



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

August 20, 2016

Weather Study

METEOROLOGY

WPR16FA158

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A. AIRCRAFT ACCIDENT

Location: Flagstaff, Arizona
Date: August 2, 2016
Time: 2122 Mountain Standard Time
0422 Coordinated Universal Time on August 3, 2016
Airplane: Piper PA 34-200T; Registration: N82806

B. METEOROLOGIST

Don Eick
Group Chairman
Operational Factors Division (AS-30)
National Transportation Safety Board

C. SUMMARY

On August 2, 2016, about 2122 mountain standard time, a Piper PA-34-200T Seneca II, N82806, was destroyed when it impacted trees and terrain shortly after takeoff from Flagstaff Pulliam Airport (FLG), Flagstaff, Arizona. The airline transport pilot received fatal injuries. The personal flight was being conducted as a medical delivery mission for the volunteer organization Flights for Life (FFL), under the provisions of Title 14 *Code of Federal Regulations* Part 91. Night visual meteorological conditions prevailed at FLG at the time of the accident. No flight plan was filed.

D. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's (NTSB) Senior Meteorologist was not on scene for this investigation and conducted the meteorology phase of the investigation from the Washington D.C. office, collecting data from official National Weather Service (NWS) sources including the Weather Prediction Center (WPC) and the National Center for Environmental Information (NCEI). All times are mountain standard time (MST) based upon the 24 hour clock, local time is +7 hours to UTC, and UTC=Z. Directions are referenced to true north and distances in nautical miles. Heights are above mean sea level (msl) unless otherwise noted. Visibility is in statute miles and fractions of statute miles. NWS airport and station identifiers use standard International Civil Aviation Organization (ICAO) 4-letter station identifiers versus International Air Transport Association (IATA) 3-letter identifiers which deletes the initial country code designator "K" for U.S. airports. Both codes are used intermittently in this report.

The accident site was located at latitude 35.1064° N and longitude 111.7240° W, at an elevation of 6,950 feet. The aircraft had climbed to 8,400 feet before descending into the terrain.

E. 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) located in Camp Springs, Maryland. These are the base products used in describing weather features and in the creation of forecasts and warnings. Reference to these charts can be found in the joint NWS and Federal Aviation Administration (FAA) Advisory Circular “Aviation Weather Services”, AC 00-45G.

1.1 Surface Analysis Chart

The southwest section of the NWS Surface Analysis Chart for 2000 MST (0300Z on August 3, 2016) is included as figure 1 with the location of Flagstaff, AZ within the red circle. The chart depicted a high pressure system at 1018-hectopascals (hPa) dominating over the state. Two thermal low pressure systems with no associated fronts were located to the northeast over southern Utah at 1009-hPa and to the northwest over southern Nevada at 1007-hPa. The station model for Flagstaff indicated a light westerly wind at approximately 5 knots, clear skies, with a temperature of 61° Fahrenheit (F), and dew point temperature of 53° F, and a sea level pressure of 1018.3-hPa.

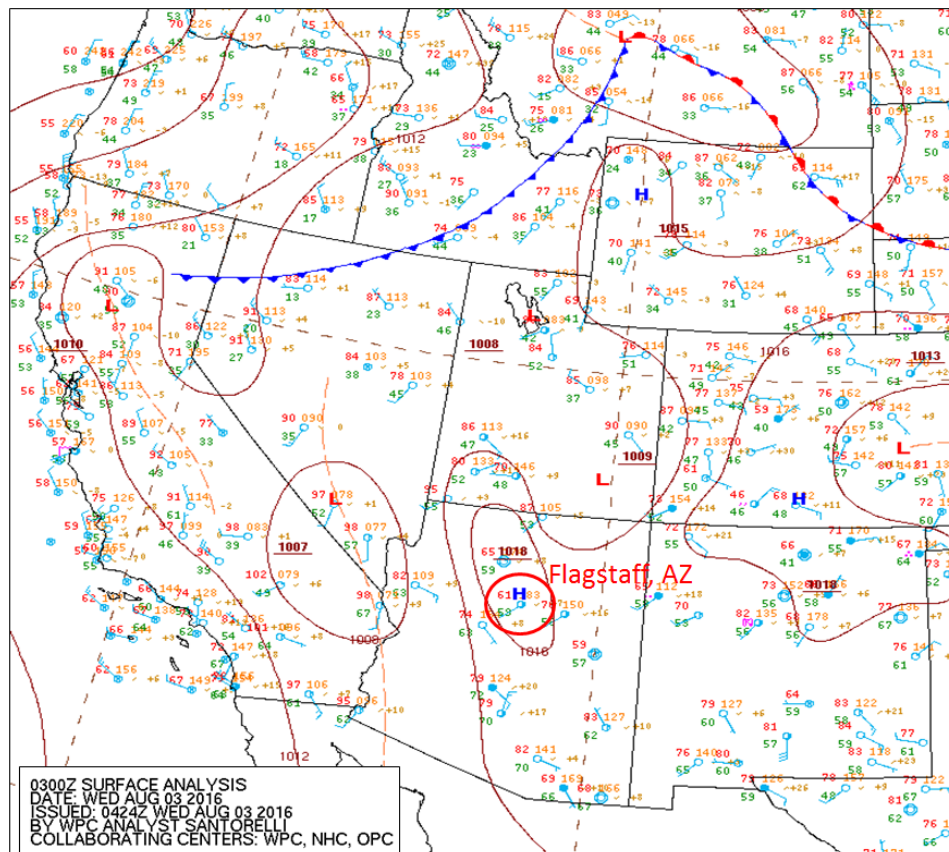


Figure 1 - Southwest section of the NWS Surface Analysis Chart for 2000 MST

1.2 National Weather Mosaic

The NWS National Composite Radar image for 2125 MST over Arizona is included as figure 2. The image depicted scattered moderate to strong intensity echoes over northwestern Arizona and a band of light to moderate echoes extending from eastern Arizona southwestward through the Phoenix area. In the Flagstaff area only very light intensity echoes were identified associated with a dissipating area of echoes.

