

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23FA172

METEOROLOGY

Specialist's Factual Report

June 11, 2023

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A. ACCIDENT

Location: Los Angeles, California
Date: April 29, 2023
Time: 1950 Pacific daylight time
0250 universal coordinated time (UTC) on April 30, 2023
Airplane: Cessna C172S; Registration: N575ND

B. METEOROLOGY SPECIALIST

Donald Eick
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National Transportation Safety Board
Washington, DC

C. SUMMARY

On April 29, about 1950 Pacific daylight time, a Cessna 172S, N575ND was substantially damaged when it was involved in an accident in Los Angeles, California. The private pilot, who was not instrument rated was fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

The accident aircraft departed from Camarillo, California, earlier in the day with a planned stop at Bermuda-Dunes Airport (KUDD), Palm Springs, California, where the pilot refueled and had lunch. The pilot departed KUDD at about 1848 PDT for the return flight to Camarillo and was diverting to Van Nuys when the accident occurred.

D. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's Senior Meteorologist was not on scene for this investigation and conducted the meteorology phase of the investigation remotely, collecting data from official National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) sources including the Weather Prediction Center (WPC) and the National Center for Environmental Information (NCEI). This report documents the general weather products and forecasts over the region during the period and the pertinent meteorological parameters related to the accident. All times are reported as Pacific daylight time (PDT) based upon the 24-hour clock, local time is -7 hours from UTC, and UTC=Z. NWS airport and weather station identifiers use the standard International Civil Aviation Organization 4-letter station identifiers versus the International Air Transport Association 3-letter identifiers,

which deletes the initial country code designator "K" for U.S. airports. Directions are referenced to true north and distances in nautical miles. Heights are in feet (ft) above mean sea level (msl) unless otherwise noted. Visibility is in statute miles and fractions of statute miles.

The accident site is based on the reported wreckage location at latitude 34.128553°N and longitude 118.44288°W, at an elevation of 1,345 ft.

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) and the WPC located in College Park, 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 Federal Aviation Administration (FAA) "Aviation Weather Handbook", FAA-H-8083-28¹.

1.1 Surface Analysis Chart

The southwest section of the NWS Surface Analysis Chart for 2000 PDT is included as figure 1 with the approximate accident site marked by the red star. The chart depicted a thermal low-pressure system with a central pressure of 1006-hectopascals (hPa)² to the east of the accident site over southeast California and near the Nevada and Arizona borders. Multiple troughs of low-pressure extended from the low north, northeast, southeast, south, and to the southwest. A high-pressure system with a central pressure of 1020-hPa was located to the north of the accident site over northeast California with a ridge extending southward. A col or neutral point was situated between the high and low pressure systems to the east of the accident site, with a generally diffluent wind pattern. No frontal boundaries were identified in the immediate vicinity of the accident site. The station models in the vicinity of the accident site depicted winds from the west to northwest at 5 knots or less, with visibilities restricted in mist and overcast sky cover over the coastal sections southwest and west of the accident site, with clear skies to the northwest through east of the accident site.

¹ <https://www.faa.gov/regulationspolicies/handbooksmanuals/aviation/faq-h-8083-28-aviation-weather-handbook>

² Hectopascals is the standard unit for reporting pressure and is interchangeable with the former term millibar (mb) with the same units. The International Standard Atmospheres (ISA) is based on a sea-level pressure of 1013.25-hPa (or 29.95 inches of mercury) at a temperature of 15° Celsius (C) or 59° Fahrenheit (F).

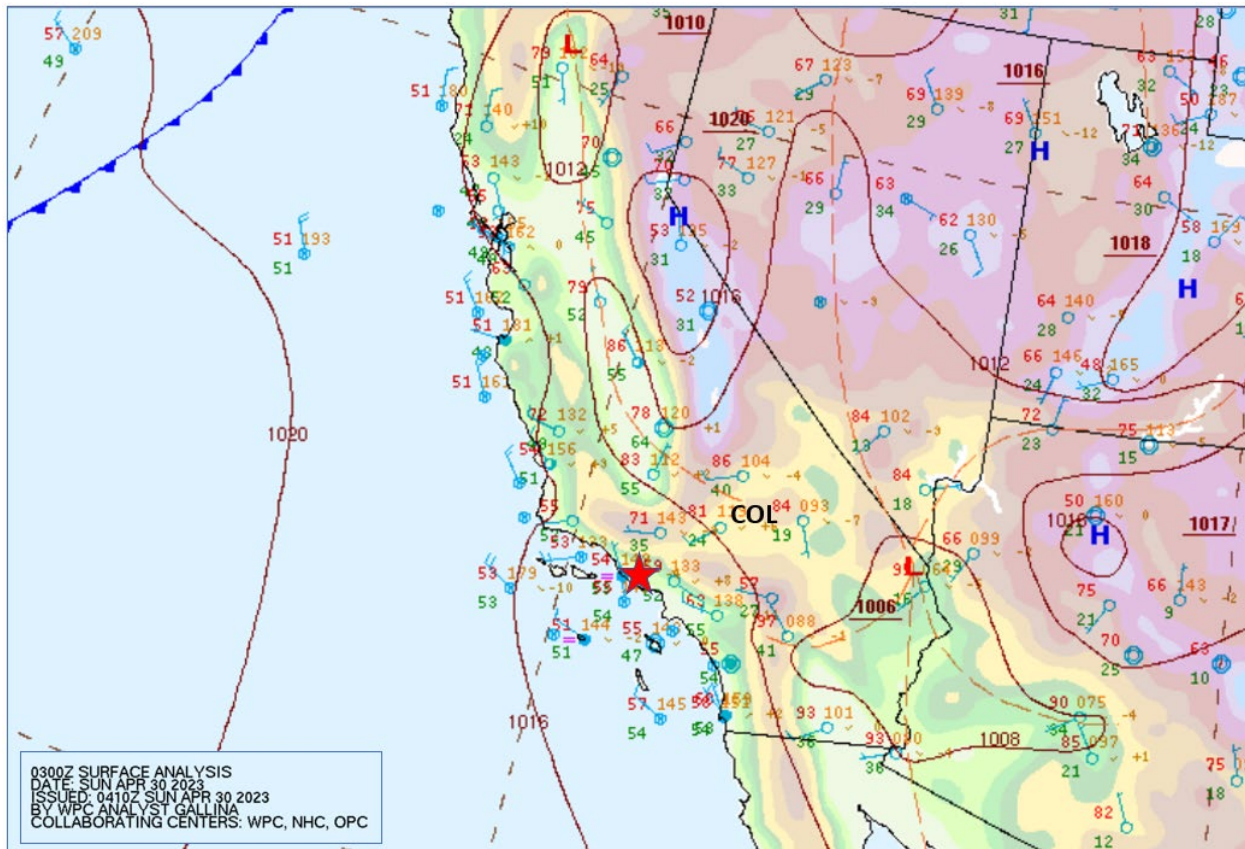


Figure 1 - NWS Surface Analysis Chart for 2000 PDT with the accident site marked by the red star.

2.0 Surface Observations

The area surrounding the accident site was documented using official Aviation Routine Weather Reports (METAR) and Aviation Selected Special Weather Reports (SPECI). Cloud heights are reported above ground level (agl) in the following section, and the magnetic variation was estimated at 12° east based on the latest sectional chart for the area.

2.1 Van Nuys, California

The closest weather reporting location was from Van Nuys Airport (KVNY) located about 6.5 miles north of the accident site at an elevation 802 ft. The airport had an Automated Surface Observation System (ASOS), which was augmented by air traffic control personnel during normal operating hours from 0600 to 2245 PDT. At the approximate time of the accident the following conditions were reported at KVNY.

Weather observation for KVNY for 1951 PDT, wind from 110° at 7 knots, visibility 10 statute miles or more, sky clear below 12,000 ft, temperature 17°C (63° F), dew point temperature 11°C (52° F), altimeter 29.94 inches of mercury

(inHg). Remarks: automated observation system with a precipitation discriminator, sea-level pressure 1013.2-Hpa, temperature 17.2° C, dew point 11.1° C, 3-hour pressure tendency risen 0.9-hPa.

