National Transportation Safety Board
Washington, D.C. 20594

Aviation Accident Brief

Accident Number: NYC05MA039
Operator: LifeNet, Inc.
Aircraft and Registration: Eurocopter EC-135 P2, N136LN
Location: Oxon Hill, Maryland
Date: January 10, 2005
Adopted On: December 4, 2007

HISTORY OF THE FLIGHT

On January 10, 2005, about 2311 eastern standard time,[1] a Eurocopter Deutschland GmbH EC-135 P2 helicopter, N136LN, operated by LifeNet, Inc., as Life Evac 2, crashed into the Potomac River during low-altitude cruise flight near Oxon Hill, Maryland. The certificated commercial pilot and the flight paramedic were killed, and the flight nurse received serious injuries. The helicopter was destroyed. The positioning flight was conducted under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91 and visual flight rules (VFR) with a company flight plan filed. Night visual meteorological conditions prevailed at the time of the accident.

The flight originated at the Washington Hospital Center Helipad (DC08), Washington, D.C., about 2304, and was en route to Stafford Regional Airport (RMN), Stafford, Virginia. Global positioning system (GPS) data for the flight[2] showed that the helicopter proceeded toward the Federal Aviation Administration's (FAA) published helicopter route 1.[3] According to FAA air traffic control (ATC) transcripts, the pilot contacted the local controller at Ronald Reagan Washington National Airport (DCA), Washington, D.C., at 2305:47 and stated, "washington tower life evac two . . . sir we're at uh medstar like to go out to uh r f k route one

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[1] Unless otherwise indicated, all times are eastern standard time, based on a 24-hour clock.

[2] The helicopter was equipped with an Outerlink GPS tracking system, which enabled communications specialists at LifeCom in Omaha, Nebraska, to track the location of each flight and provide flight requests and flight-following services to the pilots. The GPS data recorded by the operator included ground track and altitude information and were consistent with the ATC radar data for the accident flight.

[3] The FAA's National Aeronautical Charting Office (NACO) publishes helicopter route charts that depict aeronautical information for helicopter pilots, including helicopter route charts that depict routes, heliport locations, navigational aids, geographical features, landmarks, and obstructions. According to the NACO Baltimore-Washington Helicopter Route Chart current at the time of the accident, a section of helicopter route 1 followed the Anacostia River, passed near Robert F. Kennedy Memorial Stadium, and intersected with route 4 at the Potomac River. Helicopter route 4 ran north-south along the Potomac River and crossed the Woodrow Wilson Bridge. According to the chart, the route's maximum altitude restriction north of the bridge was 200 feet and south of the bridge was 300 feet.

then to route four south." The local controller responded, "life evac two (unintelligible) bravo airspace altimeter three zero two five." The pilot responded, "roger understand cleared as requested."

Examination of FAA ATC radar data showed that the helicopter intercepted a segment of published helicopter route 1, followed it southwest to intercept helicopter route 4, and then flew southbound along the Potomac River toward Woodrow Wilson Bridge (see figure 1).

