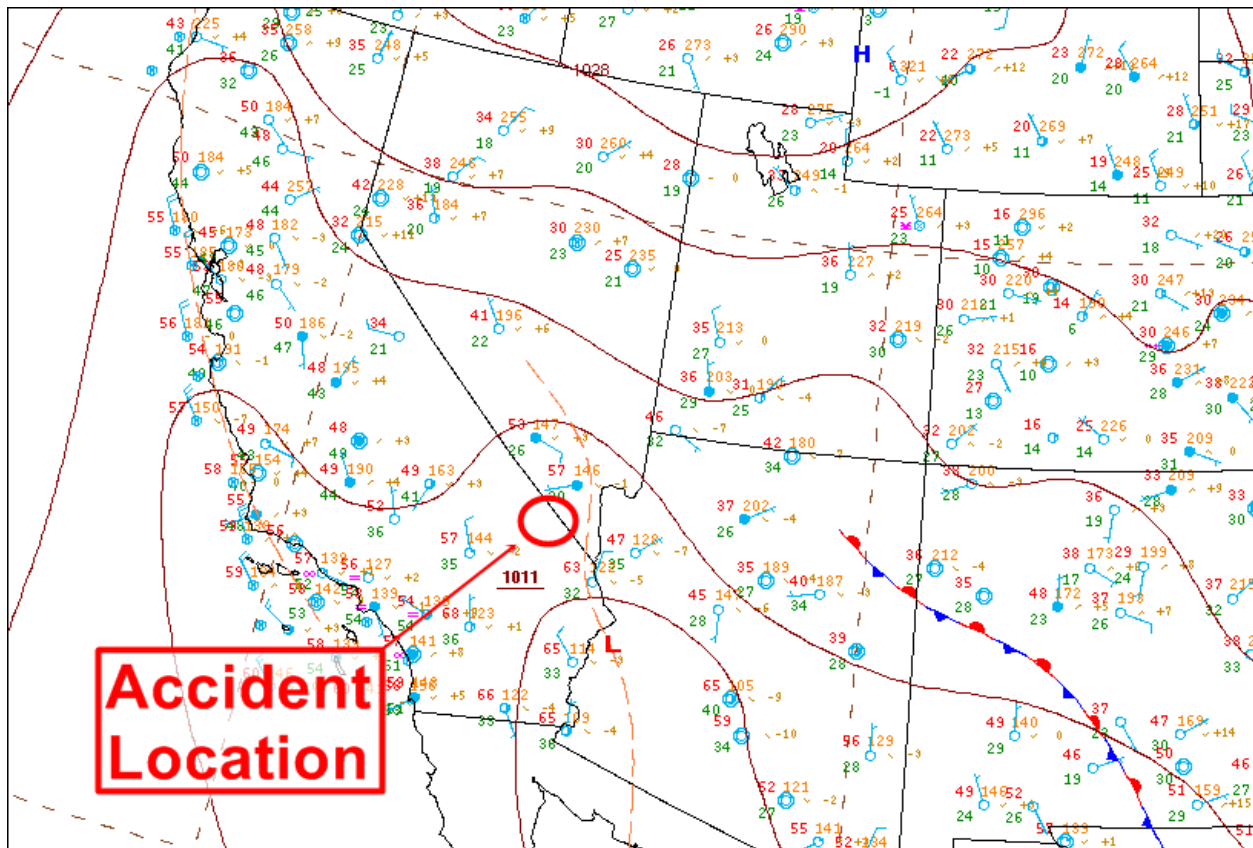
The National Transportation Safety Board's meteorological specialist was not on scene and gathered weather data for this investigation from the Washington D.C. office from official National Oceanic and Atmospheric Administration (NOAA)'s National Weather Service (NWS) sources including the National Climatic Data Center (NCDC), except where noted. All times are for January 20, 2015, unless otherwise noted, and are based upon the 24-hour clock. Directions are referenced to true north and distances in nautical miles. Heights are above mean sea level (msl) unless otherwise noted. Distances along the surface of the earth are calculated using the "Great Circle" formula.

