



EMS Helicopter Strikes Terrain On Dark, Snowy Night

The U.S. National Transportation Safety Board said that the pilot of the emergency medical services helicopter continued the repositioning flight under visual flight rules in deteriorating instrument meteorological conditions.

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Joel S. Harris

About 2350 local time April 3, 1999, a Messerschmitt-Bolkow-Blohm (MBB; now Eurocopter) BO 105 CBS-4 helicopter was being repositioned to its home base after transporting a patient to a hospital when it struck terrain and burned near Indian Springs, Nevada, U.S. The helicopter was destroyed; the pilot and two medical crewmembers were killed.

The U.S. National Transportation Safety Board (NTSB) said that the probable cause of the accident was “the pilot’s decision to continue VFR [visual flight rules] flight in deteriorating IFR [instrument flight rules] conditions, resulting in spatial disorientation and subsequent loss of control.”

The helicopter, which was being operated by Metro Aviation under U.S. Federal Aviation Regulations Part 91, “General Operating and Flight Rules,” departed from Valley Hospital Medical Center in Las Vegas, Nevada, at 2315, en route to Hidden Hills Airport in Pahrump, Nevada, about 60 statute miles (97 kilometers) west of Las Vegas. The accident occurred in instrument meteorological conditions (IMC) in uncontrolled airspace 45 miles (72 kilometers) north of Las Vegas.



The accident helicopter was used for Valley Hospital’s air medical transport service and was operated from a satellite base at Hidden Hills Airport.

At 2225, the helicopter, operating with the call sign Lifeguard 2, was landed at the helipad at Valley Hospital to deliver a patient.

At 2315, the accident helicopter departed from Valley Hospital en route to Pahrump. The pilot told an air traffic controller in the control tower at McCarran (Las Vegas) International Airport that he had departed from the hospital helipad, and he requested clearance into the controlled Class B airspace surrounding the airport for a northwest-bound flight. The controller issued the clearance, with instructions to fly the helicopter at or below 3,000 feet and told the pilot the altimeter setting. The pilot told the controller that he did not want to receive air traffic control (ATC) traffic advisories and said that he would “be staying pretty low.”

The initial ATC radar return showed the helicopter at 2,100 feet four miles (6.4 kilometers) northwest of McCarran. (McCarran’s elevation is 2,179 feet.) At 2316, the controller

told the pilot he was departing the Class B airspace and terminated radar service. Radar contact was lost six minutes later; the last radar contact showed the aircraft at 3,000 feet and tracking northwest.

The operator said that the pilot flew the helicopter northwest from Valley Hospital, instead of flying a more direct southwest heading toward Pahrump, because “low weather over the mountains forced the trip to go north to Indian Springs, Nevada, then to Pahrump.”

Hidden Hills Airport is in the Pahrump Valley west of Las Vegas. The valley is oriented northwest to southeast. The Spring Mountains, with elevations of up to 11,915 feet, and U.S. Interstate Highway 95 (I-95) are parallel to the valley to the northeast. The mountain chain can be circumnavigated by flying northwest from Las Vegas along I-95, past the town of Indian Springs, then turning south into the Pahrump Valley and continuing southeast to Hidden Hills Airport.

The night of the accident, a company VFR flight plan was filed. After departure, the pilot was required to make a position report with the hospital on the company radio frequency every 15 minutes. The first position report was due at 2330 hours, but the company received no radio transmissions from the pilot at any time during the flight.

A motorist driving northwest on I-95 toward Indian Springs saw a helicopter “with a flashing strobe light” about 1,000 feet above ground level (AGL), being flown in the same direction. The motorist said that the sky was overcast and that freezing rain had changed to wet snow and then to freezing sleet. The freezing precipitation obscured forward vision through his car’s windshield, and after a few minutes, his windshield wipers were unable to remove the frozen accumulation. He said that before he reached Indian Springs, he opened his side window to see and slowed his car’s speed from 70 mph (113 kph) to about 35 mph (56 kph). When he arrived in Indian Springs, visibility was about 50 feet (15 meters), he said.

Another motorist was traveling southeast on I-95 toward Las Vegas when she saw a helicopter traveling in the opposite direction, “flying very low ... about 150 [feet] to 200 feet off the ground.” She said that the helicopter’s searchlight was on and that the helicopter “would suddenly swerve off into the desert, then return to (the) road ... and again swerve off into the desert.”

