NATIONAL TRANSPORTATION SAFETY BOARD Office of Aviation Safety Washington, DC 20594

July 13, 2005

ATC GROUP FACTUAL REPORT

NYC05MA039

A. AIRCRAFT ACCIDENT

- **Location:** Oxon Hill, Maryland
- **Date/Time:** January 10, 2005, 2311 eastern standard time January 11, 2005, 0411 coordinated universal time¹
- Aircraft: N136LN, Eurocopter 135

B. AIR TRAFFIC CONTROL (ATC) GROUP

Chairman: Ms. Sandy Rowlett National Transportation Safety Board Washington, D.C.

Mr. Dan Diggins Federal Aviation Administration (FAA) Washington, D.C.

C. SUMMARY

On January 10, 2005, at 2311 eastern standard time, N136LN, a Eurocopter EC135 P2, operated by Air Methods Corporation, d.b.a. LifeNet, was destroyed during an impact with the Potomac River near Oxon Hill, Maryland. The certificated commercial pilot and flight medic were fatally injured, and the flight nurse received serious injuries. Visual meteorological conditions prevailed, and a company flight plan had been filed for the flight. The flight originated at Washington Hospital Center (DC08), Washington, D.C., at 2304, and was destined for the Stafford Regional Airport (RMN), Stafford, Virginia. The air ambulance positioning flight was conducted under 14 CFR Part 91.

¹All radar and radio transmission times are expressed in coordinated universal time (UTC) unless otherwise noted.

D. DETAILS OF THE INVESTIGATION

At the time of the accident, N136LN (known by air traffic control as "LifeEvac 2") was under the control of Ronald Reagan Washington National Airport Air Traffic Control Tower (DCA), Washington, D.C. The ATC Group convened at DCA on January 13, 2005, collected data on the accident sequence, reviewed the tower controller's training folder, listened to recorded voice communications, and interviewed the controller. Following the interview, the group collected the rest of the data, and completed the field phase of the investigation.

1. History of Flight

At 0405:43, the flightcrew of LifeEvac 2 transmitted its call sign to the DCA local controller (LC) and the LC responded. At 0405:49, the pilot of LifeEvac 2 said, "LifeEvac 2 at Medstar, like to go out to RFK, Route 1, then Route 4 South." The preassigned transponder code for LifeEvac 2 was "0365"². LC responded, "Washington Tower Life Evac2 (garbled) altimeter three zero two five." The crew responded, "Cleared as requested."



² "Pre-Assigned Transponder Codes Adapted in the PCT (Potomac Consolidated TRACON) ARTS IIIE" dated October 18, 2004 indicated that N5194C, a BK 17, was assigned transponder code "0365".

Figure 1. Helicopter Route Chart

At 0407:35, the flightcrew of Delta Express flight 4666, call sign "Candler 666" (CAA 666), a CRJ-7, made initial contact with the LC and said, "and good evening tower, Candler triple six with you for the visual runway one." LC replied, "Candler triple six, Washington Tower, the wind calm, runway one cleared to land." At 0407:47, the crew replied, "Runway one, cleared to land, Candler triple six."

At 0411:20, the flightcrew said, "Tower LifeEvac 2 is at the Woodrow Wilson Bridge." LC responded, "LifeEvac 2, Washington Tower traffic on a ten mile final is an Airbus." The crew responded, "Roger we have him in sight and will be out of his way." LC responded, "LifeEvac 2 maintain visual separation from that traffic." At 0411:46, LC said, "United six twenty eight (UAL 628, an Airbus), traffic a helicopter as you turn final twelve o'clock two miles southbound maintaining visual at or below five hundred feet." The UAL628 crew reported that they had the helicopter in sight.

At 0414:46, LC advised LifeEvac 2 "frequency change approved." There was no response from the flightcrew. (For more detailed radar information see the Aircraft Performance Study.)



Figure 2. Flight tracks of N136LN (red dots) and CAA666 (blue dots). Maltese cross represents the accident site.

1. Facility Information

DCA was an ATC Level 10 tower with radar capability operational 24 hours per day, 365 days per year. Among other equipment, the tower is equipped with a Digital Bright Radar Tower Equipment (D-BRITE). One GS-15 supervisor is required to be assigned to the tower cab at all times.

The facility used an ARTS $IIIE^3$ radar processing unit and one ASR-9⁴ antenna that rotates once every 4.62 seconds.

