NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

April 8, 2019

Weather Study

METEOROLOGY

ERA19LA012

Table Of Contents

A. ACCIDENT

Location: Westhampton Beach, New York
Date: October 13, 2018
Time: about 1100 eastern daylight time
1500 Universal Coordinated Time (UTC)
Airplane: Piper PA-34-200T Seneca II; Registration: N593MS

B. METEOROLOGIST

Don Eick
Senior Meteorologist
Operational Factors Division (AS-30)
National Transportation Safety Board

C. SUMMARY

On October 13, 2018, about 1100 eastern daylight time, a Piper PA-34-200T airplane, N593MS, was substantially damaged when it experienced an in-flight breakup and impacted the Atlantic Ocean near Westhampton Beach, New York. The flight instructor, the private pilot receiving instruction, and a passenger were fatally injured. The airplane was owned by the instructor and operated under the provisions of Title 14 *Code of Federal Regulations* Part 91. Instrument meteorological conditions (IMC) prevailed along the route of flight, and no flight plan was filed for the instructional flight, which originated from Danbury Municipal Airport (DXR), Danbury, Connecticut, about 1025 and was en route to Charleston Executive Airport (JZI), Charleston, South Carolina.

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 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 eastern daylight time (EDT) based upon the 24-hour clock, local time is -4 hours from UTC, and UTC=Z. NWS airport and 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 was estimated at latitude 40.798611º N and longitude 72.61250º W.

E. WEATHER 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 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 joint NWS and Federal Aviation Administration (FAA) Advisory Circular "Aviation Weather Services", AC 00-45H.

1.1 Surface Analysis Chart

The northeast section of the NWS Surface Analysis Chart for 1100 EDT (1500Z) on October 13, 2018 is included as figure 1 with the approximate accident site labelled by the red star. The chart depicted a low pressure system at 1007-hectopascals (hPa)[1] off the New York Long Island coast with a cold front extending southwestward to another low off the North Carolina coast at 1011-hPa. A high pressure system at 1021-hPa was located over southern Indiana with a ridge extending eastward into New Jersey. The accident site was located north of the frontal boundary in the cold air side of the front, and north of the ridge. The station models in the area depicted west to northwesterly winds of approximately 10 knots, overcast cloud cover with multiple stations reporting light continuous rain, with temperatures in the mid to upper 40's degrees Fahrenheit (F), with dew point temperatures a few degrees cooler, or with temperature-dew point spreads of 2º F or less.

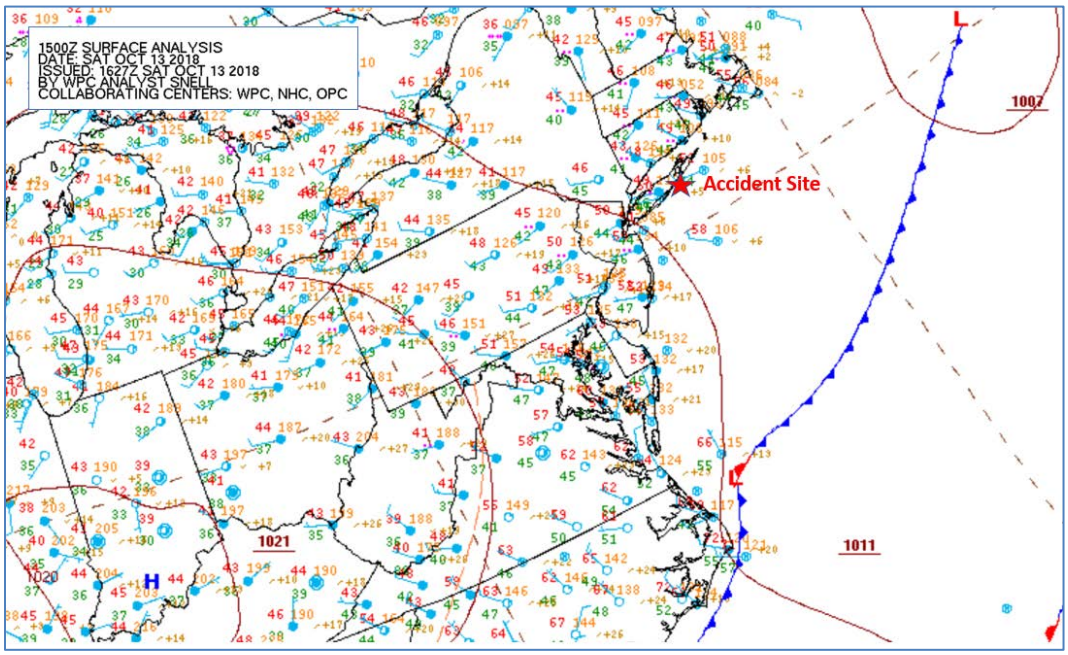

Figure 1 - Northeast section of the Surface Analysis Chart for 1100 EDT

[1] Hectopascals (hPa) is the NWS's new standard term for reporting sea-level pressure and is interchangeable with the former term millibar (mb) with the same units. Standard sea-level pressure is 1013.25-hPa.

1.2 National Composite radar Mosaic

The northeast section of the NWS National Composite Radar Mosaic for 1100 EDT is included as figure 2 with the approximate accident site marked by the red star. The image depicted a band of light to moderate intensity echoes extending from eastern Connecticut and long Island, New York, and extended over the accident site.

Figure 2 – NWS National Composite Radar Mosaic for 1100 EDT

Based on the echoes observed over the accident site, section 5.0 will document the closest NWS weather radar and the echoes along the flight track.

1.3 500-hPa Constant Pressure Chart

The NWS Storm Prediction Center (SPC) constant pressure chart for 500-hPa for 0800 EDT is included as figure 3 and depicted the conditions at 18,000 ft, the mean atmosphere and near the accident airplanes altitude over Long Island immediately prior to the accident. The chart depicted an upper level trough of low-pressure extending southward from Canada across western New York, Pennsylvania, into West Virginia. The approximate accident site is marked by the red star and was located ahead of the upper level trough in an area of favorable upward vertical motion supporting cloud and precipitation development over the region. This upper level disturbance was referenced in NWS advisories (section 8.2) as the principle cause of the clouds and precipitation that was expected over the region during the period and was the upper-level support to the low-pressure system and associated frontal system off the coast.

