

Preliminary Information

Data Requested

Synoptic Conditions - High pressure dominated over the area, with a deep low-pressure system and associated occluded front to the southwest off the California Pacific coast, which was slowly moving eastward. No boundaries of fronts were identified in the immediate vicinity of the accident site.

Observations - The closest reporting station and destination airport 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. Cloud heights are reported above ground level (agl) and the winds based on true north. The magnetic variation over the area was 15° East and are only applicable to ATC and local observations broadcasts in the area.

The accident site was in an open field adjacent to the destination airport of Independence State Airport (7S5), Independence, OR, at an elevation of about 180 ft. The airport did not have any weather reporting capability. The closest official weather source was from McNary Field Airport (KSLE), Salem, OR, located about 9 miles east-northeast. KSLE had an Automated Surface Observation System (ASOS) and was augmented by air traffic controllers during normal operating hours. At the time of the accident the following conditions were reported.

5-minute weather observation for KSLE, automated, wind from 180° at 3 knots, visibility 5 miles in mist, sky clear below 12,000 ft, temperature 2° Celsius (C), dew point temperature 1° C, altimeter 30.17 inches of mercury.

The 5-minute ASOS observations for KSLE surrounding the period from 1600 through 1730 PST are included below along with the observation which were disseminated longline to users. The observations indicated that LIFR to IFR conditions were reported at KSLE prior to 1130 PST (1930Z), improved to MVFR to VFR conditions immediately prior to the accident with a fog bank and lower visibility reported to the southeast of the station prior to the accident, and rapidly deteriorating conditions to LIFR conditions approximately 15-minutes after the accident at 1715 PST (0115Z) and continuing into the evening.