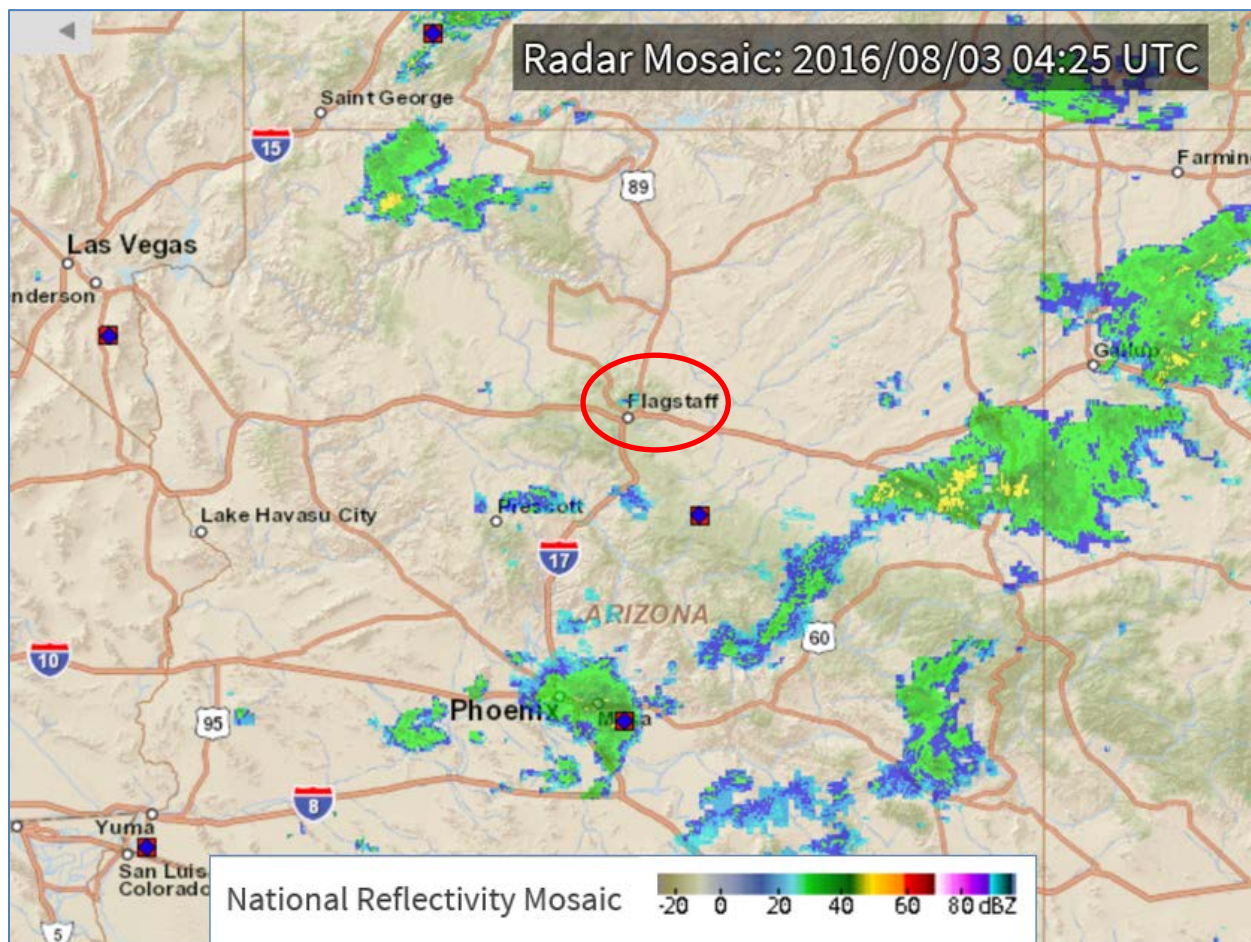


Figure 2 - NWS Composite Reflectivity Mosaic for 2125 MST

The closest NWS weather radar will be further reviewed in section 6.0 of this report, for any potential impact from the echoes observed near the airport.

1.3 12-hour Surface prognostic Chart

The 12-hour Surface Prognostic Chart valid for 0500 MST (1200Z) on August 3, 2016 depicting the expected forecast conditions is included as figure 3. The chart depicted a high pressure system at 1020-hPa over northern Arizona with a thermal low pressure system over southeastern California with a trough extending southward. A large area of scattered thunderstorms and rain showers was depicted over southeastern California, southern Nevada, Utah and Colorado, and over almost all of Arizona and New Mexico, into the western Texas

panhandle. An area of greater than 50% probability of precipitation was depicted as dark green between Flagstaff and Phoenix eastward into New Mexico.

