

**NATIONAL TRANSPORTATION SAFETY BOARD**  
**Office of Aviation Safety**  
**Washington D.C. 20594**

November 20, 2008

METEOROLOGICAL GROUP CHAIRMAN'S FACTUAL REPORT  
MIA-08-MA-203

**A. ACCIDENT**

Location: Walker Mill Regional Park, District Heights, Maryland  
Date / Time: September 27, 2008, 2358 Eastern Daylight Time (EDT)  
September 28, 2008, 0358 Coordinated Universal Time (UTC)  
Aircraft: Aerospatiale SA365N1, N92MD

**B. WEATHER GROUP**

Chairman: Gregory D. Salottolo  
National Resource Specialist, Meteorology  
National Transportation Safety Board  
Washington D.C.

Member: None

**C. SUMMARY**

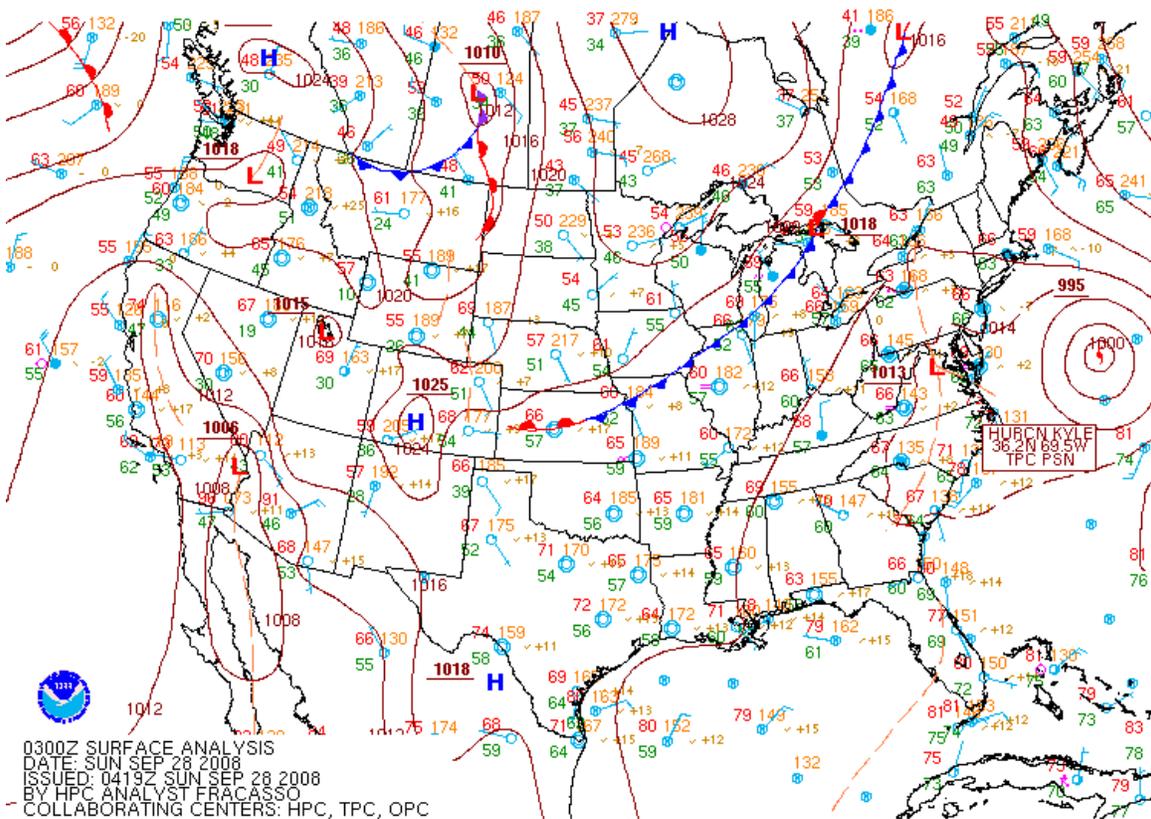
On September 27, 2008, at 2358, eastern daylight time (September 28, 2008 at 0358 UTC) an Aerospatiale (Eurocopter) AS365N1, N92MD, call sign Trooper 2 (T2), registered to and operated by the Maryland State Police, as a Public Use medical evacuation flight, was substantially damaged when it collided with trees and terrain in Walker Mill Regional Park, District Heights, Maryland. The flight had been cleared by air traffic control for an instrument landing system (ILS) approach to runway 19R at Andrews A.F. B. (ADW), Camp Springs, Maryland. Instrument meteorological conditions prevailed at the time of the accident. The commercial pilot, one flight paramedic, one field provider, and one of two automobile accident patients being transported were killed. The other patient being transported survived the helicopter accident and was taken to a local hospital with serious injuries. The flight originated from a landing zone located at Wade Elementary School, Waldorf, Maryland, on September 27, 2008, at 2337 EDT (September 28, 2008 at 0337 UTC), destined for the Prince George's County Hospital (PG), Cheverly, Maryland.

## D. DETAILS OF INVESTIGATION

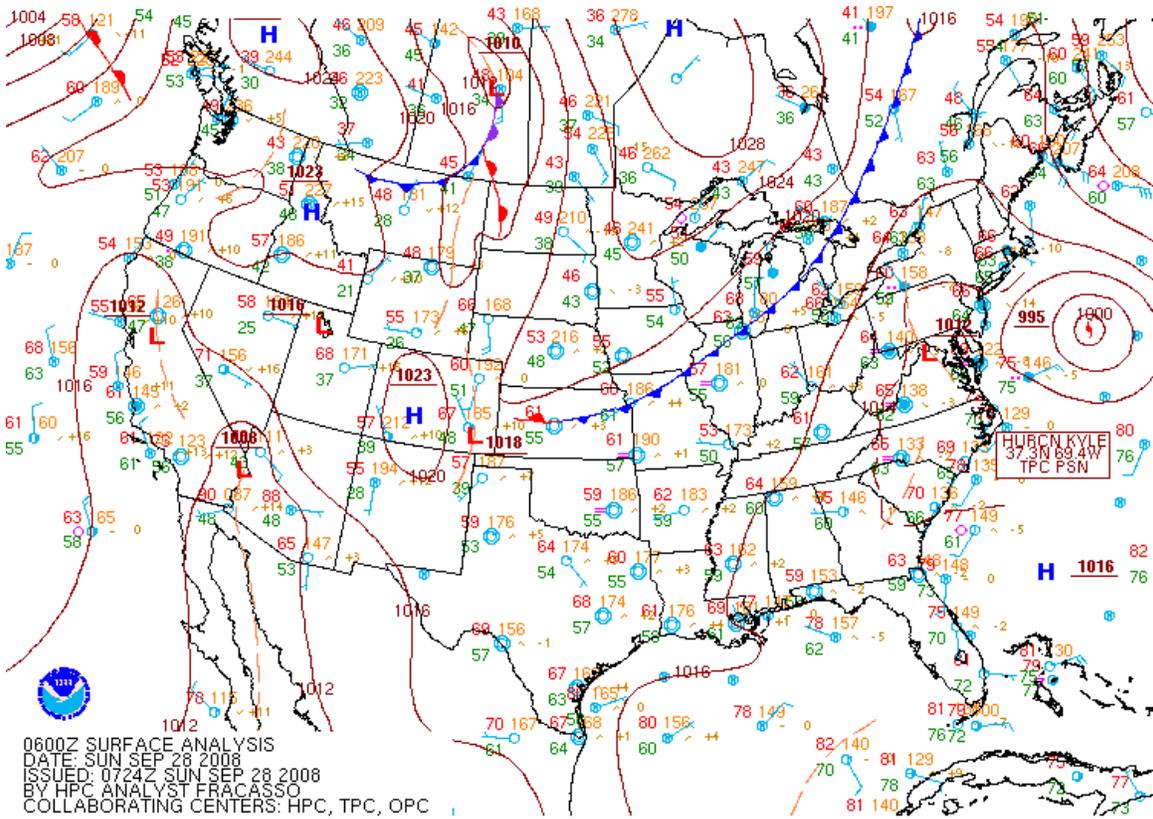
Note: All times are stated as EDT based on the 24-hour clock unless otherwise noted. All heights above mean sea level (MSL) unless otherwise noted. Heights in surface weather observations and terminal forecast above ground level (AGL). All directions are referenced to true north unless otherwise noted. Z = UTC. EDT = Z - 4 hours. The accident location is at 38.869133 degrees north latitude and 76.87276 degrees west longitude.

