



MEMORANDUM FOR RECORD

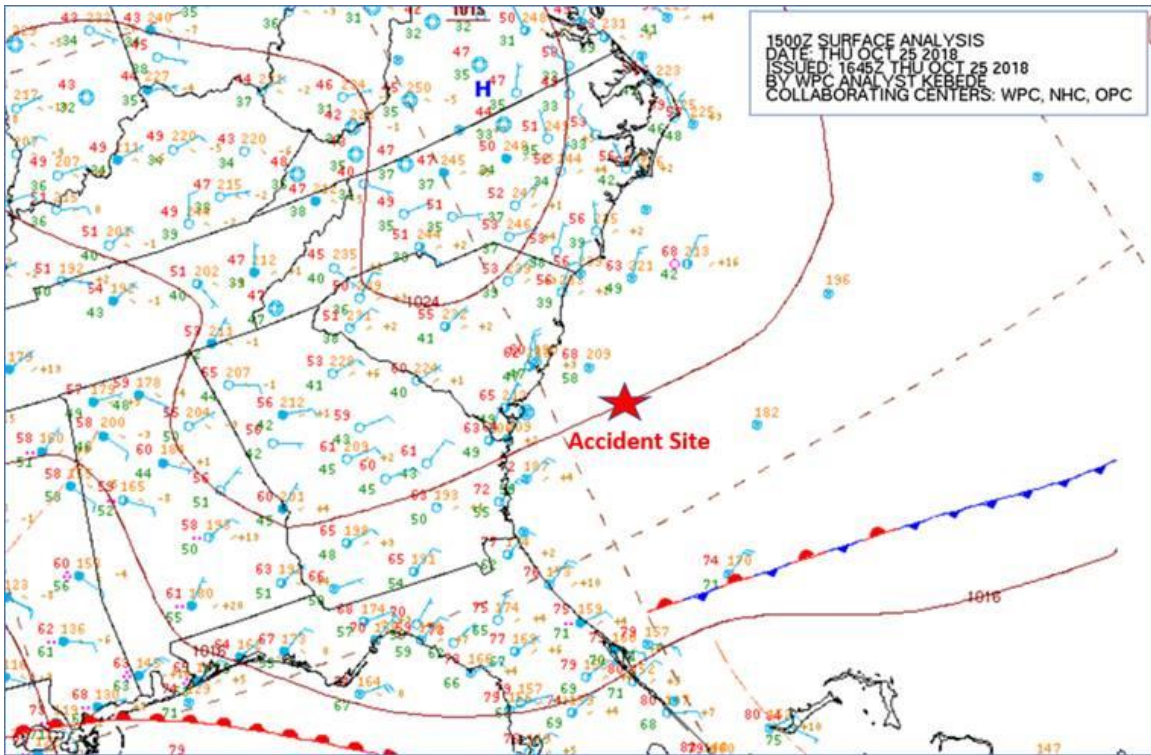
Douglass Brazy
Air Safety Investigator
Eastern Region Aviation

November 15, 2018

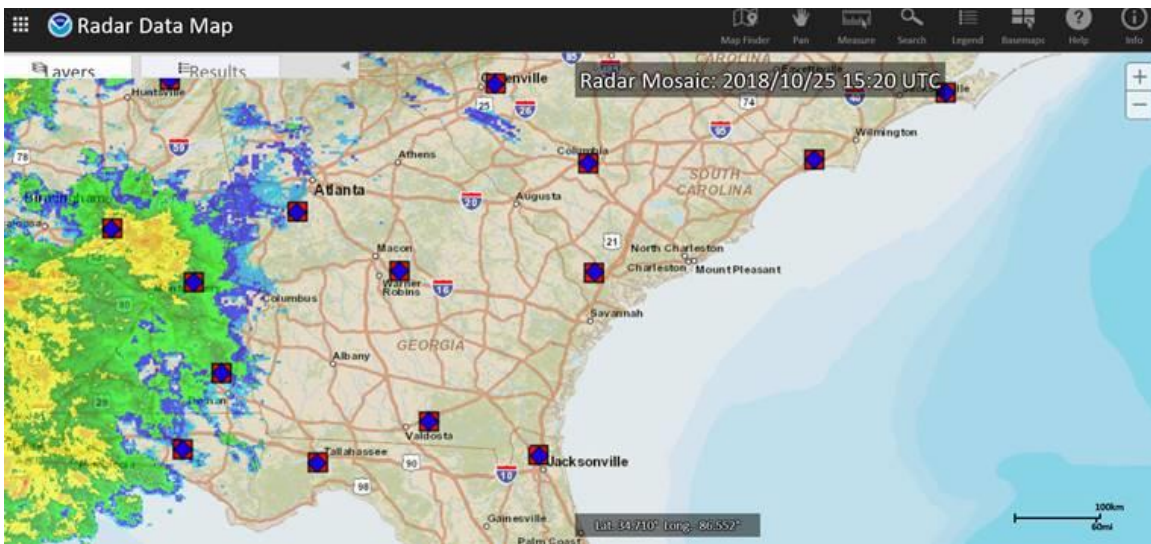
Subject: NTSB investigation ERA19LA026, N555PM, Piper PA31T, Atlantic Ocean (about 100 miles southeast of Charleston, South Carolina, October 25, 2018).