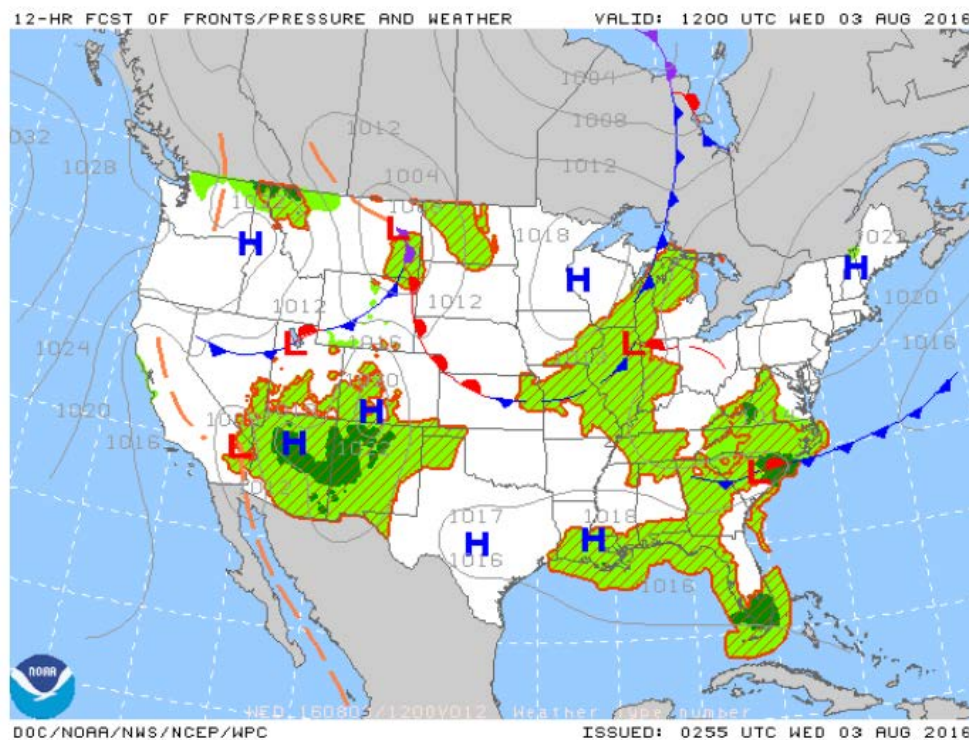


Figure 3 - 12-hour Surface Prognostic Chart valid for 0700 MST

2.0 Surface Observations

The routine weather observations for the departure and destination airports were documented utilizing standard Meteorological Aerodrome Reports (METAR) and special observations (SPECI) surrounding the period.

2.1 Flagstaff Pulliam Airport (KFLG), Flagstaff, AZ

The accident airplane had departed from Flagstaff Pulliam Airport (KFLG), Flagstaff, Arizona at approximately 2119 MST. The airport lists runway 3/21 at 8,800 feet long and 150 feet wide. The airport lists an elevation of 7,014 feet, and a magnetic variation of 14° E. The airport is equipped with a federally installed and maintained Automated Surface Observation System (ASOS) and reported the following conditions at the approximate time of the accident:

Flagstaff Pulliam Airport weather observation at 2057 MST (0357Z), wind calm, visibility 10 statute miles, scattered clouds at 10,000 feet above ground level (agl), temperature 15° Celsius (C), dew point temperature 14° C, altimeter 30.35 inches of mercury (Hg). Remarks: automated surface observation system with a precipitation discriminator, sea level pressure 1018.0-hPa, temperature 15.0° C, dew point 14.4° C.

The estimated density altitude at the time was approximately 8,390 feet based on a relative humidity of 96% and rounding to the nearest 10 feet. The raw observations in standard format from approximately 1200 through 2400 MST were as follows:

*METAR KFLG 021757Z 25004KT 10SM BKN038 BKN046 OVC055 22/13 A3036 RMK AO2 SLP177 OCNL
LTGCG NE CB N-NE TCU AQDS T02220133 10228 20133 56006=*

*SPECI KFLG 021837Z 32007G15KT 7SM TSRA SCT038 OVC048 17/14 A3036 RMK AO2 RAB26 TSB31 OCNL
LTGICCG N TS OHD MOV LTL P0005 T01670144=*

*METAR KFLG 021857Z 04012KT 7SM +TSRA SCT029 OVC050 16/16 A3037 RMK AO2 RAB26 TSB31 SLP201
OCNL LTGICCG N TS OHD MOV LTL P0032 T01560156=*

*SPECI KFLG 021904Z 04015G21KT 4SM +TSRA BR BKN029 OVC050 16/15 A3037 RMK AO2 P0007
T01560150=*

SPECI KFLG 021921Z 06006G18KT 4SM +TSRA BR OVC033 15/14 A3039 RMK AO2 P0029 T01500139=

*METAR KFLG 021957Z 19003KT 7SM -TSRA BKN055 BKN065 OVC080 14/14 A3037 RMK AO2 SLP199 OCNL
LTGCGCG OVHD TS OVHD MOV LTL P0073 T01440144=*

*METAR KFLG 022057Z 35004KT 9SM TS OVC095 16/16 A3035 RMK AO2 RAE19 TSE19B21 SLP188 P0006
60111 T01610156 58002=*

*SPECI KFLG 022105Z 35006KT 10SM -RA FEW044 OVC090 17/16 A3035 RMK AO2 RAB2059 TSE2059 P0000
T01720156=*

*METAR KFLG 022157Z 27004KT 10SM FEW090 18/14 A3033 RMK AO2 RAB2059E08 TSE2059 SLP175 P0000
T01830144=*

METAR KFLG 022257Z 28003KT 10SM FEW095 17/14 A3033 RMK AO2 SLP179 T01670139=

*METAR KFLG 022357Z 00000KT 10SM SCT110 16/14 A3033 RMK AO2 SLP185 60111 T01610139 10228 20144
55007=*

METAR KFLG 030057Z 32003KT 10SM CLR 16/14 A3032 RMK AO2 SLP184 T01560144=

METAR KFLG 030157Z VRB03KT 10SM SCT100 BKN120 16/14 A3033 RMK AO2 SLP185 T01610144=

METAR KFLG 030257Z 23003KT 10SM BKN110 16/15 A3035 RMK AO2 SLP183 T01610150 53007=

METAR KFLG 030357Z 00000KT 10SM SCT100 15/14 A3035 RMK AO2 SLP180 T01500144=

Accident 0422Z

METAR KFLG 030457Z AUTO 24003KT 10SM BKN110 15/14 A3035 RMK AO2 SLP177 T01500144 TSNO=

*METAR KFLG 030557Z AUTO 00000KT 10SM OVC110 15/14 A3036 RMK AO2 SLP176 T01500144 10161 20150
53001 TSNO=*

A review of the observations surrounding the period indicated a period of thunderstorms and heavy rain reported at the airport between 1130 and 1400 MST, with 1.11 inches of rainfall during the period with rain ending at 1408 MST. At the time of the accident, visual flight rule (VFR) conditions prevailed.