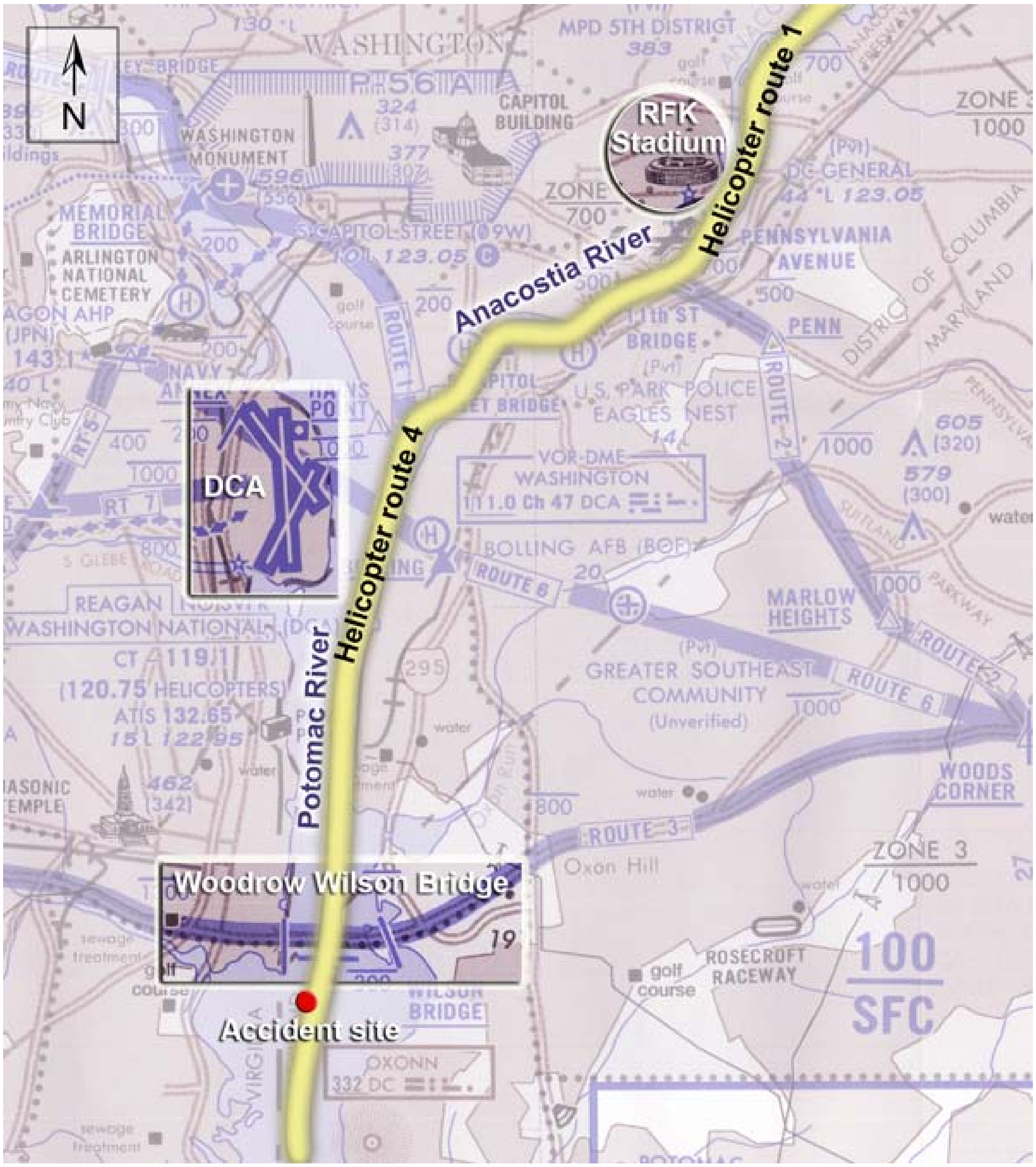

Figure 1. Helicopter route chart with routes 1, 4, and select landmarks highlighted.

As the helicopter flew over the river toward Woodrow Wilson Bridge, its Mode C transponder reported that its altitude varied from 0 to 100 feet.[4] When the helicopter was about 0.5 nautical mile (nm) north of the bridge, its reported Mode C altitude was 200 feet.

At 2311:20, the pilot reported to the local controller, "life evac two is at the Woodrow Wilson [Bridge]," and the controller responded, "life evac two washington tower traffic on a ten mile final is a seven [sic] an airbus."[5] At 2311:30, the pilot responded, "roger we have him in sight and will be out of his way," and the controller stated, "life evac two maintain visual separation from traffic." ATC radar data showed that, at the time of the pilot's response, the helicopter was about 0.25 nm north of the Woodrow Wilson Bridge at an altitude of about 200 feet. The pilot made no further radio communications.

According to the flight nurse, who was seated in the helicopter's left front copilot's seat, the pilot maneuvered the helicopter to cross the bridge midspan. The flight nurse stated that the helicopter appeared to be at the same or higher altitude than the lights he saw on some construction cranes near the Woodrow Wilson Bridge. He stated that he "called the lights" on both sides of the river to the pilot and that the pilot acknowledged him. According to a Maryland Department of State Police report, the flight nurse also stated that there was a "commercial airplane coming into [DCA], and the pilot . . . made a change in his flightpath and started to descend."[6]

According to ATC radar data, at 2311:39, the helicopter had crossed over the Woodrow Wilson Bridge and was just south of the bridge with a ground track of about 180º and an altitude of about 200 feet. Four seconds later, the helicopter had a ground track of about 190º and an altitude of about 100 feet. The helicopter's last recorded position at 2311:48 showed a ground track of about 200º and an altitude of about 0 feet. According to ATC radar data, at the time of the helicopter's last radar return, the northbound Airbus that the local controller previously mentioned was about 2.2 nm south of the helicopter's position at an altitude of about 1,700 feet.