NTSB Meteorologist Don Eick, provided the following information via email:

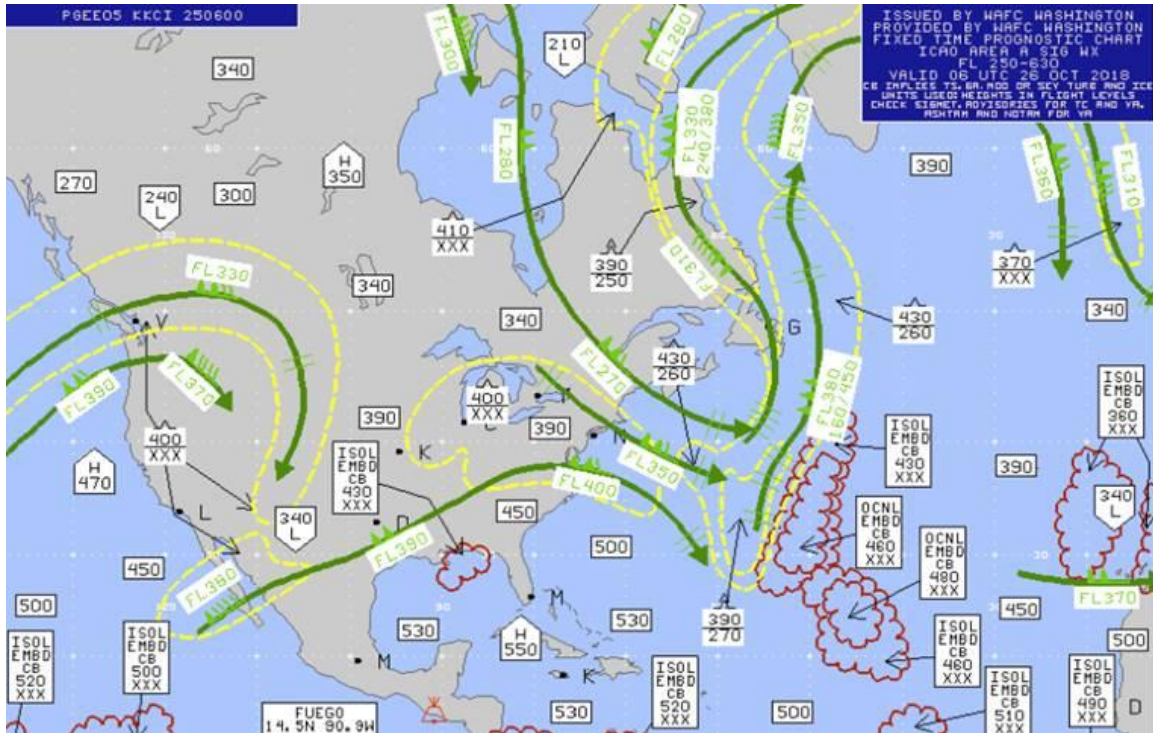
Synoptic Conditions – The NWS southeast section of the Surface Analysis Chart for 100 EDT (1500Z) depicted a stationary front south of the area extending east-to-west north of the Bahamas. A high pressure system was located over Virginia and North Carolina with a central pressure of 1015-hectopascals (hPa) with a ridge extending eastward. The station models and pressure field indicated a surface wind from the northeast at 10 to 15 knots over the accident site.



