



Memorandum For Record

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Eastern Region

Date: January 11, 2021
NTSB Accident Number: ERA21LA092

The following weather reports and records was provided by Don Eick, NTSB's Senior Meteorologist, Office of Aviation Safety, Operational Factors Division (AS-30).

Synoptic Conditions - The northeast section of the NWS Surface Analysis Chart for 1300 EST (1800Z) is included as figure 1 with the approximate location of the accident site within the red circle. The chart depicted a low-pressure system at 1001- hectopascals (hPa) off the east coast to the east-northeast of the accident site associated with an occluded frontal system. To the west a high-pressure system at 1024-hPa was located over Kentucky, which resulted in a strong pressure gradient over the region with west-northwest winds. The station models surrounding the accident site depicted wind from the WNW at 15 knots, broken clouds, temperature 52° Fahrenheit (F), with a dew point temperature of 25° F.

Surface Observations - Culpeper Regional Airport (KCJR), Culpeper, VA, at an elevation of 315 ft and had a magnetic variation of 10 W based on the latest sectional chart. The airport had an Automated Weather Observation System (AWOS) and issued observations every 20-minutes. The observations issued during the period from 0915 through 1400 EST were as follows.

METAR KCJR 221415Z AUTO 30006G16KT 10SM CLR 08/M01 A2998 RMK AO2 T00801015=
METAR KCJR 221435Z AUTO 28010G15KT 10SM SCT047 BKN060 BKN070 08/M01 A2999 RMK AO2 T00801014=
METAR KCJR 221455Z AUTO 28007KT 10SM OVC060 08/M02 A3000 RMK AO2 T00821016=
METAR KCJR 221515Z AUTO 30006G16KT 10SM BKN050 OVC060 09/M02 A3002 RMK AO2 T00871017=
METAR KCJR 221535Z AUTO 29009G14KT 10SM OVC055 09/M02 A3002 RMK AO2 T00901021=
METAR KCJR 221555Z AUTO 30012G21KT 10SM OVC055 09/M03 A3003 RMK AO2 T00901029=

Departed KGAI 1600Z

METAR KCJR 221615Z AUTO 30015G25KT 10SM BKN055 10/M03 A3004 RMK AO2 T01031029=
METAR KCJR 221635Z AUTO 32016G26KT 10SM BKN055 11/M03 A3005 RMK AO2 T01081035=
METAR KCJR 221655Z AUTO 29016G29KT 10SM OVC055 11/M03 A3005 RMK AO2 T01071035=

Accident KCJR 1700Z

METAR KCJR 221715Z AUTO 31015G22KT 10SM SCT055 SCT070 11/M03 A3005 RMK AO2 T01061035=
METAR KCJR 221735Z AUTO 30012G25KT 10SM SCT055 10/M04 A3006 RMK AO2 T01041040=
METAR KCJR 221755Z AUTO 30012G20KT 280V340 10SM SCT055 10/M04 A3006 RMK AO2 T01041038

10109 20064=

METAR KCJR 221815Z AUTO 32013G20KT 280V340 10SM SCT055 11/M04 A3006 RMK AO2 T01131037=

METAR KCJR 221835Z AUTO 31015G26KT 10SM CLR 11/M04 A3006 RMK AO2 T01101040=

METAR KCJR 221855Z AUTO 32009G23KT 10SM CLR 11/M04 A3006 RMK AO2 T01101039=

The observations indicated from 1055 through 1355 EST winds were from 290° to 320° sustained at 12 to 15 knots with gusts from 21 to 29 knots, with the strongest gust reported at 1155 EST. The report at 1155 EST indicated the wind from 290 at 16 knots with gusts to 29 knots, which implied for runway 22 with a heading of 208° true a headwind component of 5 knots with a crosswind of 29 knots based on peak gust.

A display of the conditions from the NWS Aviation Weather centers METAR display for 1200 EST is included as figure 2 and depicted wind gust from 20 to 35 knots over the region at the time of the accident.

NWS Forecasts - The closest NWS Terminal Aerodrome Forecast (TAF) was issued for Quantico Marine Corps Airfield/ Turner Field (KNYG), Quantico, Virginia, located approximately 27 nautical miles east of the airport. A review of the TAF indicated forecast wind temporarily from 310° at 15 knots gusting to 30 knots during the period.