2. ATIS Information

At the time of the accident, DCA ATIS information "U" was current and being broadcast on ATIS frequency 132.65 between 0352-0452 UTC:

Washington National Airport information uniform, 0351 zulu, wind calm, visibility one zero, ceiling one three thousand broken, two zero thousand broken, temperature seven, dew point two, altimeter three zero two five.... Notices to Airmen: Crane lighted with flags two zero zero feet at the Wilson Bridge. Bird activity in the vicinity of the airport....

3. Aeronautical Study

On February 13, 2003, the FAA conducted an aeronautical study concerning the cranes used in the construction of the Woodrow Wilson Bridge. The study stated that "the structure does exceed the obstruction standards but would not be a hazard to air navigation provided the following condition(s), if any, is (are) met: As a condition to the Determination...the structure should be marked and/or lighted...."⁵

4. Notice to Airmen

FDC 3/1918 stated:

³ FAA Pilot/Controller Glossary defines ARTS III as Automated Radar Terminal System, which displays for the terminal controller aircraft identification, flight plan data, and other flight associated information; e.g., altitude, speed, and aircraft position symbols in conjunction with the controller's radar presentation. Normal radar co-exists with the alphanumeric display. In addition to enhancing visualization of the air traffic situation, ARTS facilitate intra/inter-facility transfer and coordination of flight information. Specially designed computers enable these capabilities and subsystems to be tailored to the radar and communications equipment and operational requirements of each automated facility. Modular design permits adoption of improvements in computer software and electronic technologies as they become available while retaining the characteristics unique to each system.

⁴ Approach control radar used to detect and display an aircraft's position in the terminal area. ASR provides range and azimuth information but does not provide elevation data. Coverage of the ASR can extend up to 60 miles.

⁵ See attachment 2, "Determination of No Hazard to Air Navigation".

DCA FI/T Ronald Reagan Washington National Washington, DC. VOR Rwy 1 Amdt 12...S-1: MDA 600/HAT 585 All Cats. Temporary crane 300 MSL 3.1 NM South runway 1, unless otherwise advised by ATC.

5. DCA Order, 7110.2D, Section 3, Helicopter Control, dated August 8, 2003

Paragraph 2-25, Position Responsibilities, states in part:

Clear VFR aircraft on routes or into zones as depicted on the Baltimore – Washington Helicopter Route Chart using appropriate Class B procedures.

6. Pilot Information

On May 17, 2005, DCA management was posed the question:

At the time of the accident we learned that helicopters in the DCA area use the published helicopter routes. The crossing restriction at the Woodrow Wilson Bridge is 200 feet. Construction is being conducted on/near the bridge with 300-foot cranes. There is no requirement for helicopters traversing the area to obtain the ATIS information, which should contain the NOTAM information on the cranes. Although these flights are VFR, pilots using the published routes/altitudes are put in danger, especially if the lights on the cranes are not lit (for some unknown reason). What advisories, if any, are controllers issuing to VFR pilots operating in the vicinity of the Woodrow Wilson Bridge or any other location where known obstacles are placed in the aircraft's flight path especially when flight crews are supposed to fly published routes?

On June 7, 2005, Safety Board investigators received this response:

It is not required that the Helicopters flying the routes have the DCA ATIS...the Crane info is on the ATIS - maybe it should be mandatory for them to pick-up the ATIS prior to flying through. The .65 does state that the ATIS contains airport and terminal area info. DCA Tower personnel have met with Local Helicopter Pilots and urged them to pick-up the ATIS.

Pilots can deviate from ATC instructions in emergencies and they can always request higher altitude or course deviation. In addition, at the DCA Helicopter Pilot Meetings, the Helicopter crews have stated that they do ask for higher and alternate routes - especially during the night hours of operation.

There were nearly 100 obstruction evaluation determinations made during 2004, involving cranes, towers and buildings within 10 miles of DCA. At any given time there are approximately 30 cranes visible from the tower. It is impractical to expect such obstruction information would be

promulgated via radio or ATIS, which leave the existing NOTAM system, pilot preflight, and general advisory means for helicopter pilots to remain aware that there are numerous obstructions within busy metropolitan areas which are not charted.

The Baltimore-Washington Helicopter Route Chart, 6th Edition, dated April 14, 2005, states the following (which appears to say it all quite sufficiently):

"ALL ROUTES ARE RECOMMENDED ROUTES WHICH PILOTS MAY EXPECT TO RECEIVE WHEN AUTHORIZED TO OPERATE IN THE CLASS B AIRSPACE. UNLESS OTHERWISE INDICATED, ALTITUDES WILL BE ASSIGNED WHEN CONTACTING AIR TRAFFIC CONTROL. HELICOPTER ROUTE AND ALTITUDE ASSIGNMENTS DO NOT RELIEVE PILOTS FROM THEIR DUTY TO COMPLY WITH FAR 91.119 AND 135.203(b). PILOTS ARE EXPECTED TO REQUEST AN ALTERNATE CLEARANCE IF NECESSARY FOR COMPLIANCE".