2.2 Falcon Field Airport (KFFZ), Mesa, AZ

The flight originated and was heading back to Falcon Field Airport (KFFZ) located in Mesa, Arizona, approximately 100 miles south of the accident site. The airport lists an elevation of 1,394 feet and a magnetic variation of 12° E. The Federal Aviation Administration (FAA) Airport Directory does not list any automated weather reporting systems located at KFFZ, but indicates that the airport utilizes a Limited Aviation Weather Reporting System (LAWRS) as their weather source, which is provided by the air traffic control tower personnel. The tower hours of operation is listed from 0530 through 2100 MST daily. The following conditions were reported at the approximate time of departure and surrounding the period:

Falcon Field Airport weather at 1948 MST, wind from 160° at 10 knots gusting to 15 knots, visibility 4 miles in thunderstorms and moderate rain, ceiling overcast at 6,000 feet, temperature and dew point missing, altimeter 29.96 inches of Hg. Remarks: lightning distant east through south.

The raw observations surrounding the period were as follows:

METAR KFFZ 021750Z 09010KT 40SM SCT080 BKN150 BKN200 A3002=
METAR KFFZ 021847Z 11012KT 40SM SCT080 BKN150 BKN200 A3000=
SPECI KFFZ 021847Z 11012KT 40SM SCT080 BKN150 BKN200 A3000=
METAR KFFZ 021947Z 15008KT 40SM SCT080 BKN150 BKN200 A2997=
METAR KFFZ 022047Z 13008KT 40SM SCT080 BKN150 BKN200 A2995=
METAR KFFZ 022154Z 13008KT 40SM SCT080 BKN150 BKN200 A2992=
METAR KFFZ 030050Z 25010G20KT 40SM BKN100 BKN150 BKN200 A2989 RMK TS OVHD ALQDS=
SPECI KFFZ 030105Z 31020G35KT 40SM BKN100 BKN150 BKN200 A2997 RMK TS N MOV S=
SPECI KFFZ 030116Z 30022G33KT 40SM TSRA BKN060 OVC120 A2997 RMK TS N MOV S=
SPECI KFFZ 030129Z 29022G35KT 2SM TSRA BKN030 OVC060 A2997 RMK TS OVHD=
SPECI KFFZ 030152Z 36010G15KT 4SM TSRA BKN030 OVC060 A2996 RMK TS OVHD=
METAR KFFZ 030248Z 16010G15KT 4SM TSRA OVC060 A2996 RMK LGT DSNT E-S=

The 1948 MST (0248Z) was the last observation of the evening transmitted, and the tower closed at approximately 2100 MST.

3.0 Terminal Forecast

The Flagstaff Pulliam Airport (KFLG) Terminal Aerodrome Forecast (TAF) issued by the NWS Flagstaff Weather Forecast Office (WFO) that was current during the period of the accident was as follows:

*TAF KFLG 022327Z 0300/0324 VRB05KT P6SM SCT060 BKN100
TEMPO 0300/0303 -SHRA BKN070
FM031600 21009KT P6SM BKN100
TEMPO 0318/0322 VRB15G25KT 3SM TSRA BKN050CB=*

The forecast expected light and variable winds at 5 knots or less, visibility better than 6 miles, with scattered clouds at 6,000 feet agl and ceiling broken at 10,000 feet, with a temporary period of light rain showers and a ceiling broken at 7,000 feet agl.

No TAFs are issued for the destination airport of KFFZ. The next closest airport near the destination that issued a forecast was for Phoenix – Mesa Gateway Airport (KIWA), located approximately 10 miles south. The forecast current at the time of departure was as follows:

*TAF AMD KIWA 030133Z 0302/0324 35018G30KT P6SM VCTS SCT060 SCT100CB BKN120
TEMPO 0302/0304 VRB20G40KT 3SM TSRA BKN080CB OVC120
FM030500 12012KT P6SM VCSH SCT100 BKN200
AMD LTD TO CLD VIS AND WIND 0303/0313=*

The forecast indicated that thunderstorms were expected in the area until 2200 MST, with a southeast wind at 12 knots, and rain showers in the vicinity, scattered clouds at 10,000 feet, and ceiling broken at 20,000 feet.

4.0 Upper Air Sounding

The NWS Flagstaff (KFZG) upper air sounding, site number 72376, located approximately 8 miles northwest from the accident site for 1700 MST (0000Z on August 3, 2016) was reviewed. The sounding observation was plotted on a standard Skew-T log P diagram¹ from the surface to 500-hPa or 18,000 feet utilizing RAOB software², and is included as figure 4.

¹ 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.

² RAOB – (The complete Rawinsonde Observation program) is an interactive sounding analysis program developed by Environmental Research Services, Matamoras, Pennsylvania.