TAF KNYG 2215/2315 28010KT 9999 SCT030 QNH2997INS

TEMPO 2216/2220 31015G30KT

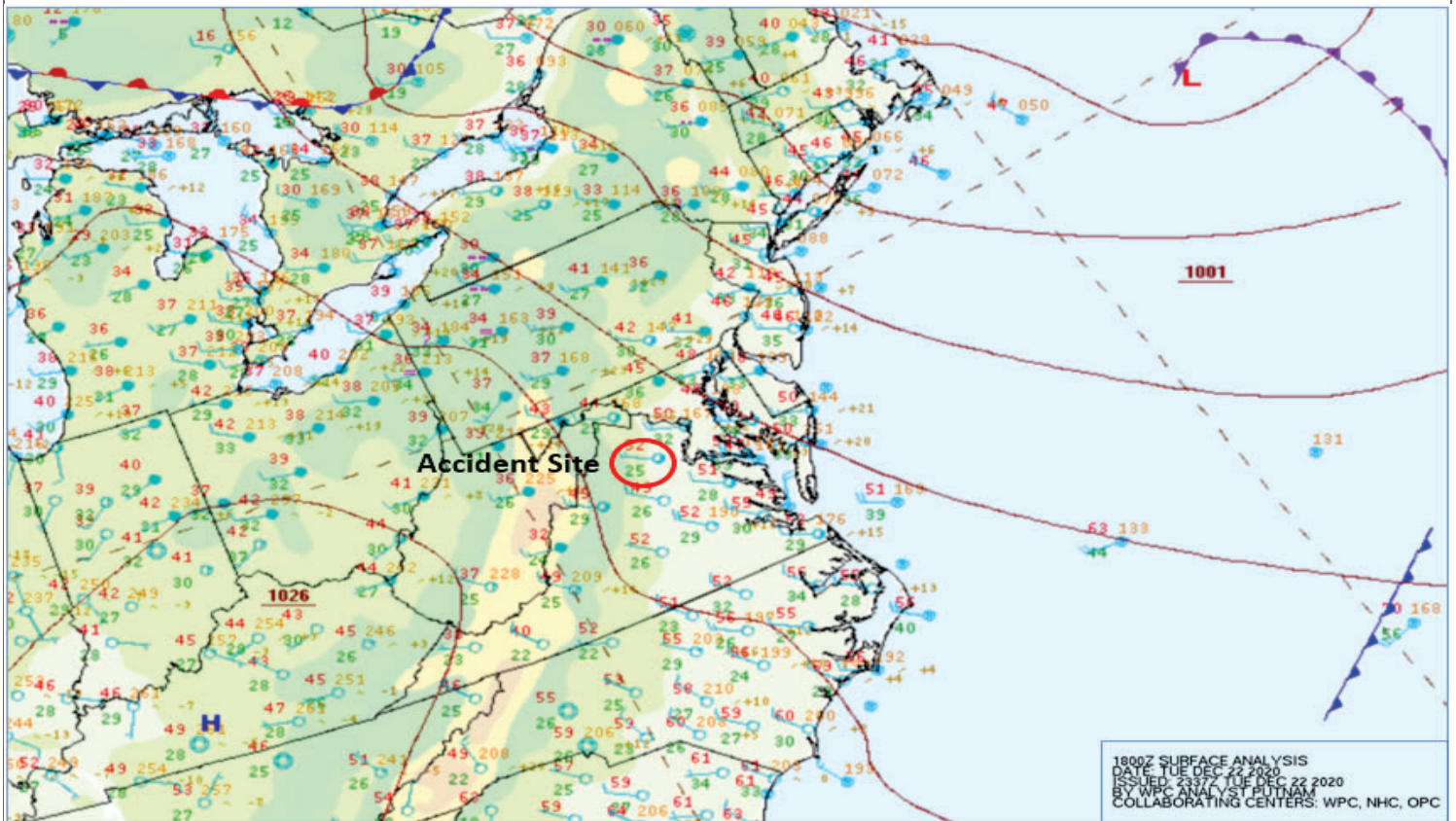
FM230200 VRB06KT 9999 SCT020 QNH3029INS

T10/2219Z TM01/2312Z=

Sounding - A High-Resolution Rapid Refresh (HRRR) numerical model data was obtained from the NOAA Air Resource Laboratory archive data and plotted on a standard Skew T log P diagram for 1100 EST over Culpeper. The sounding depicted a near surface temperature of 9° C (° F), a dew point temperature of 0° C (32 °F). The sounding had a lifted condensation level (LCL) and level of free convection (LFC) at 3,821 ft msl and supported a shallow layer of stratiform clouds at about 4,000 ft agl based on the stable atmosphere. The wind profile indicated a surface wind from 310 at 15 knots with gusts to 29 knots, with little directional variation of the wind with height but with increasing wind speeds. Wind speeds exceed 20 knots immediately above the surface at 400 ft msl with the maximum winds of 130 knots at 24,000 ft. Due to the strong increase in wind a slight low-level wind shear was indicated below 400 ft.