LIFR METAR KSLE 161856Z 29003KT 2SM BR BKN003 02/01 A3020 RMK AO2 SLP229 T00170011=

IFR SPECI KSLE 161925Z 00000KT 2SM BR SCT002 03/01 A3019 RMK AO2 T00330011=

MVFR SPECI KSLE 161932Z 00000KT 3SM BR SCT002 03/01 A3019 RMK AO2 T00330011=

MVFR METAR KSLE 161956Z 00000KT 5SM HZ FEW002 04/02 A3019 RMK AO2 SLP224 *FG BANK SE-S VIS LWR SE*
T00440017=

MVFR METAR KSLE 162056Z 11005KT 5SM BR SCT004 04/03 A3017 RMK AO2 SLP217 *FG BANK SE* T00440028
58013=

VFR METAR KSLE 162156Z 17003KT 10SM BR CLR 06/03 A3015 RMK AO2 SLP213 T00560028=

VFR METAR KSLE 162256Z 14004KT 10SM CLR 06/03 A3016 RMK AO2 SLP214 *FG BANK 3 SE* T00610033=

VFR METAR KSLE 162356Z 11004KT 10SM CLR 05/03 A3016 RMK AO2 SLP214 T00500028 10061 20000 55002

METAR KSLE 170000Z AUTO 12003KT 10SM CLR 05/02 A3016

METAR KSLE 170005Z AUTO 18004KT 10SM CLR 04/02 A3016

METAR KSLE 170010Z AUTO 19004KT 10SM CLR 04/02 A3016

METAR KSLE 170015Z AUTO 19005KT 10SM CLR 04/02 A3016

METAR KSLE 170020Z AUTO 18004KT 10SM CLR 03/02 A3016

METAR KSLE 170025Z AUTO 17003KT 10SM CLR 04/02 A3016

METAR KSLE 170030Z AUTO 00000KT 10SM CLR 04/02 A3017

METAR KSLE 170035Z AUTO 14004KT 9SM CLR 04/02 A3017

METAR KSLE 170040Z AUTO 13004KT 7SM CLR 03/02 A3017

METAR KSLE 170045Z AUTO 13005KT 6SM BR CLR 02/01 A3017

METAR KSLE 170050Z AUTO 14005KT 5SM BR CLR 02/01 A3017

Accident 0054Z

METAR KSLE 170055Z AUTO 18003KT 5SM BR CLR 02/01 A3017

MVFR METAR KSLE 170056Z 19003KT 5SM BR CLR 02/01 A3017 RMK AO2 SLP219 T00220011

METAR KSLE 170100Z AUTO 19005KT 6SM MIFG CLR 02/02 A3017

METAR KSLE 170105Z AUTO 17005KT 5SM MIFG CLR 02/01 A3017

METAR KSLE 170110Z AUTO 14004KT 2SM MIFG CLR 02/01 A3017

METAR KSLE 170115Z AUTO 12004KT 4SM MIFG FEW003 02/01 A3018
 METAR KSLE 170120Z AUTO 13004KT 4SM MIFG CLR 02/01 A3018
 METAR KSLE 170125Z AUTO 16004KT 4SM MIFG CLR 01/01 A3018
 LIFR SPECI KSLE 170127Z 15003KT 1/4SM R31/1400V2400FT FG VV003 01/01 A3018 RMK AO2 T00110006
 METAR KSLE 170130Z AUTO 14003KT 1/4SM FG VV003 01/01 A3018
 LIFR METAR KSLE 170156Z 15004KT 1/4SM R31/1400V1800FT FG VV003 01/00 A3018 RMK AO2 SLP222
 T00060000=
 LIFR METAR KSLE 170256Z 17005KT 1/2SM R31/1600V2200FT FG VV001 01/00 A3018 RMK AO2 SLP222
 T00110000 51007=
 LIFR METAR KSLE 170356Z 15003KT 1 1/2SM R31/5000VP6000FT BR BKN002 01/00 A3018 RMK AO2 SLP222
 T00060000=
 LIFR METAR KSLE 170456Z 00000KT 1 1/2SM R31/2400V6000FT BR BKN003 01/M01 A3019 RMK AO2 SLP225
 T00061006=

The NWS Terminal Aerodrome Forecast issued for KSLE during the period expected MVFR conditions in mist at the estimated time of arrival, with conditions above alternate requirement limits. The forecasts were as follows:

TAF KSLE 161732Z 1618/1718 VRB03KT 2SM BR BKN002
 FM161900 VRB03KT 4SM BR SCT002
 FM162000 VRB03KT P6SM BKN250
 FM170400 VRB02KT 1SM BCFG BR BKN003=

TAF KSLE 162334Z 1700/1724 VRB04KT P6SM BKN250
 FM170200 VRB02KT 4SM BR SCT250
 FM170600 VRB02KT 1/2SM FG BKN002
 FM171900 36004KT 4SM BR SCT250
 FM172000 36005KT P6SM SCT250=

The departure station was from McMinnville Municipal Airport (KMMV), McMinnville, OR, at approximately 1638 PST, located about 20 miles north of the accident site at an elevation of 163 ft. The airport also had an ASOS and reported similar conditions around the period of the accident.

LIFR METAR KMMV 161853Z AUTO 00000KT 10SM OVC002 00/00 A3020 RMK AO2 SLP228 T00000000 \$=
 LIFR METAR KMMV 161953Z AUTO 00000KT 10SM BKN003 02/02 A3019 RMK AO2 SLP224 T00220022 \$=
 VFR SPECI KMMV 162004Z AUTO 00000KT 10SM SCT003 03/03 A3018 RMK AO2 T00280028 \$=
 VFR METAR KMMV 162053Z AUTO 00000KT 10SM CLR 04/03 A3017 RMK AO2 SLP217 T00390028 58012 \$=
 VFR METAR KMMV 162153Z AUTO 10003KT 10SM CLR 06/03 A3016 RMK AO2 SLP215 T00610033 \$=
 VFR METAR KMMV 162253Z AUTO 10003KT 10SM CLR 07/03 A3016 RMK AO2 SLP214 T00670033 \$=
 VFR METAR KMMV 162353Z AUTO 14003KT 10SM CLR 06/03 A3017 RMK AO2 SLP216 T00610033 10067 21011
 55001 \$=