The general flight categories³ and raw disseminated observations issued surrounding the period from about 1650 through 2250 PDT were as follows. The 1951 PDT observation decoded above, and the time of the accident are in bold type.

VFR METAR KVN Y 292351Z 11010KT 10SM CLR 28/12 A2991 RMK AO2 SLP121 T02830122 10328 20233 56014=

VFR METAR KVN Y 300051Z 13008KT 10SM CLR 26/12 A2991 RMK AO2 SLP120 T02560122=

VFR METAR KVN Y 300151Z 10009KT 10SM CLR 22/12 A2992 RMK AO2 SLP125 02170117=

Accident 0250Z

VFR METAR KVN Y 300251Z 11007KT 10SM CLR 17/11 A2994 RMK AO2 SLP132 T01720111 53009=

VFR METAR KVN Y 300351Z 14006KT 10SM CLR 15/11 A2997 RMK AO2 SLP142 T01500111=

VFR METAR KVN Y 300451Z 11005KT 10SM SCT010 14/11 A2998 RMK AO2 SLP147 T01440111=

VFR METAR KVN Y 300551Z AUTO 10003KT 9SM CLR 14/11 A2998 RMK AO2 SLP147 T01440111 10283 20139 50015=

2.2 Santa Monica, California

The next closest weather reporting facility was located at Santa Monica Municipal Airport (KSMO), Santa Monica, California, approximately 8 miles south of the accident site at an elevation of 170 ft. The airport also had an ASOS and reported the following conditions at the time of the accident.

Weather observation for KSMO for 1951 PDT, wind from 200° at 5 knots, visibility 7 miles, ceiling overcast at 300 ft, temperature 12°C (54°F), dew point temperature 11°C (52°F), altimeter 29.97 inHg. Remarks: automated observation

³ As defined by the NWS and the FAA Aeronautical Information Manual (AIM) section 7-1-7 defines the following general flight categories:

- Low Instrument Flight Rules (LIFR*) - ceiling below 500 ft above ground level (agl) and/or visibility less than 1 statute mile.
- Instrument Flight Rules (IFR) - ceiling between 500 to below 1,000 feet agl and/or visibility 1 to less than 3 miles.
- Marginal Visual Flight Rules (MVFR**) - ceiling from 1,000 to 3,000 ft agl and/or visibility 3 to 5 miles.
- Visual Flight Rules (VFR) - ceiling greater 3,000 ft agl and visibility greater than 5 miles.

* By definition, IFR is a ceiling less than 1,000 ft agl and/or visibility less than 3 miles while LIFR is a sub-category of IFR.

system with a precipitation discriminator, sea-level pressure 1014.9-hPa, temperature 12.2° C, dew point 11.1° C, 3-hour pressure tendency risen 0.3-hPa.

The general flight categories and raw observation surrounding the period from about 1450 through 2130 PDT were as follows. The 1951 PDT observation transcribed above, and the time of the accident are in bold italic type for reference.

IFR METAR KSMO 292151Z 24008KT 8SM OVC007 15/12 A2999 RMK AO2 SLP153 T01500117=

IFR METAR KSMO 292251Z 26007KT 10SM OVC006 14/11 A2997 RMK AO2 SLP149 T01440111=

IFR METAR KSMO 292351Z 23007KT 10SM OVC006 14/11 A2996 RMK AO2 SLP145 T01390111
10156 20139 56013=

LIFR SPECI KSMO 300049Z 23007KT 10SM OVC004 13/11 A2996 RMK AO2=

LIFR METAR KSMO 300051Z 23007KT 10SM OVC004 13/11 A2996 RMK AO2 SLP145 T01330111=

LIFR METAR KSMO 300151Z 24005KT 10SM OVC004 13/11 A2997 RMK AO2 SLP147 T01280111

Accident 0250Z

LIFR **METAR KSMO 300251Z 20005KT 7SM OVC003 12/11 A2997 RMK AO2 SLP149
T01220111 53003=**

LIFR METAR KSMO 300351Z 19005KT 4SM BR OVC002 12/11 A3000 RMK AO2 SLP156 T01220111

LIFR SPECI KSMO 300428Z 00000KT 2SM BR OVC002 12/11 A3000 RMK AO2 T01170111=

2.3 Los Angeles USC Campus Downtown, California

A weather reporting station on the University of Southern California Campus (KCQT), Los Angeles, located about 11 miles southeast of the accident site reported the following conditions at the time of the accident.

Weather observation for KCQT at 1947 PDT, automated, wind calm, visibility 10 miles or more, ceiling overcast at 500 ft agl, temperature 14°C, dew point temperature 12°C, altimeter 29.98 inHg. Remarks: automated station with a precipitation discriminator, sea-level pressure 1015.1-hPa, temperature 13.9°C, dew point 12.2°C, 3-hour pressure tendency risen of 0.05-hPa, maintenance indicator on (\$).

The general flight categories and raw observation surrounding the period were as follows.

VFR METAR KCQT 292247Z AUTO 26006KT 9SM CLR 18/12 A2997 RMK AO2 SLP149 T01780122\$

VFR METAR KCQT 292347Z AUTO VRB03KT 10SM CLR 17/12 A2996 RMK AO2 SLP146 T01720122

10233 20167 56009 \$=

MVFR SPECI KCQT 300042Z AUTO 00000KT 10SM BKN010 17/12 A2996 RMK AO2 T01670122 \$=

MVFR METAR KCQT 300047Z AUTO VRB03KT 10SM BKN010 16/12 A2996 RMK AO2 SLP146
T01610122 \$=

IFR SPECI KCQT 300103Z AUTO 25006KT 10SM OVC009 16/12 A2997 RMK AO2 T01560122 \$=

IFR METAR KCQT 300147Z AUTO 00000KT 10SM OVC007 14/12 A2997 RMK AO2 SLP149
T01440117 \$=

IFR **METAR KCQT 300247Z AUTO 00000KT 10SM OVC005 14/12 A2998 RMK AO2 SLP151
T01390122 53005 \$=**

Accident 0250Z

IFR METAR KCQT 300347Z AUTO 00000KT 10SM OVC005 14/12 A3000 RMK AO2 SLP158
T01390122 \$=

IFR METAR KCQT 300447Z AUTO 00000KT 8SM OVC005 13/12 A3001 RMK AO2 SLP161
T01330122 \$=

2.4 Camarillo, California

The planned destination was Camarillo Airport (KCMA), Camarillo, California, located about 37 miles west of the accident site at an elevation of 77 ft. The airport also had an ASOS and reported the following conditions at the time of the accident.

Weather observation for KCMA at 1955 PDT, automated, wind from 250° at 5 knots, visibility 8 miles, ceiling overcast at 600 ft, temperature 13° C (55° F), dew point temperature 11° C (52° F), altimeter setting 29.95 inHg. Remarks: automated station with a precipitation discriminator, sea-level pressure 1015.2-hPa, temperature 13.3° C, dew point 11.1° C, 3-hour pressure tendency fallen then risen 0.0-hPa.

The general flight conditions and observations surrounding the period from about 1500 through 2000 PDT were as follows.