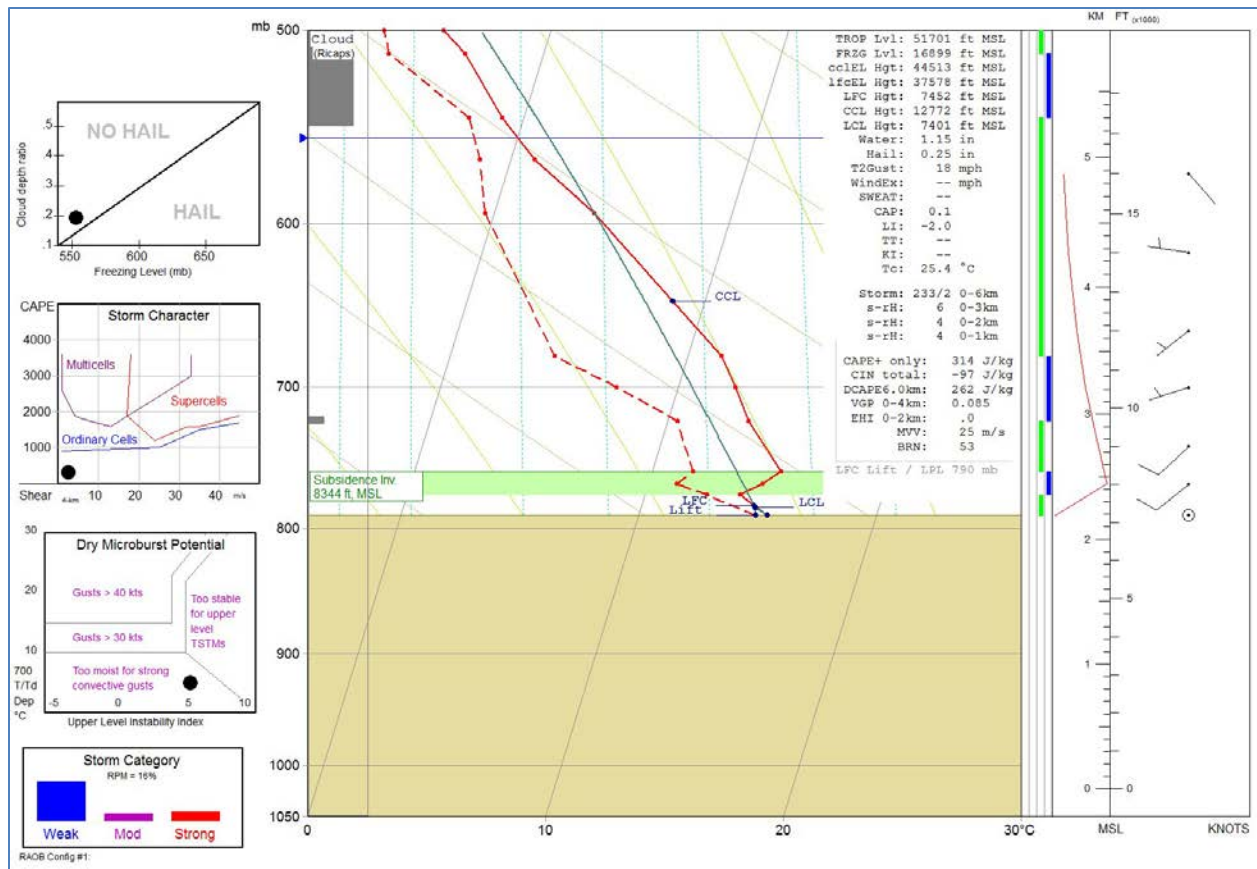


Figure 4- Flagstaff 1700 MST sounding

The Flagstaff 1700 MST sounding depicted calm surface wind, a surface temperature 15.4° C (60° F), dew point temperature of 14.9° C (59° F), with a relative humidity of 97%, and a density altitude of 8,568 feet, the elevation of the station was 7,192 feet. A defined temperature inversion was noted immediately above the surface due to subsidence with the top of the inversion at 8,355 feet. Due to the high relative humidity the lifted condensation level (LCL)³ was identified at 210 feet agl, and the level of free convection (LFC)⁴ at 260 feet agl, and the convective condensation level (CCL)⁵ at 5,580 feet agl. The sounding indicated moist layers where the relative humidity was 75% or greater from the surface to 10,000 feet, and between 16,000 and 25,000 feet. The freezing level was identified at 16,900 feet and supported icing conditions but was well above the accident airplanes planned cruising level. The tropopause was identified at 51,700 feet.

³ Lifting Condensation Level (LCL) - The height at which a parcel of moist air becomes saturated when it is lifted dry adiabatically.

⁴ Level of Free Convection (LFC) -The level at which a parcel of saturated air becomes warmer than the surrounding air and begins to rise freely. This occurs most readily in a conditionally unstable atmosphere.

⁵ Convective Condensation Level (CCL) - The height to which a parcel of air, if heated sufficiently from below, will rise adiabatically until condensation starts. This is typically used to identify the base of cumuliform clouds, which are normally produced from surface heating and thermal convection.

The atmosphere was characterized as unstable based on the Lifted Index⁶ of -2.0, and indicated a weak ordinary airmass thunderstorm development with a sufficient lifting source.

The wind profile indicated weak vertical winds with the mean 0 to 6 kilometer or 18,000 feet wind from 200° at 3 knots. A low-level wind maximum was identified near 8,000 feet below the top of the inversion with the wind from 230° at 12 knots, and due to the strong vertical shear being the calm surface wind and the top of the inversion indicated a potential of turbulence.

Figure 5 is a table plot of the observed height, pressure, temperature, dew point temperature, relative humidity, wind direction and speed, and potential clear air turbulence (CAT), low-level wind shear (LLWS), and icing based on standard algorithms.

Height (ft-MSL)	Pres (mb)	T (C)	Td (C)	RH (%)	DD/FF (deg/kts)	CAT (FAA)	LLWS	Icing - Type (AFGWC method)
7192	790	15.4	14.9	97	0/0			
7726	775	14.0	12.6	91		SVR	LIGHT	
8015	767	14.8	11.2	79	230/12			
8344	758	15.4	11.7	79				
9000	740				225/10			
9659	723	13.4	10.4	82		LGT		
10553	700	12.4	7.4	72	250/7			
11351	680	11.4	4.4	62				
12000	664				230/5			
14000	617				280/3			
15017	594	4.2	-0.4	72				
16000	572				140/2			
16348	565	1.0	-1.3	85				
17395	543	-0.9	-2.3	90				
18982	511	-3.3	-6.5	78				TRC Rime

Figure 5 - Flagstaff sounding parameters

5.0 Satellite Imagery

The Geostationary Operational Environmental Satellite number 15 (GOES-15) data was 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. Due to the time of the accident only the infrared long wave imagery were obtained surrounding the time of the accident and reviewed. The infrared long wave imagery (band 4) at a wavelength of 10.7 microns (μm) provided standard satellite image with radiative cloud top temperatures with a resolution of 4 km.