According to the flight nurse, after the helicopter flew over the southern half of the Woodrow Wilson Bridge, the next thing he recalled was being submerged in water with his seatbelt on and his helmet off. He stated that the helicopter's master caution lights and panel segment lights did not illuminate and that he did not hear any audio alarms sound before the

[4] A Mode C transponder transmits the helicopter's identification and altitude information in response to interrogation signals received from ground-based radar equipment. Mode C information, if available, provides the helicopter's altitude above mean sea level (msl) in 100-foot increments. All altitudes in this report were derived from transmitted Mode C altitudes. The elevation of the river in the vicinity of the accident site is about 10 feet above msl.

[5] At the time that the controller notified the helicopter pilot of the Airbus, the Airbus was south of the helicopter's position and was about to turn and fly northbound for the final approach to DCA. The controller also advised the Airbus flight crew to expect that, once they were on the final approach, the southbound helicopter would be at their 12 o'clock position and 2 miles away. A member of the Airbus crew stated to the controller that the helicopter was in sight.

[6] According to the police report, this interview took place about 10 hours after the accident at the hospital where the flight nurse was receiving treatment.

crash. He stated that the pilot did not execute any evasive maneuvers or communicate any difficulties, either verbally or nonverbally.

According to witnesses in vehicles on the Woodrow Wilson Bridge, the helicopter crossed over the bridge before it descended and then impacted the water. None of the witnesses reported seeing the helicopter impact any objects before its descent. The wreckage was located in the Potomac River about 0.5 nm south of the Woodrow Wilson Bridge.

At 2314:46 (about 3 minutes after the helicopter crashed), the DCA local controller stated, “life evac two frequency change approved.” The controller received no reply and made no further attempts to contact the flight. The Maryland State Police later notified the controller of the crash.

PILOT INFORMATION

The pilot, age 56, was hired by LifeNet in June 2004. He held a commercial pilot certificate with ratings for airplane single- and multi-engine land, rotorcraft helicopter, and instrument helicopter. His most recent FAA second-class airman medical certificate was issued on May 28, 2004. On his application for the medical certificate, he reported 1,500 hours total civilian flight experience, 30 hours of which were accumulated in the previous 6 months.[7] A review of company records showed that, in the 90 days, 30 days, and 24 hours before the accident, the pilot flew 42 hours, 12 hours, and 1 hour, respectively, and performed a total of 71 night landings.

According to LifeNet’s training records, during the pilot’s first few weeks of employment, the company provided 12 hours of basic indoctrination training, as well as 20 hours of initial ground training and 7.8 hours of flight training in the Messchersmitt Bolkal Blohm BK-117 helicopter. The training records indicated that the pilot completed the initial pilot-testing requirements of 14 CFR 135.293 and the pilot-in-command flight check required by 14 CFR 135.299 on July 8, 2004, in the BK-117. The company subsequently provided the pilot 18 hours of transition ground training and 5.8 hours of transition flight training for the EC-135, and the pilot completed the initial testing and flight-check requirements in the EC-135 on October 3, 2004.

During his employment with LifeNet, the pilot accumulated 51.5 flight hours in the BK-117 and 40.8 flight hours in the EC-135. According to LifeNet’s assistant chief pilot, when the pilot applied for employment, he reported that he had been retired since 1997 but that he was current for Part 135 operations and had passed Part 135 flight checks in a Bell 206 helicopter in February 2004 and in a BK-117 in April 2004. The assistant chief pilot stated that, according to the pilot’s interview and résumé, he had been a military pilot in the U.S. Army from 1968 to 1971 and had accumulated about 2,400 military flight hours in helicopters, including about 350 hours of night flying and about 70 hours of instrument flying. From 1971 to his retirement in

[7] On the medical application, the pilot listed as his employer the name of a Part 135 helicopter operator that had terminated his employment 1 month earlier.

1997, the pilot worked for a corporation in both nonflying and flying positions. During his 26-year corporate employment, the pilot accumulated 400 hours total flight experience in Agusta 109 and Sikorsky S76 helicopters and about 300 total civilian flight hours in fixed-wing airplanes.