McIDAS - Man computer Interactive Data Access System. McIDAS is an interactive meteorological analysis and data management computer system. McIDAS is administered by personnel at the Space Science and Engineering Center at the University of Wisconsin at Madison. Data are accessed and reviewed on a Windows XP Pro Workstation running McIDAS-X software.

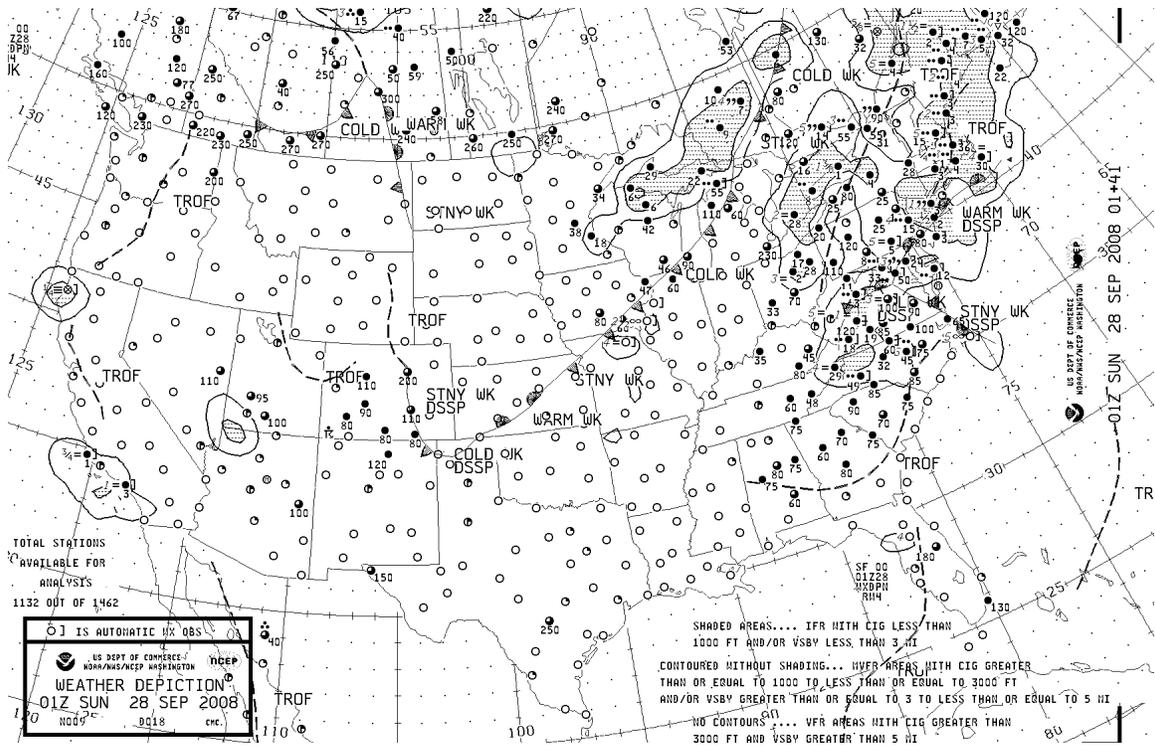
### 1. Synoptic Situation



National Weather Service Surface Analysis for September 27, 2008 at 2300 EDT (September 28, 2008 at 0300Z).



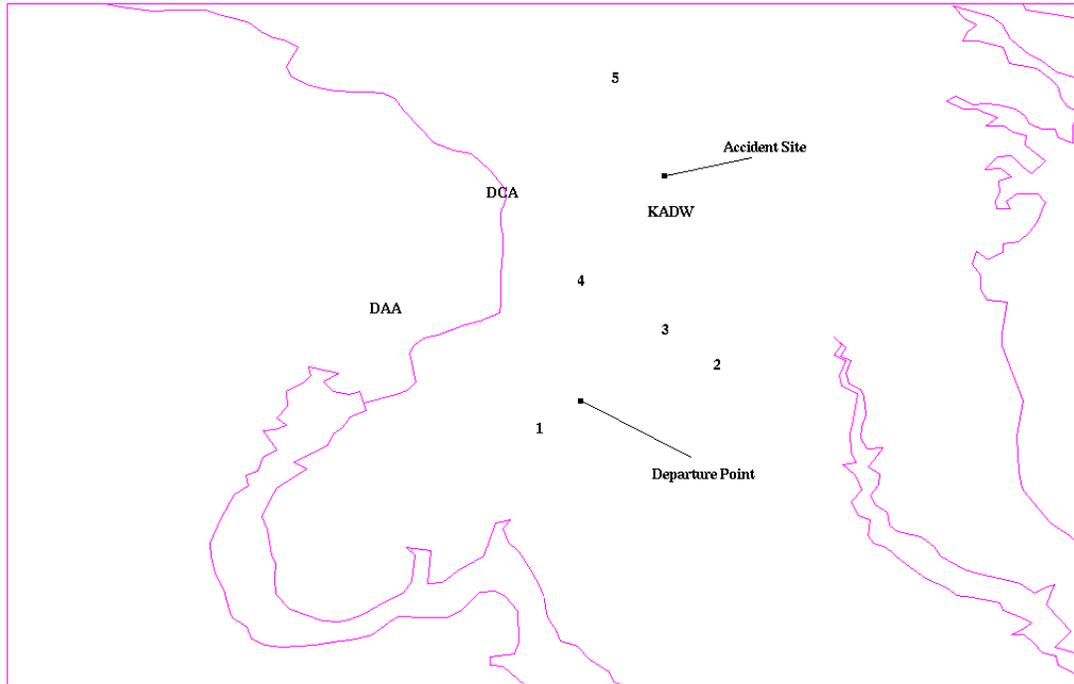
National Weather Service Surface Analysis for September 28, 2008 at 0200 EDT (0600Z).



National Weather Service Weather Depiction Chart for September 27, 2008 at 2100 EDT (September 28, 2008 at 0100Z).



## 2. Surface Weather Observations



Map showing locations of surface weather observation sites.

- 1- LaPlata, Maryland
- 2 - Cedarville, Maryland
- 3 - US-301 at MD-5
- 4 - Potomac, Maryland (VKX)
- 5 - College Park, Maryland (CGS)
- KADW - Andrews Air Force Base, Maryland
- DCA - Washington National Airport
- DAA - Fort Belvoir, Virginia

### Andrews Air Force Base, Maryland (KADW)

There is an Automated Surface Observing System (ASOS) at KADW. The Air Force designation is FMQ-19. Observations are augmented and backed up by Air Force personnel. These personnel are qualified weather observers and weather forecasters. The FMQ-19 was in augmented mode at the time of the accident. The accident location is 356 degrees at 3.8 nautical miles from KADW. KADW is at an elevation of 280 feet.

2255 EDT September 27, 2008: Wind 110 degrees at 3 knots, visibility 7 miles, ceiling 1,300 feet broken, temperature 20 degrees C, dew point 20 degrees C, altimeter setting 29.92 inches of Hg.

2355 EDT September 27, 2008: Wind 080 degrees at 3 knots, visibility 4 miles, mist, 200 feet scattered, ceiling 500 feet broken, temperature 20 degrees C, dew point 20 degrees C, altimeter setting 29.91 inches of Hg.

Note: Since this observation was issued at 2355 EDT (within 15 minutes of the hour) a special (SPECI) was not noted.

0055 EDT September 28, 2008: Wind 070 degrees at 3 knots, visibility 4 miles, mist, ceiling 200 feet broken, 500 feet overcast, temperature 20 degrees C, dew point 20 degrees C, altimeter setting 29.91 inches of Hg.

Surface weather observations for KADW were obtained from the KADW Weather Flight Commander.

#### Fort Belvoir, Virginia (KDAA)

The accident location is 55 degrees at 15.7 nautical miles from KDAA. KDAA is at an elevation of 73 feet.

2255 EDT September 27, 2008: Wind calm, visibility 1 ¼ miles, mist, few clouds at 15,000 feet, temperature 20 degrees C, dew point 20 degrees C, altimeter setting 29.91 inches of Hg.