VFR METAR KCMA 292155Z 27008KT 10SM CLR 18/13 A2999 RMK AO2 SLP164 T01830128=

VFR METAR KCMA 292255Z 26008KT 10SM SCT012 17/12 A2998 RMK AO2 SLP159 T01720122=

MVFR SPECI KCMA 292306Z 25007KT 10SM BKN012 17/12 A2998 RMK AO2 T01720122=

MVFR METAR KCMA 292355Z 26008KT 10SM BKN012 16/12 A2997 RMK AO2 SLP156 T01560117
10194 20156 56013=

IFR SPECI KCMA 300051Z VRB04KT 9SM OVC009 14/12 A2995 RMK AO2=

IFR METAR KCMA 300055Z 28004KT 9SM OVC009 14/12 A2995 RMK AO2 SLP152 T01440117=

IFR METAR KCMA 300155Z 26004KT 8SM OVC007 14/11 A2995 RMK AO2 SLP150 T01390111=

IFR SPECI KCMA 300215Z 18003KT 7SM OVC006 13/11 A2995 RMK AO2 T01330111=

Accident 0250Z

IFR **METAR KCMA 300255Z 25005KT 8SM OVC006 13/11 A2995 RMK AO2 SLP152
T01330111 55000=**

IFR METAR KCMA 300355Z 22004KT 8SM OVC005 13/11 A2998 RMK AO2 SLP161 T01280111=

LIFR SPECI KCMA 300402Z AUTO 22004KT 7SM OVC004 13/11 A2998 RMK AO2 T01280111=

2.5 METAR Display

A display of the conditions from the NWS Aviation Weather Center's METAR website for 1950 PDT is included in figure 2 with the approximate accident site marked by the red star. The temperature and dew point temperatures are depicted in °F. The image depicted VFR conditions prevailing over the Van Nuys area with clear skies, visibility unrestricted, with an easterly wind of 10 knots while immediately south of the accident site LIFR to IFR conditions due to low ceilings between 400 to 500 ft agl were reported with light westerly winds of 10 knots or less.

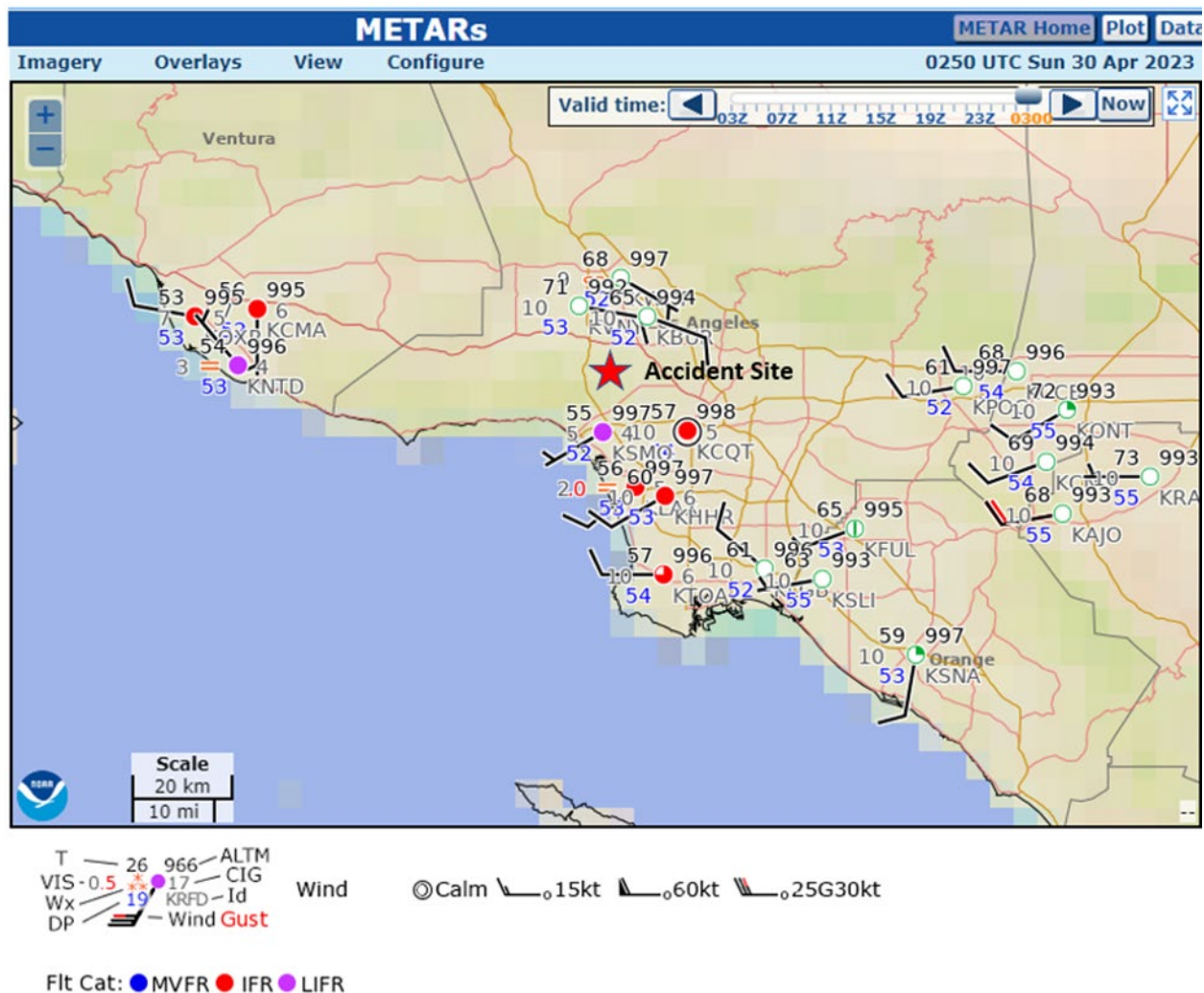


Figure 2 - NWS Aviation Weather Center's METAR display for 1950 PDT with the approximate accident site marked by the red star. IFR to LIFR conditions depicted south through west of the accident site and VFR conditions immediately north.

3.0 Sounding

A High-Resolution Rapid Refresh (HRRR)⁴ numerical model sounding was obtained from the NOAA Air Resource Laboratory's website for the closest grid point⁵ to the accident site for 2000 PDT. The sounding data were then plotted on a standard

⁴ The HRRR is a NOAA real-time three-kilometer resolution, hourly-updated, cloud-resolving, convection-allowing atmospheric model, initialized by three-kilometer grids with three-kilometer radar assimilation. Radar data is assimilated in the HRRR every 15 minutes over a one-hour period.

⁵ Grid point was latitude 34.13°N and longitude 118.44°W.

Skew T log P diagram⁶ using the RAOB Analysis software⁷ and is included as figure 3 from the surface to approximately 450-hPa or 22,000 ft.

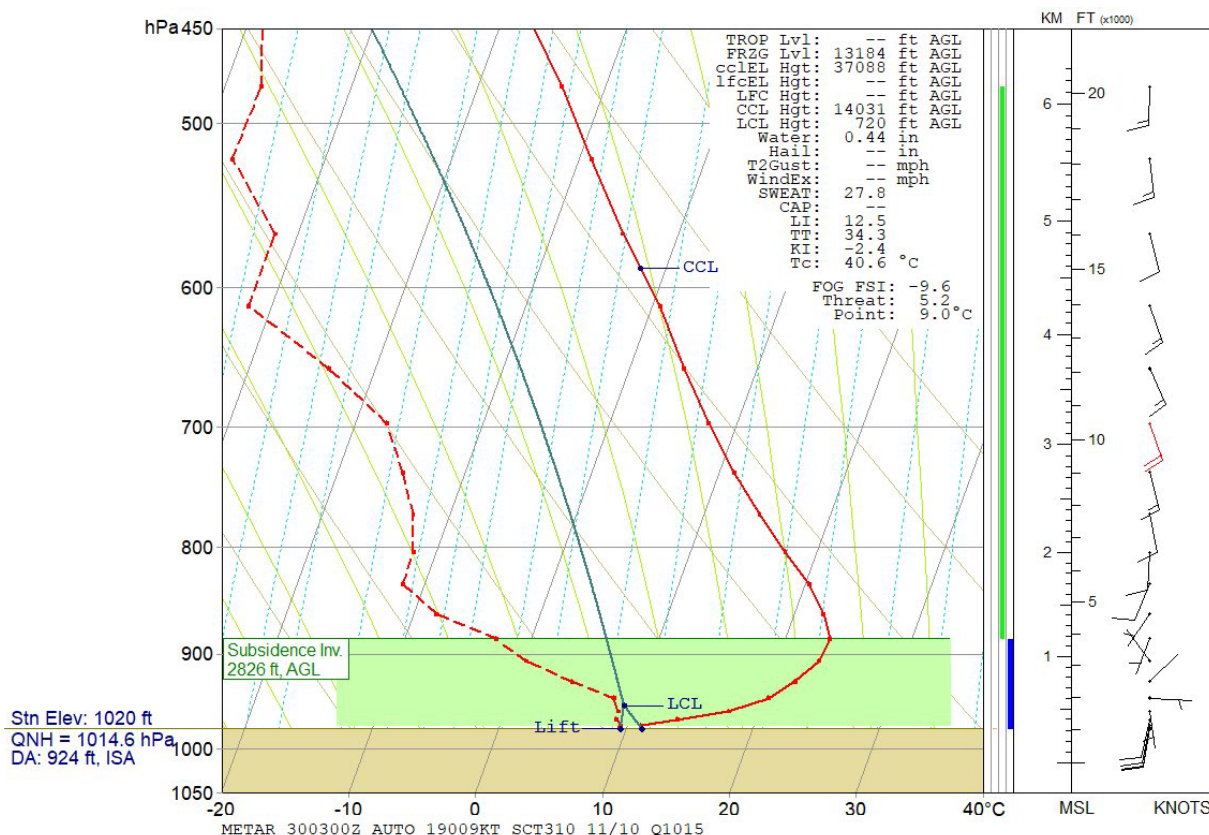


Figure 3 - HRRR numerical model sounding over the closest grid to the accident site for 2000 PDT.