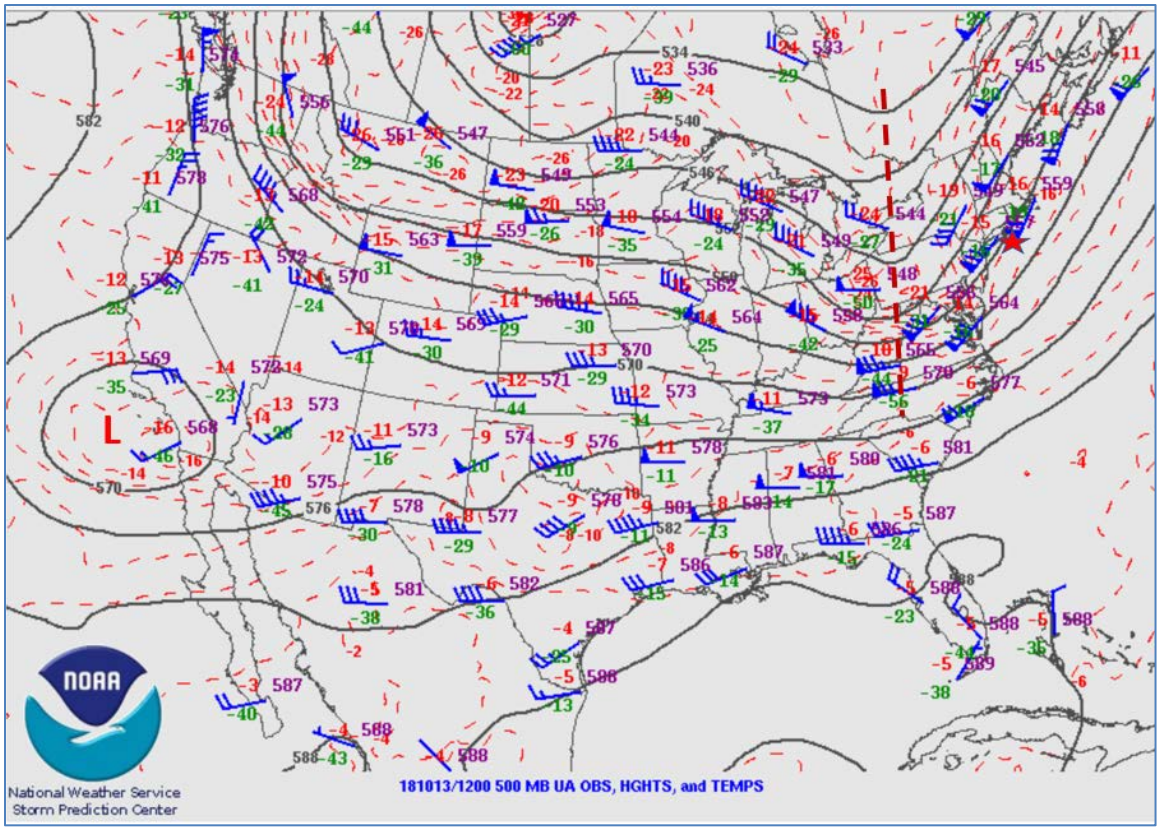

Figure 3 - 500-hPa Constant Pressure Chart for 0800 EDT

1.4 12-hour Surface Prognostic Chart

The NWS 12-hour Surface Prognostic Chart current for the period and valid for 1400 EDT is included as figure 4. The chart depicted the low-pressure system off the Atlantic coast with the trailing cold front. The coastal sections of the New England states that included Long Island, and on the eastern side of the Great Lakes expected scattered rain covering less than 50% of the area. Based on the chart scattered rain showers were expected over the region and in the vicinity of the accident site during the period.

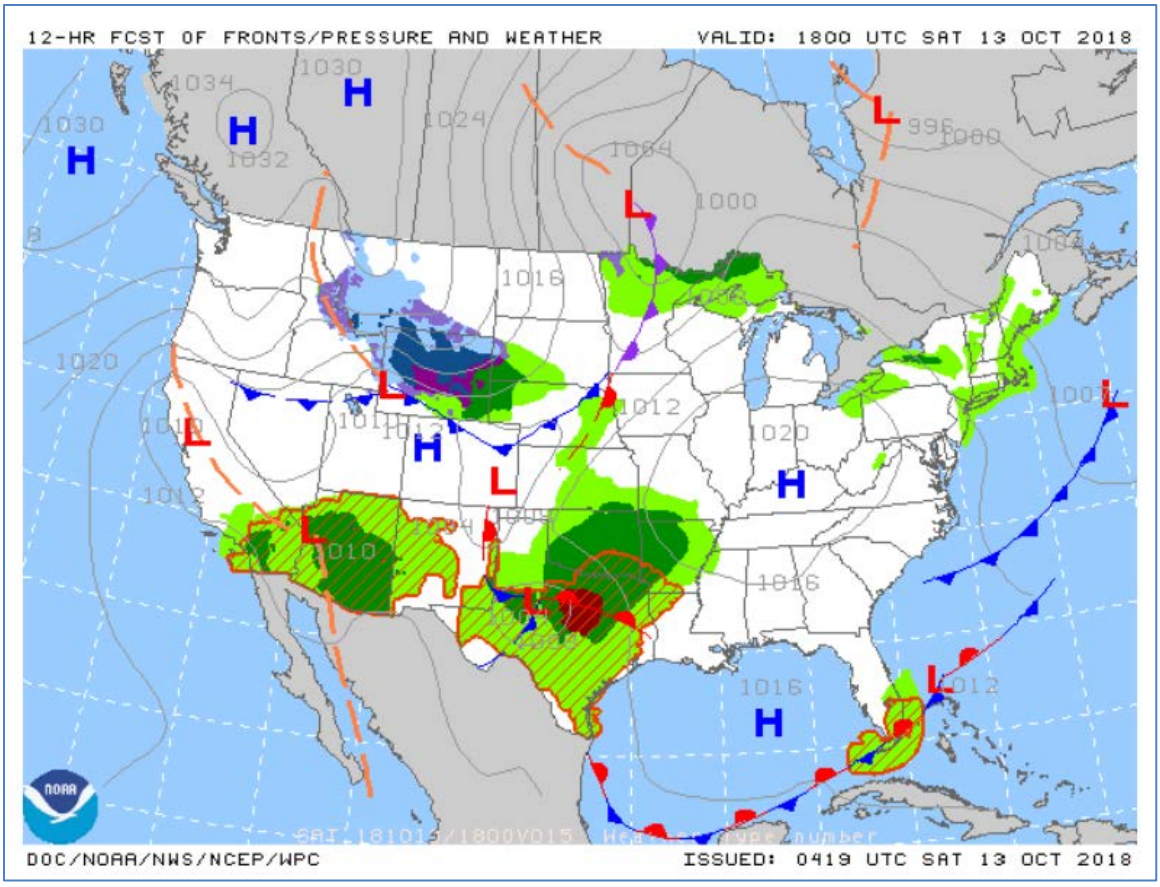

Figure 4 – NWS 12-hour Surface Prognostic Chart valid for 1400 EDT

2.0 Observations

The surrounding area was documented using standard Meteorological Aerodrome Reports (METARs) and Specials (SPECI) from official reporting stations. Cloud heights in the following section are reported in heights above ground level (agl). The magnetic variation over the area was 14° West based on the latest sectional chart at the time of the accident.