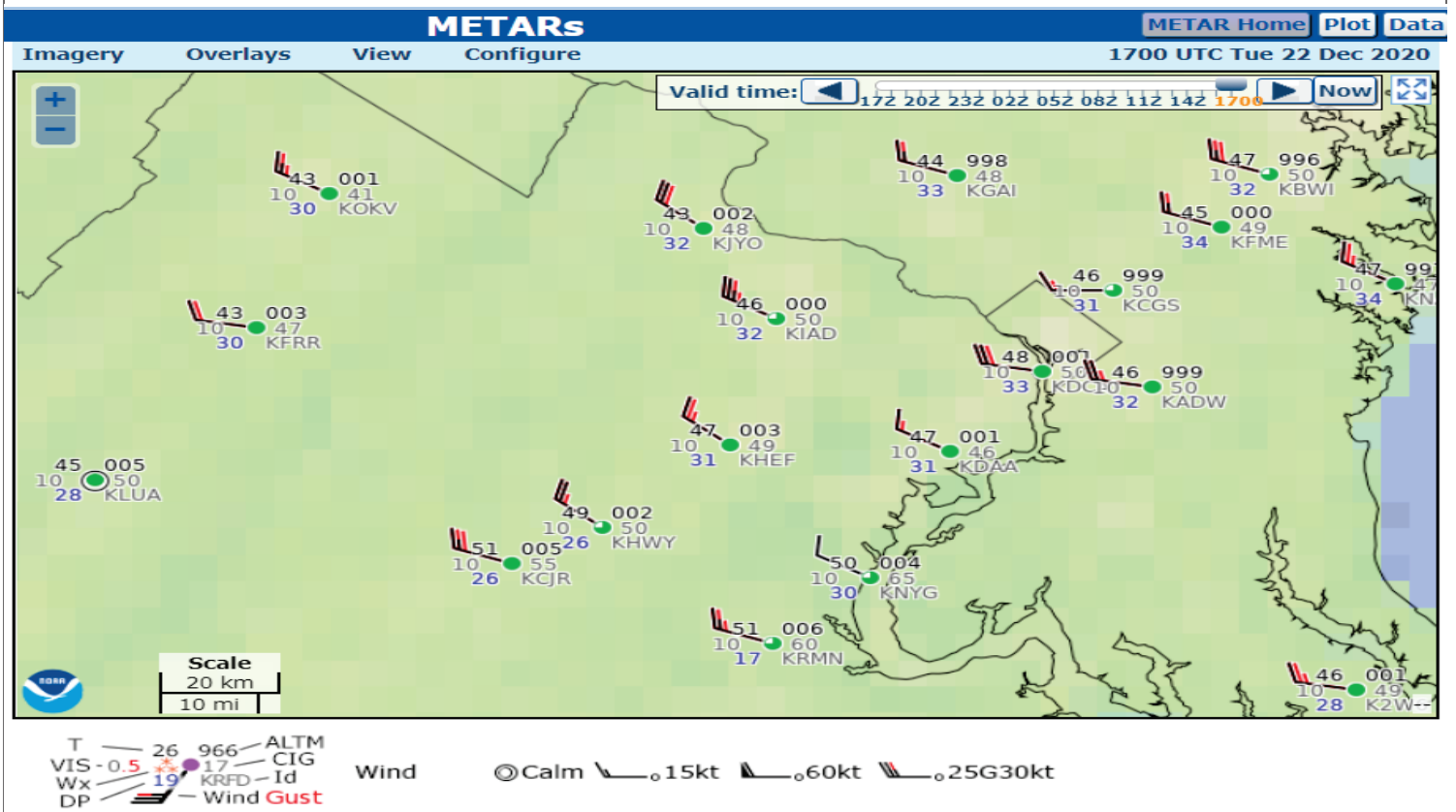
NWS Inflight Weather Advisories - A review of the NWS Aviation Weather Center indicated that a Graphic-AIRMET was current for low-level turbulence from the surface to 12,000 ft over the area during the period. There were no SIGMETs, Convective SIGMETs, or Center Weather Advisories (CWA's) current during the period.