Departure 0038Z

VFR METAR KMMV 170053Z AUTO 00000KT 10SM CLR 04/02 A3017 RMK AO2 SLP217 T00440022 \$=
 VFR METAR KMMV 170153Z AUTO 00000KT 10SM CLR 03/02 A3018 RMK AO2 SLP222 T00280017 \$=
 VFR METAR KMMV 170253Z AUTO 00000KT 10SM CLR 01/01 A3018 RMK AO2 SLP220 T00110006 50004 \$=
 VFR METAR KMMV 170353Z AUTO 00000KT 10SM CLR 00/00 A3019 RMK AO2 SLP224 T00000000 \$=
 VFR SPECI KMMV 170423Z AUTO 05003KT 10SM SCT004 M01/M01 A3019 RMK AO2 T10061011 \$=
 LIFR SPECI KMMV 170431Z AUTO 00000KT 10SM BKN003 M01/M01 A3019 RMK AO2 T10061011 \$=
 LIFR SPECI KMMV 170450Z AUTO 00000KT 10SM OVC002 M01/M01 A3019 RMK AO2 \$=
 LIFR METAR KMMV 170453Z AUTO 00000KT 10SM OVC002 M01/M01 A3019 RMK AO2 SLP226 T10061006 \$=

The NWS Aviation Weather Center (AWC) METAR display for the approximate time of the accident is included as figure 1 with KSLE in the center of the display and the approximate accident site marked by a red star. The display also incorporates the regional radar mosaic for the period, which indicated no significant meteorological echoes over the area during the period.

Sounding - The NWS Salem (KSLE) raob sounding for 1600 PST (0000Z) was obtained from the University of Wyoming's website. The data were then plotted on a standard Skew T log P diagram using the RAOB Analysis software. And is included as figure 2.

The KSLE sounding depicted a surface temperature of 6°C (42°F), a dew point temperature of 3°C (38°F), with a

relative humidity of 84%. The sounding depicted the lifted condensation level (LCL) at 1,031 ft agl, and a convective condensation level (CCL) at 15,100 ft agl. The sounding also indicated a defined temperature inversion above 1,000 ft through 3000 ft. The RAOB Analysis program supported a few stratiform clouds at 700 ft agl below this inversion, with a layer of cirrus clouds at higher altitudes. The freezing level was identified around 10,400 ft, well above the accident airplanes cruising altitude and thus icing was not a factor. The fog threat temperature of 2.5°C, with the fog FSI and threat index supporting radiation fog development.

The sounding wind profile indicated light and variable winds at the surface through 2,000 ft with winds of 5 knots or less, with winds above 2,000 ft from the southwest which veered to the west with height. The mean 0 to 6 kilometer or 18,000 ft wind from 250° at 15 knots. The RAOB Analysis program supported a chance of light to moderate turbulence near the tops of the inversion between 2,000 ft and 3,000 ft.

Inflight Weather Advisories - The NWS had a Graphic-AIRMET current for IFR conditions which extended over the destination and KSLE for ceilings below 1,000 ft agl and/or visibility below 3 miles in fog/mist and is displayed in image 3.

Satellite Imagery - the GOES-18 infrared and visible imagery were examined surrounding the period. Attached as figure 4 is the last usable GOES-18 visible image for 2016 PST before the sun angle was too low over the area. The image depicted a large area of low stratiform clouds and/or fog extending over the accident site and to the south of KSLE. Figure 5 is the GOES-18 infrared image for 1656 PST at 4X magnification which further shows low clouds over the region.