2.1 Westhampton Beach, New York

The closest weather reporting location to the accident site was from Francis S. Gabreski Airport (KFOK), Westhampton Beach, New York, located about 2 ½ miles north of the accident site at an elevation of 66 ft. The airport had a federally installed and maintained Automated Surface Observation System (ASOS) and was augmented by air traffic control tower personnel. The following conditions were reported at the time of the accident:

KFOK weather observation at 1053 EDT, wind from 300° at 7 knots, visibility 10 miles in light rain, ceiling broken at 4,600 ft agl, overcast at 5,500 ft, temperature 9° Celsius (C), dew point temperature 7° C, altimeter 29.87 inches of mercury (Hg). Remarks: automated weather observation system with a precipitation discriminator, sea level pressure 1011.6-

hPa, hourly precipitation 0.02 inches, temperature 9.4° C, dew point 6.7° C, 3-hour pressure tendency risen 0.7-hPa.

The raw observations surrounding the period were reported:

METAR KFOK 131053Z 00000KT 10SM FEW120 08/07 A2983 RMK AO2 SLP100 T00830067=

METAR KFOK 131153Z 00000KT 9SM -RA SCT041 BKN050 OVC065 08/07 A2985 RMK AO2 RAB39 SLP109 P0000 60000 70011 T00830067 10083 20061 53020=

METAR KFOK 131253Z 26003KT 7SM -RA SCT036 BKN045 OVC055 09/07 A2986 RMK AO2 SLP111 P0007 T00890067=

METAR KFOK 131353Z 29005KT 10SM -RA SCT043 BKN055 OVC075 09/07 A2987 RMK AO2 RAE28B53 SLP113 P0000 T00940072=

METAR KFOK 131453Z 30007KT 10SM -RA BKN046 OVC055 09/07 A2987 RMK AO2 SLP116 P0002 60009 T00940067 53007=

Accident 15000Z

METAR KFOK 131553Z 29008KT 10SM -RA OVC040 09/07 A2988 RMK AO2 SLP120 P0002 T00940067=

METAR KFOK 131653Z 28015G20KT 10SM FEW020 BKN075 OVC090 11/07 A2988 RMK AO2 RAE21 SLP119 P0001 T01110067=

METAR KFOK 131753Z 29013KT 10SM FEW022 OVC110 13/07 A2987 RMK AO2 SLP115 60012 T01280067 10128 20083 58001=

SPECI KFOK 131825Z 30010G17KT 10SM BKN025 BKN035 13/07 A2987 RMK AO2 T01280067=

2.2 Danbury, Connecticut

The accident flight originated from Danbury Municipal Airport (KDXR), Danbury, Connecticut, which lists an elevation of 457 ft. The airport had an ASOS and reported the following conditions at the time of the flight departure:

KDXR special weather observation at 1002 EDT (1402Z), wind from 260° 5 knots, visibility 8 miles in light rain, a few clouds at 1,500 ft agl, ceiling broken at 4,100 ft, overcast at 4,900 ft, temperature 7° C, dew point 5° C, altimeter 29.87 inches of Hg. Remarks: automated weather observation system with a precipitation discriminator, hourly precipitation since 0953 EDT less than 0.01 inch (trace), temperature 7.2° C, dew point 5.0° C.

The following conditions were reported surrounding the period were as follows:

KDXR 131153Z 21003KT 7SM -RA OVC034 08/06 A2985 RMK AO2 SLP109 P0002 60002 70002 T00780061 10083 20072 51026

KDXR 131253Z 24003KT 5SM -RA BR OVC035 07/06 A2985 RMK AO2 SLP110 P0005 T00720056

KDXR 131320Z 00000KT 4SM -RA BR BKN023 OVC031 07/06 A2986 RMK AO2 P0002 T00720061

KDXR 131353Z 26006KT 7SM -RA FEW015 BKN023 OVC034 07/06 A2987 RMK AO2 SLP114 P0003 T00720056

KDXR 131402Z 26005KT 8SM -RA FEW015 BKN041 OVC049 07/05 A2987 RMK AO2 P0000 T00720050

Departed 1415Z

KDXR 131453Z 27005KT 10SM -RA BKN045 OVC055 07/06 A2987 RMK AO2 SLP116 P0001 60009 T00720056 53008

Accident 1500Z

KDXR 131512Z VRB05KT 10SM SCT014 BKN022 OVC042 08/07 A2987 RMK AO2 RAE10 P0000 T00780067

KDXR 131531Z 25007KT 10SM BKN014 OVC023 08/06 A2987 RMK AO2 RAE10 P0000 T00830061

KDXR 131553Z 28007KT 10SM BKN016 BKN022 OVC027 08/06 A2988 RMK AO2 RAE10 SLP119 P0000 T00830061

3.0 Sounding

A High Resolution Rapid Refresh (HRRR)[2] numerical model for 1100 EDT on October 13, 2018 was obtained from archive data at the NOAA Air Resource Laboratory and was plotted on a standard Skew T log diagram[3] using the complete Rawinsonde Observation RAOB program software[4]. Figure 5 is the HRRR sounding plot from the surface through 450-hPa or approximately 21,000 ft over the accident site.

The HRRR model sounding depicted an estimated surface temperature of 10.5° C (50.9° F), a dew point temperature of 7.7° C (45.9° F), with a relative humidity of 83%. The lifted condensation level (LCL) and level of free convection (LFC) were at 1,157 ft, with the convective condensation level (CCL) at 2,503 ft. The sounding was characterized as stable with a Lifted Index of 9.0 and supported multiple layer of clouds from the LCL through 18,700 ft, where the relative humidity exceeded 90%. The freezing level was identified at 4,265 ft (blue horizontal line) with structural icing possible in-clouds and in-precipitation from that level through 18,700 ft. A defined temperature inversion was noted at 10,590 ft (green bar) due to subsidence with the layer remaining below freezing. The atmosphere was moist with a precipitable water content of 0.76 inches.

[2] The HRRR is a National Oceanic and Atmospheric Administration (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.

[3] 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.

[4] RAOB software – The complete RAwinsonde OBservation program is an interactive sounding analysis program developed by Environmental Research Services, Matamopras, Pennsylvania, for plotting and analyzing upper air data.