2317 EDT September 27, 2008 (SPECI): Wind calm, visibility 1 mile, mist, ceiling 7,000 feet broken, temperature 20 degrees C, dew point 20 degrees C, altimeter setting 29.91 inches of Hg.

2340 EDT September 27, 2008 (SPECI): Winds calm, visibility 1 ¾ miles, mist, ceiling 9,000 feet broken, temperature 20 degrees C, dew point 19 degrees C, altimeter setting 29.91 inches of Hg.

2355 EDT September 27, 2008: Wind calm, visibility ¾ mile, mist, ceiling 5,000 feet broken, temperature 19 degrees C, dew point 19 degrees C, altimeter setting 29.91 inches of Hg.

0002 EDT September 28, 2008 (SPECI) Wind calm; visibility 1 ¼ miles, mist, ceiling 2,800 feet broken, temperature 19 degrees C, dew point 19 degrees C, altimeter setting 29.91 inches of Hg., ceiling 700 feet variable 10,000 feet.

Surface weather observations for KDAA were obtained from the KADW Weather Flight Commander.

#### Washington National Airport (KDCA)

The accident location is 82 degrees at 7.6 nautical miles from KDCA. KDCA is at an elevation of 15 feet.

2252 EDT September 27, 2008: Wind calm, visibility 10 miles, few clouds at 1,400 feet, 3,000 feet scattered, 11,000 feet scattered, ceiling 25,000 feet broken, temperature 22 degrees C, dew point 19 degrees C, altimeter setting 29.92 inches of Hg.

2325 EDT September 27, 2008 (SPECI): Wind calm, visibility 10 miles, ceiling 1,200 feet broken, 12,000 feet overcast, temperature 22 degrees C, dew point 20 degrees C, altimeter setting 29.91 inches of Hg.

2352 EDT September 27, 2008: Wind calm, visibility 10 miles, ceiling 1,000 feet overcast, temperature 22 degrees C, dew point 20 degrees C, altimeter setting 29.91 inches of Hg., ceiling 900 feet variable 1,300 feet.

0019 EDT September 28, 2008 (SPECI): Wind 050 degrees at 3 knots, visibility 10 miles, ceiling 800 feet overcast, temperature 22 degrees C, dew point 20 degrees C, altimeter setting 29.92 inches of Hg.

KDCA surface weather observations were obtained from McIDAS.

College Park, Maryland (KCGS)

The accident location is 161 degrees at 7 nautical miles from KCGS. KCGS is at an elevation of 48 feet.

2250 EDT September 27, 2008: Wind calm, visibility 10 miles, ceiling 800 feet overcast, temperature 21 degrees C, dew point 21 degrees C, altimeter setting 29.92 inches of Hg.

2310 EDT September 27, 2008: Wind calm, visibility 10 miles, ceiling 800 feet broken, 1,200 feet overcast, temperature 21 degrees C, dew point 21 degrees C, altimeter setting 29.92 inches of Hg.

2335 EDT September 27, 2008: Wind calm, visibility 5 miles, ceiling 600 feet broken, 1,800 feet overcast, temperature 21 degrees C, dew point 21 degrees C, altimeter setting 29.91 inches of Hg.

2355 EDT September 27, 2008: Wind calm; visibility 10 miles, ceiling 600 feet overcast, temperature 21 degrees C, dew point 21 degrees C, altimeter setting 29.91 inches of Hg.

0015 EDT September 28, 2008: Wind calm, visibility 10 miles, ceiling 600 feet overcast, temperature 21 degrees C, dew point 21 degrees C, altimeter setting 29.91 inches of Hg.

KCGS surface weather observations were obtained using: <http://www.uswx.com/us/wx/>

The following surface weather observations were obtained from MesoWest: <http://www.met.utah.edu/mesowest/>

#### Potomac, Maryland (KVXX)

The accident location is 29 degrees at 8.1 nautical miles from KVXX. KVXX is at an elevation of 118 feet.

2335 EDT September 27, 2008: Visibility  $\frac{3}{4}$  mile, relative humidity 94%, temperature 66.2 degrees F, dew point 64.4 degrees F.

0035 EDT September 28, 2008: Visibility 10 miles, relative humidity 94%, temperature 66.2 degrees F, dew point 65.4 degrees F.

#### LaPlata, Maryland (AP258)

The accident location is 18 degrees at 18.4 nautical miles from AP258. AP258 is at an elevation of 210 feet.

2325 EDT September 27, 2008: Temperature 68 degrees F, dew point 67.7 degrees F, relative humidity 99%, wind calm.

2355 EDT September 27, 2008: Temperature 68 degrees F, dew point 67.7 degrees F, relative humidity 99%, wind calm.

0017 EDT September 28, 2008: Temperature 68 degrees F, dew point 67.7 degrees F, relative humidity 99%, wind calm.

#### Cedarville, Maryland (TS525)

The accident location is 349 degrees at 13.5 nautical miles from TS525. TS525 is at an elevation of 200 feet.

2319 EDT September 27, 2008: Temperature 68 degrees F, dew point 68 degrees F, relative humidity 100%, wind calm.

0019 EDT September 28, 2008: Temperature 68 degrees F, dew point 68 degrees F, relative humidity 100%, wind calm.

#### US-301 at MD-5 (MD041)

The accident location is 360 degrees at 10.8 nautical miles from MD041. MD041 is at an elevation of 226 feet.

2330 EDT September 27, 2008: Visibility 7.1 miles, temperature 68.9 degrees F, dew point 52.6 degrees F, relative humidity 56%, wind west at 1 mph gusts to 2 mph.

2350 EDT September 28, 2008: Visibility 7.1 miles, temperature 68.9 degrees F, dew point 51.6 degrees F, relative humidity 54%, wind west-southwest at 2 mph gusts to 2 mph.

0011 EDT September 28, 2008: Visibility 7.1 miles, temperature 68.9 degrees F, dew point 52.6 degrees F, relative humidity 56%, wind west at 1 mph gusts to 5 mph.

### **3. Air Force Weather Agency (AFWA) Communication Issues**

According to Captain Green, KADW Weather Flight Commander, there was a communication problem at the Air Force Weather Agency (AFWA) that impacted

longline dissemination of KADW observations to non-Department of Defense (DOD) weather outlets. Local dissemination of the KADW surface weather observations was not affected. The last KADW observation noted on non-DOD weather outlets was September 27, 2008 at 1855 EDT (2255Z). The transmission of KADW observations resumed with the September 28, 2008, 1055 EDT (1455Z) surface weather observation.

Colonel Corpman, U.S. Air Force, provided information that indicated there was a failure of a DISA (Defense Information Systems Agency) ATM (Asynchronous Transfer Mode) switch at 1949 EDT (2349Z) on September 27, 2008 in building 301 D, Offutt Air Force Base, Nebraska. This resulted in AFWA's inability to transmit military alphanumeric data to the National Weather Service (NWS) via circuit 73XY. All DOD surface weather observations received, processed, and transmitted by AFWA to NWS, Silver Spring, Maryland were affected. On September 27 at 2043 EDT (September 28 at 0043Z) DISA contacted a Verizon technician about the outage. DISA classified this as a priority 1 ticket. On September 27 at 2224 EDT (September 28 at 0224Z) DISA notified AFWA that the Verizon Technician from St Louis, Missouri would be on-site at Offutt Air Force Base at 1200 EDT (1600Z) on September 28. On September 28 at 0009 EDT (0409Z) AFWA contacted the NWS to offer assistance in establishing an alternate path to provide military alphanumeric data to the NWS. During this conversation, the NWS informed AFWA that they had established an alternate path to receive military observations from the Aviation Weather Center. On September 28 at 0833 EDT (1233Z) AFWA was informed by the NWS that they would send an Admin message out informing the individual NWS sites of the issue. The Verizon technician traveled from St. Louis, Missouri to Offutt Air Force Base and arrived on September 28 at 1145 EDT (1545Z). The new switch was installed on September 28 at 1317 EDT (1717Z). On September 28 at 1401 EDT (1801Z) AFWA confirmed that military alphanumeric data was successfully being sent to the NWS via circuit 73XY.

In addition, a search of available records indicated a similar unscheduled outage occurred on March 18, 2003. This outage caused an interruption to the DISA ATM between AFWA and NWS. In this event a similar action to replace a bad switch at Offutt Air Force Base restored connectivity. This outage lasted 14 hours and 52 minutes (March 18, 2003 at 2329Z to March 19, 2003 at 1421Z).