Figure 1



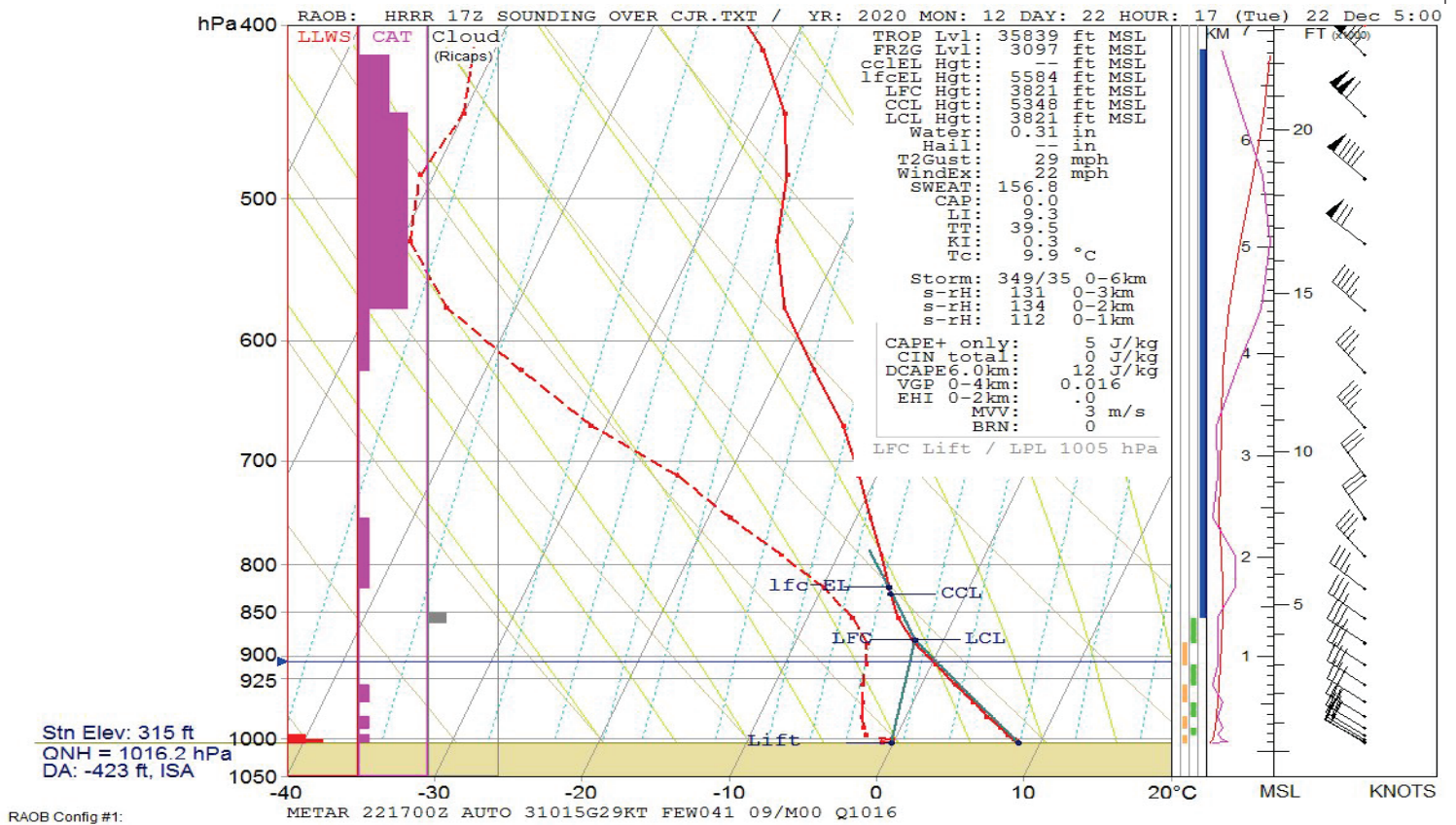
Caption Northeast section of the NWS Surface Analysis Chart for 1300 EST (1800Z) depicting the primary surface pressure systems and wind over the area.