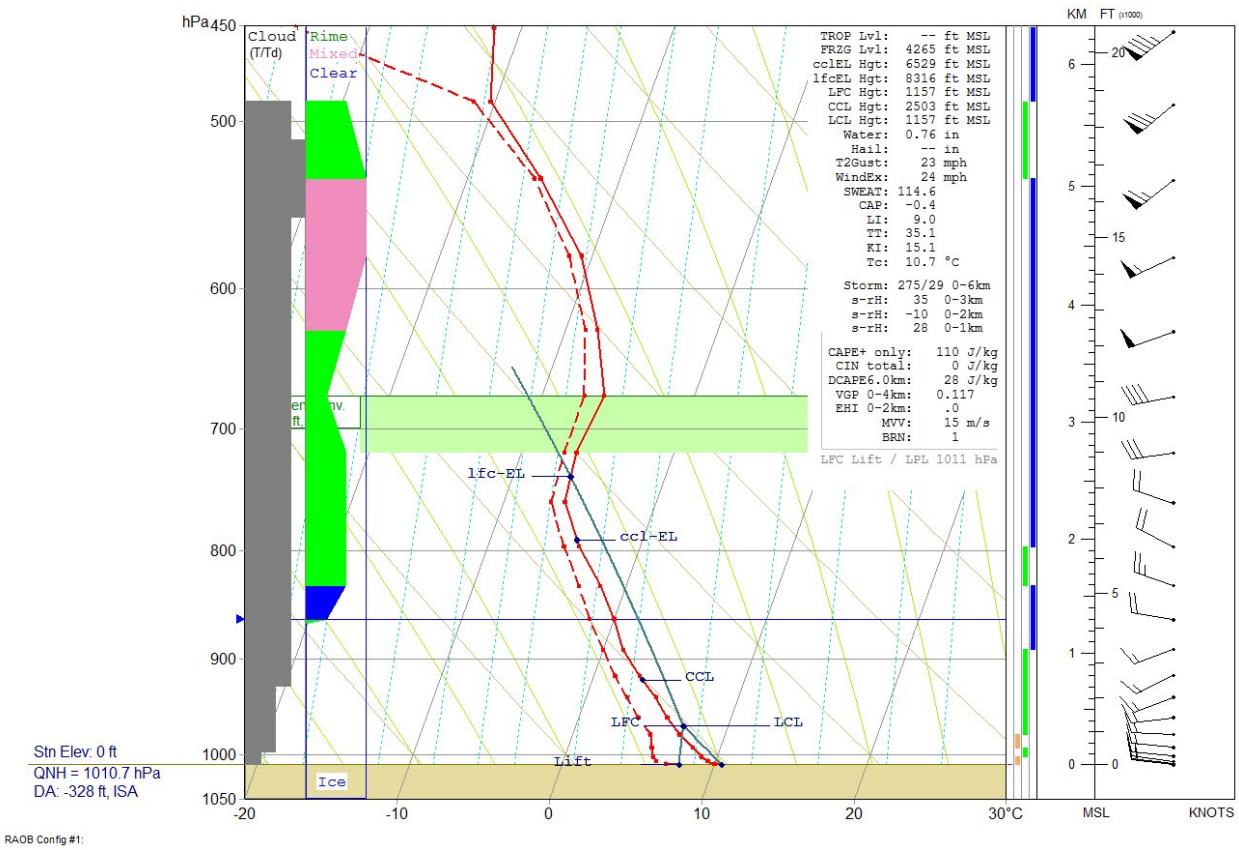

Figure 5 - HRRR numerical model sounding for 1100 EDT over the accident site

The HRRR sounding wind profile indicated surface winds from the west or from approximately 280° at 14 knots with little variation with height through 9,000 ft and then backing to the west-southwest and wind speeds exceeding 50 knots above 12,000 ft. The mean 0 to 6 kilometer or approximately 18,000 ft steering wind was from 245° at 39 knots. The level of maximum wind was at 33,600 ft from 245° at 107 knots. The sounding indicated support for turbulence between 3,390 ft through 18,600 ft due to several layers of strong vertical shear, where wind speeds changed more than 5 knots per 1,000 ft.

Figure 6 is a table of the HRRR model data of heights, pressure, temperature (T), dew point (Td), relative humidity (RH%), wind direction and speed, and RAOB derived clear air turbulence (CAT), low-level wind shear (LLWS), and icing potential from the surface to 21,000 ft.

Height (ft-MSL)	Pres (hPa)	T (C)	Td (C)	RH (%)	DD / FF (deg / kts)	CAT (FAA)	LLWS	Icing - Type (AFGWC method)
0	1011	10.5	7.7	83	278 / 14			
27	1010	10.0	6.8	80	278 / 13		LIGHT	
108	1007	9.5	6.1	79	278 / 15			
244	1002	9.0	5.8	80	276 / 16			
517	992	8.2	5.5	83	276 / 16			
902	978	7.0	5.1	88	273 / 16			
1403	960	5.8	3.9	88	263 / 16	LGT		
1996	939	4.6	2.7	87	248 / 15			
2629	917	3.0	1.4	89	241 / 15			
3392	891	1.3	0.0	91	249 / 16	SVR		
4265	862	0.0	-1.6	89	281 / 19	LGT		TRC Rime
5226	831	-1.7	-3.1	90	291 / 23	LGT		LGT Clear
6346	796	-4.0	-5.0	93	300 / 21	LGT		LGT Rime
7609	758	-6.0	-6.9	93	290 / 18	SVR		LGT Rime
9002	718	-6.4	-7.2	94	261 / 31	MDT		LGT Rime
10590	675	-5.9	-7.2	91	258 / 42	LGT		TRC Rime
12440	628	-7.9	-8.7	94	249 / 49	LGT		LGT Rime
14503	579	-10.7	-11.5	94	243 / 55	MDT		MDT Mixed
16623	532	-15.2	-15.6	97	230 / 67	LGT		MDT Mixed
18694	489	-20.3	-21.4	91	228 / 76	LGT		LGT Rime
20541	453				230 / 83			

Figure 6 - HRRR sounding parameters and derived turbulence, wind shear, and icing potential

4.0 Satellite Imagery

The Geostationary Operational Environmental Satellite number 16 (GOES-16) data was obtained from an archive at the Space Science Engineering Center at the University of Wisconsin-Madison in Madison, Wisconsin, and processed using the Man-computer Interactive Data Access System (McIDAS) software. The infrared long wave and visible imagery were obtained surrounding the time of the accident, with the images closest to the time of the accident documented below. The infrared long wave imagery (band 13) at a wavelength of 10.3 microns (μm) provided radiative cloud top temperatures with a nominal spatial resolution of 2 km. The visible (band 2) at a wavelength of 0.64 μm images at a resolution of 1 km.