The National Weather Service Telecommunications Gateway (NWSTG) Program Manager noted that there is no backup system to help in a communication failure between the AFWA and NWSTG. The Program Manager noted that having such a system to exchange alphanumeric data between the NWS and the military would be beneficial. The typical outages between the AFWA and the NWSTG are of a short duration and may not help in those outages, but would in the event of extended time frames such as the one on September 28, 2008. The outage times of the circuit between the NWSTG and the AFWA during this event was from September 27, 2008 at 1922 EDT (2322Z) to September 28, 2008 at 1355 EDT (1755Z).

In addition to KADW, the KDAA surface weather observations to NWS circuits were also affected by the AFWA outage (last observation was September 27, 2008 at 1855 EDT next observation was September 28, 2008 at 1111 EDT).

Information on the AFWA can be obtained from: <http://www.afweather.af.mil/>

Documentation of the AFWA communication issues is contained in attachment 1.

#### **4. HEMS (Helicopter Emergency Medical Services) Weather Data**

The Maryland State Police Aviation Command has access to HEMS<sup>1</sup>. On October 2, 2008, Civilian Pilot II stated that he arrived at the Trooper Two Hangar at about 0310 EDT on September 28. He stated that most pilots read the weather directly from the HEMS prior to a mission. He also noted that the pilot's (N92MD) computer was on and HEMS was on the screen.

An individual from the Maryland State Police who assumed control of flight operations at the console of SYSCOM, helicopter dispatch for the Maryland State Police Aviation Command at about 1800 EDT (September 27), stated that the weather tool HEMS indicated marginal VFR conditions throughout most of the state. He noted that all sections were indicating a mission by mission conditional response due to the weather conditions throughout the state (see SYSCOM -- #2415 incident report for September 28, 2008).

Surface weather observations for Fort Belvoir, Virginia (KDAA), Andrews Air Force Base, Maryland (KADW), Washington National Airport (KDCA), and College Park, Maryland (KCGS) are available through HEMS.

Operational guidance on use of the HEMS Tool is contained in FAA Notice 8000.333. Excerpts from Notice 8000.333:

**d. Limitations.** Operators may not use this Tool in any way to support IFR operations. The only approved use of this Tool is in VFR operations and then only in the context of supporting a “no-go” decision. Operators may not use the Tool as the sole source for decisions to “Go.” They may only use established primary products such as METARs, TAFs, area forecasts, weather depiction charts, prognosis charts, etc., to make both “Go” and “No-Go” decisions. We have provided the following examples:

(1) If primary products, such as METARs, TAFs and area forecasts indicate a proposed flight would encounter weather conditions worse than those required by OpSpec for VFR operations, and the HEMS tool indicates that conditions meet OpSpecs

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<sup>1</sup> At the request of the Federal Aviation Administration (FAA), the ADDS (Aviation Digital Data Service) development team created a tool specifically designed to show weather conditions for short-distance and low-altitude flights that are common for the helicopter emergency medical services (HEMS) community.

minima, an operator cannot use the HEMS tool to support a “Go” decision not supported by primary products.

(2) If the primary products indicate that an operator could complete a flight in conditions at or above the OpSpec minima, and the HEMS tool indicated weather lower than required along the route of flight, the HEMS tool can support a “no-go” decision. This is particularly important since many primary products (such as area forecasts) do not have the specificity to identify highly localized low weather conditions. The HEMS tool can resolve assessments at the 5km x 5km grid level.

(3) The following table reflects the relationship of the HEMS tool to primary weather products:

Condition	Primary Weather Products	ADDS HEMS Tool	Decision
1	No-Go	Go	No-Go
2	Go	Go	Go
3	Go	No-Go	No-Go

Note: The ADDS HEMS Tool is an experimental product. Operators are encouraged to make a “No-Go” decision when the Tool indicates ceilings and / or visibilities below OpSpec minimums even when primary products indicate acceptable weather conditions.

Source: <http://weather.aero/hems/>

## 5. Witness Statements

All witness statements can be found in attachment 2.

Below are excerpts from interviews conducted by the NTSB Investigator in Charge (IIC) of this accident investigation.

On September 30, 2008, the NTSB IIC interviewed a homeowner who resided at Kenova Street, District Heights, Maryland (*see the map below*). He stated that he was watching TV at his home on September 27, 2008, between 2345 EDT to 0000 EDT. The resident heard a helicopter approaching his home and it flew over his house flying towards Walker Mill Regional Park and Andrews Air Force Base. He went outside and observed the helicopter below the clouds in a descending attitude he estimated the clouds were 100 to 150 feet above the trees. He stated it was dark and with a light mist of rain. He followed the helicopter until it disappeared from view.

On September 29, 2008, the NTSB IIC interviewed the resident of a home on Shady Glen Terrace, District Heights, Maryland (*see the map below*) who stated he was standing in his yard at his home on September 27, 2008, at about 2350 EDT. His home is located about 1.5 miles from Walker Mill Regional Park, Maryland. He heard the helicopter approaching his home heading towards Andrews Air Force Base. He observed the helicopter below the clouds at an undetermined altitude. He initially thought the helicopter was trying to land.

Excerpts from witness statements from the Maryland Coordination and Analysis Watch Section.

Witness 1

48<sup>th</sup> Avenue Riverdale Park, Maryland (*see the map below*).

The witness stated that a helicopter flew very close overhead. The witness did not recall what time this occurred, but he stated that the helicopter was probably only about 50 (feet) off the ground. The witness called back and advised that he remembered thinking, “why is a helicopter flying in this weather.” He then thought that maybe the helicopter was trying to fly below the weather. He stated that it was very foggy at the time he heard the helicopter.

Witness 2

Black Bear Ct., Waldorf, Maryland.

The witness advised that at around 2300 hours she heard a helicopter flying very low and that it did not sound right. The witness stated that she went out to see what was happening and she said she could see yellow on the helicopter and that it was not raining. The witness lives relatively close to the scene of the accident.

Witness 3

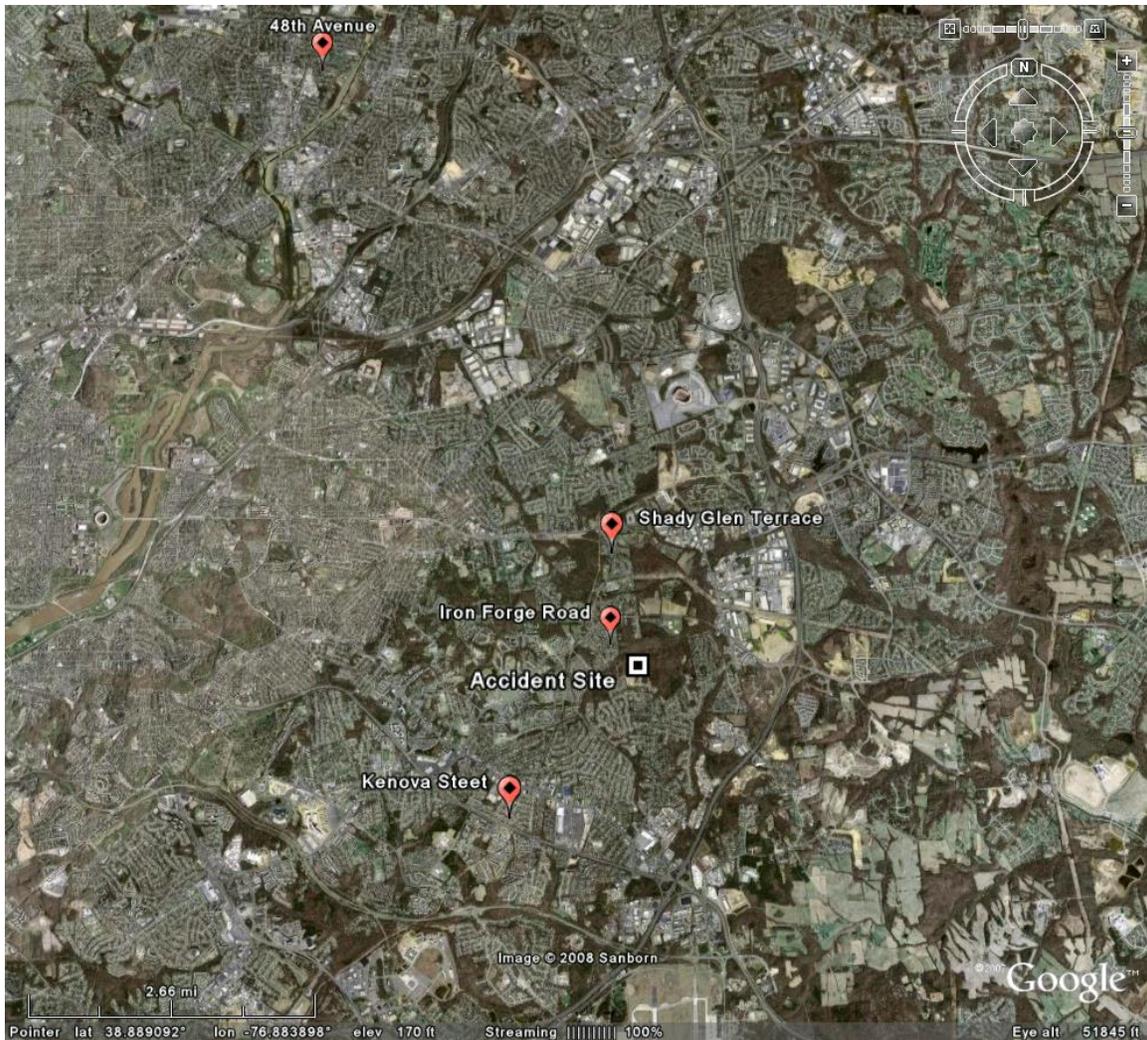
Warfield St, White Plains, Maryland.