"CAUTION: ROUTES DEPICTED AND ALTITUDES ASSIGNED DO NOT PROVIDE OBSTACLE CLEARANCE PROTECTION. PILOTS ARE RESPONSIBLE FOR SEEING AND AVOIDING TERRAIN AND OBSTACLES. THIS CHART DOES NOT DEPICT COMPLETE OBSTACLE INFORMATION DUE TO THE HIGH CONCENTRATION OF OBJECTS IN THE AREA. OBSTACLES AND OTHER FEATURES SUCH AS POWER TRANSMISSION LINES AND PROMINENT STRUCTURES ARE DEPICTED FOR LANDMARK VALUE ONLY".

"NOTE: PILOTS ARE EXPECTED TO MAINTAIN THE MAXIMUM ALTITUDE CHARTED WHEN CEILING PERMITS, UNLESS OTHERWISE INSTRUCTED BY ATC".

In addition, I have attached some FAR info:

§ 91.3 Responsibility and authority of the pilot in command.

(a) The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.

(b) In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency.

(c) Each pilot in command who deviates from a rule under paragraph (b) of this section shall, upon the request of the Administrator, send a written report of that deviation to the Administrator.

(Approved by the Office of Management and Budget under control number 2120–0005)

§ 91.103 Preflight action.

Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include—

(a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:

(1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and

(2) For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

91.119 Minimum safe altitudes: General.

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) *Anywhere*. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) *Over congested areas*. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

(c) *Over other than congested areas*. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

(d) *Helicopters*. Helicopters may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with any routes or altitudes specifically prescribed for helicopters by the Administrator.

§ 135.203 VFR: Minimum altitudes.

Except when necessary for takeoff and landing, no person may operate under VFR—

(a) An airplane—

(1) During the day, below 500 feet above the surface or less than 500 feet horizontally from any obstacle; or

(2) At night, at an altitude less than 1,000 feet above the highest obstacle within a horizontal distance of 5 miles from the course intended to be flown or, in designated mountainous terrain, less than 2,000 feet above the highest obstacle within a horizontal distance of 5 miles from the course intended to be flown; or

(b) A helicopter over a congested area at an altitude less than 300 feet above the surface.

7. Interviews

Michael Steven Stewart

DCA Supervisor

| Training records indicate: | |
|--|--------------------|
| Entered on duty (EOD) with the FAA: | September 28, 1986 |
| EOD JFK: | September 29, 1986 |
| Attended Air Traffic Control Academy: | July 28, 1987 |
| EOD JFK as an Air Traffic Assistant: | October 7, 1987 |
| HPN Tower: | October 2, 1989 |
| CTO Certificate: | October 30, 1990 |
| EOD LGA: | October 18, 1992 |
| EOD DCA: | June 3, 2001 |
| CPC (LC) DCA: | February 14, 2003 |
| Certified on Helicopter position, DCA: | February 12, 2003 |

The ATC Group interviewed Mr. Stewart on January 13, 2005. In response to questions, Mr. Stewart provided the following information:

He had 22 years air traffic control experience. He served as a controller in the US Air Force for 6 years before being employed by the FAA. Mr. Stewart was initially assigned to JFK as an Air Traffic Control Assistant before he attended the ATC Academy in Oklahoma City, Oklahoma. After he graduated, he was assigned to White Plains Tower, New York; then LaGuardia, New York. In May or June 2000, he was the LGA Procedures Specialist. He became a supervisor at DCA in 2003. He became a certified professional controller at DCA 2 years ago. His operating initials were "MS". He was not a pilot. His medical certificate was current with no waivers or restrictions.

Saturday and Sunday were his regular days off. His schedule was: one week of midnight shifts (2200-0630 local) and one week of swing shifts (1400-2200 local). The accident occurred on the first night of his mid-shift week.

At 2200 local there was one traffic manager, one supervisor, and two controllers assigned to the tower cab. Between 2300 and 0000 local, there was one controller and one supervisor. He arrived at the facility at 2200 local and received a relief briefing from the

previous supervisor. After the briefing, he determined the staffing for the facility until midnight, then reviewed the daily log, sign-on/sign off sheet, and Presidential movements for the following day.