Pilot Reports - the following reports pilot reports or PIREPs were recorded within 50 miles and below 12,000 ft over the area:

TTD UA /OV TTD060008/TM 0029/FL016/TP C172/TB MOD
UAO UA /OV KUAO/TM 0054/FL004/TP C560/SK VV002-TOP004/RM DURC RY35
PSC UA /OV PSC300005/TM 0240/FL010/TP BE9L/SK OVC024-TOP032

A PIREP near Portland-Troutdale Airport (TTD) about 50 miles northeast of the accident site from a pilot in a similar Cessna 172 reported moderate turbulence at 1,600 ft. While another PIREP from Aurora State Airport (UAO) located about 29 miles northeast of the accident site reported at the time of the accident a layer of clouds with bases near 200 ft with tops near 400 ft during his departure.

Area Forecast Discussion - the Portland NWS Weather Forecast Office (WFO) responsible for the TAFs and other local weather warnings issued the following Area Forecast Discussion (AFD) to describe the conditions influencing the area, and their reasoning behind the forecasts.

FXUS66 KPQR 162353
AFDPQR

Area Forecast Discussion
National Weather Service Portland OR
351 PM PST Sat Dec 16 2023

.SYNOPSIS...*Strong ridge of high pressure aloft and low-level offshore flow are leading to unseasonably warm conditions this weekend across much of SW Washington and Oregon. That said, strong inversions have developed, with cooler air trapped in many inland valleys. These valleys stand to see occasionally dense fog through Monday morning, mainly during the night and morning hours.* Low pressure will lurk offshore through much of next week, leading to occasional chances for rain as wraparound moisture drifts northward from California. Snow levels will remain unseasonably high through much of next week.

.AVIATION...*Little change in the overall pattern, as broad low pressure remains off the north Calif coast. This will maintain south to southwest flow aloft, with variable high clouds across the region into tonight. Light offshore flow near the surface will keep region dry. Widespread VFR conditions throughout the region, except for **persistent low stratus remaining in KEUG. Beginning around 03-04z Sun, guidance suggests chances of LIFR fog for areas south of Portland around 50-70%, with all other inland areas around 10-30%.*** Areas of localized freezing fog remain a concern for tonight into Sunday morning.

PDX AND APPROACHES...*VFR with variable high clouds into tonight. Light offshore flow will maintain east winds out of the Columbia Gorge, enough to keep areas to east of PDX free of fog. Chances for MVFR conditions throughout the TAF period remain under 20%.*

-JH

Astronomical Conditions - Data from the United States naval Observatory's website provided the following astronomical data for the Independence, OR area on December 16, 2023.

<u>SUN</u>	<u>Time (PST)</u>
Beginning civil twilight	0711
Sunrise	0744
Upper transition	1208
Sunset	1632
<i>Accident</i>	<i>1654</i>
End civil twilight	1706