The HRRR sounding for 2000 PDT depicted an elevation of 1,020 ft over the grid point with a temperature of 11.3° C (52.3° F), a dew point temperature of 9.6° C (49.3° F), a relative humidity of 89%, an estimated pressure of 28.89 inHg, which resulted in a density altitude of 924 ft. The sounding depicted a surface-based temperature inversion to about 4,000 ft agl, where the temperature increased with altitude and resulted in a large temperature-dew point spread with relatively dry air near 5,000 ft. The lifted condensation level (LCL)⁸ was identified at 720 ft agl, with the convective condensation level (CCL)⁹ at 14,000 ft agl. The precipitable water content was 0.44

⁶ 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.

⁷ RAOB -The Universal RAWinsonde OBservation program is an interactive sounding analysis program developed by Eosonde Research Services (ERS) previously known as Environmental Research Services, The Villages, Florida.

⁸ Lifted Condensation Level (LCL) - the level at which a lifted parcel becomes saturated. The LCL height corresponds to cloud base height for forced ascent.

⁹ Convective Condensation Level (CCL) - the height at which a parcel of air, when heated sufficiently from below, rises and becomes saturated. It is where newly forming convective clouds should form

inches. The freezing level was identified at about 13,180 ft, which was above the accident airplanes cruising level of 6,500 ft. The atmosphere was characterized as stable with a Lifted Index¹⁰ of 12.5, and no positive CAPE¹¹ values.

The sounding wind profile indicated a near surface wind from 190° at 9 knots, with the winds generally below 10 knots through the inversion and slowly increasing in speed to 20 knots near 10,000 ft while remaining from the south. The mean 0 to 6 kilometer (or 18,000 ft) steering wind was from 170° at 11 knots. A slight change in wind direction from the east at 5 knots was noted near 2,000 ft, and the RAOB Analysis program indicated the potential of a shallow layer of potential moderate turbulence between 1,600 and 2,000 ft due to a 7 kt/1000 ft vertical wind shear. A table of the HRRR sounding parameters of height, pressure (Pres), temperature (T), dew point temperature (Td), relative humidity (RH), wind, derived Clear Air Turbulence (CAT), and Low-Level Wind Shear (LLWS) is below from the surface through 6,000 ft.

Height (ft-msl)	Pres (hPa)	T (°C)	Td (°C)	RH (%)	Wind (dir/kts)	CAT (FAA)	LLWS (FAA)
1020	978	11.3	9.6	89	189/ 9		
1048	977	11.2	9.5	89	189/ 8	LGT	LIGHT
1132	974	11.1	9.5	90	191/ 11		
1302	968	13.8	9.0	73	192/ 11	LGT	LIGHT
1562	959	17.6	8.9	57	173/ 6	MDT	LIGHT
1977	945	20.4	8.2	45	094/ 5	LGT	
2492	928	22.0	4.4	32	043/ 1		
3145	907	23.3	0.2	22	326/ 1	LGT	
3846	885	23.5	-2.8	17	199/ 4	LGT	
4630	861	22.3	-8.2	12	212/ 7		
5567	833	20.3	-11.7	11	202/ 8		

4.0 Pilot Reports

The following pilot reports (PIREPs) were disseminated longline¹² into the FAA database within 60 miles of the accident site between 1700 and 2200 PDT.

bases.

¹⁰ 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. Positive values indicate a stable atmosphere, while negative numbers indicate instability.

¹¹ Convective Available Potential Energy and is a measure of the amount of energy available for convection. CAPE is directly related to the maximum potential vertical speed within an updraft; thus, higher values indicate greater potential for severe weather.

¹² Includes only the reports official recorded and disseminated as a PIREP and may not include "ride reports" broadcasted or other conditions solicited by air traffic controllers and not entered in the formal PIREP format coding. These reports are available to users in near real-time.

LAX UA /OV LAX070001/TM 2302/FL010/TP B739/SK OVC005/RM TOPS 1000 BASES 500 DEPARTURE
END

SMO UA /OV SMO030003/TM 2305/FL008/TP C172/SK OVC009-TOP015/RM DURD RWY21

SMO UA /OV KSMO030002/TM 2320/FL007/TP PC12/SK OVC012/RM DURD 21

TOA UA /OV 1/2 MI WEST/TM 0013/FL007/TP C172/SK BKN007/WX 10SM/TA 16/WV 27016G21/RM
BASES 006 1/2 MI WEST

SMO UA /OV SMO030002/TM 0025/FLDURGD/TP BE9T/SK OVC007

TOA UA /OV KTOA29003/TM 0045/FL015/TP SLG4/SK OVC007-TOP012/SKC

LAX UA /OV LAX070004/TM 0101/FL005/TP B789/SK OVC005/RM TOPS 1000 BASES 500

LAX UA /OV LAX25005/TM 0115/FL015/TP B739/SK OVC003 / TOPS014

LAX UA /OV LAX047003/TM 0135/FL003/TP E75L/SK OVC003/RM BASES 300

SMO UA /OV SMO/TM 0215/FL004/TP SR22/SK OVC004-TOP015/RM DURD RWY21

LAX UA /OV LAX048003/TM 0218/FL004/TP B738/SK OVC004/RM BASES 004 TOPS 015

LAX UA /OV LAX250003/TM 0249/FL015/TP C550/SK OVC003/TOP015

Accident 0250Z

CMA UA /OV CMA/TM 0258/FL005/TP P28A/SK OVC005/WX TOPS 012 BASES 005

SMO UA /OV SMO/TM 0330/FL003/TP C172/SK OVC004-TOPUNKN/RM DURD RWY21

LAX UA /OV LAX070003/TM 0336/FL004/TP B739/SK OVC004/RM BASES 400

SBA UA /OV SBA/TM 0356/FL006/TP A319/SK OVC006-TOPUNKN

LAX UA /OV LAX050003/TM 0402/FL004/TP B752/SK OVC004

All 17 of the PIREPs in the immediate area reported low overcast clouds with bases as low as 300 ft with cloud tops from 1,000 to 1,500 ft msl.

5.0 Satellite Imagery

NOAA Geostationary Operational Environmental Satellite number 18 (GOES-18) infrared imagery were 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. The infrared band 13 at a wavelength of 10.3 microns (µm) provided a resolution of 2

kilometers (km) with radiative cloud top temperatures. While the visible band at a wavelength of 0.64 μm provided a finer spatial resolution of 0.5 km.

Figure 4 is the GOES-18 infrared image at 4X magnification for 1951 PDT with a standard MB temperature enhancement curve applied to highlight higher and colder cloud tops typically associated with deep convection and high cirriform clouds, and the pressure systems and front for 2000 PDT overlaid. The image depicted an area of low stratiform clouds along the California coast to the west and south of the accident location, which was marked by the white square. The infrared image was not able to distinguish the extent or depth of the low stratiform cloud at the time.