The GOES-16 imagery infrared and visible imagery images at 1102 EDT are included as figure 7 and 8 respectively, with the accident site marked by a red square. The satellite imagery depicted an extensive area of clouds obscuring the accident site, consistent with nimbostratus type clouds that supported light to moderate rain. The infrared radiative cloud top temperature over the accident site was 251° Kelvin or -22.16° C, which corresponded to cloud tops near 21,000 ft based on the HRRR sounding. No defined cumulonimbus clouds typically associated with thunderstorms were identified over the region at the time.

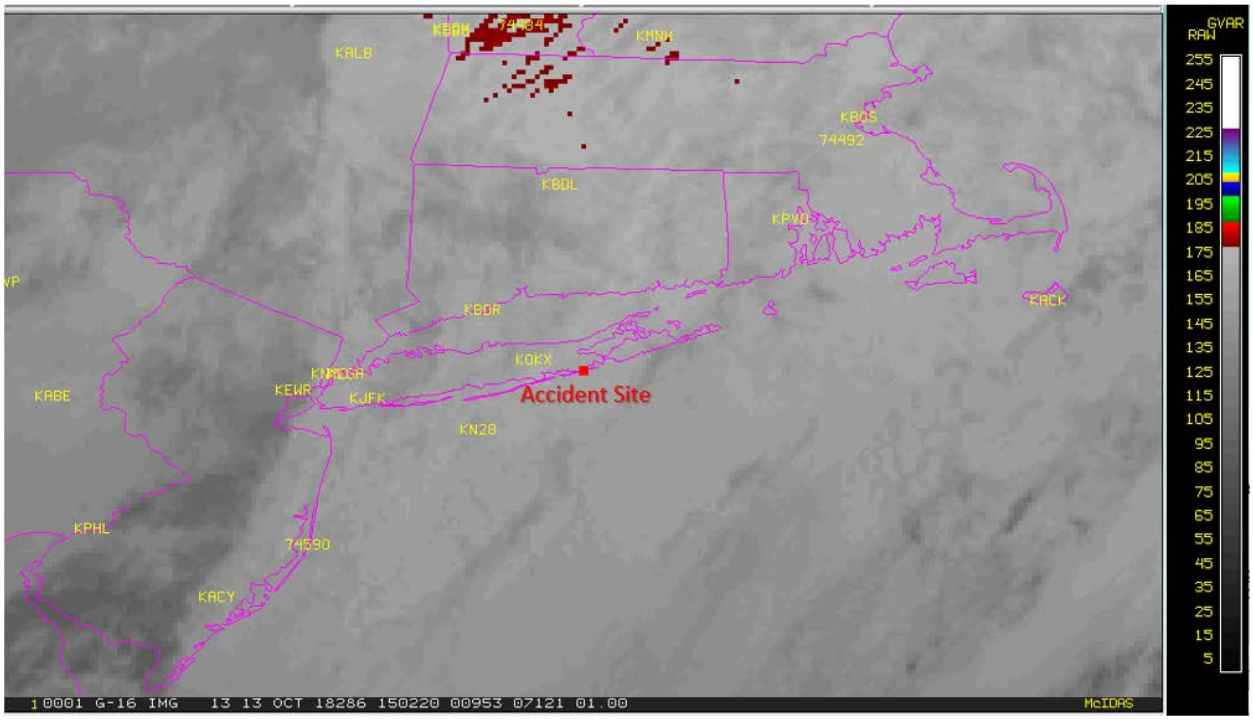

Figure 7 - GOES-16 infrared image at 1102 EDT at 4X magnification

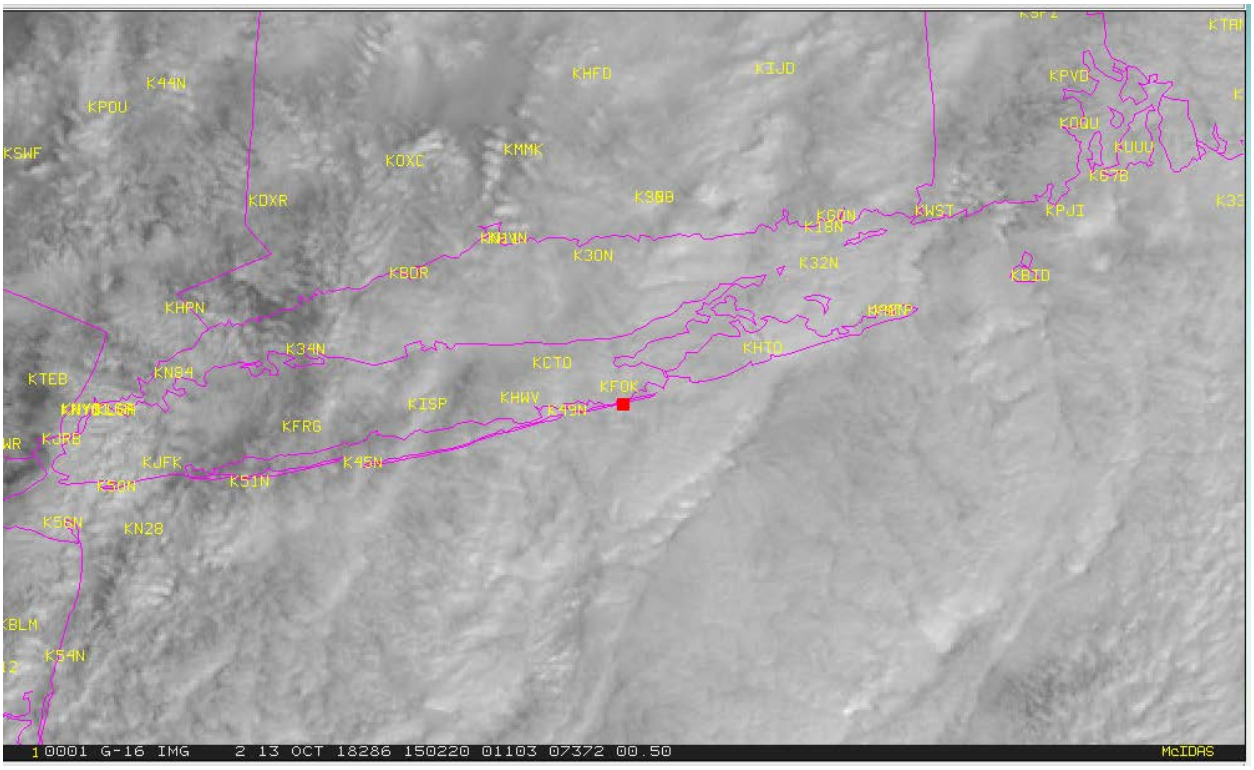

Figure 8 - GOES-16 visible image at 1102 EDT at 2X magnification

5.0 Weather Surveillance Radar Imagery

The closest Weather Surveillance Radar 1988 Doppler (WSR-88D) was from the NWS Upton (KOKX), New York, Weather Forecast Office (WFO) located 23 miles west-northwest of the accident site. The level II archive data was obtained from the NCEI using the Hierarchical Data Storage System and displayed using the NWS NEXRAD Interactive Viewer and Data Exporter software.