Figure 2



Caption NWS Aviation Weather Center's METAR display for 1200 EST.

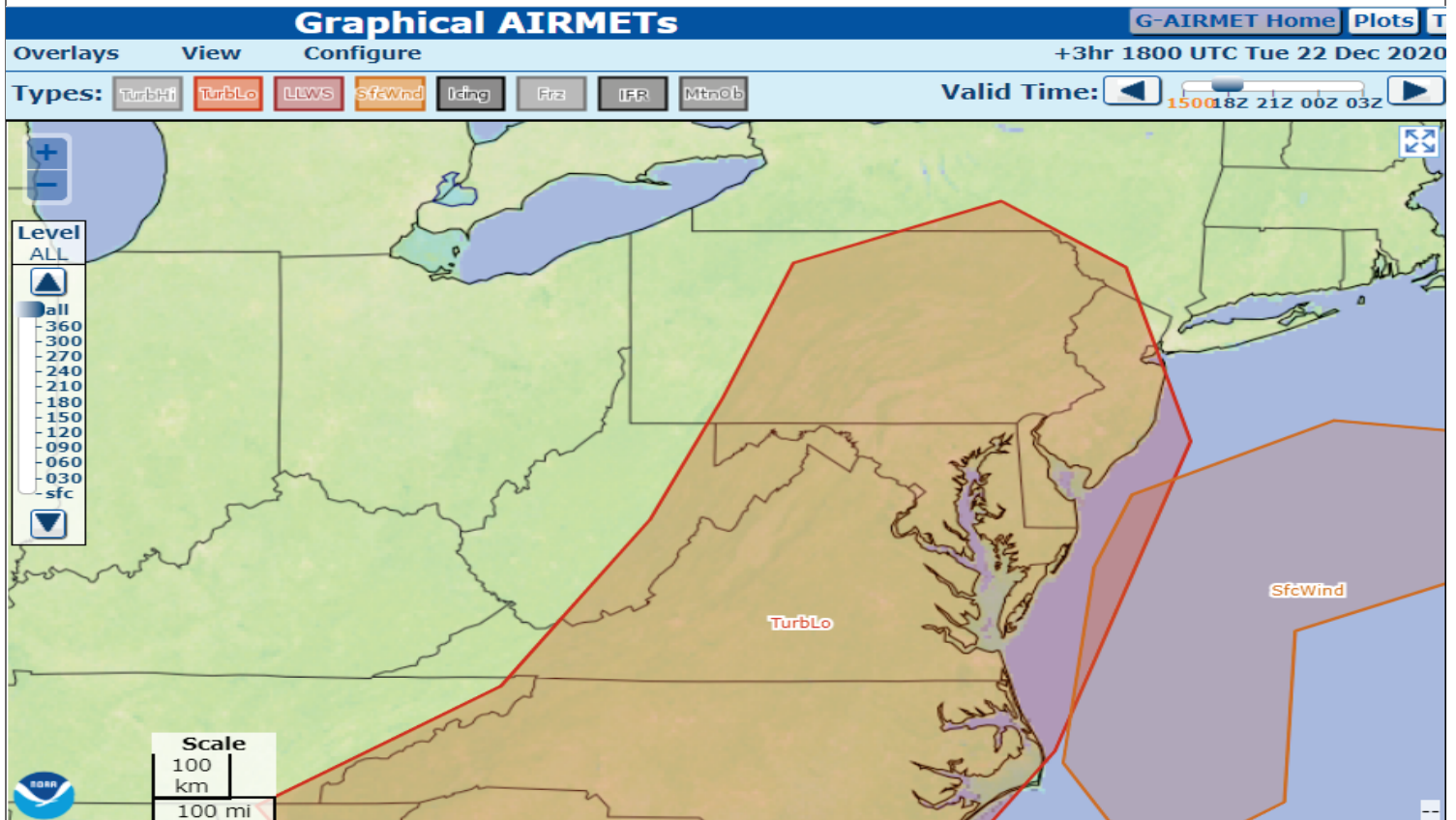
Figure 3



Caption

High-Resolution Rapid Refresh (HRRR) numerical model over Culpeper for 1200 EST

Figure 4



Caption

NWS Graphic-AIRMET Tango for occasional moderate turbulence below 12,000 ft.