Figure 6 is the GOES-15 infrared image at 4X magnification for 2130 MST (0430Z) with a standard MB temperature enhancement curve applied to highlight the higher and typically colder cloud tops associated with deep convection with the accident site marked. The image depicted a

⁶ Lifted Index (LI) - A common measure of atmospheric instability. Its value is obtained by computing the temperature that air near the ground would have if it were lifted to 500-hPa or approximately 18,000 feet and comparing that temperature to the actual temperature at that level. Negative values indicate instability - the more negative, the more unstable the air is, and the stronger the updrafts are likely to be with any developing thunderstorms.

large area of cumulonimbus clouds over the Phoenix and Mesa areas, with the anvil extending northward to the Sedona (KSEZ) area. A broken to overcast layer of altocumulus to altostratus type clouds extended over the Flagstaff area and the accident site. The radiative cloud top temperature over the accident site was recorded as 251° Kelvin (K) or -22.16° C, which corresponded to cloud tops near 29,000 feet based on the Flagstaff sounding. The radiative cloud temperatures with the main convective over Phoenix (yellow enhanced area) was 214° K or -59.16° C, which corresponded to cloud tops near 44,000 feet.

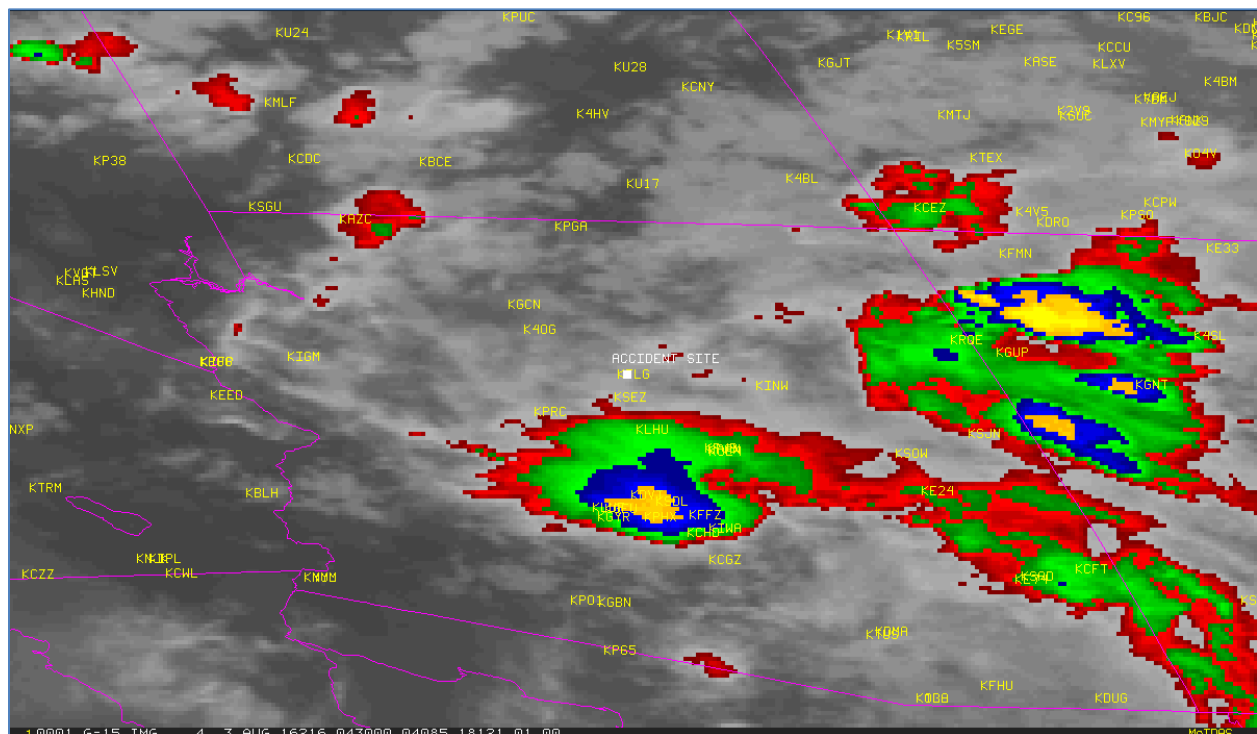


Figure 6 - GOES-15 infrared image at 2130 MST

6.0 Weather Radar Imagery

The NWS Flagstaff (KFSX) Weather Surveillance Radar-1988, Doppler (WSR-88D) located 41 miles southeast of the accident site data was reviewed for conditions in the vicinity of the accident with the absence of any significant weather echoes. The level II archive data was obtained from the NOAA NCEI utilizing the Hierarchical Data Storage System (HDSS) and displayed using the NWS NEXRAD Interactive Viewer and Data Exporter and GR2 software programs.

The WSR-88D is a S-band 10 centimeter wavelength radar with a power output of 750,000 watts, with a 28-foot parabolic antenna concentrating the energy into a 0.95° beam width. The radar produces three basic types of products reflectivity, radial velocity, and spectral width. During the period the KFSX WSR-88D was operating in the precipitation mode (VCP-212) updating every 4 1/2 minutes.