<u>Moon</u>	
Moonrise	1118
Upper transition	1559
Moonset	2050

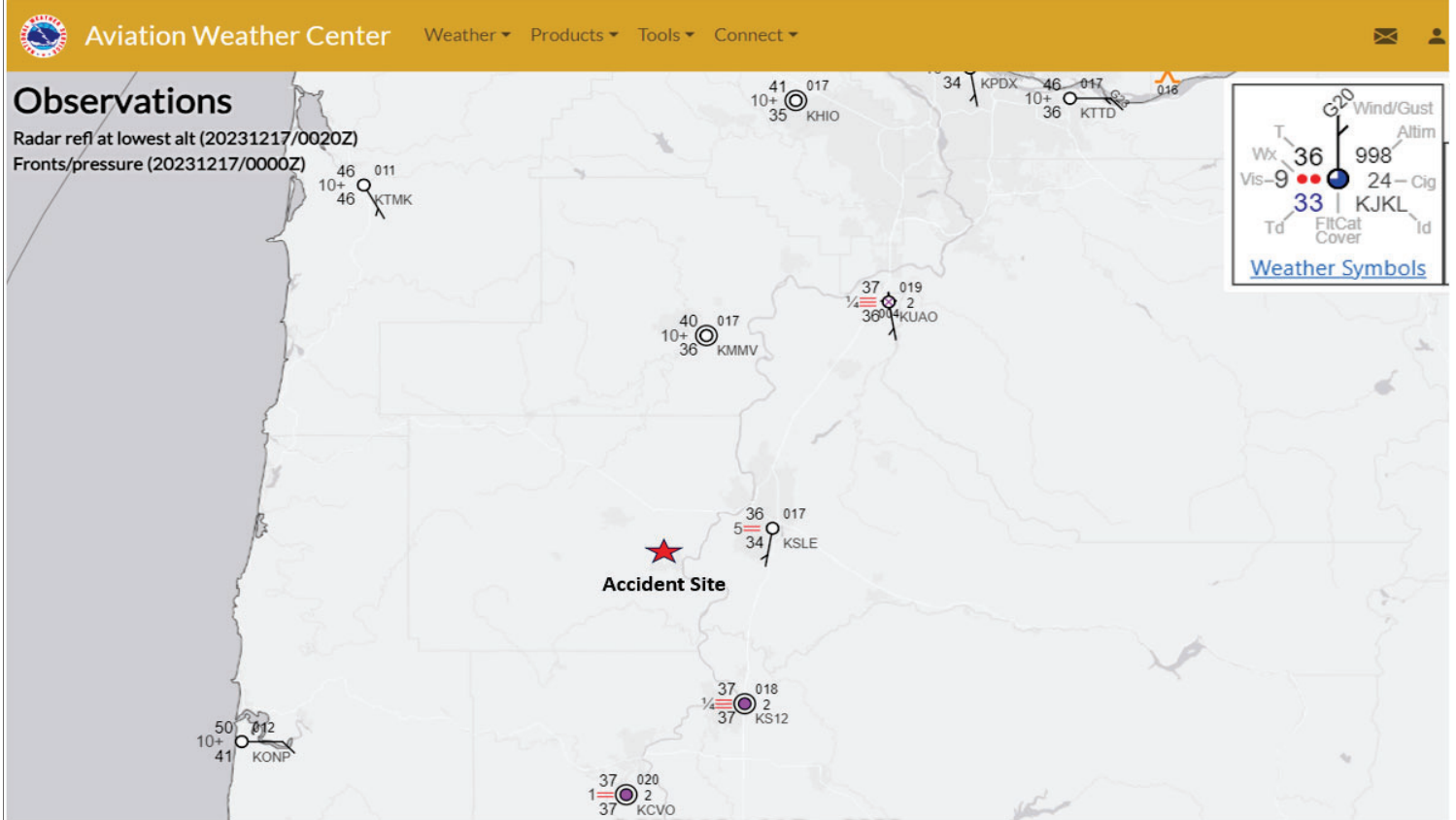
At the approximate time of the accident the Sun was about 4° below the horizon at an azimuth of 240°.

Preliminary Analysis

The area was beginning to fog in with a low layer of stratus clouds being reported in the surrounding stations and in the Raob observation for KSLE. The local METARs had LIFR conditions reported about 15-minutes after the accident. It is likely the developing fog and low stratiform cloud was encountered and resulted in VFR into IMC conditions. An G-AIRMET for IFR conditions was current for the area; however, the local NWS forecast office forecast for KSLE was for MVFR conditions. Will submit request for weather briefing and see if the pilot was aware of the AIRMET.