Figures 5 and 6 are the GOES-18 visible imagery at 2X magnification for 1836 and 1926 PDT with a brightness enhancement applied to the later image to brighten the image due to the low sun angle. Both images were for times prior to the time of the accident. The accident location is marked by the red square, and the imagery show an area of low stratiform clouds extending over the Pacific and eastward into the Los Angeles basin south of the Santa Monica Mountains and over the Pleasant Valley extending over the Camarillo area. The GOES-18 visible image for 1836 and 1926 PDT shows the stratus clouds slowly spreading north and eastward over the area with time. No visible image was available at the time of the accident due to the low sun angle.

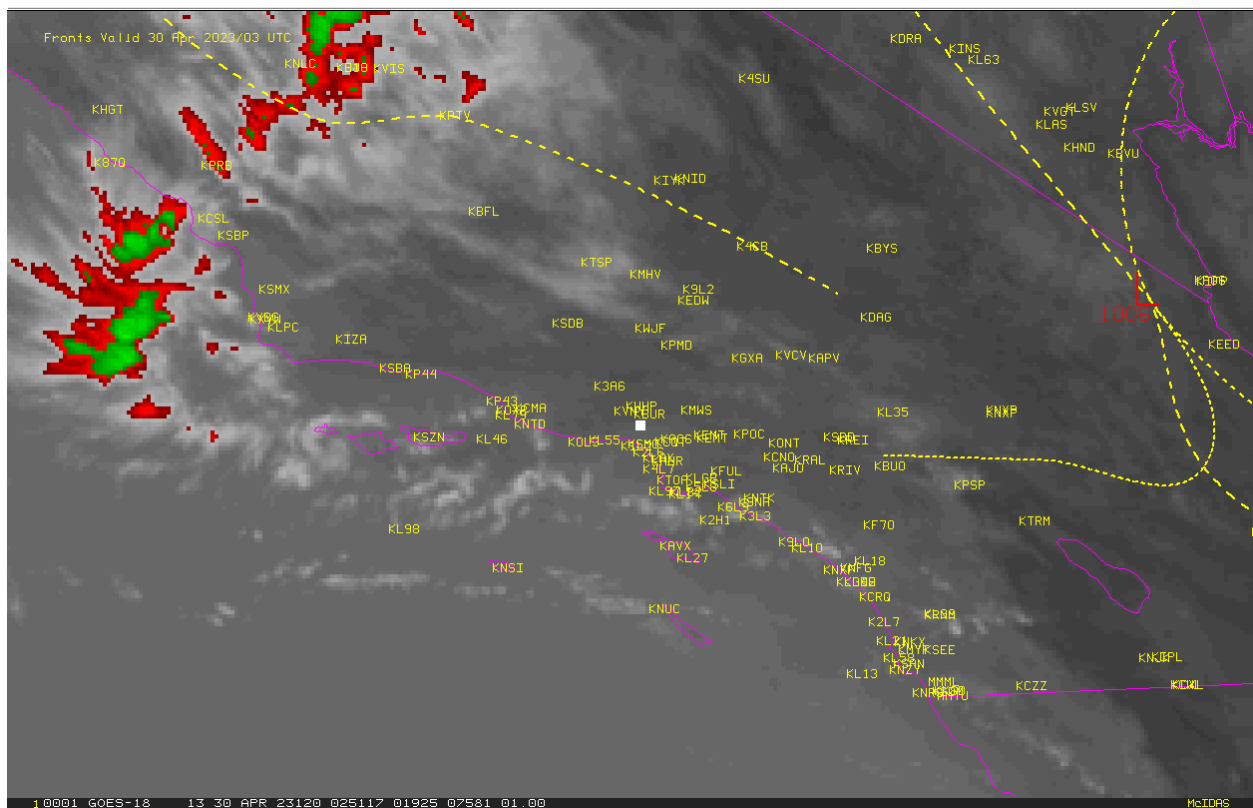


Figure 4 - GOES-18 infrared image for 1951 PDT at 4X magnification with the accident site marked by the white square.

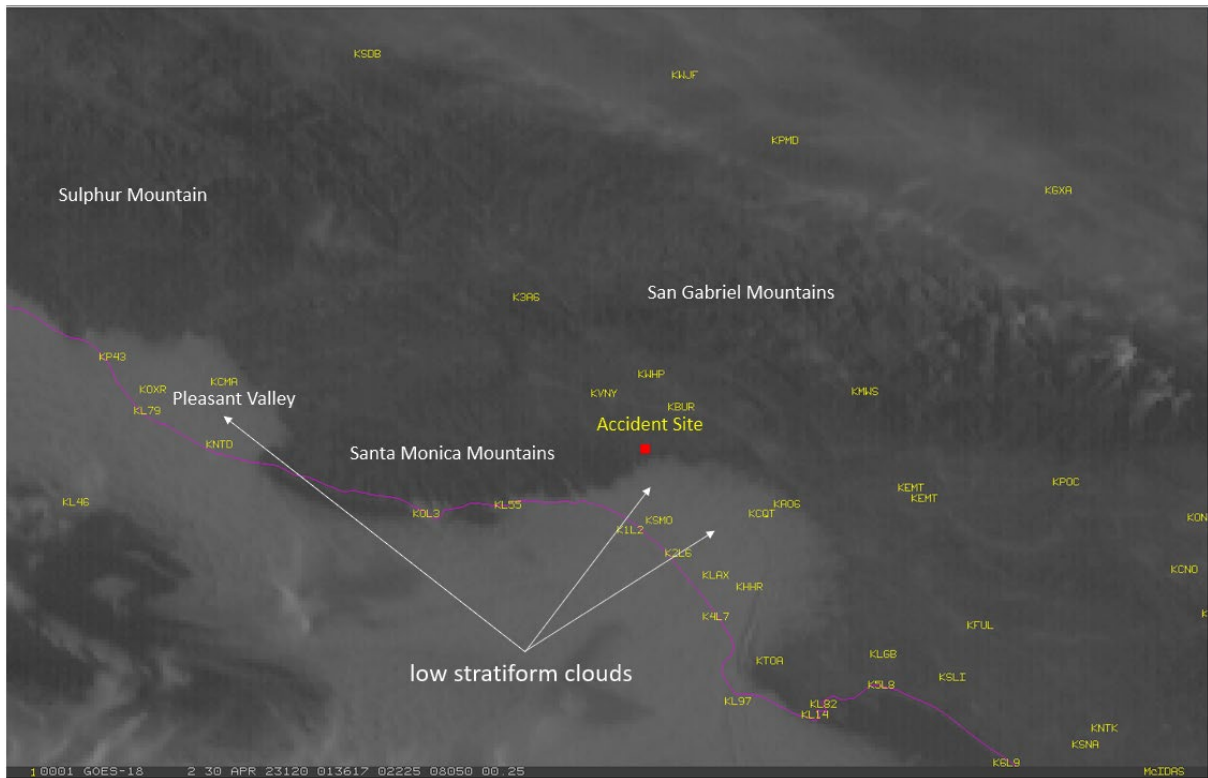


Figure 5 - GOES-18 visible image for 1836 PDT with future accident site marked by red square.