Coordinates used for the accident locations: 35.525467° North latitude, -115.727817° West longitude.

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

## Synoptic Conditions

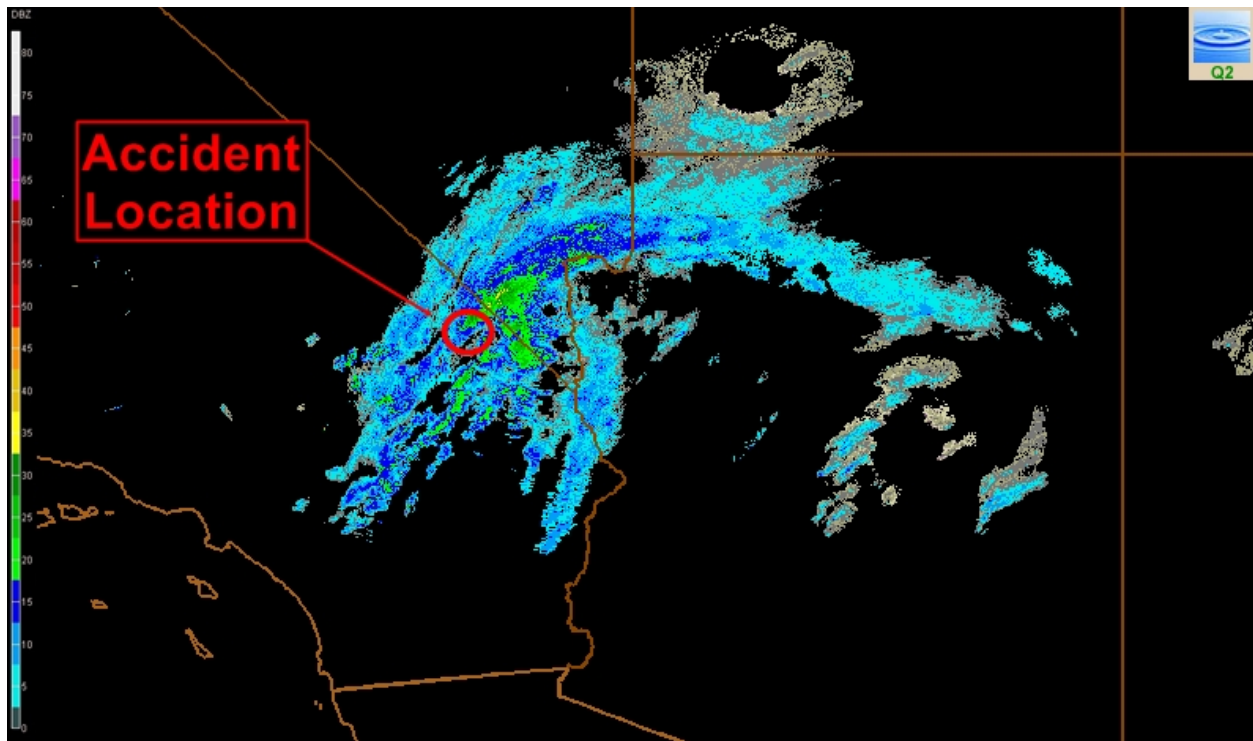


**Figure 1** – NWS Surface Analysis Chart for 1900 PST.

The NWS Surface Analysis Chart for 1900 PST (figure 1) depicted a trough stretching from southern Nevada southward through Arizona into Mexico. A low-pressure center was depicted along the California-Arizona border. Regional winds were relatively light (about 10 knots or less) from varying directions. Dew point depressions surrounding the accident were as high as 31° Fahrenheit.

A Regional WSR-88D radar composite reflectivity mosaic obtained from the National Mosaic and Multi-Sensor (NMQ) Project<sup>2</sup> at 2004 PST (figure 2) identified an extensive area of light (with small, isolated areas of moderate) reflectivity across the accident region.

<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.



**Figure 2** – NMQ NEXRAD mosaic from 2004 PST.

## **Surface Observations**

Unofficial weather observations were retrieved from the Bureau of Land Management & National Interagency Fire Center weather station HTSC1,<sup>3</sup> which was located about 17 miles to the northwest-north of the accident site at an elevation of approximately 5,046 feet. Data from this station is presented in table 1. This station's maintenance, siting and data quality are unknown.