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.

5.1 Reflectivity Scales

Reflectivity is the measure of the efficiency of a target in intercepting and returning radio energy. With hydrometeors, it is a function of the drop size distribution, number of particles per unit volume, physical state (ice or water), shape, and aspect. Reflectivity is normally displayed in decibels (dBZ[5]) and is a general measure of echo intensity. The chart below relates the NWS video integrator and processor (VIP) intensity levels versus the WSR-88D's display levels, precipitation mode reflectivity in decibels, and rainfall rates.

NWS VIP/DBZ CONVERSION TABLE

NWS VIP	WSR-88D LEVEL	PREC MODE DBZ	RAINFALL
0	0 1 2	< 5 5 to 9 10 to 14	
1 Very Light	3 4 5	15 to 19 20 to 24 25 to 29	.01 in/hr .02 in/hr .04 in/hr
2 Light to Moderate	6 7	30 to 34 35 to 39	.09 in/hr .21 in/hr
3 Strong	8	40 to 44	.48 in/hr
4 Very Strong	9	45 to 49	1.10 in/hr
5 Intense	10	50 to 54	2.49 in/hr
6 Extreme	11 12 13 14 15	55 to 59 60 to 64 65 to 69 70 to 74 > 75	>5.67 in/hr

Air traffic control (ATC) Air Route Traffic Control Center (ARTCC) weather display systems also use radar weather processors with the ability to determine precipitation intensity, with

[5] dBZ - 10 log Ze

controllers instructed to describe the intensity to pilots based on the following table. One exception is that the centers weather and radar processor system does not display light intensity echoes below 30 dBZ. This table is also referenced for pilots in Advisory Circular AC 00-24C - "Thunderstorm".

Reflectivity (dBZ) Ranges	Weather Radar Echo Intensity Terminology
< 30 dBZ	Light
30 – 40 dBZ	Moderate
>40 – 50 dBZ	Heavy
>50 dBZ	Extreme

5.2 Base Reflectivity Imagery

Figure 9 is the KOKX WSR-88D base reflectivity image for 1102 EDT with a constant altitude plan position indicator (CAPPI) altitude scan at 10,000 ft, and the accident site marked by a red star. The image depicts a large area of very light to light intensity echoes extending over Connecticut, Long Island, New York, and over the coastal waters with reflectivity's ranging from 5 to 30 dBZ over the general flight path and accident site.

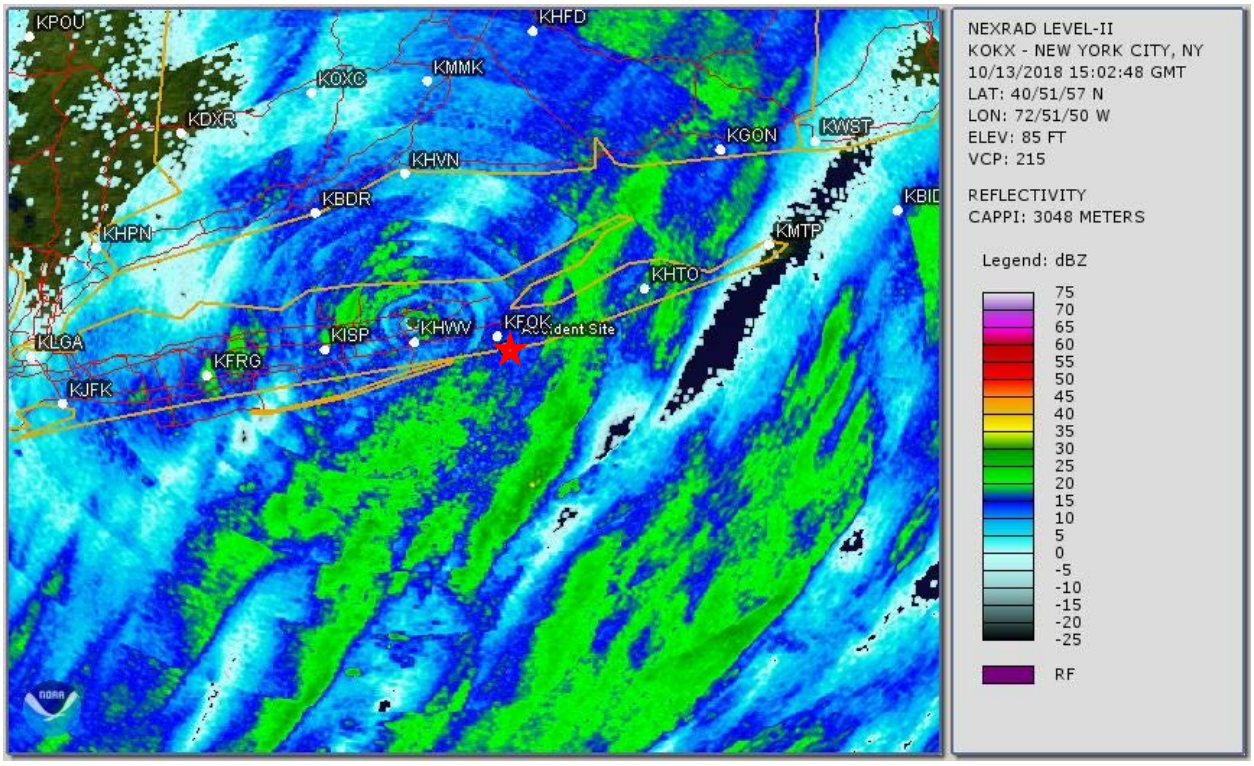

Figure 9 - KOKX WSR-88D base reflectivity image for 10,000 ft at 1102 EDT

6.0 Lightning Strikes

A review of Earth Networks archives of lightning data indicated no cloud-to-ground lightning strikes or in-cloud lightning over the region during the period.