He recalled the weather was marginal VFR and all the tower equipment was working. He did not recall if he worked LifeEvac 2 inbound. He stated that he listened to the voice tape but had not reviewed the radar replay.

Regarding the accident flight, Mr. Stewart stated that LifeEvac 2 transmitted from MedStar (approximately 4 miles NW of DCA) and requested to fly to RFK, Route 1, Route 4 southbound. He noticed that the altitude of the flight was 200 feet and he issued a clearance inbound, the altimeter, and cleared the flight on the requested route. He stated that it was a normal operation.

When asked about his clearance and the pilot's response, he stated "it's understood, they know the route to fly."

He stated that Route 1 is over the Anacostia Freeway to Haynes Point southbound. Route 4 is Potomac River over the Woodrow Wilson Bridge normally about 200 feet. The routes were published.

Mr. Stewart stated that LifeEvac 2 has a standard transponder code and the D-BRITE displays only the call sign.

He indicated that the requirements for flights within the Class B airspace are separation standards and direct communication with flights. He indicated that standard separation is 500 feet and 1 mile from fixed wing aircraft. When asked what separation he was applying between LifeEvac 2 and Candler flight 666 (CAA666) he stated that he provided visual separation. He saw the helicopter and the fixed wing on final approach and saw that they were no where near each other and were not going to hit. He said that there was no factor between CAA666 and the helicopter visually from the tower. He exchanged traffic information between UAL628 and LifeEvac 2 because he visually observed LifeEvac 2 in the vicinity of UAL628. He indicated that he said "at or below 500 feet" as additional information only.

Mr. Stewart terminated service with the flight when the aircraft was 2 miles north of Fort Washington, just north of the Wilson Bridge. He could not recall the last altitude he saw. He received a call about 5 minutes later stating that there was traffic down about 5 miles south of the field. He called the Metropolitan Washington Airport Authority (MWAA) and advised them of the call.

Mr. Stewart later received a call from the police stating that either a fixed wing aircraft or a helicopter went down in the vicinity of the Wilson Bridge.

Trooper 2 (police helicopter) called saying that they were inbound to investigate. Mr. Stewart advised that he had worked a helicopter southbound and Trooper 2 requested that

Mr. Stewart report traffic in the area. The trooper flew over the area and saw a blue/white object that he identified as a helicopter. Mr. Stewart activated the crash phone then notified MWAA, DEN, and the operations manager.

He did not provide weather information to LifeEvac 2 because the weather was marginal VFR. He could see the aircraft out the tower window.

There was no drug test conducted on him.

Mr. Stewart could not see the cranes working on the Wilson Bridge during the day or at night.

He said that he knew of the construction on the bridge through either the "Read and Initial" binder or NOTAM. Either of these documents would advise him of the position and height of the obstruction and whether the obstruction is lit or flagged. Normally the information is on the ATIS. He indicated that the ATIS was broadcasting information that the cranes were 200 feet high.

He prepared a flight progress strip for the outbound flight that includes the call sign and the requested route. The strip was used for traffic count purposes. He indicated that there should be a flight progress strip for the inbound flight.

He noticed nothing unusual about this flight.

He does radar identify both helicopter and fixed wing aircraft if he believes the pilots are not familiar with the area.

Mr. Stewart stated that there is no requirement to radar identify all aircraft and he was familiar with this flight. He can radar identify by correlating the location of the aircraft with the reported location by the crew. He provides traffic services and radar separation even without radar identifying the flights.

Mr. Stewart indicated that the helicopter routes are used often.

He couldn't recall the height of the cranes.

For helicopters when they lose the primary radar target for one sweep it is dropped.

Radar depicts helicopters 10-15 miles south depending on the height of the aircraft.

A chart showing the helicopter routes is readily accessible at the flight data position.

He stated that the altitudes on the helicopter chart depict the maximum altitudes and that when he's in the cab, he can provide accurate helicopter altitude information to arrival and departure aircraft. When flights are away from the tower cab, he can provide traffic information. He said that on Route 4 southbound, 200 feet is the maximum altitude at the Wilson Bridge.

When asked what the charted altitude restrictions provide, he stated that the altitudes provide separation from landing traffic to runway 1; he could provide traffic regarding helicopters that traverse the area. He stated that the routes do not provide obstacle clearance to helicopters.

Mr. Stewart did not know the altitude flights cross the Wilson Bridge; if they are southbound and cross at 200 feet, sometimes the targets drop but he assumes the flights are at the correct altitude.

He stated that he believes the chart requires pilots to review the ATIS broadcast if they are transitioning through the area but he is not responsible for ensuring that flights that are not arriving to DCA have that information.