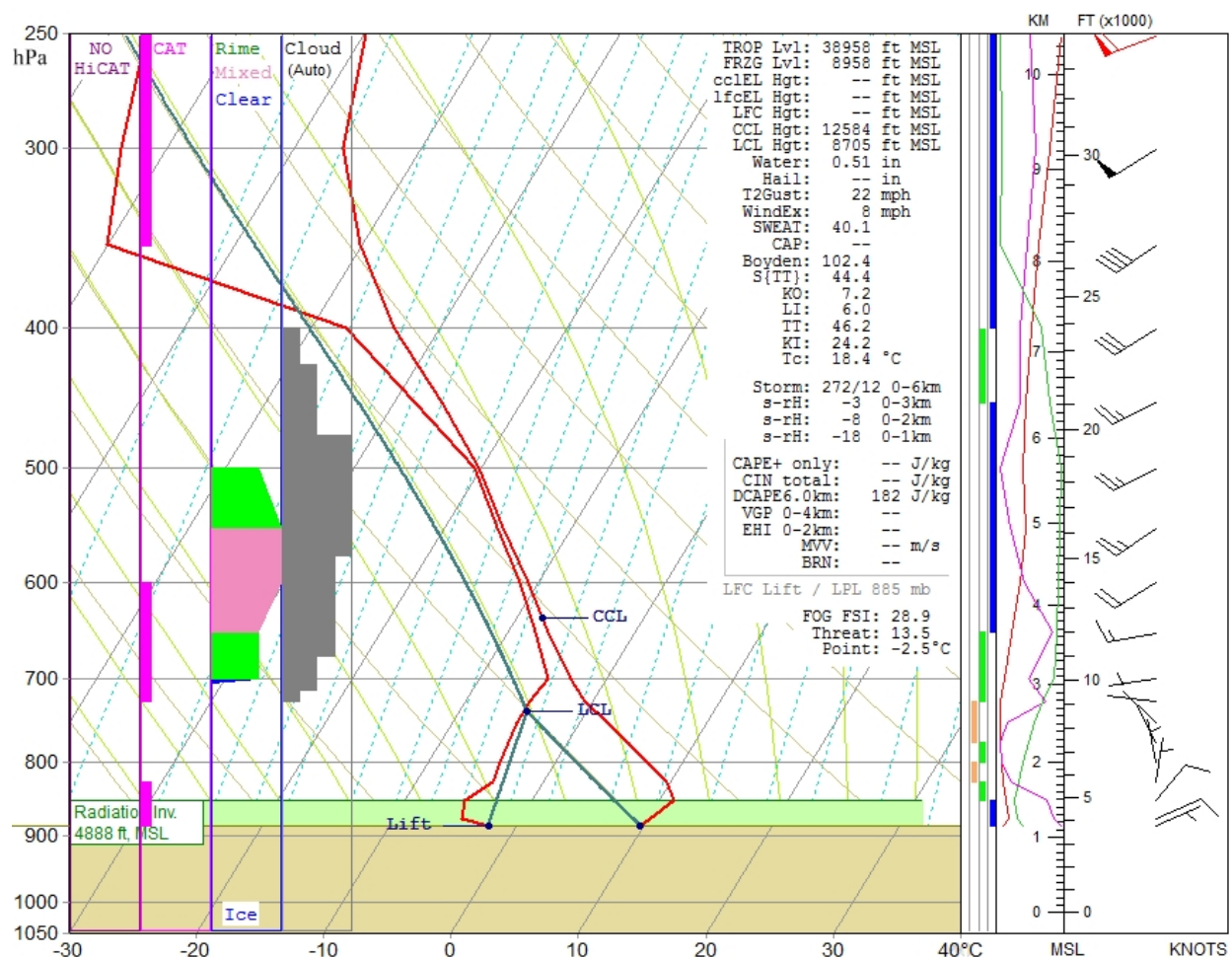
| <u>Time</u> | <u>Temp(°C)</u> | <u>D Temp(°C)</u> | <u>RH(%)</u> | <u>W Sp(kts)</u> | <u>W Sp Dir</u> | <u>W Gust(kts)</u> | <u>W Gust Dir.</u> |
|-------------|-----------------|-------------------|--------------|------------------|-----------------|--------------------|--------------------|
| 1851        | 47              | 31                | 54           | 5                | 162°            | 10                 | 144°               |
| 1951        | 46              | 32                | 58           | 3                | 131°            | 8                  | 139°               |
| 2051        | 46              | 34                | 63           | 5                | 157°            | 10                 | 138°               |
| 2151        | 46              | 35                | 64           | 3                | 180°            | 10                 | 147°               |
| 2251        | 45              | 31                | 58           | 1                | 108°            | 8                  | 173°               |