7.0 Pilot Reports

The following pilot reports or PIREPs were recorded over the region between 0700 through 1300 EDT (1100Z-1700Z) surrounding the period. The raw reports in standard code and abbreviations, with time in UTC were as follows:

JFK UA /OV LENDY/TM 1123/FL190/TP A320/TB LIGHT TO MODERATE/RM CHOPPY

JFK UA /OV 5 S JFK/TM 1204/FL050/TP A320/TB LGT-MOD

JFK UA /OV CARMRN/TM 1216/FL130/TP A321/TA-7/IC LT RIME

FRG UA /OV DPK 330/340/TM 1312/FL060/TP P28A/TA -2/IC LGT RIME

LGA UA /OV LGA050015/TM 1330/FL230/TP B737/SK TOPS 230/TB MOD FL230-210

LGA UA /OV 5 NM W TPZ BRIDGE/TM 1354/FL060/TP PC12/WX IMC/TA -4/IC LGT RIME/RM BETWEEN 8,000-10,000 FT

JFK UA /OV JFK120025/TM 1407/FL170/TP A320/TA M15/IC LGT RIME

JFK UA /OV CRI/TM 1429/FLDURC/TP B737/RM BASES 042

ISP UA /OV 10 NW BDR/TM1420/FL050/TP C172/TA 0/IC LGT RIME

ISP UA /OV 10 WEST HTO VOR/TM 1425/FL060/TP PA34/TA 0/IC LGT RIME

JFK UA /OV CRU/TM 1503/FLDURC/TP B737/RM BASES 042

JFK UA /OV CAMRN/TM 1523/FL120/TP A320/TA M10/IC MIXED

JFK UA /OV JFK165035/TM 1539/FL150/TP B737/TB MOD

FOK UA /OV CCC/TM 1654/FL120/TP CRJ9/TB MOD CHOP

The PIREPs indicated that light-to-moderate turbulence and light rime to mixed icing conditions were being reported over the area surrounding the period, with the majority of the reports from air carrier jet type aircraft. Cloud tops were reported at 23,000 ft approximately 90 minutes prior to the accident.

8.0 NWS Forecasts

The following forecasts and advisories were issued by the NWS during the period.

8.1 Terminal Aerodrome Forecast

The closest NWS Terminal Aerodrome Forecast (TAF) to the accident site was from Long Island Mac Arthur Airport (KISP), located in Islip, New York, approximately 23 miles west of the accident site at an elevation of 99 ft. TAFs are valid for a 5 mile radius around an airport's center point. When planning a flight to an airport that does not have a TAF, pilots and other flight planning systems will typically refer to the closest available TAFs to supplement the information

in weather forecast products that cover large areas, such as the Graphic Aviation Forecast (GFA), Airmen's Meteorological Information (AIRMET) bulletins, and other graphical products. The TAF that was current at the time was issued by the NWS KOKX WFO at 0731 EDT and was as follows:

TAF KISP 131131Z 1312/1412 28004KT P6SM -SHRA FEW030 BKN050 OVC080
TEMPO 1312/1315 BKN030
FM131700 29012G19KT P6SM BKN050
FM132200 30007KT P6SM SCT040
FM140100 32004KT P6SM FEW250=

The forecast for KISP current for the period of the accident expected VFR to MVFR conditions to prevail with a wind from 280º at 4 knots, visibility 6 miles or more in light rain showers, a few clouds at 3,000 ft agl, ceiling broken at 5,000 ft, overcast at 8,000 ft, with a temporary ceiling broken at 3,000 ft between 0800 and 1100 EDT.

8.2 Area Forecast Discussion

The NWS KOKX WSFO Area Forecast Discussion (AFD) issued at 0739 EDT describing the general synoptic conditions, public forecast, and the reasoning behind the TAF issued for the region, and an indication of any weather advisories current over the area is included below. The forecast is in general plain language with minimal abbreviation.

FXUS61 KOKX 131139
AFDOKX

Area Forecast Discussion
National Weather Service New York NY
739 AM EDT Sat Oct 13 2018

.SYNOPSIS...
An upper level disturbance passes through the area this morning and early afternoon. High pressure then builds into the region into Sunday, with a cold front passing through Monday night. High pressure then dominates the weather pattern through Friday with the exception of a cold front moving through on Wednesday.

.NEAR TERM /UNTIL 6 PM THIS EVENING/...
Forecast is mainly on track. Made slight adjustments to the database based on latest obs and trends.

A strong northern stream shortwave will track across the area this morning into the early afternoon. Showers have spread into eastern PA and western NJ and will move into western portions of the forecast area through 12z, eastern areas 12-15z. Rainfall intensity is expected to be light although there is still some indication in the hi res models for some heavier showers across eastern LI, possibly SE CT late this morning/early aftn. Showers will taper off from west to east from late morning into the mid afternoon hours with gusty NW winds developing.

The combination of cloud cover, rain, and a cool Canadian airmass over the region (850 hpa temps hovering around 0c) should result in an unseasonably chilly day (5-10 degrees below normal) with highs in the mid to upper 50s for much of the Tri-State, around 60 in the metro area.

.SHORT TERM /6 PM THIS EVENING THROUGH MONDAY/...

Shortwave shifts offshore early this evening with zonal flow developing aloft and sfc high pressure building in from the west. This will result in clearing skies and diminishing winds, setting up good radiational cooling conds across outlying areas. This will bring the potential for lows in the mid to upper 30s across interior and pine barrens. Have issued a frost advsy for Orange, Putnam, northern Fairfield and western Passaic where areas of frost are expected to develop. The remaining interior zones of southern CT are marginal at this time. Day shift can take another look and expand if needed. Frost is also expected to develop in the Pine Barrens of Long Island, however it is not widespread enough to issue an advsy here. Elsewhere, lows are expected to be in the 40s.

High pressure builds towards the Mid Atlantic coast Sun morning and offshore during the aftn. Sunny skies with a developing SW flow and weak warm advection should boost temps into the upper 50s and lower 60s.

Cloud cover will increase Sun night as the high moves further offshore and the next shortwave approaches from the Great Lakes. Additional southern stream energy will fuse into this shortwave allowing a weak sfc low to develop well N of the area. Overrunning rain is expected to move into the area Mon morning, especially northern zones, with a cold front approaching from the west.

.AVIATION /12Z SATURDAY THROUGH WEDNESDAY/...
An upper level disturbance, and weak surface low, will move across the area this morning with a chance of showers. High will then build in from the west through tonight and be over the region Sunday, moving east Sunday night.

***Mainly VFR conditions, 3500-5000FT, with periods of MVFR ceilings, around 2500 ft, as the showers move through the terminals**. Clearing with unlimited ceilings this evening.*

W-NW winds less than 10 kt, will increase and become gusty as the showers end, with gusts up to 20 kt. Gusts end and wind diminish around 22Z, and veer to NW.

.OUTLOOK FOR 12Z SUNDAY THROUGH WEDNESDAY...
.Sunday...VFR.
.Monday...Chance of MVFR in showers. SW gusts 20kt.
.Tuesday and Wednesday...VFR.