The résumé that the pilot submitted to LifeNet did not list his most recent employer, which was another Part 135 helicopter operator that had terminated his employment after about 2 weeks. According to the chief pilot for that company, the accident pilot was hired on April 12, 2004, but the company terminated his employment on April 28, 2004, because the pilot was unable to adequately perform complex tasks in the helicopter or fly a "complete mission" involving several tasks in a series.[8] During his training with this operator, the pilot accumulated about 7 hours of flight time in a BK-117.

Two medical crewmembers who flew with the pilot the night before the accident on the same route as the accident flight and on other previous flights stated that the pilot flew the helicopter in a manner equivalent to other pilots in the company.

HELICOPTER INFORMATION

The helicopter was manufactured in 2004 and was equipped with two Pratt & Whitney Canada PW206B-series turboshaft engines. The helicopter was configured with a front right pilot seat, a front left copilot's seat, an aft-facing passenger seat in the left aft cabin, and an area for one medical patient in the aft cabin. Each seat was equipped with lap belt and shoulder harness restraints.

The helicopter was maintained in accordance with an FAA-approved aircraft inspection program. According to maintenance records, the most recent 50-hour inspection was performed on December 17, 2004. The most recent 100-hour inspection was performed on November 23, 2004, at an airframe total time of 94.5 hours. At the time of the accident, the helicopter had accumulated 166.6 total hours.

The maintenance logbook recovered from the helicopter included an entry dated January 10, 2005, for an inoperative radar altimeter.[9] The maintenance log also contained a "Record of Minimum Equipment List (MEL) Items and Deferred Maintenance" section that

[8] In accordance with the Pilot Records Improvement Act of 1996, which was enacted to ensure that an operator adequately investigates a pilot's background before hiring him or her, LifeNet requested records from the previous employer listed on the pilot's résumé. Because the pilot did not disclose to LifeNet his most recent employer, LifeNet was unaware of the employment termination.

[9] A radar altimeter is also known as a radio altimeter. The radar altimeter in the accident helicopter, when functional, provided a digital readout of altitude in feet above terrain, a low/high warning (visual amber indicator), and an indicator on the pilot's multifunction display.

included an entry stating that the inoperative radar altimeter could be deferred for maintenance until January 20, 2005.[10]

METEOROLOGICAL INFORMATION

According to the DCA automated surface observing system, located about 3.5 nm north of the accident site, the reported conditions at 2251 were winds calm, visibility 10 statute miles, broken clouds at 13,000 feet and 20,000 feet, temperature 45º Fahrenheit (F), dew point 36º F, and altimeter setting 30.25 inches of mercury.

According to recorded astronomical data, at the time and location of the accident, a new moon was below the horizon and provided no illumination.

WRECKAGE AND IMPACT INFORMATION

The helicopter was recovered from about 5 feet of water in the Potomac River. Wreckage was scattered along a north-south oriented debris path. The wreckage was recovered, and examination indicated no evidence of a collision with a bird or other object, fatigue fractures, or other anomalies.

The main fuselage section was separated into the lower cockpit area and upper cockpit area. The lower cockpit area included the flight-crew floorboard section, antitorque pedals, the forward skid frame, and fragments of the fuel tank. The upper cockpit area included the flight-control tubes, the center electrical and flight-control structure, the upper flight-control deck, engines, the main transmission, and the rotor head.

The cyclic, collective, and antitorque control systems were damaged, and portions of some push-pull tubes were separated and not recovered. Continuity could not be established because of the separations; however, the separated surfaces showed fracture features consistent with impact-related overload.

The main rotor mast was in place and intact in the main transmission. The root ends of the four main rotor blades remained attached to the main rotor hub on the mast. Three of the four pitch-change links were connected to their two attach points, and the other pitch-change link was fractured in the middle. The fracture surfaces were consistent with compression-bending overload.