The witness advised that she heard the helicopter fly over her residence and it did not sound right, she advised it made a “piercing sound” as it passed over. She further advised that when the helicopter lifted off from the area after picking up the crash victims it did not seem like it went up right, almost as if it struggled. She advised that she could see this from her residence.

Witness 4

Iron Forge Rd, District Heights, Maryland (*see the map below*).

The witness stated she heard the helicopter and it was not sounding normal. She saw it out her kitchen window and it was flying very low. Then she heard a “bump” sound about 1 minute or more after it went past her residence and she looked out side but did not see anything. The witness stated she saw the helicopter around 2300-2400 hours.



Map of selected witness locations relative to the accident site.

Excerpt of crash survivor interview conducted on October 9, 2008 by the Department of Maryland State Police at the University of Maryland Shock Trauma Unit.

The survivor could see out of the helicopter window and she noticed it was very foggy. The survivor advised that she woke up outside of the helicopter on her back. It was raining and very dark.

## 6. Upper Air Data

Data for the location of KADW for September 27, 2008 at 2300 EDT from the North American Mesoscale (NAM12) numerical model.

Source: <http://www.arl.noaa.gov/ready.html>

E = Estimated Surface Height

PRESS ... Pressure in hectopascals

HGT .. Height in meters  
 TEMP ... Temperature in degrees C  
 DEW PT ... Dew Point Temperature in degrees C  
 WND DIR .... Wind Direction degrees true  
 WND SPD ... Wind speed in meters per second

PRESS	HGT(MSL)	TEMP	DEW PT	WND DIR	WND SPD
HPA	M	C	C	DEG	M/S

E = Estimated Surface Height

1008.	47.	21.4	20.6	92.4	0.9
1000.	115.	20.8	20.4	92.9	1.6
975.	335.	19.2	19.1	138.8	2.7
950.	559.	18.3	17.2	162.7	3.2
925.	787.	17.0	15.2	155.1	2.5
900.	1021.	16.0	13.3	134.2	1.7
875.	1261.	14.9	10.8	236.2	0.7
850.	1506.	13.8	8.5	242.9	1.8
825.	1757.	12.5	6.3	211.9	2.4
800.	2015.	11.2	4.0	191.6	3.3
775.	2279.	9.9	2.8	185.6	4.4
750.	2551.	8.6	3.5	187.5	5.8
725.	2832.	7.6	4.4	185.7	7.1
700.	3120.	5.8	3.9	175.4	8.4
650.	3723.	1.8	0.3	167.6	10.0
600.	4364.	-2.1	-2.6	182.0	11.0
550.	5052.	-5.6	-6.0	197.4	13.7
500.	5793.	-10.2	-12.4	194.1	12.1
450.	6597.	-15.2	-23.1	188.5	10.4
400.	7476.	-21.3	-29.1	184.7	9.3
350.	8447.	-28.3	-31.7	187.7	5.5
300.	9531.	-37.3	-39.6	195.9	5.7
250.	10764.	-46.8	-51.9	193.2	10.8
200.	12213.	-54.9	-72.7	175.7	23.4
150.	14036.	-59.1	-79.0	200.6	20.3
100.	16537.	-64.9	-85.3	207.7	10.6
50.	20743.	-63.1	-95.2	282.7	1.8

====Relative Humidity (RH)=====

HGT	RH%
115.	97.5
335.	99.3
559.	93.5
787.	89.3
1021.	83.8
1261.	76.6
1506.	70.5
1757.	65.6
2015.	61.1
2279.	61.5
2551.	70.1
2832.	80.2
3120.	87.5
3723.	89.7
4364.	96.8
5052.	97.1

5793.	84.5
6597.	51.8
7476.	50.7
8447.	73.2
9531.	79.7
10764.	57.6
12213.	11.3
14036.	7.7
16537.	6.1
20743.	1.0

## 7. Weather Radar Data

Level II Doppler weather radar data for Sterling, Virginia (KLWX) was reviewed using IDV<sup>2</sup>. These data were provided by the National Weather Service.

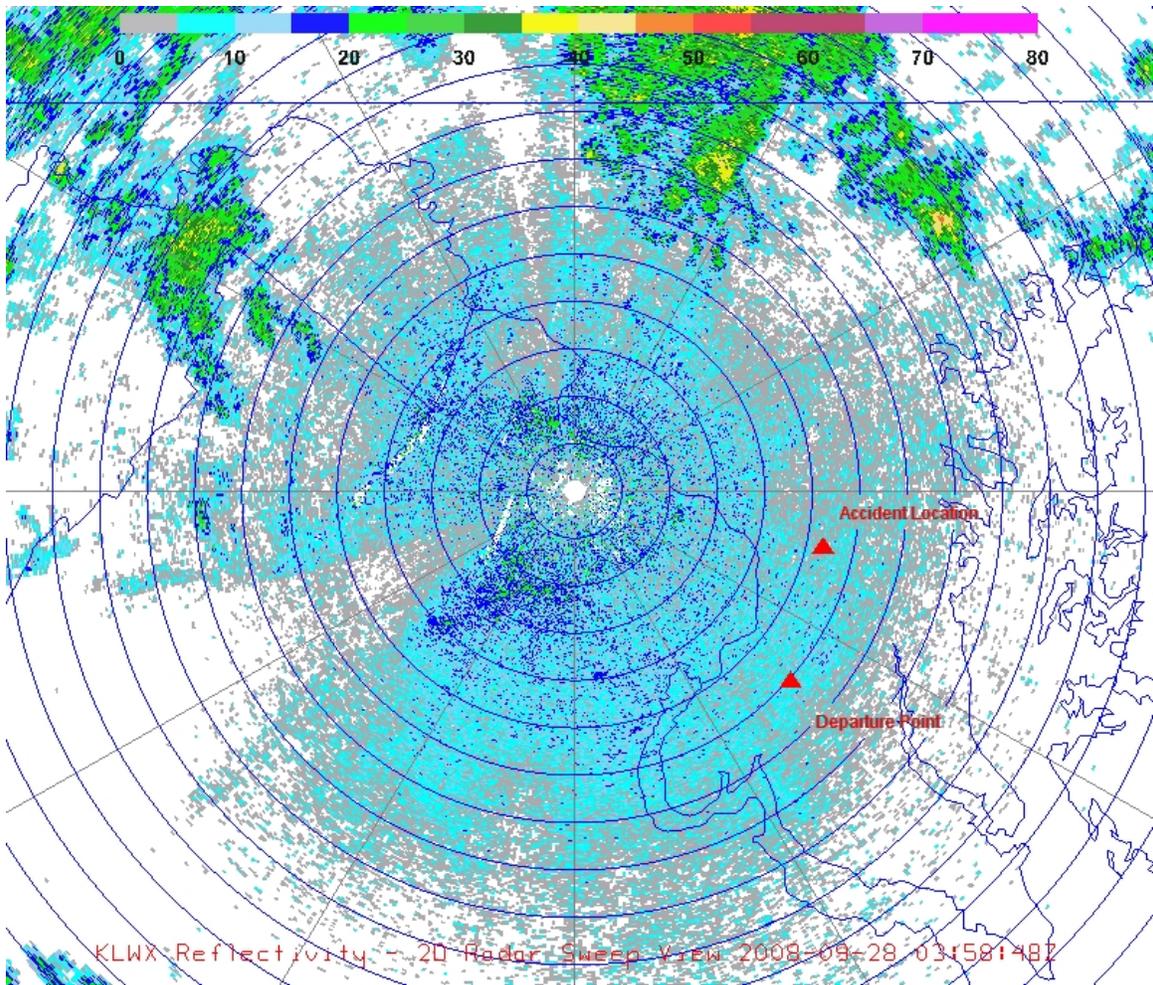
<http://hurricane.ncdc.noaa.gov/pls/plhas/has.dsselect>

The accident location is about 103 degrees at 29.2 nautical miles (54 kilometers) from the KLWX radar antenna.