8.3 Inflight Weather Advisories

Inflight Aviation Weather Advisories are forecasts to advise en route aircraft of 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) associated with FAA Air Route Traffic Control Center's (ARTCCs). There are four basic types of inflight aviation weather advisories: the Significant Meteorological Information (SIGMET), the Convective SIGMET, the Airmen's Meteorological Information (AIRMET), and the Center Weather Advisory (CWA). Inflight advisories serve to notify en route 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.

During the period there were no SIGMETs, Convective SIGMETs issued by the NWS AWC, or CWAs issued from the New York Center Weather Service Unit (CWSU). The NWS AWC did have a series of AIRMET advisories current for IFR, moderate turbulence, and moderate icing conditions over the area, which were as follows:

WAUS41 KKCI 131445
WA1S
BOSS WA 131445
AIRMET SIERRA UPDT 2 FOR IFR AND MTN OBSCN VALID UNTIL 132100
.
AIRMET IFR...PA OH WV MD VA
FROM 40WSW ERI TO 20S PSB TO 40SE EKN TO 20WSW PSK TO 40ESE LOZ
TO 20NNW EKN TO 20NNE AIR TO 40SSW CLE TO 40WSW ERI
CIG BLW 010/VIS BLW 3SM PCPN/BR. CONDS ENDG 15-18Z.
.
AIRMET IFR...NY NJ PA
FROM 50S SYR TO 30SSW ALB TO 20ENE ETX TO 50S SYR
CIG BLW 010/VIS BLW 3SM PCPN/BR. CONDS ENDG 15-18Z.
.
AIRMET MTN OBSCN...ME NH VT MA NY PA WV MD VA NC
FROM 40ESE YSC TO 20WNW BGR TO CON TO 30N SAX TO 20W ETX TO
30WSW HAR TO 30ESE PSK TO 30NW SPA TO 50SSW VXV TO HMV TO HNN TO
EWC TO 30SW BUF TO SYR TO 20ESE MSS TO 40ESE YSC
MTNS OBSC BY CLDS/PCPN/BR. CONDS CONTG BYD 21Z ENDG 21-00Z.
....

WAUS41 KKCI 131445
WA1T
BOST WA 131445
AIRMET TANGO UPDT 2 FOR TURB VALID UNTIL 132100
.
AIRMET TURB...ME NH VT MA RI CT NY NJ PA WV MD DC DE VA NC SC GA AND CSTL WTRS
FROM MSS TO 20ENE ENE TO 40E ACK TO 50WNW ILM TO 20SW CLT TO ATL TO GQO TO HMV
TO MSS
***MOD TURB BLW FL180**. CONDS CONTG BYD 21Z THRU 03Z.*
.
OTLK VALID 2100-0300Z
TURB ME NH VT MA RI CT NY NJ PA WV MD DC DE VA AND CSTL WTRS
BOUNDED BY YSC-60WSW YSJ-50SE ACK-60SE HTO-ORF-HMV-YSC
MOD TURB BLW 150. CONDS CONTG THRU 03Z.
....

WAUS41 KKCI 130845
WA1Z
BOSZ WA 130845
AIRMET ZULU UPDT 1 FOR ICE AND FRZLVL VALID UNTIL 131500
.
AIRMET ICE...ME NH VT MA RI CT NY LO NJ PA LE WV MD DE VA AND CSTL WTRS
FROM 70NW PQI TO 40NNE PQI TO 50ESE PQI TO 150ENE ACK TO 30E ACK
TO 50S ACK TO 80SSE HTO TO 80SE SIE TO 20SE EMI TO 30SSE EKN TO
20W JHW TO 30ESE YYZ TO 60SSW YOW TO 20ENE YOW TO YSC TO 70NW PQI
MOD ICE BTN FRZLVL AND FL210. FRZLVL 020-080. CONDS CONTG BYD 15Z THRU 21Z.
.
AIRMET ICE...WV MD DC DE VA AND CSTL WTRS
FROM 20SE EMI TO 40SSE SIE TO 40S SBY TO 50SE LYH TO 20ESE PSK TO 30W BKW TO 20SE EMI
MOD ICE BTN FRZLVL AND FL200. FRZLVL 060-120. CONDS ENDG 12-15Z.
.
AIRMET ICE...VT NY LO PA OH LE WV MD VA
FROM 30SE YYZ TO 20WSW JHW TO 30SSE EKN TO 30W BKW TO 40SSW APE TO 20SSW ROD TO
20SSE DXO TO 30SE YYZ
MOD ICE BTN FRZLVL AND 160. FRZLVL 020-060. CONDS CONTG BYD 15Z ENDG 18-21Z.

.
OTLK VALID 1500-2100Z
AREA 1...ICE ME NH VT MA RI CT NY NJ PA MD DE AND CSTL WTRS
BOUNDED BY 70NW PQI-40NNE PQI-40W YSJ-200SE ACK-190SSE ACK-170ESE
SIE-70ESE SBY-30WSW ETX-50WSW YSC-30E YSC-70NW PQI
MOD ICE BTN FRZLVL AND FL210. FRZLVL 020-080. CONDS CONTG THRU 21Z.
.
AREA 2...ICE VT MA CT NY LO PA LE
BOUNDED BY 40WSW YSC-30WSW ETX-40SW HAR-20SE AIR-30E YYZ-30SE
YOW-40WSW YSC
MOD ICE BTN FRZLVL AND 090. FRZLVL 020-050. CONDS ENDG 18-21Z.
.
FRZLVL...RANGING FROM 020-135 ACRS AREA
MULT FRZLVL 030-110 BOUNDED BY 30WSW ROD-60SSE ROD-50SW EKN-
50SW CSN-40SW PSK-40SSW HMV-HMV-HNN-CVG-30WSW ROD
MULT FRZLVL 030-100 BOUNDED BY 40ESE PQI-50SE HUL-140E ACK-
160SSE HTO-70SE SIE-30SSE CYN-30WSW BDL-30W CON-ENE-40ESE PQI
040 ALG 20S HNN-20NE EKN-30ESE JST-20S BDL-70SW YSJ
080 ALG 30N HMV-20S SBY-110S HTO-140ENE ACK
120 ALG 150SE SIE-180S ACK-150ESE ACK
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9.0 Weather Briefing Information

A search of the FAA Automated Flight Service Station (AFSS) provider Leidos indicated that they had no requests from the pilot for a weather briefing, or to file a flight plan, and no other contact with him. A similar search with ForeFlight also came up with no contact for any weather briefing information. It is therefore unknown what the pilot reviewed to familiarize himself with regards to the reported and forecast weather conditions prior to flight.

Submitted by:

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Don Eick
Senior Meteorologist