



## Air Ambulance Strikes Mountain In Heavy Snow and High Winds

*Witnesses said blizzard conditions existed at a remote rescue site when a Bell 222UT pilot attempted to evacuate a critically injured cross-country skier. The investigation report said that the pilot's "perception of pressure" to complete the flight was a factor in the accident.*

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*Joel S. Harris*

On Jan. 11, 1998, at approximately 2250 local time, a Bell 222UT, operated by Air Methods of Englewood, Colorado, U.S., was destroyed when it collided with mountainous terrain during an emergency medical services flight in Little Cottonwood Canyon near Sandy, Utah. All four occupants were killed.

The U.S. National Transportation Safety Board said in its final report that the probable causes of the accident were "flight by the pilot into known adverse weather conditions and [the pilot's] failure (or inability) to maintain sufficient clearance or altitude from mountainous terrain."

The report said that factors related to the accident were "darkness, heavy snow, high winds, the pilot's perception of pressure that was induced by the conditions and events, and mountainous terrain."

At 1714, the Salt Lake County (Utah) Sheriff's Office was told by the safety office at the Snowbird ski resort that a cross-country skier had been injured in an avalanche and that one of the victim's companions was waiting for help at a vehicle-parking area on a road between Sandy and the Snowbird ski area.

A sheriff's deputy went to the parking area and was told by the victim's companion that the avalanche had occurred about 1630

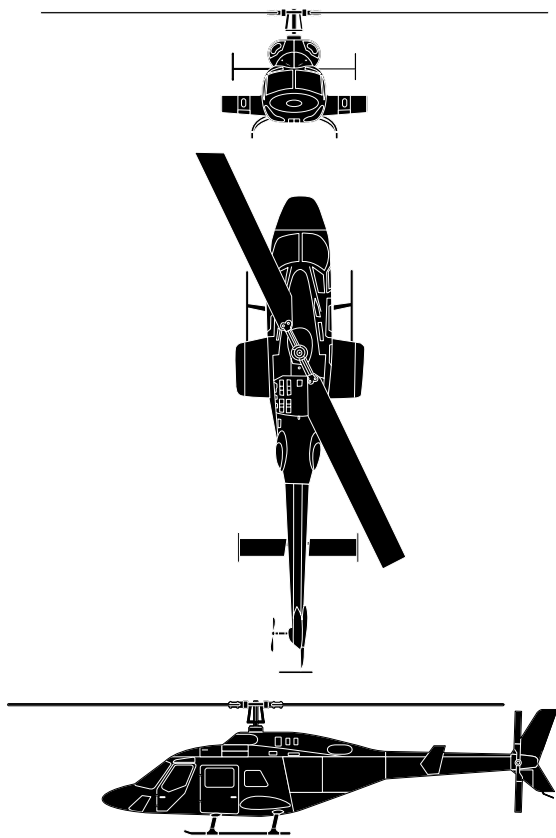


on the south wall of Little Cottonwood Canyon while he was skiing west of the Snowbird ski area with the victim and the victim's wife. The companion said that the victim apparently had leg and pelvic fractures and that the victim's wife had remained with the victim.

A search-and-rescue (SAR) command center was established in the parking area. At 1718, the Salt Lake County Fire Department requested that the University of Utah Medical Center in Salt Lake City send a helicopter to the command center to assist in the evacuation of the injured skier. [Sandy is approximately 11 nautical miles (20 kilometers) south of Salt Lake City.] The helicopter, call sign AirMed 4, was flown by a pilot (not the accident pilot) who was on duty at the time.

At 1731, the pilot landed the helicopter at the command center. The report said that weather conditions included winds gusting between 15 miles per hour (mph) and 20 mph (24 kilometers per hour [kph] to 32 kph), moderate snowfall and poor visibility. The pilot attempted to fly rescue workers to the injured skier but returned to the command center because of the weather.

Ground teams of ski-patrol personnel and medical personnel then were sent to recover the injured skier. The ground-team members were transported on snowmobiles for about one mile (1.6 kilometers) and then traveled on cross-country skis and snowshoes to the victim's location.



**Bell 222UT**

Bell Helicopter Textron began delivering the light twin-engine Model 222 in 1980 and introduced the Model 222UT (utility twin) in 1984. The nonutility models have retractable tricycle landing gear; the utility model has tubular-skid landing gear.

The Bell 222UT has accommodations for a pilot and six passengers or seven passengers. Maximum takeoff-and-landing weight is 8,250 pounds (3,742 kilograms).