“At one point, [the helicopter pilot] ... spotlighted a car, seemingly following it,” she said. “The weather was blowing snow, very heavy snow The helicopter [pilot apparently was] lost and trying to locate roads with [the] spotlight, apparently following cars at one point.”

In a statement to Las Vegas police, a resident of Indian Springs said that he was “in my house talking with my wife” the

night of the accident, when “I heard an aircraft flying back and forth.”

“It sounded like a north and south direction, for about 10 minutes,” he said. “The noise of the engine stopped for a short time, like it flew out of hearing range for about two [minutes] to five minutes.”

He set a clock, observing that the time was about 2340, and then heard the helicopter’s engine again for a few minutes, followed by “a big thump” and no further sound. He immediately drove toward the accident site but turned around when he saw flames and returned home to tell his wife to call law enforcement authorities. Then he drove back to the accident site to look for survivors. There were none.

A Las Vegas Metropolitan Police Department search and rescue officer’s report said that police aircraft could not be flown to the accident scene because of the severe weather; police officers were dispatched using ground transportation.

The accident site was on gently rolling, open desert terrain, 0.6 mile (one kilometer) north of the intersection of two roads, at an elevation of about 3,200 feet. The wreckage was spread over an area 466 feet (142 meters) long.

“From the initial scars, the wreckage was fanned out about 30 degrees along either side of the long axis of the debris path on a 188-degree bearing,” the report said. “A secondary ground scar was found beyond the fire area.”

A ground fire had burned beyond the initial ground scars, but fire damage to the wreckage was confined to the initial burn area, where charring and soot were found. The fire did not spread and stopped burning within several minutes.

Although aircraft records showed that the helicopter was equipped with an emergency locator transmitter (ELT), an ELT was not found in the wreckage, and there was no reported ELT signal associated with the accident.

The pilot of the accident helicopter was a 42-year-old former Soviet Air Force pilot with 10,920 flight hours, including 6,580 flight hours in helicopters, of which 187 flight hours were in MBB 105s. He was a certificated airline transport pilot and helicopter flight instructor. He had accumulated 3,592 hours of instrument flight time and held instrument ratings for helicopters and for airplanes. He had a first-class medical certificate issued July 21, 1998. He had worked for the operator as an emergency medical services (EMS) pilot for about one year.

The report said, “The operator reported that he had satisfactorily completed an inadvertent [IMC] evaluation with the last 90 days. The operator provided copies of his training records showing that he had satisfactorily completed

an unusual-attitude-recovery evaluation on April 30, 1998. A further review of the training records showed that the training form content had been revised. The last record that specifically documents inadvertent IMC training in combination with unusual-attitude-recovery [training] was dated Oct. 22, 1997; however, on that date, inadvertent IMC procedures for the pilot were not evaluated.”

An autopsy of the pilot found small amounts of chlorpheniramine (a sedating antihistamine found in over-the-counter cold and allergy preparations) and phenylpropranolamine (a decongestant found in over-the-counter cold and allergy products) and lidocaine (a local anesthetic used in over-the-counter skin preparations and for minor surgical procedures).

The accident helicopter was medically equipped to transport critically ill and injured patients. The aircraft was not certified for instrument flight and did not have an autopilot. Nevertheless, the helicopter was equipped with flight instruments, including an attitude indicator, a horizontal situation indicator, very-high-frequency navigation radios, a global positioning system and a radar altimeter that provided an aural warning when the helicopter descended below a pre-set altitude. (Continued operation below the pre-set altitude did not result in subsequent radar-altimeter warnings of the proximity of terrain.)

The helicopter was approved for flight in wet snow, in accordance with airworthiness directive 90-23-08-RO and MBB service bulletin BO 105-80-108, and was equipped with external windshield wipers and an internal defroster that operated with engine bleed air.

A review of the accident helicopter’s maintenance records did not reveal any discrepancies. The operator estimated that the fuel tanks contained about 120 gallons (454 liters) of Jet A fuel when the helicopter departed from the hospital helipad.

Earlier in the evening, at 1900, the pilot received a direct user access terminal (DUAT) weather briefing on the Internet. There were no records that he received subsequent weather updates.