The National Composite radar Mosaic for 1120 EDT was reviewed and showed no convective echoes over the region. The GOES-16 satellite imagery would also confirm that no precipitation echoes were identified over the region.



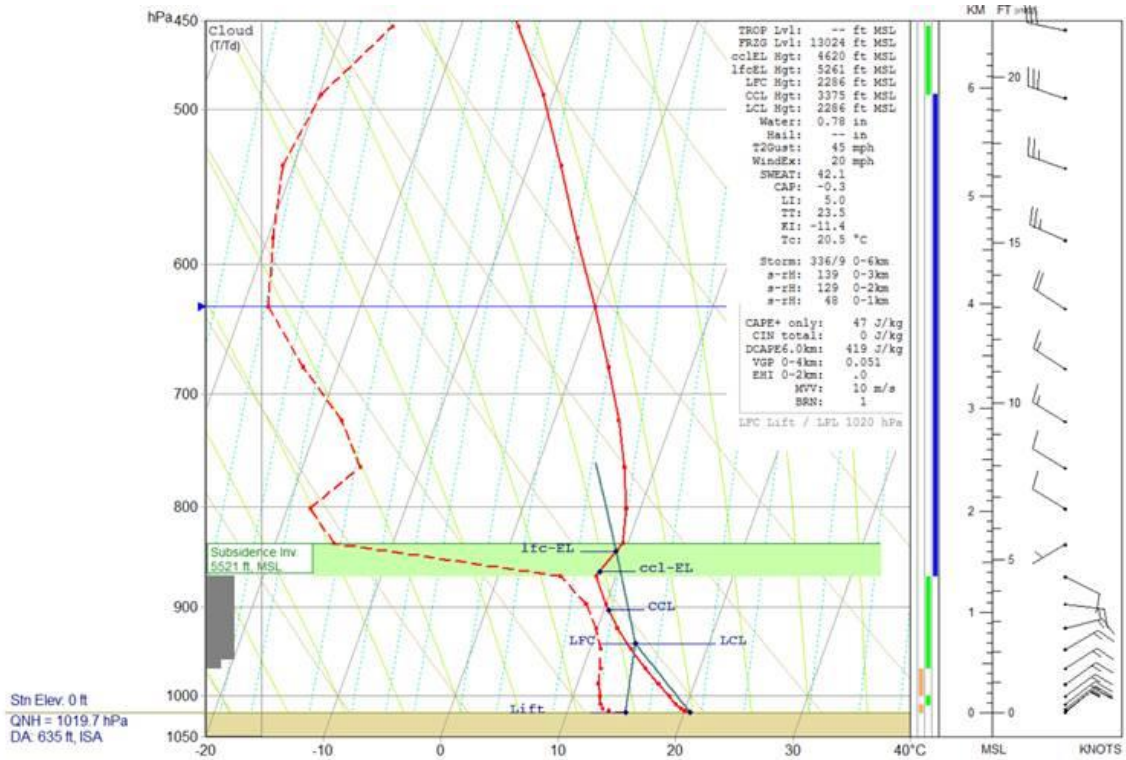
The High Level Significant Weather Prognostic Chart valid at the period indicated the subtropical jet stream core at FL400 at 110 knots with the potential for moderate turbulence associated with the jet stream in the ridge. No organized areas of thunderstorms were expected for the route of flight.



Sounding – a NOAA High Resolution Rapid Refresh (HRRR) numerical model was obtained from archive data and run over the accident site coordinates for 1100 EDT. The below Skew Log P diagram is that sounding which indicated a lifted condensational level (LCL) and level of free convection (LFC) at 2,286 ft agl, and a convective condensation level (CCL) at 3,375 ft agl, which supported scattered cumulus clouds. The expected cloud tops were at 5,261 ft msl. The top of the marine layer was noted by a defined temperature inversion at 5,521 ft. The overall atmosphere was characterized as stable with a Lifted Index of +5.0. The freezing level was at 13,042 ft; a shallow layer near 23,000 ft indicated a shallow layer favorable for light rime type icing.