The helicopter has two Textron Lycoming LTS 101-750C-1 turboshaft engines, each with a takeoff rating of 684 shaft horsepower (510 kilowatts). The main rotor and the tail rotor both have two blades.

Maximum rate of climb at sea level is 1,680 feet per minute. Hovering ceiling in ground effect is 7,100 feet. Hovering ceiling out of ground effect is 6,400 feet.

Source: *Jane's All the World's Aircraft*

Because the weather showed no sign of improvement, and because SAR personnel determined that the ground teams would require several hours to bring the injured skier to the command center, the pilot flew the helicopter back to the medical center. The helicopter arrived at the medical center at 1804. The accident pilot began duty at that time.

The pilot, 48, was employed by Air Methods in 1990 and, at the time of the accident, was lead pilot for the company's

Salt Lake City operation. He had an airline transport pilot certificate with ratings for multi-engine airplanes and for helicopters, and a flight instructor certificate with ratings for instrument instruction in airplanes and helicopters. He had type ratings in the Bell 205 and Bell 206. He had completed a U.S. Federal Aviation Regulations (FARs) Part 135 flight proficiency check and a Part 135 instrument competency check in a Bell 222UT in September 1997. The pilot had 6,257 flight hours, including 4,871 flight hours in helicopters, 318 flight hours in type and 510 instrument flight hours.

The pilot's flight-time records and duty-time records showed that he had worked 12-hour shifts, with 12 hours off between shifts, in the 10 days before the accident. The records showed that he had flown 2.4 hours during the period.

The ground teams reached the injured skier about 2100 and assessed his condition as critical, with probable multiple internal injuries, as well as multiple femoral [thigh and thigh bone (femur)] injuries, a fractured tibia [the larger of the two bones between the knee and ankle] and a fractured pelvis. He was placed on a rescue sled for transportation down the mountain to the command center.

At 2141, the Salt Lake County Sheriff's Office asked the medical center to send the helicopter back to the command center. The pilot, a 32-year-old flight nurse and a 45-year-old flight paramedic were aboard the helicopter when it departed from the medical center at 2150. The medical center's communications center provided flight-following services. The hospital dispatcher said that snow was not falling when the helicopter departed.

The Part 135 unscheduled air-taxi flight was conducted under visual flight rules (VFR). The helicopter was equipped and certified for single-pilot, instrument flight rules operations.

The pilot landed the helicopter on a landing zone that had been prepared on a road near the command center. Weather conditions included winds gusting at 30 mph to 35 mph (48 kph to 56 kph) and light-to-moderate snowfall.

At 2203, the pilot used a cellular telephone to tell the medical-center dispatcher that they had arrived at the command center.

The dispatcher was observing weather conditions with a remotely controlled, closed-circuit television system with a camera mounted on the side of the hospital. At 2206, she telephoned the pilot and said that snow had begun to fall heavily near the hospital.

"[The snow storm] is coming this way fast," said the dispatcher.

The pilot acknowledged the information and said that the ground team had not yet returned to the command center with the injured skier.

The dispatcher said, "If you are there too long, you might not make it back."

At 2209, the hospital dispatcher telephoned the pilot and said, "It is snowing hard here." She said that on a video monitor she could not see past a section of the hospital 300 feet (92 meters) from the video camera. The pilot thanked her for the information.

At 2225, the accident pilot telephoned the dispatcher and asked, "How is it looking where you're at?"

The dispatcher said that snow was falling "really hard" and that the wind velocity was "23, according to our machine, ... oh, 33, now 37."

The pilot asked the dispatcher to tune her radio-receiver scanner to the Salt Lake City International Airport automatic terminal information system (ATIS); he then listened to the ATIS broadcast via her VHF (very high frequency) transmission.

The report said that the current (2216) weather observation at the airport included the following information: "winds [from] 350 degrees at 24 knots [44 kph], gusts to 34 knots [63 kph]; visibility two statute miles [three kilometers]; light snow showers; broken clouds [at] 3,000 feet; overcast [at] 5,000 feet; temperature 36 degrees F [Fahrenheit; two degrees Celsius (C)]; dew point 34 degrees F [one degree C]; altimeter setting 29.85 inches of mercury."

The pilot then said that snow was falling in the canyon. He said that he would be able to take off in the next five minutes to 10 minutes but would have to take the patient to another hospital.

The dispatcher said that she could "hardly see the helipad." [The location of the helipad was not included in the report.]

The pilot said that the ground team and the injured skier had not arrived at the command center. This was the last communication between the pilot and the dispatcher.