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[10] According to the FAA, certain aircraft equipment may be inoperative without compromising an acceptable level of safety if the operator adheres to the conditions and limitations stated in the operator's FAA-approved MEL. The FAA's master MEL for the EC-135-series helicopter, on which the operator's MEL is based, states that the helicopter may be dispatched with an inoperative radar altimeter, provided that the radar altimeter is repaired within 10 calendar days, excluding the day that the malfunction was recorded in the aircraft maintenance records. According to LifeNet's director of operations, when the radar altimeter was functional, generally, the pilots of twin-engine helicopters would set the altitude preselect/alerter to the landing decision point (LDP) altitude. The LDP is the last point in the approach and landing path at which a balked landing can be accomplished with a failed or failing critical engine and with the engine failure recognized by the pilot.

Portions of all four main rotor-blade tips were recovered. Each main rotor blade had overload fractures and chordwise scoring on the lower blade skin between 6 to 12 inches from the blade hub. Each blade also showed fractures along the blade span, consistent with impact damage. The main transmission remained attached to the center section of the upper airframe structure, and all four mounting points were intact. The main transmission turned freely, no chips were found on the detectors, and the transmission appeared intact and functional.

The tail boom was separated at the aft fuselage frame. The tail section included the complete fenestron assembly[11] with the tail rotor gearbox and tail rotor. The tail rotor driveshaft was displaced forward about 1.5 inches. The aft portion of the driveshaft, which was carbon composite, was found fractured, torsionally cracked, and deformed. All tail rotor blades remained complete and attached to the hub. The fenestron shroud around the tail rotor showed a rotational scrape at the 5 o'clock position. The width of the scrape corresponded with the tail rotor-blade width.

Both engines showed little damage, and the gas generator (N1 compressor and turbine) and power turbine (N2 turbine) for each engine rotated freely. Nonvolatile memory data extracted from the electronic engine control units for each engine revealed no evidence of preimpact faults.

MEDICAL AND PATHOLOGICAL INFORMATION

The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing on specimens from the pilot, and no drugs or alcohol were detected in the pilot's blood or urine.

SURVIVAL ASPECTS

The State of Maryland, Office of the Chief Medical Examiner, performed autopsies on the pilot and the flight paramedic. The medical examiner determined that the pilot's cause of death was "multiple injuries." The flight paramedic's cause of death was listed as "drowning complicated by hypothermia";[12] the paramedic was found still belted into the left aft cabin seat.

According to the flight nurse, after the crash, he was submerged in water but was able to remove his seat restraints, exit the helicopter, and remain near the helicopter's partially submerged tail section until a rescue boat arrived. He was taken to a hospital and treated for a broken arm and burns.

Several of the witnesses who saw the helicopter impact the water telephoned 911 to report the crash. According to the DCA tower's daily record of operation, the DCA controller

[11] A fenestron is a type of helicopter tail rotor system in which the tail rotor assembly consists of a series of rotating blades shrouded within the vertical tail structure.

[12] The report also stated that the flight paramedic sustained a pelvic injury that, "although not fatal, may have contributed to death by restricting . . . mobility."

received a call about 2326 from a Maryland State Police helicopter crew advising that they were inbound to investigate reports of a downed aircraft near the Woodrow Wilson Bridge. According to an incident report from the City of Alexandria (Virginia) Fire Department, Station 201, the station was notified about the downed aircraft at 2330:18 and dispatched the first of nine emergency medical service apparatuses about 2331:12; the first boat was dispatched at 2333:09.

ORGANIZATIONAL AND MANAGEMENT INFORMATION

LifeNet's Part 135 certificate was issued in 1995. LifeNet is headquartered in Chesterfield, Missouri, and has 89 aircraft based at various locations across the country. LifeNet's fleet includes various AS-350, BK-117, and EC-135 series helicopters, various models of Bell helicopters, Eurocopter BO-105 helicopters, McDonnell Douglas MDHS-MD-900 helicopters, and Beech BE-100 and BE-200 twin-engine turboprop airplanes. LifeNet employs pilots and medical personnel.

TESTS AND RESEARCH

A National Transportation Safety Board performance engineer completed a performance study using the last 30 seconds of the flight's Mode C radar data and the location of the crash site to estimate the helicopter's bank angle and flightpath descent angle at impact, as well as the time of the crash. The study estimated that the helicopter's flightpath angle was about -3º, its bank angle was about 12º right, and it impacted the water about 3.5 seconds after the last radar return.[13]

The study also used primary and Mode C radar data to examine the helicopter's proximity to other aircraft and to evaluate any possible encounter with wake turbulence or a bird flock.[14] Review of the Mode C radar data showed that a 70-passenger Canadair Regional Jet 700 (CRJ-700) passed northbound over Woodrow Wilson Bridge about 1 minute 45 seconds before the helicopter passed over the bridge. According to the data, the helicopter passed 900 feet directly beneath the flightpath of the CRJ-700. On the basis of the radar data, weather information, and information obtained through consultation with an FAA wake turbulence specialist, the study concluded that the time frame was sufficient to expect that the jet's wake would be completely decayed before it could reach the helicopter and that, even if the wake had not decayed at all, its descent rate would not have been sufficient for it to have reached the helicopter.