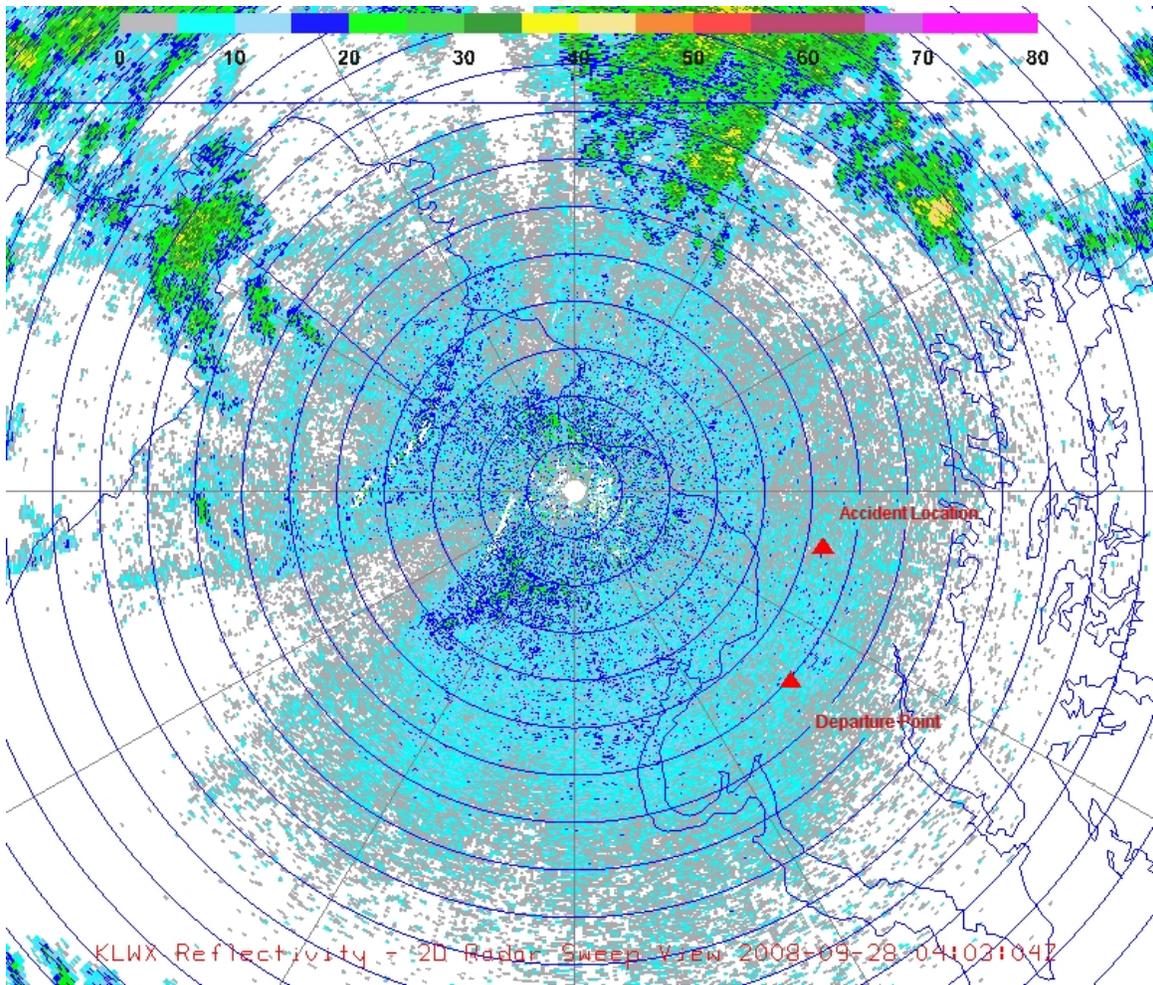
At the accident location at an elevation angle of 0.5 degree the KLWX radar beam center is about 2,500 feet with a beam width of about 3,000 feet.

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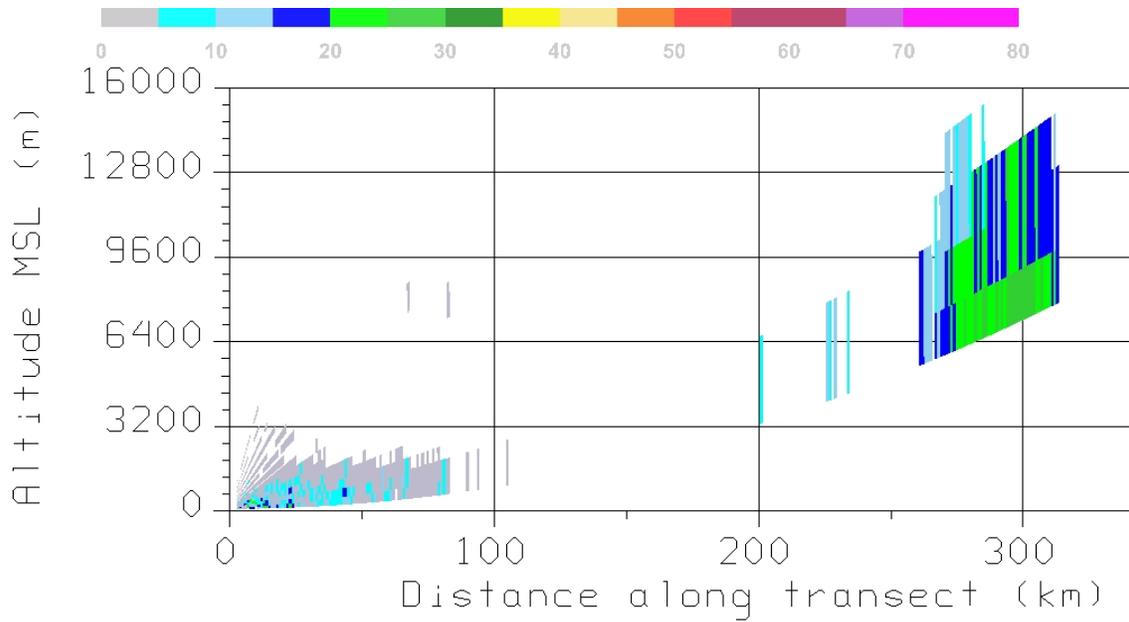
<sup>2</sup> Murray, D., J. McWhirter, S. Wier, S. Emmerson, 2003: The Integrated Data Viewer: a Web-enabled application for scientific analysis and visualization. Preprints, 19th Intl Conf. on IIPS for Meteorology, Oceanography and Hydrology.



KLWX Base Reflectivity Image for September 27, 2008 at 2358:48 EDT (September 28, 2008 at 0358:48Z) at a 0.5 degree elevation angle. Weather radar echo intensities are in dBZ (see the color bar at the top of the image). Range rings are every 10 kilometers. The departure point and accident location are noted. Weak weather radar echoes are seen in the area of the accident.