**Table 1** – Data collected from HTSC1, with time in PST. D\_Temp = dew point temperature; RH = relative humidity; W\_Sp = wind speed; W\_Gust = wind gust; Dir = wind direction (true).

<sup>3</sup> Courtesy of MesoWest

## Model Sounding

A North American Mesoscale (NAM) model sounding (figure 3) for the accident location at 1900 PST was retrieved from NOAA's Air Resources Laboratory. The NAM model sounding indicated that below 11,000 feet the relative humidity was less than 90 percent. Between 11,000 feet and about 19,700 feet, the relative humidity was greater than 90 percent. This temperature and moisture profile presented an "inverted V"-type sounding. Near surface wind was light and from the northeast. Above this level the wind *backed* with height to a westerly wind of 7 knots near 10,000 feet. Below 10,000 feet, wind magnitudes were generally less than 10 knots. The freezing level was about 9,000 feet, and the RAwinsonde OBservation Program identified the potential for significant icing above this level.



**Figure 3** – NAM model sounding for the accident site in Skew-T/Log-P format for 1900 PST, surface to 250 hPa.

## **Pilot Reports**

Publicly disseminated pilot reports<sup>4</sup> made within about two hours of the accident time in the accident region are presented here. The only report from 10,000 feet or below stated: *At 2020 PST, a Cessna 172 aircraft at 10,000 feet 20 miles away on the 020° radial from the Barstow-Daggett Airport reported strong downdrafts.*