Figure 7 is the KFSX WSR-88D 0.5° base reflectivity image at 2122 MST (0422Z). The image depicts a large area of ground clutter over the radar site and the Flagstaff area with very light reflectivity echoes of less than 10 dBZ, which were associated with the ducting of the radar beam due to the low-level temperature inversion. Further south over the Phoenix and the Mesa areas are an area of echoes near 40 dBZ associated with thunderstorms and rain showers. No significant weather echoes were detected in the vicinity of the accident site.

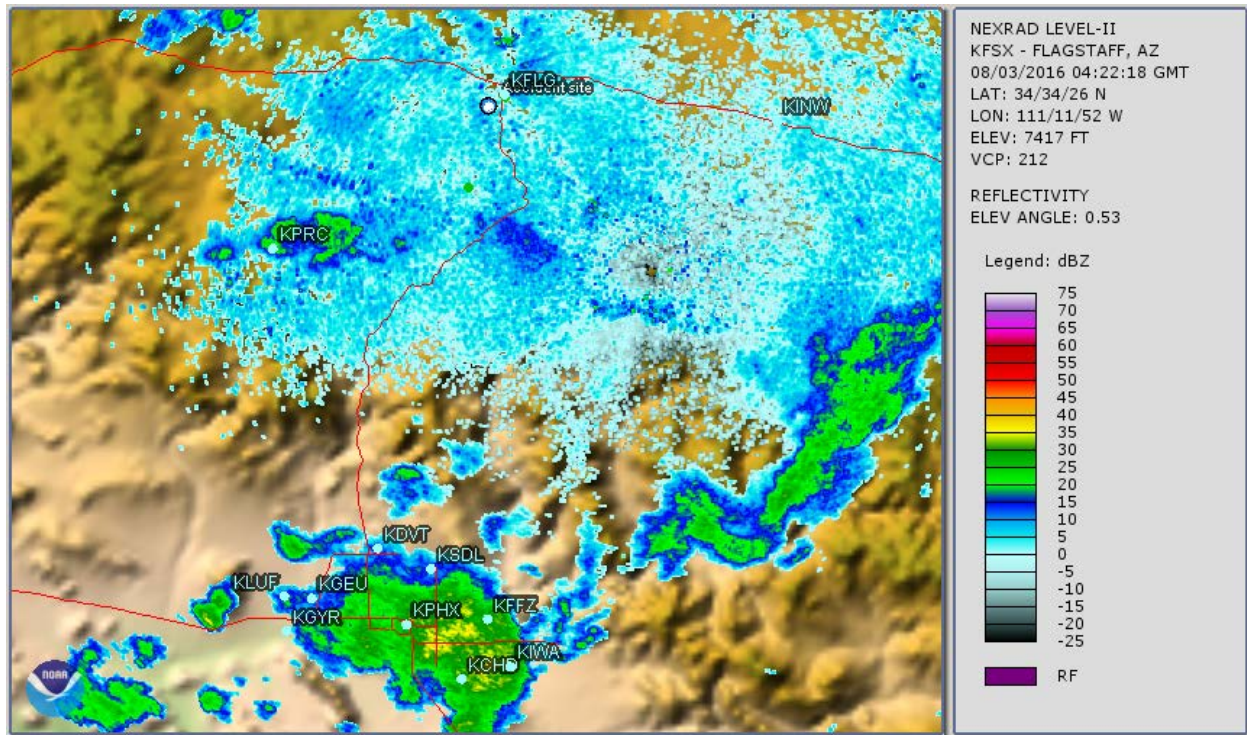


Figure 7 - KFSX WSR-88D 0.5° base reflectivity image at 2122 MST

7.0 Area Forecast

The Area Forecast (FA) is a forecast of VFR clouds and weather conditions over an area as large as the size of several states. It must be used in conjunction with the AIRMET Sierra (IFR) bulletin for the same area in order to get a complete picture of the weather. The area forecast together with the AIRMET Sierra bulletin are used to determine forecast enroute weather and to interpolate conditions at airports which do not have a terminal forecast (TAF) issued. The NWS Aviation Weather Center (AWC) located in Kansas City, Missouri, issues the FA at regular intervals and issues special reports as necessary usually in the form of an AIRMET. The Salt Lake City (KSLC) regional forecast that was current at the time of the accident was issued at 1945 MST and valid through 0800 MST on August 3, 2016. The forecast was as follows:

FAUS45 KNCI 030245
FA5W
-SLCC FA 030245
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 032100
CLDS/WX VALID UNTIL 031500...OTLK VALID 031500-032100

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..UPR LOW OVR NERN WA BY 21Z OVR SWRN SK. TROF OVR
NERN WA-SWRN OR BY 21Z OVR SWRN SK-SWRN MT-SERN ID. HI PRES RDG
OVR NWRN TX-CNTRL NM-CNTRL AZ-SRN CA DRFTG SEWD THRU 21Z. MOD
SWLY FLOW OVR NWRN PTN FA DVLPG EWD THRU 21Z. SFC..OCLD FNT OVR N
CNTRL MT BECMG CDFNT OVR NERN WY-SERN ID-NWRN NV-NERN CA AND
WRMFNT THRU SERN WY-NERN CO. BY 21Z CDFNT OVR SWRN SD-SWRN
WY-NWRN UT BECMG QSTNRY FNT OVR CNTRL NV-E CNTRL AND NERN CA.

..

.
AZ

N HLF...BKN120-140 LYRD FL250. WDLY SCT -SHRA/TSRA. CB TOP FL450.
BECMG 0608 SCT120 BKN150. WDLY SCT -SHRA. TIL 12Z ISOL -SHRA. CB
TOP FL420. OTLK...VFR 18Z TSRA.
SWRN...SCT080 SCT-BKN120 TOP FL220. WDLY SCT -SHRA/ISOL -TSRA. CB
TOP FL450. 08Z BKN080-100 TOP FL200. WDLY SCT -SHRA. OTLK...VFR.
SERN...SCT080 BKN120-140 LYRD FL250. OCNL VIS 3SM SCT -SHRA/BR.
WDLY SCT -TSRA. CB TOP FL450. 08Z SCT100 BKN150. WDLY SCT
-SHRA/ISOL -TSRA. CB TOP FL420. OTLK...VFR SHRA 19Z TSRA.