Additional Details

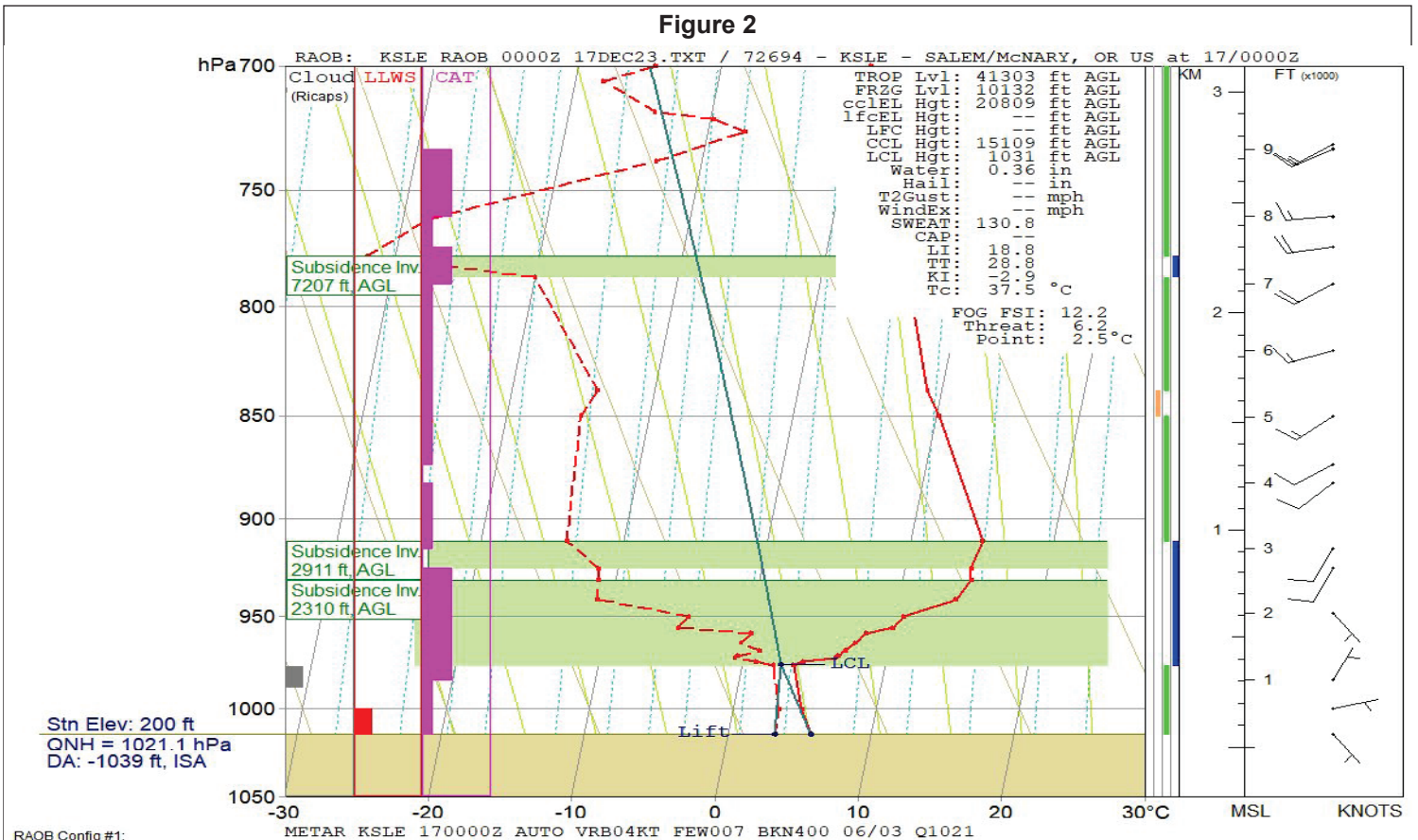
Figure 1



Caption

NWS Aviation Weather Center's METAR and radar display for 1700 PST with the approximate accident site marked by the red star. Multiple station in the area were reporting LIFR to MVFR conditions due low ceiling/mist