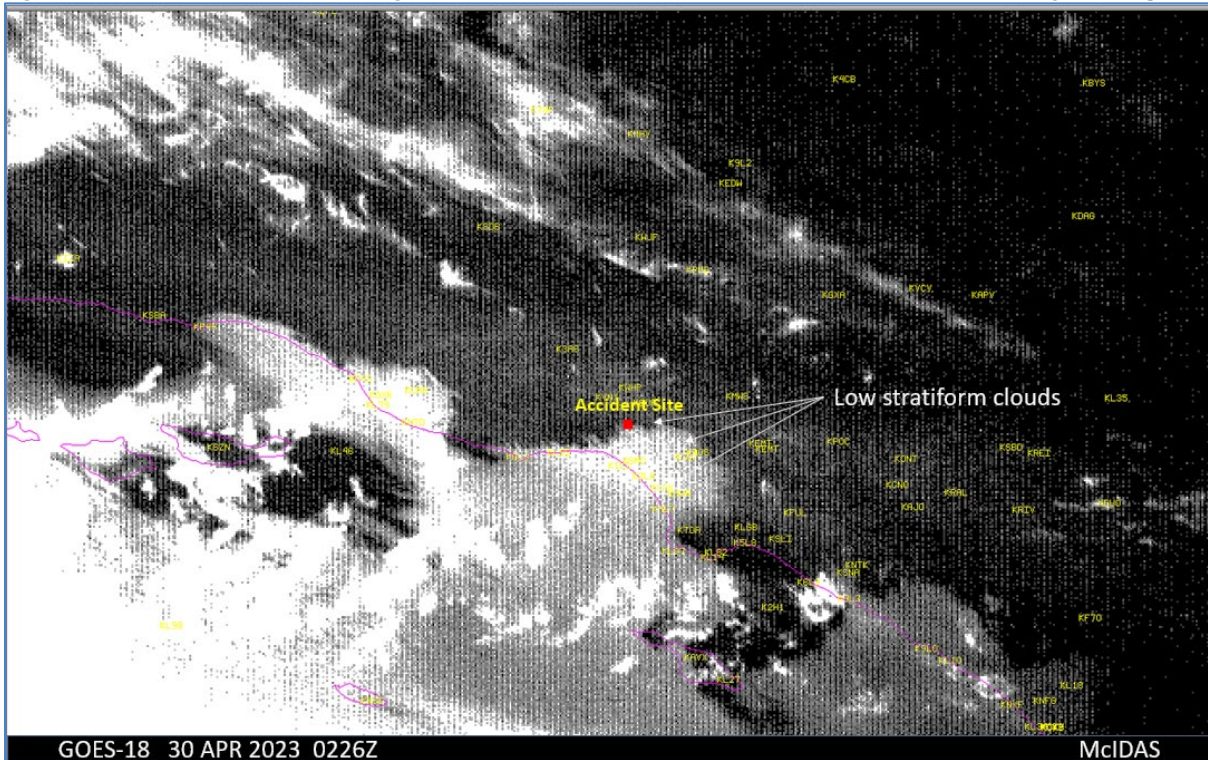


Figure 6 - GOES-18 visible image for 1926 PDT at 2X magnification with an enhancement curve applied. This was the last relatively useful visible image due to the low sun angle.

The GOES-18 GeoColor image for 1951 PDT is included as figure 7 with the major airports identified, and the approximate accident site by the red star. The GeoColor imagery is a multispectral product composed of True Color (using a simulated green component) during daytime, and an infrared product that uses multiple bands at night. During the day, the imagery looks approximately as it would when viewed with the human eye from space. At night, the blue colors represent liquid water clouds such as fog and stratus, while gray to white indicate higher ice clouds, and the city lights come from a static database for orientation. The GeoColor was developed by the Cooperative Institute for Research in the Atmosphere (CIRA) and the Regional and Mesoscale Meteorology Branch (RAMMBA) of NOAA's Center for Satellite Applications and research (STAR).

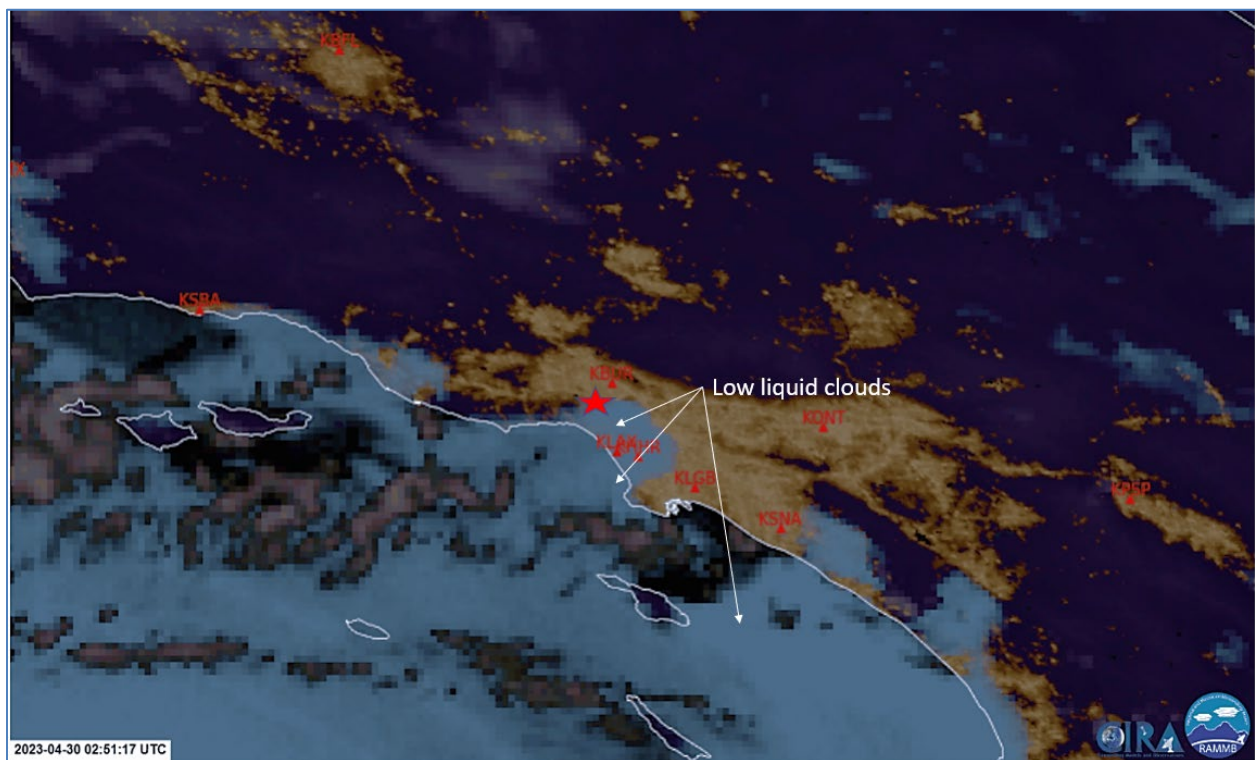


Figure 7 - GOES-18 GeoColor image for 1951 PDT with the approximate accident.

6.0 NWS Forecasts & Advisories

The NWS AWC located in Kansas City, Missouri, was responsible for providing the aviation enroute products and inflight weather advisories, while the NWS Los Angeles/Oxnard (KLOX) Weather Forecast Office (WFO) was responsible for the issuance of the local forecasts, weather discussions and weather warnings for the area.

6.1 Terminal Aerodrome Forecasts

The NWS Terminal Aerodrome Forecast (TAF) is a concise statement of the expected meteorological conditions significant to aviation for a specified time period, usually 24-hours and within 5 statute miles of the center of the airport's runway complex (terminal). The TAFs issued by NWS KLOX WFO for the airports documented in section 2.0 above were as follows.

Camarillo Airport

AMD TAF KCMA 291754Z 2918/3018 23008KT P6SM SCT012

*FM300300 VRB03KT 5SM BR BKN005
FM300500 VRB03KT 1 1/2SM BR OVC003
FM301500 VRB03KT 6SM BR OVC009=*

TAF KCMA 292338Z 3000/3024 24008KT P6SM BKN009

*FM300300 VRB03KT 4SM BR BKN005
FM300500 VRB03KT 2SM BR OVC004
FM301200 VRB03KT 4SM BR OVC008
FM301600 VRB03KT P6SM OVC012
FM301900 24008KT P6SM BKN015=*

Van Nuys Airport

AMD TAF KVNy 292338Z 3000/3024 14008KT P6SM SCT200

*FM300900 12005KT 3SM BR BKN005
FM301600 14005KT 6SM HZ SCT200
FM302000 15009KT P6SM SCT200=*

Santa Monica Municipal Airport

AMD TAF KSMO 300101Z 3001/3024 25007KT P6SM OVC004

*FM300300 VRB03KT 4SM BR OVC004
FM301000 VRB03KT 6SM BR OVC010
FM301600 VRB03KT P6SM OVC013
FM301900 24008KT P6SM BKN015=*

The TAF issued for KCMA at 1054 PDT expected VFR conditions to prevail through 2000 PDT, with a wind from 230° at 8 knots, visibility 6 miles or more, with scattered clouds at 1,200 ft. After 2000 PDT, the winds were expected to be variable at 3 knots, visibility 5 miles in mist, with a ceiling broken at 500 ft agl. The second TAF for KCMA issued at 1638 PDT and current at the time of the accident, expected IFR conditions due to ceilings broken at 900 ft agl. And after 2000 PDT, with visibilities of 4 miles in mist with ceilings broken at 500 ft.