DAG UA /OV DAG/TM 0202/FL200/TP BE20/TA M20/IC LGT MX 200/RM  
ZLAWC AWC-WEB:FAAZLA=

LAS UA /OV LAS213043/TM 0236/FL200/TP B738/IC LGT RIME/RM ZLAWC  
AWC-WEB:FAAZLA=

BLH UA /OV BLH250025/TM 0257/FL230/TP C425/TA M14/IC LGT RIME  
230/RM ZLAWC AWC-WEB:FAAZLA=

TRM UA /OV TNP/TM 0257/FL210/TP E50P/TA M11/IC MOD RIME 210/RM  
ZLAWC AWC-WEB:FAAZLA=

LAS UA /OV GFS300020/TM 0352/FL160/TP BE90/TA M14/IC MOD RIME  
160/RM ZLAWC AWC-WEB:FAAZLA=

**DAG UA /OV DAG020020/TM 0420/FL100/TP C172/RM STRONG  
DOWNDRAFTS...ZLAWC AWC-WEB:FAAZLA=**

LSV UA /OV BLD070020/TM 0431/FL272/TP B737/TB MOD 272/RM ZLAWC  
AWC-WEB:FAAZLA=

AVX UA /OV PSP255101/TM 0446/FL170/TP B737/IC LGT RIME/RM ZLAWC  
AWC-WEB:FAAZLA=

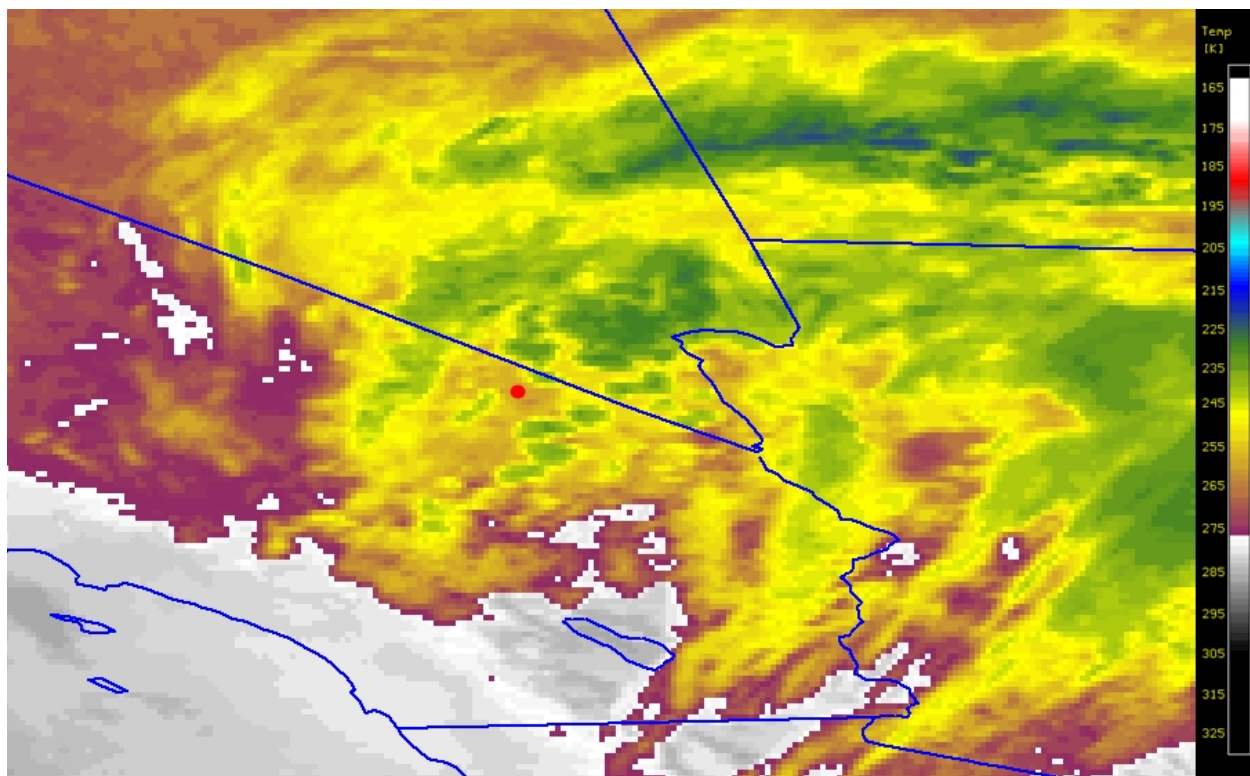
DAG UA /OV HEC025025/TM 0532/FL190/TP BE20/TA M22/IC LGT MX  
190/RM ZLAWC AWC-WEB:FAAZLA=

## **Satellite Imagery**

Geostationary Operational Environmental Satellite (GOES)-15 infrared (10.7µm) data were obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison. Imagery from 2000 PST is presented in figure 4. The GOES-15 infrared imagery identified cloudy conditions at the accident location, with cloud-top temperatures varying between approximately -22° Celsius (C) and -39°C in the immediate accident region. When considering the NAM model sounding, -22°C and -39°C corresponded to heights of approximately 19,200 and 26,400 feet, respectively. It should be noted that figure 4 has not been corrected for any parallax error.

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<sup>4</sup> Only pilot reports distributed with the UBCA\*\* and UBNV\*\* headers were considered.



**Figure 4** – GOES-15 10.7 $\mu$ m (infrared) color-enhanced imagery from 2000 PST. Red dot denotes accident location.

### **Area Forecast**

An Area Forecast that included southern California was issued at 1945 PST by the Aviation Weather Center in Kansas City, Missouri. The previous Area Forecast that included southern California was issued at 1245 PST. Both are presented here:

FAUS46 KPCI 210345

FA6W

\_SFOC FA 210345

SYNOPSIS AND VFR CLDS/WX

SYNOPSIS VALID UNTIL 212200

CLDS/WX VALID UNTIL 211600...OTLK VALID 211600-212200

WA OR CA AND CSTL WTRS

.