The sounding wind profile indicated low level northeasterly flow at 15 knots with wind veering to the west-northwest above the marine layer inversion. The mean 0 to 6 kilometer wind was from 306° at 12 knots, and the level of maximum wind at 42,800 ft from 304° at 92 knots. A layer of potential turbulence existed near the

Marine layer from 2,700 through 6,000 ft where moderate and greater turbulence was possible.

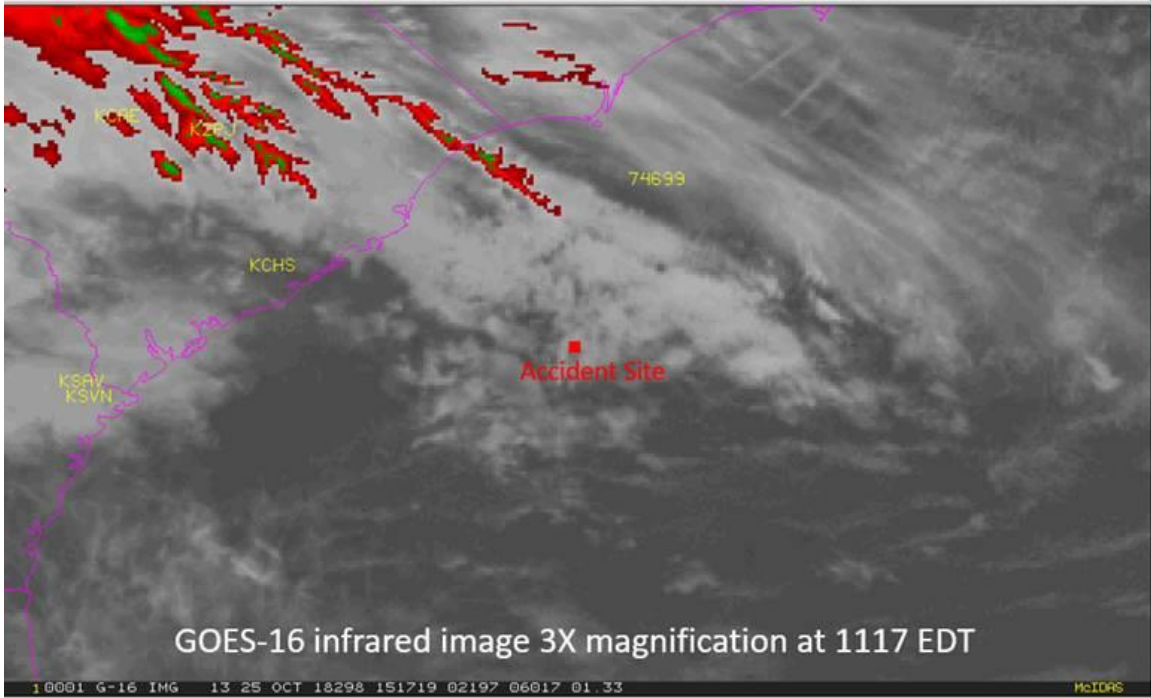


Height (ft-MSL)	Pres (hPa)	T (C)	Td (C)	RH (%)	DD / FF (deg / kts)	CAT (FAA)	LLWS	Icing - Type (AFGWC method)
0	1020	20.5	15.0	71	49 / 15			
56	1018	20.0	13.5	66	49 / 15		LIGHT	
140	1015	19.6	12.9	65	50 / 16			
280	1010	19.0	12.6	66	50 / 17			
560	1000	18.2	12.3	68	51 / 17			
956	986	16.9	11.8	72	52 / 17			
1471	968	15.3	11.5	78	55 / 17			
2110	946	13.5	10.9	84	57 / 17	LGT		
2789	923	11.7	9.9	89	74 / 16	MDT		
3573	897	10.0	8.3	89	97 / 14	LGT		
4468	868	8.3	5.3	81	118 / 11	SVR		
5521	835	9.6	-15.0	16	238 / 3	MDT		
6650	801	8.8	-18.1	13	303 / 8			
7965	763	7.4	-15.1	18	303 / 11			
9450	722	5.5	-18.1	16	303 / 15			
11127	678	3.0	-23.0	13	305 / 17			
13024	631	0.0	-27.8	10	305 / 20			
15133	582	-3.6	-29.5	11	295 / 24			
17348	534	-7.2	-30.9	13	290 / 27			
19364	493				289 / 29			
19479	491	-10.9	-29.8	19				
21378	455				282 / 32			
21494	453	-15.1	-25.8	40		LGT		
23317	421				283 / 39			
23473	418	-19.3	-21.2	85		LGT		LGT Rime
25174	390				292 / 47			
25343	387	-22.4	-24.7	81		LGT		
26959	362				296 / 53			
27143	359	-25.5	-30.1	65				
28652	337				297 / 55			
28848	334	-29.3	-33.1	70				
31749	295				298 / 59			
32026	291	-37.3	-40.1	75				
34544	260				300 / 64			