He indicated that there is no NOTAM in the tower cab regarding the cranes. At any given time, he can see 15 cranes because of all the construction occurring.

ATIS was changed January 12, 2005 to state that the cranes are 300 feet high, not 200 feet high.

When tower controllers receive a new weather sequence, they input the information to a computer and it is broadcast via the ATIS. . They do not monitor the ATIS to ensure it is accurate.

At the time of the accident there were 2 people assigned to the tower cab. At 2300 Mr. Stewart relieved the other controller to allow him to go on break because he'd been on position for 2 hours. Once it was confirmed that the helicopter was in the water, he brought the controller back to the tower cab.

He was not wearing a headset.

Prior to the accident, it was a "typical" evening shift.

When asked if he learned anything from this accident he replied: "In my heart, mind, soul, I did everything I can do to keep aircraft safe."

He said the onus is on the pilot to maintain visual separation from any obstacles. He works with the understanding that all pilots should know the routes, altitudes, and obstructions.

Pilots could receive a briefing from flight service.

William E. Merritt

Airspace Specialist (AEA 521.3)

On January 18, 2005, Mr. Merritt was interviewed by the ATC Group regarding his evaluation of the request to erect cranes near the Woodrow Wilson Bridge. He requested Mr. Brooke Lewis as his representative. In response to questions, Mr. Merritt provided the following information:

Mr. Merritt has 38 years of air traffic control experience. He was an air traffic controller in the United States Air Force for 20 years, then a flight service specialist/quality assurance specialist in the FAA for 10 years, then 8 years in the current job. As an airspace specialist he conducts: obstruction evaluations, airspace reviews for lasers, fireworks, and balloons; as well as non-rulemaking airport studies (obstruction evaluations on airports).

He explained the process by which this evaluation was made. The proponent completed FAA Form 7460-1 that included the latitude/longitude of the construction, site elevation, and height of the crane. A study number was then assigned. This request, 2003-AEA-547-OE, was evaluated by two other FAA divisions, New York Flight Procedures Branch and Airways Facilities. The Procedures Branch reviewed to ensure that there was no interference on instrument procedures and Airways Facilities ensured that the cranes weren't blocking radar antennas. He then reviewed Part 77 to determine what obstruction standards were exceeded and the New York Flight Procedures previously determined that the DCA approach minima needed to be raised.

He then reviewed the U.S. Geological Survey (USGS) chart to verify locations and confirm that he was looking at the right areas. He determined that the cranes would have an impact on IFR flights, thus requiring that lights and flags (marked and lighted) be put on the cranes. He believed the request was "pretty cut and dried".

He stated that he was aware that the helicopter routes were there. When asked about a 300 foot crane with a 200 foot crossing restriction, he stated "lighting and marking".

One of the additional conditions was "lower at night" which was copied directly from the New York Flight Procedures Office. When asked what "lower at night" meant, he indicated it meant just that, that the proponent was required to lower them at night. It's a common response. If the proponent has a problem, they'll respond and advise they can't lower them. He believed that if they couldn't lower them, it would be brought to his attention.

He believed there would be 2 cranes, one at 310 feet and another at 220 feet.

He couldn't recall if he spoke with this proponent. He stated that there were no "remarks" in the case file which is not unusual. There is a case file on this request that includes a 4-page determination, and a Form 7460-1 from a prior study. There are no records of conversation.

8. FAA Order 7110.65, "Air Traffic Control"

Paragraph 7-2-1, "Visual Separation" states in part:

Aircraft may be separated by visual means, as provided in this paragraph, when other approved separation is assured before and after the application of visual separation. To ensure that other separation will exist, consider aircraft performance, wake turbulence, closure rate, routes of flight, and known weather conditions. Reported weather conditions must allow the aircraft to remain within sight until other separation exists. Do not apply visual separation between successive departures when departure routes and/or aircraft performance preclude maintaining separation.

a. TERMINAL. Visual separation may be applied between aircraft under the control of the same facility within the terminal area up to but not including FL 180, provided:

1. Communication is maintained with at least one of the aircraft involved or the capability to communicate immediately as prescribed in paragraph 3-9-3, Departure Control Instructions, subparagraph a 2 is available, and:

2. The aircraft are visually observed by the tower and visual separation is maintained between the aircraft by the tower. The tower shall not provide visual separation between aircraft when wake turbulence separation is required or when the lead aircraft is a B757....

Sandra L. Rowlett Deputy Chief, Operational Factors Division

Attachments

- 1. FAA Accident Package
- 2. Determination of No Hazard to Air Navigation