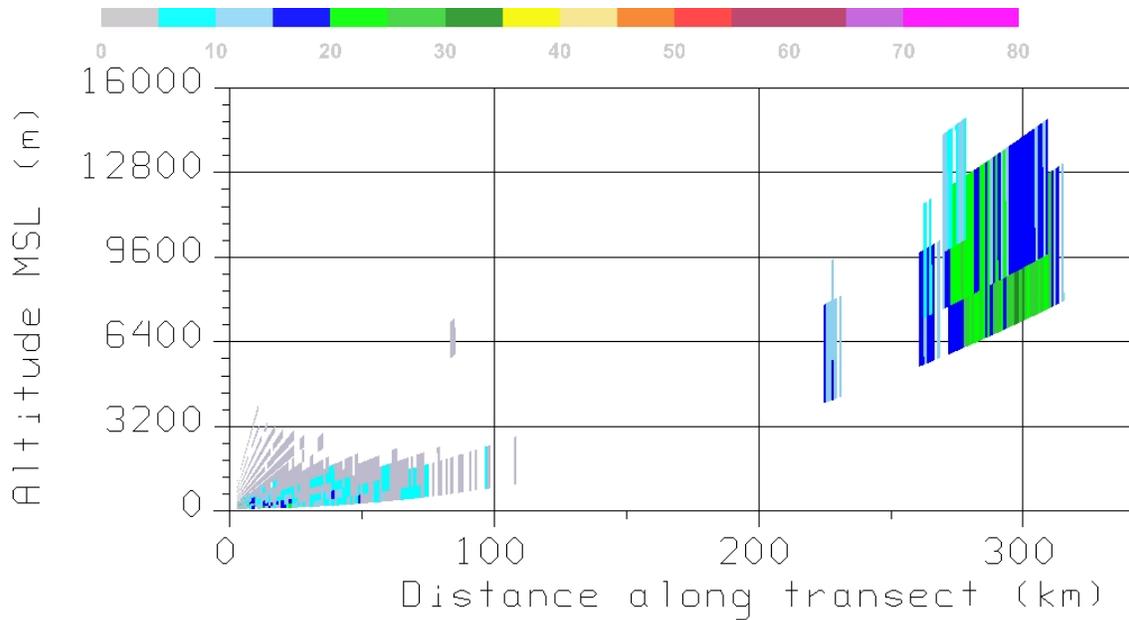


KLWX Base Reflectivity Image for September 28, 2008 at 0003:04 EDT (September 28, 2008 at 0403:04Z) at a 0.5 degree elevation angle. Weather radar echo intensities are in dBZ (see the color bar at the top of the image). Range rings are every 10 kilometers. The departure point and accident location are noted. Weak weather radar echoes are seen in the area of the accident.



KLWX Reflectivity - RHI 2008-09-28 03:58:48Z

KLWX Range Height Indicator (RHI) Base Reflectivity Image for September 27, 2008 at 2358:48 EDT (September 28, 2008 at 0358:48Z) for the radial through the accident site (103 degrees). The range along this radial (distance along the transect in the image) to the accident site is 54 kilometers. Weather radar echo intensities are in dBZ (see the color bar at the top of the image). Weak weather radar echoes with tops of about 7,000 feet are seen in the accident area.



KLWX Reflectivity - RHI 2008-09-28 04:03:04Z

KLWX Range Height Indicator (RHI) Base Reflectivity Image for September 28, 2008 at 0003:48 EDT (September 28, 2008 at 0403:04Z) for the radial through the accident site (103 degrees). The range along this radial (distance along the transect in the image) to the accident site is 54 kilometers. Weather radar echo intensities are in dBZ (see the color bar at the top of the image). Weak weather radar echoes with tops of about 7,000 feet are seen in the accident area.

Output from the KLWX Velocity Azimuth Display for September 28, 2008 at 0003 EDT.

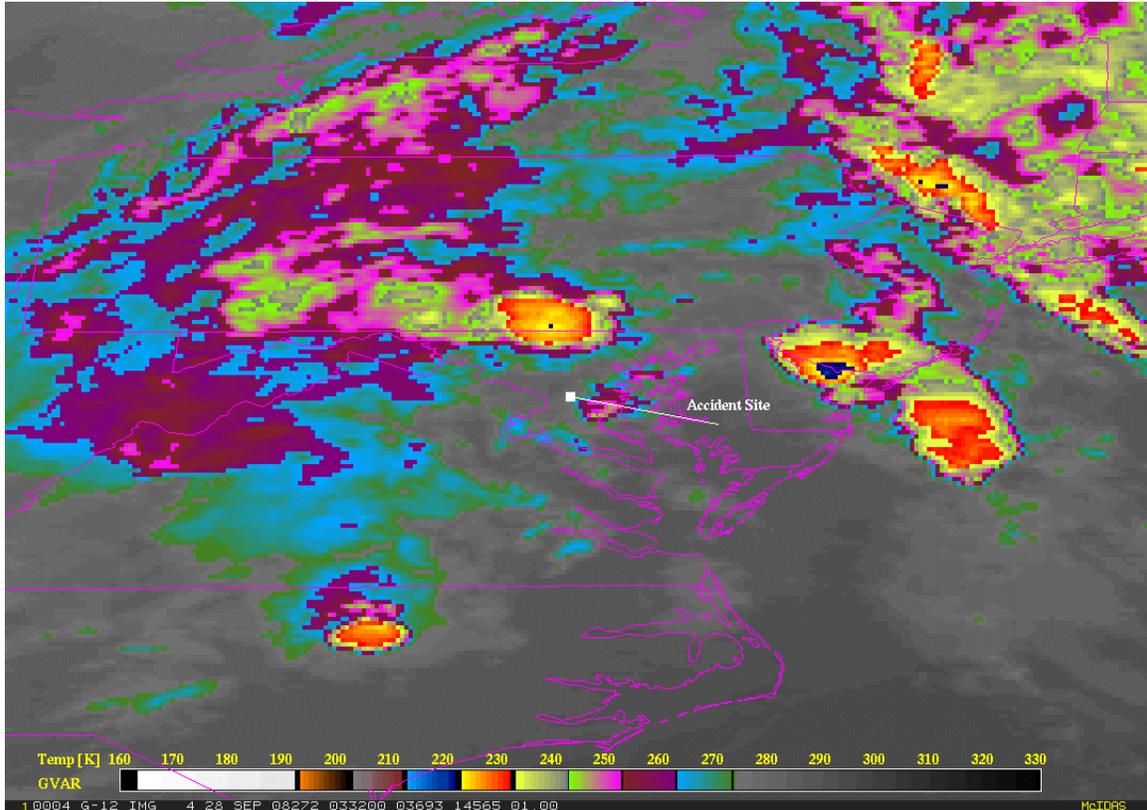
The output was generated using the NOAA Weather and Climate Toolkit software and Level III Doppler weather radar data from the National Weather Service.

<http://www.ncdc.noaa.gov/oa/wct/>

Altitude (feet)	Wind Direction (degrees)	Wind Speed (knots)
700	010	11
1,000	044	10
1,500	050	5
2,000	351	3
2,200	309	3
3,000	270	7

## 8. Satellite Data

Geostationary Operational Environmental Satellite (GOES)-12 data were reviewed using McIDAS.



GOES-12 infrared image for September 27, 2008 at 2332 EDT (September 28, 2008 at 0332Z) at a 1 kilometer (blow up) resolution. The accident site is noted. A radiative temperature of 272.8 degrees K (-0.4 degrees C) was noted at the accident location. Using NAM12 upper air data this temperature corresponds to a cloud top of about 13,400 feet.