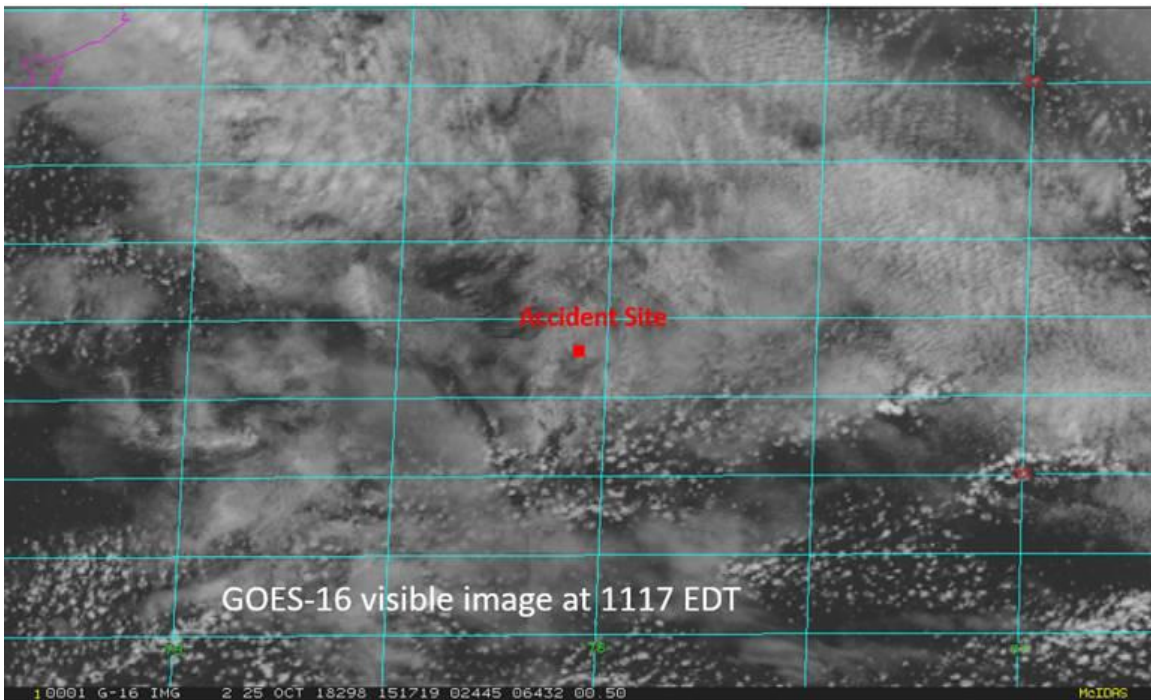
Satellite Imagery – The GOES-16 infrared and visible satellite imagery surrounding the period were reviewed.

The GOES-16 infrared image at 1517 EDT at 3X magnification is included below with a standard MB temperature enhancement curve applied. The image depicted a mid-level area of clouds over the region with a radiative cloud top temperature of 269° kelvin or -4.16° Celsius (C), which corresponded to cloud tops near 15,500 ft.

[Icing conditions were likely between the freezing level to cloud tops 15,500 ft. – NTSB Don Eick Email, 11/5/18]



The GOES-16 visible imagery at a resolution of 1 mile for 1117 EDT at 3X magnification is included below and depicted a layer of altocumulus and low stratocumulus type clouds.