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...04Z TROF S NV-S CA-N BAJA CSTL WTRS. RDG SW BC-BC CSTL WTRS TO INTL WTRS OFF CNTRL CA CST. 22Z TROF SW CO-S CNTRL AZ-N BAJA CA. RDG FM S BC ACRS N CA TO S CA CSTL WTRS. ...SFC...04Z TROF SRN OR CSTL SXNS-N CA CSTL SXNS-N PTN SRN CA CSTLN. HIGH EXTRM NERN WA. 22Z CDFNT FM LOW SW NM TO SW AZ. TROF N CA CSTL SXNS-S CA CSTL WTRS.

.  
SRN CA..VBG-NID-60NNW BIH LN SWD  
CSTL SXNS...  
N 1/3...SKC OR SCT CI. 07Z VIS 3-5SM BR. OTLK...VFR.  
S 2/3 CSTLN...OVC015 TOP 025. 06Z OVC010. VIS 3-5SM BR.  
OTLK...IFR CIG BR BECMG 1921 VFR.  
S 2/3 INLAND...BKN020 TOP 025. VIS 3-5SM BR. 12Z SCT020. VIS 3-5SM BR.  
OTLK...VFR.  
INTR MTNS-MOJAVE-SRN DESERTS...BKN120 TOP FL240. BECMG 0507  
BKN CI. 12Z SCT150 WITH SCT CI ABV. OTLK...VFR.  
IMPERIAL-COACHELLA VLYS...BKN CI. 14Z SCT150 WITH SCT CI ABV.  
OTLK...VFR.

FAUS46 KKCI 202045  
FA6W  
\_SFOC FA 202045  
SYNOPSIS AND VFR CLDS/WX  
SYNOPSIS VALID UNTIL 211500  
CLDS/WX VALID UNTIL 210900...OTLK VALID 210900-211500  
WA OR CA AND CSTL WTRS

.  
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...AT 21Z TROF EXTDS FROM ID-MT-ERN WY-ERN CO.  
TROF ALSO OVR SRN CA-SRN NV. RDG EXTDS FM BC CST-WRN WA-WRN  
OR-CA CSTL WTRS. BY 15Z TROF OVR MT-WY-CO-NRN AZ-NRN NM. WK  
TROF SRN NV. RDG WL EXTND FM BC-WA-OR-NRN CA. ...SFC...AT 21Z  
TROF OFF BC CST. WK TROF NRN-CNTRL CA CST. STNR FNT FM NRN AZ-  
WRN NM. HI PRES SE BC...WRN MT AND NRN CA CSTL WTRS. BY 15Z  
CDFNT BC CST. TROF ALTA-WRN MT. WK TROF CA CST. LOW PRES SRN  
NM WITH ASSOCD STNR FNT FM NRN AZ-SW NM. HI PRES ERN ID...SRN  
WY AND CA CSTL WTRS.

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SRN CA..VBG-NID-60NNW BIH LN SWD  
CSTL SXNS...BKN015 TOP 030. BECMG 2201 BKN150 TOP FL250. 03Z  
BKN010 TOP 020. VIS 5SM BR. 06Z VIS 3-5SM BR. OTLK...IFR CIG BR.  
INTR MTNS-MOJAVE-SRN DESERTS...SCT150 BKN CI. OTLK...VFR.  
IMPERIAL-COACHELLA VLYS...SCT-BKN CI. OTLK...VFR.

### **Aviation Section of the Area Forecast Discussion**

An Area Forecast Discussion (AFD) was issued at 1913 PST by the NWS Weather Forecast Office in Las Vegas, Nevada (KVEF). The aviation portion of the AFD, which was originally issued at 1452 PST in a previous AFD, is presented here.