## 9. Area Forecast

The National Weather Service Aviation Weather Center in Kansas City, Missouri, issued an Area Forecast (FA) for the accident location on September 27, 2008 at 2045 EDT (September 28, 2008 at 0045Z) that was valid until September 28, 2008 at 0900 EDT (1300Z). The following is the forecast:

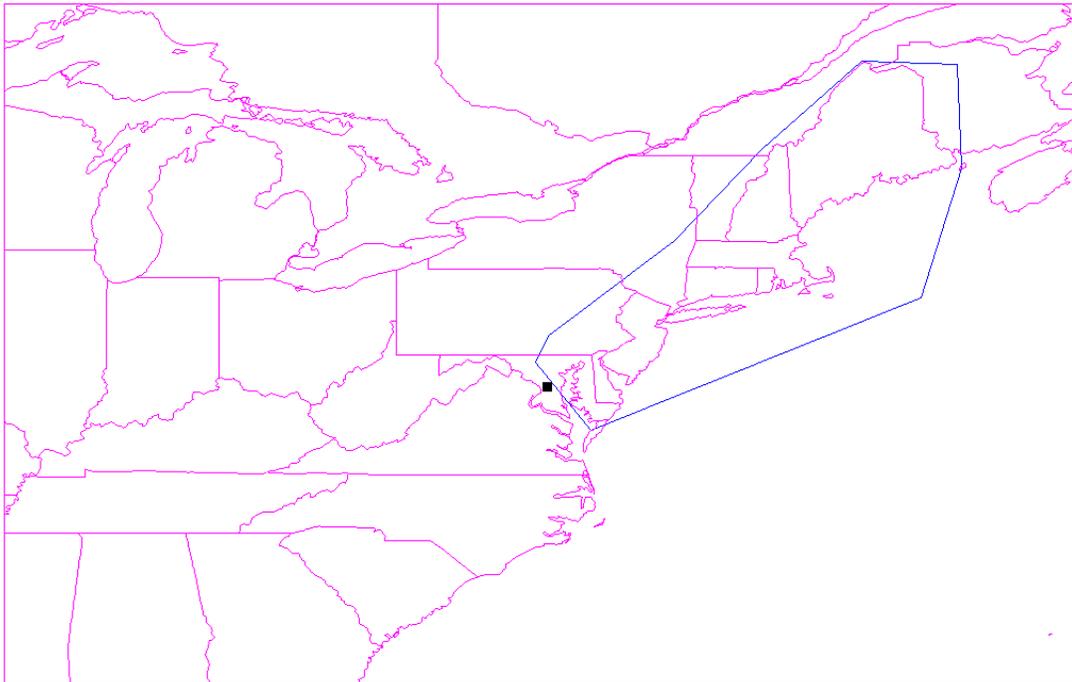
Clouds 5,000 feet broken tops 8,000 feet. Widely scattered moderate rain showers / isolated thunderstorms moderate rain. Cumulonimbus tops to FL350.

In the introduction section to the FA the existence of in-flight advisory AIRMET Sierra for IFR conditions was noted.

## 10. In-Flight Weather Advisories

AIRMET Sierra Update 3 for IFR issued September 27, 2008 at 1645 EDT ( September 27, 2008 at 2045Z) and valid until September 27, 2008 at 2300 EDT (September 28, 2008 at 0300Z).

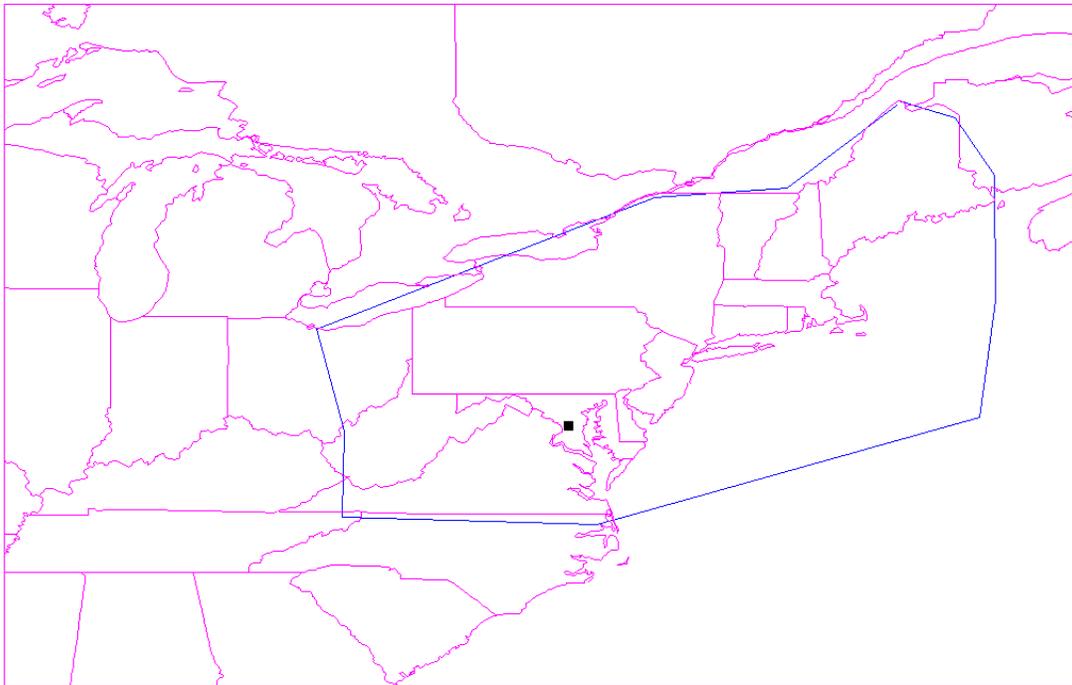
Ceiling below 1,000 feet / visibility below 3 miles in precipitation / mist. See the plot below. The solid black box is the accident site location.



AIRMET IFR ISSUED 2045Z TO 0300Z

AIRMET Sierra for IFR issued September 27, 2008 at 2245 EDT ( September 28, 2008 at 0245Z) and valid until September 28, 2008 at 0500 EDT (0900Z).

Ceiling below 1,000 feet / visibility below 3 miles in precipitation / mist. See the plot below. The solid black box is the accident site location.



AIRMET IFR 0245Z TO 0900Z

The AIRMETs were issued by the National Weather Service Aviation Weather Center in Kansas City, Missouri.

### **11. KADW Weather Forecaster Journeyman Interview**

On October 2, 2008, the Weather Group Chairman conducted a telephone interview with the Weather Forecaster Journeyman who was on duty the day of the accident from 1200 EDT to 0000 EDT. The forecaster stated that he was also certified as a weather observer. His duties include issuing weather observations as required, weather watches, warnings, and advisories, and performing a meteorological watch. He issued the observations at 2255 EDT and 2355 EDT. At 2345 EDT to 2350 EDT he went outside to look at the weather and noted a lower cloud deck at 200 feet (not solid) with a cloud deck at 500 feet broken. From 2300 EDT to 0000 EDT he was monitoring the weather elements including the ceiling and visibility on his computer screen. At about 2330 EDT he saw a few lower clouds. Around midnight he saw 500 feet broken with the 200 feet layer still forming. He said that all weather equipment was operating satisfactorily.

### **12. Weather Briefing**

An event reconstruction for N92MD was done by the DTC DUAT<sup>3</sup> Service for the period September 27, 2008 at 1851 EDT (2251Z) to September 28, 2008 at 0003 EDT (0403Z). According to DTC DUAT there was a contact with N92MD on September 27, 2008 at

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<sup>3</sup> **The Direct User Access Terminal (DUAT) Service** is a computerized service provided by the FAA. It allows current pilots to directly access Federal Aviation Administration weather data and flight plan systems. Data Transformation Corp. (DTC) has provided the DUAT service for over fifteen years.

1851 EDT (2251Z). The contact lasted until September 27, 2008 at 1854 EDT (2254Z). There were no other contacts during this period.

Information available during the contact was trend weather observations, pilot reports, weather radar data, terminal forecasts, and winds aloft forecasts. The September 27, 2008 at 1755 EDT (2155Z) KADW surface weather observation and the KADW terminal forecast (TAF KADW 272217) was included. The KADW terminal forecast for September 27, 1800 EDT (2200Z) to September 28, 2008 at 0100 EDT (0500Z) indicated wind 120 degrees at 6 knots, visibility 7 miles, 2,000 feet scattered, altimeter setting 29.85 inches of Hg. The 1755 EDT KADW surface weather observation indicated winds 090 degrees at 5 knots, visibility 7 miles, few clouds at 1,000 feet, temperature 21 degrees C, dew point 20 degrees C, altimeter setting 29.90 inches of Hg.

Link: <https://www.duat.com/>

### **13. Astronomical Data**

According to data from the U.S. Naval Observatory the moon was below the horizon at the time and location of the accident.

Moonrise on September 28, 2008 was 0616 EDT.

Moonset on September 28, 2008 was 1822 EDT.

Moonrise on September 29, 2008 was 0720 EDT.

Data from [http://aa.usno.navy.mil/data/docs/RS\\_OneDay.php](http://aa.usno.navy.mil/data/docs/RS_OneDay.php)

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Meteorology