The forecast for KVNy expected VFR conditions to prevail during the period.

The forecast for KSMO issued at 1801 PDT expected LIFR conditions with ceilings overcast at 400 ft, and visibility lowering to 4 miles in mist after 2000 PDT.

6.2 Aviation Forecast Discussion

The NWS Area Forecast Discussions (AFD) are issued by each WFO to describe the short-term weather conditions within their region with an aviation section that includes the general conditions as they relate to the creation of the TAF. These are useful for additional aviation-related issues that cannot be encoded into the TAF and provide some reasoning behind the forecast. These are generated roughly every 6 hours and correspond to the release of the latest TAFs for that office. The NWS KLOX WFO issued the AFD at 1650 PDT and was as follows.

FXUS66 KLOX 292350
AFDLOX

.AVIATION...29/2349Z.

At 2340Z, the marine layer depth was around 1000 feet deep at KLAX. The top of the marine inversion was around 2900 feet with a temperature near 24 degrees Celsius.

Moderate confidence in 00Z TAFs, except high confidence in KPMD and KWJF where VFR conds will prevail. Timing of flight category changes may be off by two hours. IFR/LIFR conditions expected through this evening, lifting to MVFR conditions by Sunday morning as marine layer depth begins to rise. There is a 30-50 percent chance that coastal TAF sites KSBA and south will have MVFR cigs lingering into Sunday afternoon, with greatest chance at KOXR and KLAX. There is a 10-20 percent chance that VFR conds prevail for KVMY and KBUR.

KLAX...Moderate confidence in 00Z TAF. IFR/LIFR cigs expected through this evening, with MVFR cigs likely by Sunday morning as marine layer depth increases. There is a 50 percent chance of MVFR cigs lingering through Sunday afternoon. Any east wind component will remain well below 8 kts.

KBUR...Moderate confidence in 00Z TAF. Return of IFR/LIFR cigs/vsby may be off by two hours. There is a 10 percent chance that VFR conds prevail.

6.3 Graphic Forecast for Aviation

The NWS Graphic Forecast for Aviation (GFA) is a graphical depiction of surface wind, thunderstorms, precipitation, color coded general flight categories, and cloud cover bases and tops, from graphical output from the NWS's National Digital Forecast Data (NDFD) with the Graphic-Airmen's Meteorological Information (G-AIRMET) for IFR conditions, mountain obscuration, icing conditions, and strong surface wind overlaid. The GFA provides a forecast for the enroute phase of flight and for locations without a TAF. The GFA is available at the NWS AWC website and through other weather briefing services. The GFA 3-hour surface and cloud forecasts issued about 1800 PDT

and valid for 2000 PDT over the southwestern United States are included as figures 8 and 9 respectively.

The GFA Surface forecast depicted light winds of 5 knots in the accident region with visibility restrictions along the California coast to the south through northwest of the accident site. A G-AIRMET for IFR conditions was depicted over the California coastal to the south and over the destination area encompassing the Carmella area. The GFA cloud forecast (figure 9) depicted cirrus clouds near the accident site with low overcast clouds at 300 ft with tops near 2,100 ft off the California coast.

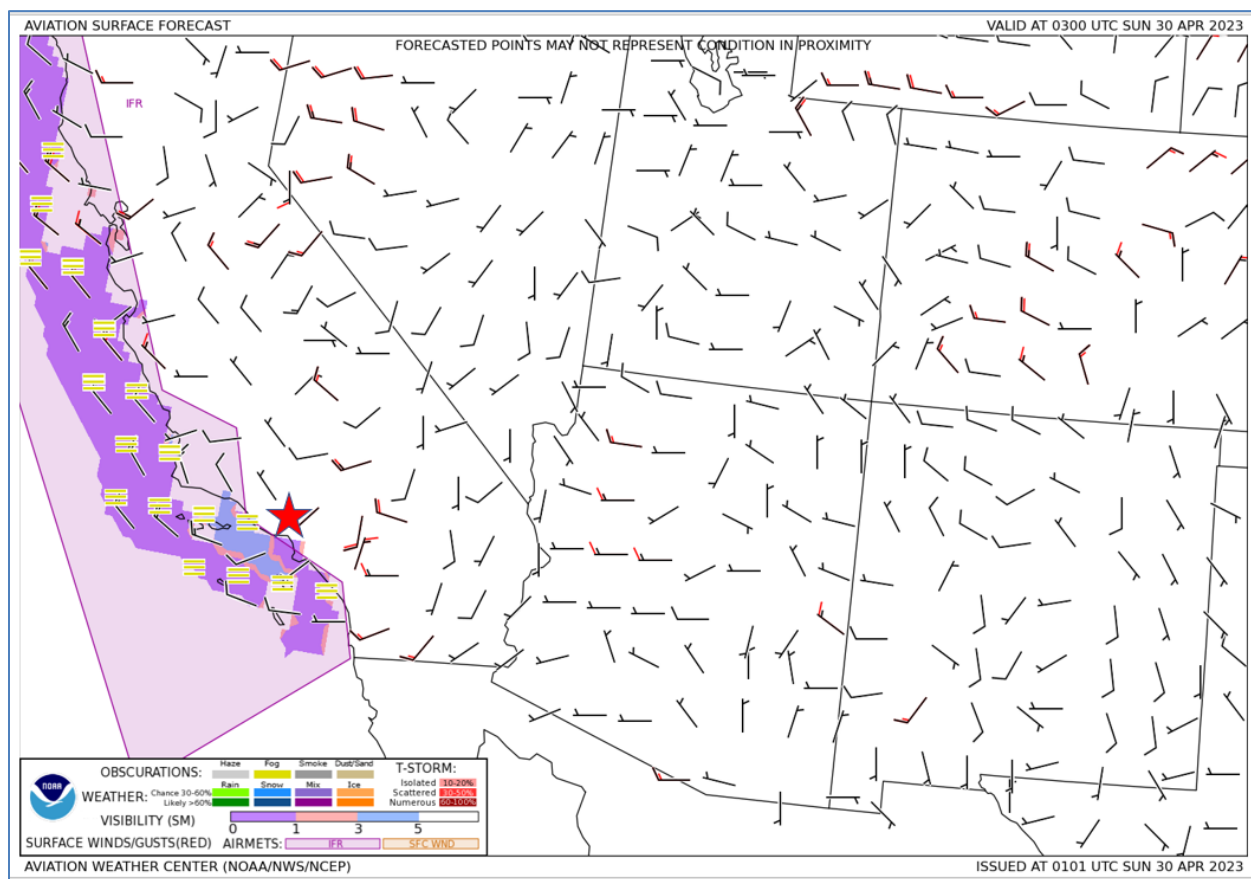


Figure 8 - Graphic Forecast for Aviation 3-hour Surface Forecast valid for 2000 PDT.