Review of the primary radar data showed that an area of primary returns, which could possibly represent a bird flock, occurred north of the bridge about 1 nm north of the point where the helicopter began its descent and about 30 seconds before the beginning of descent. The data showed that the helicopter's flightpath continued undisturbed beyond the location of the primary

[13] The study assumed that the helicopter followed a constant descent rate and angle from the location of the last radar return to the location of the wreckage and considered a Mode C uncertainty range of +/- 50 feet.

[14] The flight nurse reported that he observed a white bird fly up from the lower left of the helicopter before the accident. Two medical crewmembers who had flown with the accident pilot on the night before the accident reported observing a large flock of white birds flying up from the water near the Woodrow Wilson Bridge.

returns, which is not consistent with a sudden or catastrophic collision with a bird flock. No evidence of bird remains was observed in the area surrounding the accident site.

Construction Crane Information

During interviews, the flight nurse stated that, although he did not remember the helicopter striking anything, he thought that it must have struck an unlighted construction crane. Safety Board investigators used the recorded ATC radar data and data from the operator's GPS to examine sites along the Potomac River. The helicopter's projected ground track along the data points toward the accident site was at least 300 feet laterally from the nearest construction crane, and no additional obstacles were observed along the track. Examination of the five construction cranes closest to the flightpath showed no evidence of an aircraft strike or structural damage, and all of the cranes had the required lighting on top of their respective boom. Also, a Maryland Department of Transportation traffic surveillance camera located on the east side of the Potomac River at Woodrow Wilson Bridge captured video that showed, at the time of the accident, an aircraft overflew the bridge, passing above and beyond the construction cranes, then began to descend.

Comparison of Accident Flight with Previous Flight on the Same Route

The pilot had flown the route from DC08 to RMN the night before the accident. A review of the operator's GPS data revealed that the previous flight's ground track and altitudes were nearly identical to those of the accident flight while north of Woodrow Wilson Bridge and up to the point of crossing the bridge midspan at an altitude of about 200 feet. According to the data, after the helicopter crossed the bridge on the previous night's flight, it continued southbound on a steady ground-track heading and at an altitude of about 200 feet until it was at least 3 nm south of the bridge, then it climbed. The data showed that the accident flight also crossed the bridge midspan at an altitude of about 200 feet; however, its heading then deviated to the right while it descended into the water.

ADDITIONAL INFORMATION

Night Flying and Featureless Terrain Considerations

Several professional helicopter pilots who routinely fly along the Potomac River in the vicinity of the Woodrow Wilson Bridge were interviewed regarding their observations of physical lighting and the natural horizon of the shoreline. All of the pilots reported that the river widens south of the bridge and that the area becomes "very dark" because the parks and natural bird habitats there limit the physical lighting on the shoreline.

One helicopter pilot reported the following in a written statement:

> Flying at night from North to South over the Woodrow Wilson Bridge is very similar to going into actual instrument conditions. A pilot [flying] low-level North of the bridge is typically flying VFR due to the intense amount of ground lights

> available along the river. Once the pilot crosses the bridge he is now flying into a black void. At this point an instrument scan must be established to maintain altitude. Because of the close proximity to water . . . a radar altimeter is necessary to ensure altitude awareness.

According to the FAA Aeronautical Information Manual (AIM),[15] chapter 8-1-5, Illusions in Flight, Featureless Terrain Illusion, "An absence of ground features, as when landing over water, darkened areas, and terrain made featureless by snow, can create the illusion that the aircraft is at a higher altitude than it actually is."

The FAA Airplane Flying Handbook,[16] chapter 10, states the following about night flying:

> Night flying requires that pilots be aware of, and operate within, their abilities and limitations. . . . Night flying is very different from day flying and demands more attention of the pilot. The most noticeable difference is the limited availability of outside visual references. Therefore, flight instruments should be used to a greater degree.