Hidden Hills Airport did not have weather reports or forecasts. The closest weather-reporting station was Desert Rock Airport in Mercury, Nevada, 43 miles (69 kilometers) north of Hidden Hills. The weather observation at Desert Rock Airport at 2356 reported winds from 110 degrees at three knots, nine miles (14 kilometers) visibility, an overcast ceiling at 1,900 feet AGL, a temperature of 36 degrees Fahrenheit ([F]; two degrees Celsius [C]), a dew point of 32 degrees F (0 degrees C) and an unknown form of precipitation, which began at 2312. (Automated weather-observation systems report “unknown” precipitation when the system cannot detect what type of precipitation is occurring.)

Nevertheless, the information was valid only within a five-mile (eight-kilometer) radius of the airport. The less-detailed area forecast for southern Nevada, issued at 1945 and valid until 0800 April 4, 1999, called for broken clouds at 7,000 feet above mean sea level, scattered light rain showers and light snow over the mountains.

An upper air data observation reported that, at 2100 at Desert Rock Airport, the air was saturated from the freezing level to 16,000 feet, the freezing level was at the surface and the wind was from 210 degrees at five knots.

Three AIRMETS¹ were in effect in the area: One forecast IFR conditions and mountain obscuration until 0600 April 4; another forecast occasional moderate turbulence below 16,000 feet and was updated at 2345 to forecast moderate turbulence below 16,000 feet and strong northerly winds over rough terrain; and the third forecast light to moderate rime icing in precipitation below 18,000 feet and was updated at 2345 to forecast freezing levels between 7,000 feet and 9,000 feet.

At 2309, the National Weather Service Las Vegas Regional Office issued a winter advisory for snow and blowing snow. Four inches (10 centimeters) of snow had fallen, and an additional two inches to three inches (five centimeters to eight centimeters) were forecast.

In response to a question from NTSB, the operator said that the accident could have been prevented by following proper inadvertent IMC procedures.♦

[Editorial note: Three reports — one by U.S. National Transportation Safety Board (NTSB) and two by Flight Safety Foundation (FSF) — have identified low visibility and/or IMC conditions as major factors in emergency medical services (EMS) helicopter accidents.

NTSB said in a 1988 report, “It is clear that poor weather conditions pose the greatest single hazard to EMS helicopter operations.”²

A 1994 FSF report by on EMS helicopter accidents from 1987 through 1993 said, “Fifty percent of fatal EMS accidents fall under the causal factor ‘weather/low visibility or spatial disorientation.’” The report also said that 72 percent of fatal EMS accidents occurred in darkness, although 37 percent of EMS flights were conducted in darkness.³

A 2001 FSF report on EMS helicopter accidents that occurred from 1987 through 2000 said that 53 percent of fatal accidents occurred during periods of low visibility or IMC and that 66 percent of fatal accidents occurred in darkness.⁴

[Editorial note: This article, except where specifically noted, is based on U.S. National Transportation Safety Board factual report and brief-of-accident report no. LAX99FA137. The reports comprise 74 pages and include diagrams and photographs.]

Notes and References

1. The U.S. Federal Aviation Administration *Pilot/Controller Glossary* defines an AIRMET (airman's meteorological information) as an in-flight weather advisory issued to amend an area forecast "concerning weather phenomena which are of operational interest to all aircraft and potentially hazardous to aircraft having limited capability because of lack of equipment, instrumentation or pilot qualifications. ... AIRMETs cover moderate icing, moderate turbulence, sustained winds of 30 knots or more at the surface, widespread areas of ceilings less than 1,000 feet and/or visibility less than three miles [five kilometers] and extensive mountain obscurement."
2. U.S. National Transportation Safety Board. *Commercial Emergency Medical Service Helicopter Operations*. NTSB/SS-88/01. Washington, D.C., U.S. 1988. The study of 45 commercial emergency medical services (EMS) helicopter accidents between 1978 and 1984 found that the accident rate of 12.34 accidents per 100,000 flight hours was nearly twice the accident rate of U.S. Federal

Aviation Regulations Part 135 unscheduled helicopter operations.

3. Harris, Joel. "U.S. Hospital-based EMS Helicopter Accident Rate Declines Over the Most Recent Seven-year Period." *Helicopter Safety* Volume 20 (July–August 1994).
4. Veillette, Patrick R. "Human Error Cited as Major Cause of U.S. Commercial EMS Helicopter Accidents." *Flight Safety Digest* Volume 20 (April–May 2001): 1–38.

About the Author

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