The pilot discussed the weather conditions with a sheriff's deputy. The pilot asked if the deputy had information about weather conditions near the mouth of the Little Cottonwood Canyon, approximately seven miles (11 kilometers) west of the command center. The pilot was told that another sheriff's deputy had reported that a mixture of rain and snow was falling near the mouth of the canyon, and that the snow was beginning to stick on the canyon road.

A severe frontal passage was witnessed between 2200 and 2300 by a retired U.S. Army helicopter pilot who was at his home at the mouth of the canyon. He said that he was watching a television news broadcast when he experienced "the most violent winter storm" in the 18 years that he had lived there.

"The wind increased rapidly to an estimated 50 knots [93 kph], with gusts to an estimated 70 knots [130 kph] in less than a

minute," he said. "The storm passed our house in a few minutes. Due to the severity of the storm, I considered leaving the family room, since I did not know if the windows would hold under these conditions."

When the ground team arrived at the command center, the victim was loaded into a ground ambulance. The sheriff's deputy said, however, that the crew of AirMed 4 decided that the patient required transportation by air because of his condition.

The pilot requested that the parking lot be cleared of vehicles so that he could conduct an emergency landing in the parking lot if necessary.

The sheriff's deputy said that by the time the injured skier was loaded into the helicopter, "the weather had changed slightly, in that it was snowing heavier, and there was some local lightning and thunder."

The sheriff's deputy said that the helicopter remained on the highway, with its rotor blades turning, for three minutes to five minutes before lifting off "in a straight-up fashion." He said that the helicopter turned toward the valley and then began to slowly circle the parking lot. He said that the helicopter's spotlight was shining on the road and the parking lot.

Witnesses said that the pilot radioed that he was going to "look at his options" and that he was going to "grab some altitude."

The sheriff's deputy told the pilot that the canyon road had been closed to traffic and that he could land on the road if necessary.

The helicopter circled the parking lot twice. The sheriff's deputy said that the helicopter appeared to gain altitude during its second circuit and that the pilot then said that he was going to "go straight up."

"The helicopter began to gain altitude for the next three to five seconds," the deputy said. "The [helicopter] then began to travel towards the north, which is bounded by a 10,000-foot-plus ridge.

"Some observers indicated that it appeared as if the [helicopter's] nose was pointed towards the south, yet the [helicopter] was moving towards the north. This could have been an effect of the wind. During the three-second period in which the [helicopter] appeared to be going towards the north, the aircraft's lights went out of sight."

Seconds later, the deputy heard a "slight muffled boom." He radioed the pilot but received no response.

Weather conditions had worsened steadily after the helicopter took off. One witness said that "blizzard conditions" had developed.

"It was snowing, and the wind was gusting to 35 knots [65 kph]," said the witness.

SAR personnel determined that the helicopter had struck terrain in an active-avalanche area.

The report said that, when the accident occurred, blowing snow reduced visibility to one statute mile (1.6 kilometers).

The report said that efforts to locate the helicopter were delayed by the extreme weather conditions and the risk of avalanches. The sheriff's deputy said that, because of the avalanche risk, SAR personnel decided to conduct avalanche-control operations before attempting to locate the helicopter.

Visibility improved later that night. During the avalanche-control operations, several small fires and smoke were sighted at 0330 on the side of a mountain. About 0700, personnel aboard a sheriff's helicopter found the burning wreckage of the accident helicopter at 8,500 feet on the north wall of Little Cottonwood Canyon (about 1,500 feet [458 meters] above the road from which the helicopter had departed).

The wreckage was still burning later that day when ground teams reached the accident site. The wreckage was on terrain that sloped from 40 degrees to 45 degrees. The report said that the ground teams photographed and videotaped the wreckage, and removed the victims' bodies from the accident site, but weather conditions and the risk of an avalanche prevented an on-site examination of the wreckage.

"Photographs and videotape taken by rescue personnel showed the helicopter on its right side and confined to the immediate area," the report said. "The cabin area had been consumed by fire. Several treetops had been severed."

The helicopter later was recovered and was transported to Phoenix, Arizona. The report said that no evidence of preimpact failure was found during examination of the airframe on Feb. 18, 1998, or during examination of the engines on April 8 and 9, 1998. ♦

[Editorial note: This article, except where specifically noted, is based entirely on U.S. National Transportation Safety Board factual accident report and brief-of-accident report FTW98FA093. The reports comprise 52 pages and contain photographs.]

### *About the Author*

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