The forecast for northern Arizona was for broken clouds between 12,000 to 14,000 feet layered to 25,000 feet, with widely scattered light rain showers and thunderstorms. Cumulonimbus cloud tops to 45,000 feet. Becoming between 2300 and 0100 MST, scattered clouds at 12,000 feet and broken at 15,000 feet with widely scattered light rain showers. The forecast for southwestern Arizona was for scattered clouds at 8,000 feet, with scattered to broken clouds at 12,000 feet with tops to 22,000 feet, with widely scattered light rain showers and isolated thunderstorms. Cumulonimbus cloud tops to 45,000 feet.

8.0 In-Flight weather Advisories

The NWS issues in-flight weather advisories designated as Severe Weather Forecast Alerts (AWW's), Convective SIGMET's (WST's), SIGMET's (WS's), Center Weather Advisories (CWA's), and AIRMET's (WA's). In-flight advisories serve to notify enroute pilots of the possibility of encountering hazardous flying conditions, which 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 on the basis of experience and the operational limits of the aircraft.

Surrounding the time of the accident the NWS issued the following Convective SIGMETs 16W and 17W for areas of thunderstorms to the east and west of the area with little movement, and with tops above 45,000 feet. Figure 8 is a plot of the advisories current at the time of the accident over the country. Two advisories bordered east and west of the accident site for an area of thunderstorms with little movement and with tops above 45,000 feet. The texts of the Convective SIGMET advisories were as follows:

WSUS33 KPCI 030355

SIGW

MKCW WST 030355

CONVECTIVE SIGMET 16W

VALID UNTIL 0555Z

CO NM AZ UT

FROM 20WSW DVC-40WNW FTI-40SSE ABQ-70ENE INW-60NE TBC-20WSW DVC

AREA TS MOV LTL. TOPS ABV FL450.

CONVECTIVE SIGMET 17W

VALID UNTIL 0555Z

AZ UT NV

FROM 10SSW ELY-50W HVE-30NE PGS-40WSW ILC-10SSW ELY

AREA TS MOV LTL. TOPS TO FL450.

chart created at 0355 UTC Wed 03 Aug 2016

SIGMETs expire at or before 0555z/3rd

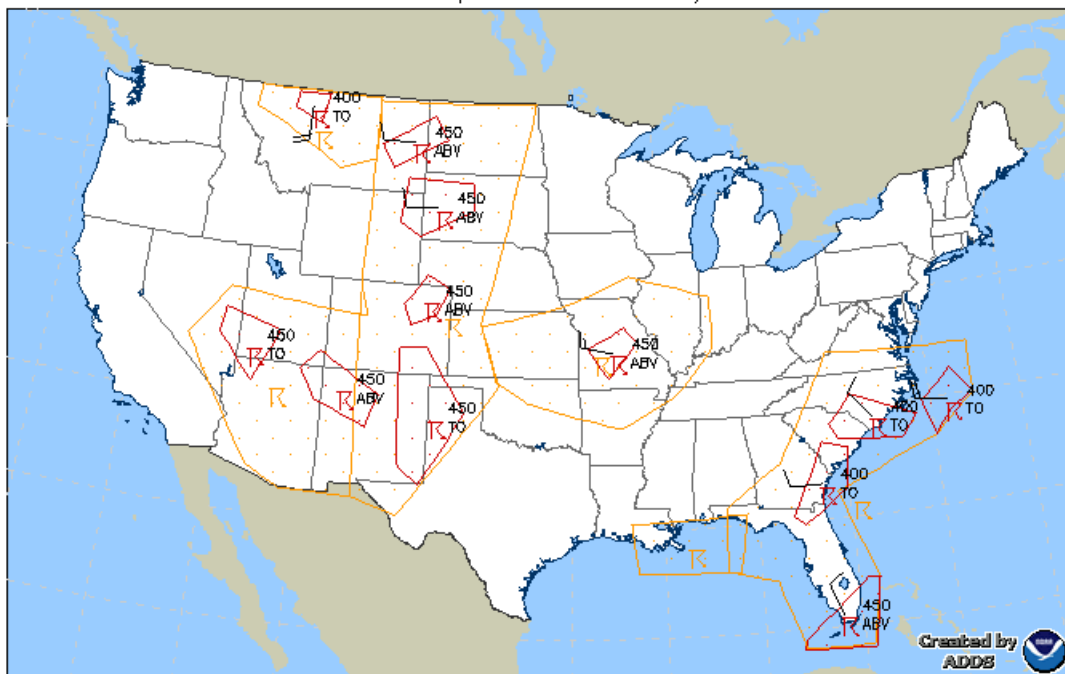


Figure 8 - Plot of Convective SIGMETs current at the time of the accident

There were no other SIGMETs, Weather Watches, Center Weather Advisories or AIRMETs issued for any organized areas of IFR conditions, turbulence, or icing was expected over the route of flight.

9.0 Astronomical Conditions

The United States Naval Observatories website provided the following astronomical conditions for August 2, 2016 for Flagstaff, Coconino County, Arizona.

Beginning of civil twilight	0509 MST
Sunrise	0537 MST

Sun transit	1233 MST
Sunset	1728 MST
End of civil twilight	1956 MST
Moonrise	0527 MST
Moonset	1922 MST

At the time of the accident both the sun and the moon were more than 15° below the horizon with no illumination over the area. The phase of the moon was a New Moon on August 2, 2016 at 1344 MST, with no visible disk.

Submitted by:

Don Eick
Senior Meteorology Investigator