Pilot Reports – a search of pilot reports or PIREPS over the region provided the following reports:

CHS UA /OV CHS290030/TM 1305/FL190/TP PC12/TA M11/TB LGT CHOP

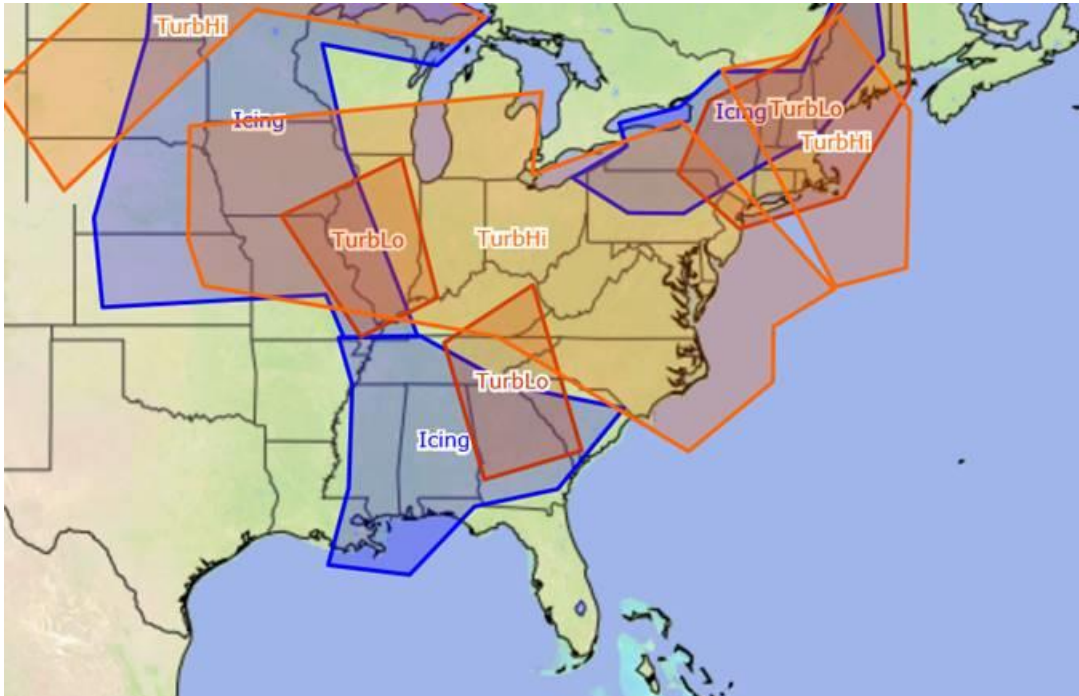
CHS UA /OV CHS020035/TM1705/FL160/TP B737/TB OCNL MOD 160-200

CHS UA /OV CRE300020/TM 1728/FL340/TP A321/TB CONT LGT TO OCNL MOD

CHS UA /OV CHS/TM 1920/FL290/TP A321/SK IMC/TA M05/TB CONT LGT CHOP

CHS UA /OV SAV360060/TM 1944/FL140/TP C441/TB CONT MOD CHOP

Inflight Weather Advisories – the NWS had an AIRMET Tango current for turbulence over the region.



WAUS42 KKCI 251445

WA2T

-MIAT WA 251445

AIRMET TANGO UPDT 2 FOR TURB VALID UNTIL 252100

.

AIRMET TURB...NC SC GA NH VT MA RI CT NY LO NJ PA OH LE WV MD DC DE VA AND CSTL WTRS

FROM MSS TO 180SSE ACK TO 160SE SIE TO 190ESE ECG TO 150SSE ILM TO 30WSW SAV TO 30NNW SPA
TO

40E VXV TO HNV TO HNN TO CVG TO FWA TO 50ESE DXO TO MSS

MOD TURB BTN FL240 AND FL410. CONDS CONTG BYD 21Z THRU 03Z.

.

AIRMET TURB...NC SC GA OH WV VA AND CSTL WTRS

FROM 20NNW EKN TO 50S ILM TO 30WSW PZD TO GQO TO HNV TO 40WSW HNN TO 20NNW EKN

MOD TURB BLW 140. CONDS ENDG 18-21Z.

....

<end>