Air Defense Identification Zone and Flight Restricted Zone Communication Requirements

After September 11, 2001, an Air Defense Identification Zone (ADIZ) was established for the Washington, D.C., area, which includes the DCA class B airspace. According to the National Security Flight Advisory, pilots are required to maintain two-way radio communications with a controller while in the ADIZ. The Washington, D.C., Metropolitan Area Flight Restricted Zone (FRZ), which includes an area within the ADIZ transitioned by the accident flight, also requires the pilot to maintain two-way radio communications with a controller.

Pilots of flights that enter the ADIZ/FRZ typically maintain two-way radio communications with a controller and do not change from the assigned radio frequency until instructed to do so by a controller.[17] Pilots who violate the provisions of the ADIZ/FRZ could be subject to criminal charges and/or FAA administrative action, including civil penalties and suspension or revocation of airman certificates, or military interception.

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[15] U.S. Department of Transportation, Federal Aviation Administration, *Aeronautical Information Manual: Official Guide to Basic Flight Information and ATC Procedures* (Washington, DC: FAA, 2006).

[16] U.S. Department of Transportation, Federal Aviation Administration, *Airplane Flying Handbook*, FAA-H-8083-3A (Washington, DC: FAA, 2004).

[17] The rules for operating within an ADIZ are outlined in 14 CFR Part 99 and include requirements for a functioning two-way radio and transponder, as well as certain procedural, position-reporting, and flight-planning requirements. The rules for operating within class B airspace are outlined in 14 CFR 91.131 and include two-way radio and transponder requirements.

ANALYSIS

Examination of the helicopter revealed no mechanical deficiencies, and no evidence of impact with a bird or other object was found. Studies determined that an encounter with wake turbulence was unlikely.

Other pilots who were familiar with the accident flight route reported that, because of the lack of physical lighting on the shoreline, flying south of the Woodrow Wilson Bridge at night was like flying into actual instrument meteorological conditions. According to the AIM and the FAA Airplane Flying Handbook, such an absence of ground features, especially at night, can result in illusions that make it difficult for a pilot to visually determine altitude, depth perception, and orientation.

The helicopter crossed over the Woodrow Wilson Bridge at an altitude of about 200 feet, then it entered a gradual descent and right bank, and, about 14 seconds later,[18] it impacted the water. Performance calculations estimated that the helicopter struck the water at a 3º nose-low and 12º right-bank attitude, which was consistent with the damage observed on the wreckage.

Because the helicopter was traveling in dark conditions over featureless terrain, the pilot would have needed to reference the flight instruments to help maintain the helicopter's safe altitude over the water. However, about 8 seconds before the onset of the helicopter's banking descent, the pilot diverted his attention from the instruments, at least momentarily, because he stated to the controller that he was looking for the approaching Airbus traffic. Additionally, the flight nurse stated that, because of the traffic, the pilot "made a change in his flightpath and started to descend."

If the pilot had continued to look out the windscreen for the traffic, he would have had few or no outside visual ground references to provide information about the helicopter's altitude, and detection of an unintentional descent during this time would have been difficult using external cues. Once the pilot detected any unintentional descent, he would have had to respond immediately to arrest it because of the helicopter's cruise speed and low altitude. Other pilots familiar with the area stated that radar altimeters are necessary to ensure altitude awareness. During low-altitude flight, a functioning radar altimeter provides a pilot constant altitude information in feet above terrain and has an alerter function that can visually and/or aurally alert a pilot that the aircraft had descended below a preset altitude.[19] However, on the night of the accident, the helicopter's radar altimeter was inoperative.

The night before the accident, the helicopter's radar altimeter was functional, and the pilot successfully flew a nearly identical route southbound over the river, crossed the Woodrow

[18] This includes the 10-second descent observed using radar data and the 3.5 seconds that the performance study estimated the helicopter continued to fly after the last radar return.

[19] The pilot can set the alerter function by setting the altitude bug, or indicator, at any altitude, in feet above terrain, that the pilot determines is appropriate for the flight or flight segment. The alerter will then produce a visual and/or aural warning (depending on the altimeter model) any time the aircraft descends below that height above terrain.