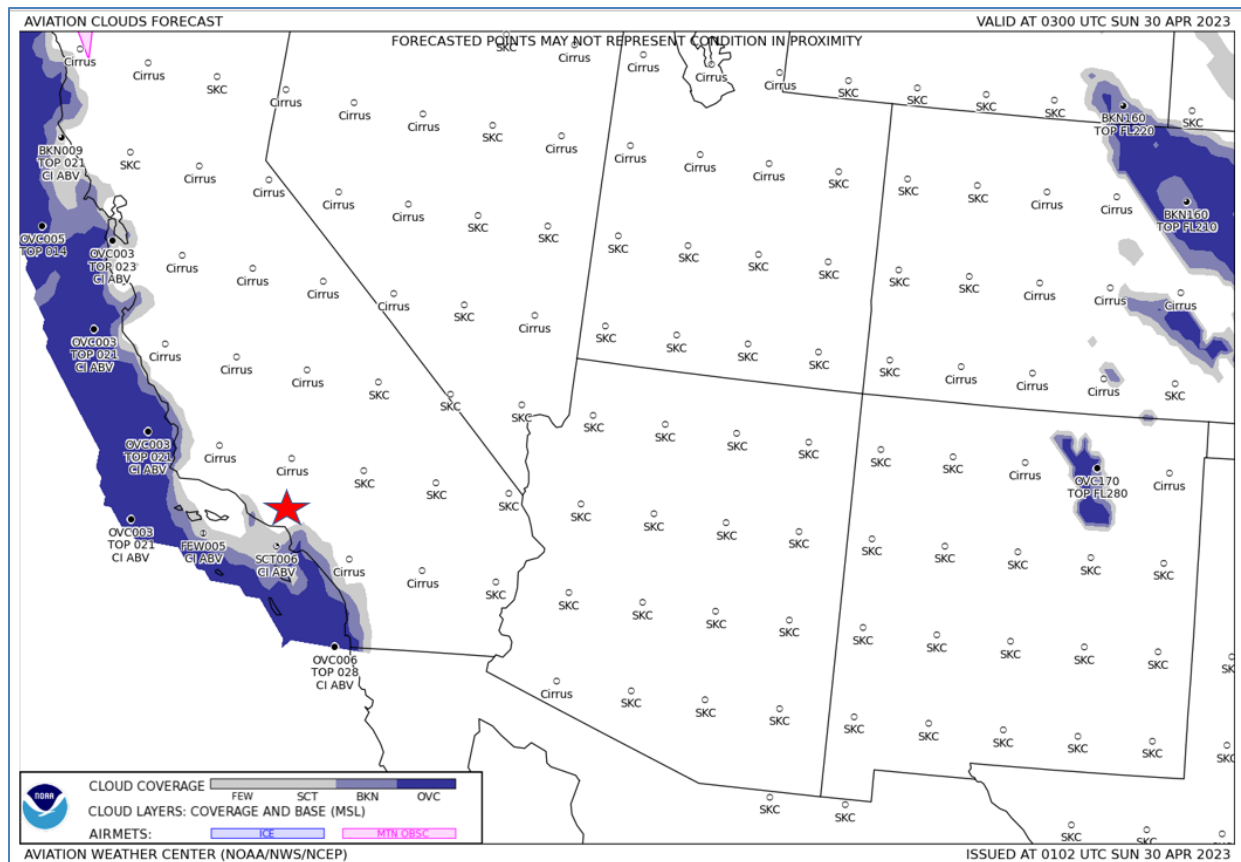


Figure 9 - Graphic Forecast for Aviation 3-hour Cloud Forecast valid for 2000 PDT.

6.4 Inflight Weather Advisories

In-flight Aviation Weather Advisories are forecasts that advise en route aircraft of the development of potentially hazardous weather. Inflight aviation weather advisories in the conterminous U.S. are issued by the NWS AWC, as well as from the Center Weather Service Units (CWSU) at the various Air Route Traffic Control Centers (ARTCCs). There are four basic types of inflight aviation weather advisories: the Significant Meteorological Information (SIGMET), the Convective SIGMET, the G-AIRMET, and the Center Weather Advisory (CWA). Inflight advisories serve to notify en-route pilots of the possibility of encountering hazardous flying conditions that 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 based on experience and the operational limits of the aircraft. Once issued they are broadcast by FAA air traffic controllers upon issuance and available on inflight weather broadcasts.

The NWS had no SIGMETs, Convective SIGMETs, Center Weather Advisories (CWA), or Severe Weather Watches current surrounding the period over the accident

site. At 1945 PDT the NWS AWC issued a G-AIRMET for IFR conditions in precipitation, mist, and fog that was valid for the region at 2000 PDT.

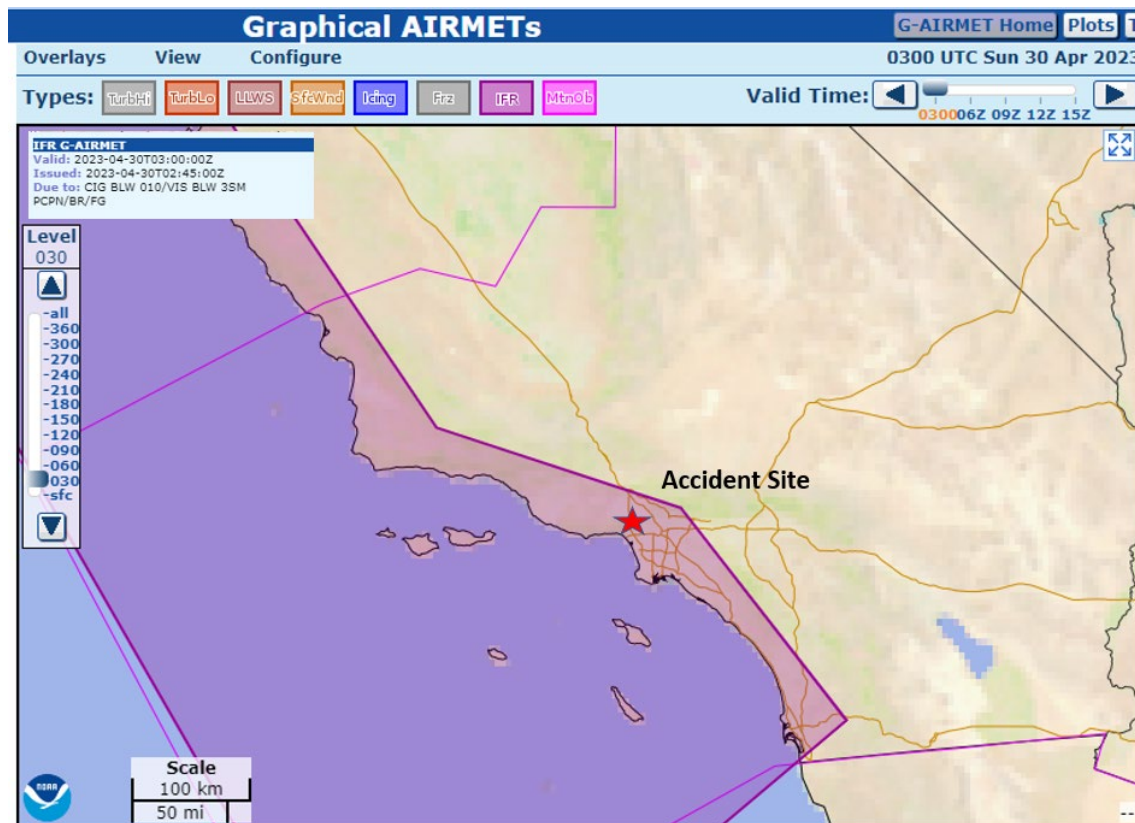


Figure 10 - G-AIRMET for IFR conditions issued at 1945 PDT which extended over the accident site.

7.0 Preflight Weather Briefing

The pilot of N575ND had no contact with the FAA Automated Flight Service Station provider Leidos nor any 3rd party vendors utilizing their system on April 29 or April 30, 2023. A separate search of ForeFlight also had no record of the pilot contacting them for any weather briefing services surrounding the period.

8.0 Astronomical Conditions

The United States Naval Observatory's website¹³ provided the following astronomical conditions over the Van Nuys, California area on April 29, 2023.

¹³ <https://aa.usno.navy.mil/data/index>

Sun	Time (PDT)
Begin civil twilight	0540
Sunrise	0606
Upper transit	1251
Sunset	1937
Accident	1950
End civil twilight	2004

Moon	Time (PDT)
Moonset	0359
Moonrise	1400
Upper Transit	2055

At the time of the accident the sun was about 3° below the horizon, while the moon was 65° above the horizon at an azimuth of 140°. The phase of the moon was a waxing gibbous with 68% of the moon's visible disk illuminated.

Submitted by:

Donald Eick
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