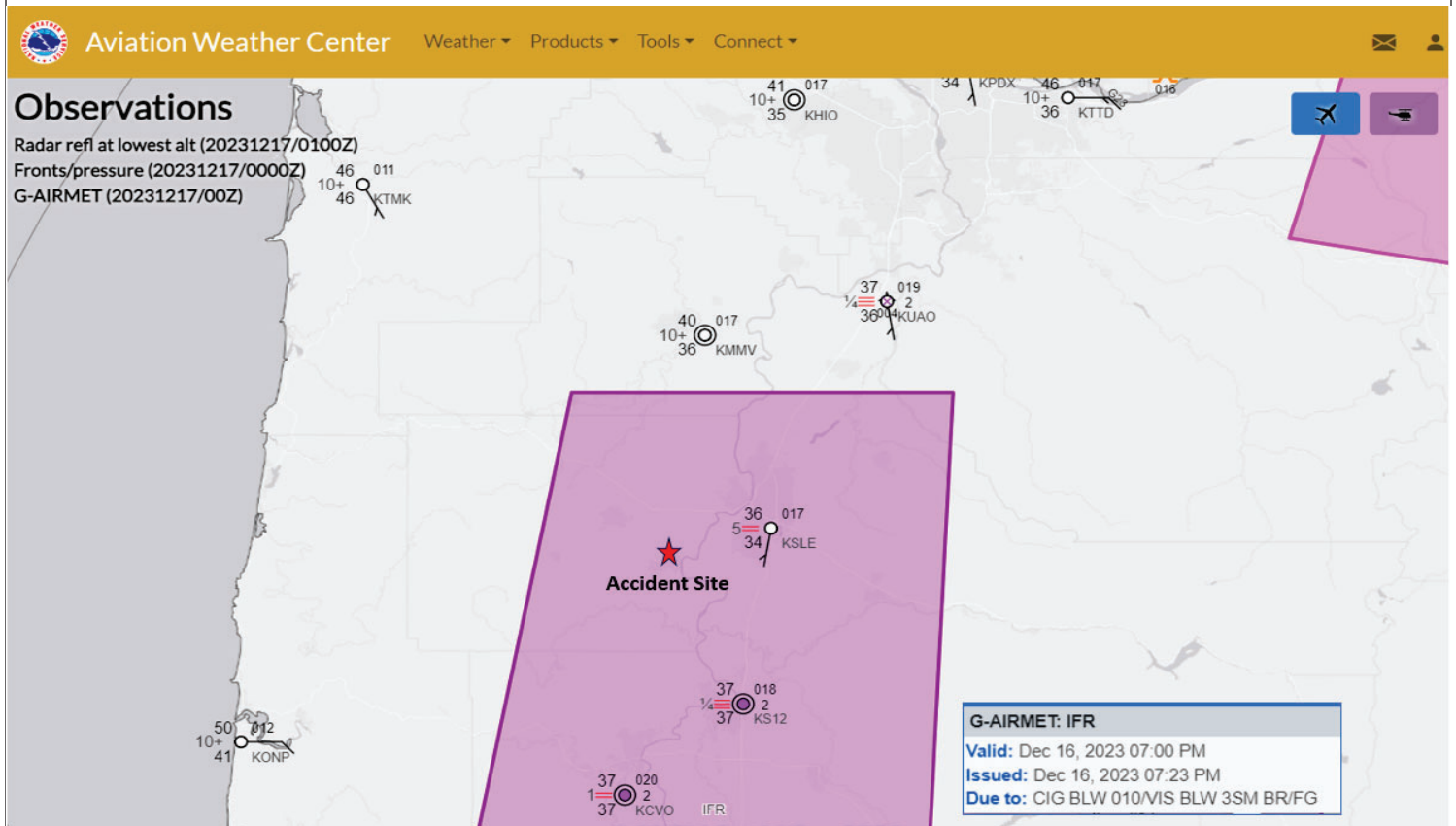
Figure 2



Caption

NWS Salem sounding for 1600 PST support low stratiform clouds and fog formation.