Wilson Bridge at an altitude of about 200 feet, and then continued southbound over the river and eventually climbed to a higher altitude. For the accident flight, the inoperative radar altimeter was allowable for 10 calendar days, according to conditions and limitations stated in the operator's FAA-approved MEL. If a functioning radar altimeter had been available to and used by the pilot, it could have provided a constant altitude cue, in the form of a digital readout of feet above the terrain, to enhance his awareness of the helicopter's height above the water. This cue may have prevented the pilot from descending the helicopter into the water. Additionally, the visual alerter features of the radar altimeter could have provided the pilot additional tools to alert him that the helicopter had descended below a set altitude.[20]

About 3 minutes after the helicopter crashed, the DCA local controller issued frequency-change instructions to the pilot but received no reply and was unaware that the helicopter had crashed. Because of the rules associated with the airspace, it would be unusual for a pilot not to maintain radio contact with the controller; thus, the controller should have attempted to locate the flight when he did not receive a reply.[21] However, because witnesses immediately called 911 to report the crash and rescue resources were dispatched, no evidence shows that the controller's actions adversely impacted the timeliness of the rescue response.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident was the pilot's failure to identify and arrest the helicopter's descent, which resulted in controlled flight into terrain. Contributing to the accident were the dark night conditions, limited outside visual references, and the lack of an operable radar altimeter in the helicopter.

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[20] As a result of the investigations of this and another HEMS accident, the Safety Board issued Safety Recommendations A-07-111 through -112 relating to radar altimeters in HEMS operations. The recommendation letter is available on the Board's Web site at <http://www.ntsb.gov/recs/letters/2007/A07_111_112.pdf>.

[21] The flight was operated under VFR; therefore, a controller would not typically continuously monitor its radar data. However, after the controller received no radio response from the pilot, he should have made further attempts to contact the flight by radio and should have noticed that radar data for the flight ceased.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

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Adopted: December 4, 2007

Member Higgins filed the following concurring statement on November 21, 2007, and was joined by Vice Chairman Sumwalt.

Notation 7690A

Member Kathryn O'Leary Higgins, Concurring:

I support the findings, and recommendations in this investigative report of an EMS accident that happened in Washington, D.C. on January 10, 2005. However, I am very troubled by one aspect of the information uncovered in the investigation.

Our investigators learned that the pilot did not fully disclose his employment history to LifeNet at the time he applied for and interviewed for the job. After listing his career as a military pilot, he identified a corporate employer, and he retired from that job in 1997. He did not reveal that he was hired by another part 135 EMS operator in April 2004 and was terminated after two weeks because, according to our investigation, "the pilot was unable to adequately perform complex tasks in the helicopter or fly a 'complete mission' involving several tasks in a series." He did tell LifeNet that he completed two check rides, one in February and one in April. His application for a medical certificate also listed the employer who terminated him and it listed 30 hours of civilian flight time in the previous 6 months. The Pilot Records Improvement Act was not useful in this case because the pilot did not identify his most recent employer.

The question I keep asking is: "Could LifeNet have learned more about this pilot before hiring him?" If they had known that he had been terminated by another EMS operator after two weeks because he did not meet their standards, would they have offered him a job? Unfortunately, prospective employees may not be fully forthcoming as to their work history. It seems to me that it is the operator's responsibility to make sure they have all the facts before hiring pilots. I believe EMS operators have a special responsibility to go the extra mile, given the life and death nature of their missions and the inherently risky conditions that often define their work. It is perhaps unfortunate that LifeNet did not talk to those who "checked out" this pilot or at least take the opportunity to understand why the accident pilot had been terminated by the previous employer. Should there be a way to cross check information provided for a medical certificate application with work histories provided on a resume? Background checks are now required for many pilots and law enforcement data bases prove useful in conducting those checks. Is something similar needed to check employment histories? Do operators need more tools to adequately examine the background of their prospective pilots?

I raise these questions, not because I have answers or specific recommendations but because I think a more thorough examination of these issues may be needed. I am advised there are other accidents where there were issues with the pilots' background, experience and employment history that were not identified because pilots did not fully disclose information. If that is the case, there may be loopholes in the Pilot Records Improvement Act that should be closed. I hope my questions will stimulate a dialogue. If these issues are legitimate, let's work together to address them. If not, we will be reassured knowing that this operator's experience with this pilot is a very rare exception.

KATHRYN O'LEARY HIGGINS

November 21, 2007