FXUS65 KVEF 210313 AAA  
AFDVEF  
AREA FORECAST DISCUSSION  
NATIONAL WEATHER SERVICE LAS VEGAS NV  
713 PM PST TUE JAN 20 2015

.AVIATION...FOR MCCARRAN...WINDS WILL FAVOR TYPICAL DIURNAL TRENDS AND REMAIN BELOW 9 KTS THROUGH TONIGHT. THERE IS A SLIGHT CHANCE THAT WINDS MAY TURN TO A NORTHERLY DIRECTION BETWEEN MIDNIGHT AND SUNRISE BUT CONFIDENCE IS VERY LOW IN THAT OCCURRING. NORTHERLY WINDS WILL IMPACT THE TERMINAL BY 17Z WEDNESDAY WITH SPEEDS OF 10-15 KTS AND GUSTS 20-25 KTS. CEILINGS OF 8-12 KFT ARE EXPECTED LATE TODAY INTO WEDNESDAY MORNING WITH A SLIGHT CHANCE OF CIGS TEMPORARILY DROPPING TO AROUND 6K FEET OVERNIGHT.

FOR THE REST OF SOUTHERN NEVADA...NORTHWEST ARIZONA...AND SOUTHEAST CALIFORNIA...WINDS WILL BE GENERALLY LIGHT IN MOST AREAS TODAY INTO THIS EVENING. INCREASING NORTH WINDS ON WEDNESDAY WITH THE STRONGEST WINDS EXPECTED IN THE COLORADO RIVER VALLEY WHERE GUSTS COULD APPROACH 30-35 KTS. CEILINGS WILL GENERALLY BE 8-12 KFT BUT COULD LOWER TO UNDER 5K FEET IN SHOWERS. OCCASIONAL MOUNTAIN OBSCURATIONS ARE POSSIBLE THROUGH TONIGHT.

NOTE...DUE TO TELECOMMUNICATIONS ISSUES WITH THE KHND WEATHER OBSERVATION, THE KHND TAF WILL CONTINUE TO CARRY AN AMD NOT SKED LINE.

## **AIRMETS**

An Airmen's Meteorological Information (AIRMET) Zulu for moderate ice was active for the accident site at altitudes between the freezing level and FL220<sup>5</sup>. No other AIRMETS were active at low altitudes for the accident location. The AIRMET Zulu, which was issued at 1845 PST, is presented here:

WAUS46 KPCI 210245  
WA6Z  
\_SFOZ WA 210245  
AIRMET ZULU FOR ICE AND FRZLVL VALID UNTIL 210900

.  
AIRMET ICE...CA NV UT AZ  
FROM 60ENE OAL TO 20ESE ILC TO 50SW DVC TO 60WSW RSK TO DRK TO  
50E TRM TO TRM TO 40ESE LAX TO 50ENE EHF TO 50SSE OAL TO 60ENE  
OAL  
**MOD ICE BTN FRZLVL AND FL220.** FRZLVL 060-100. CONDS CONTG BYD  
09Z THRU 15Z.

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<sup>5</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.

## **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 at the Los Angeles Air Route Traffic Control Center that were active for the accident location at the accident time.

## **Lightning**

Total lightning data from the Earth Networks Total Lightning Network did not identify the presence of any lightning in the accident area at the accident time.

## **Pilot Weather Briefing**

A request for information to Lockheed Martin Flight Services (LMFS) yielded the following response:

*On 1/20/15 at 1517Z the pilot of N999CJ contacted LMFS by phone advised he was going to Las Vegas in the afternoon and saw that the president was going to be up in Boise, Idaho on the 21st and wanted to know if the president was coming to Las Vegas. No other information was requested and no flight plan was filed. No other contacts were made between LMFS and N999CJ. Upon querying the DUAT/DUATS vendors they did not have any contact with N999CJ for the requested timeframe.*

## **Astronomical Data**

The astronomical data obtained from the United States Naval Observatory for 115° 44' west longitude and 35° 32' north latitude, indicated the following:

### **SUN**

|                    |          |
|--------------------|----------|
| Sunset             | 1658 PST |
| End Civil Twilight | 1726 PST |

### **MOON**

|         |          |
|---------|----------|
| Moonset | 1737 PST |
|---------|----------|

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