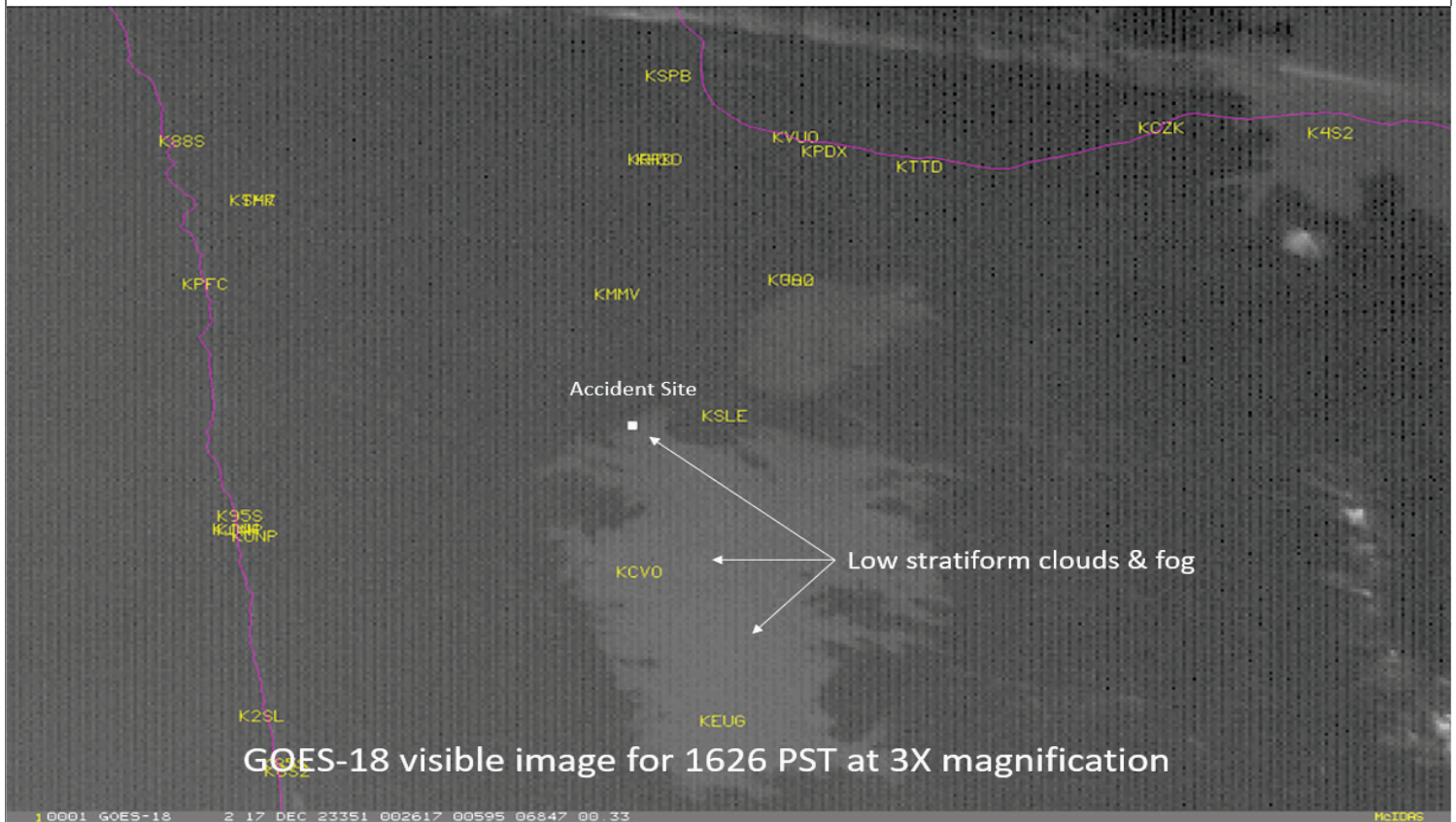
Figure 3



Caption

NWS depiction of the Graphic-AIRMET for IFR conditions valid over the region at the time of the accident.

Figure 4



Caption

GOES-18 visible image for 1626 PST or the last usable image due to the low light at twilight. Image depicted a large area of low stratiform clouds and fog over the accident site.

[illegible]

The GOES-18 infrared image for 1656 PST at 4X magnification.

--