



National Transportation Safety Board Aviation Accident Final Report

Location:	SANDY, Utah	Accident Number:	FTW98FA093
Date & Time:	January 11, 1998, 22:50 Local	Registration:	N222UH
Aircraft:	Bell 222UT	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	4 Fatal
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled - Air Medical (Unspecified)		

Analysis

The hospital helicopter was dispatched to transport a skier, who had been injured in an avalanche. Snow was not falling when the helicopter departed the hospital, but there were 'gusty winds and light to moderate snow' during arrival at the landing zone. The dispatcher telephoned the pilot (using a cellular phone) to advise him that hospital weather conditions had deteriorated due to a fast moving front. She said it was 'snowing really hard,' the winds were gusting to 37 knots, and visibility was less than 300 feet (she could not see a wing of the hospital on the closed circuit television monitor, and could barely distinguish the helipad). A sheriff's deputy said that the helicopter took off from the landing zone in 'blizzard conditions' and circled the landing zone, then turned north and disappeared from view. Seconds later, a deputy heard 'a slight muffled boom. . . The weather had grown steadily worse and the snow was falling very heavily.' Later, the helicopter was found where it had impacted mountainous terrain in a canyon area. Several tree tops were severed when the helicopter crashed.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: flight by the pilot into known adverse weather conditions, and his failure (or inability) to maintain sufficient clearance or altitude from mountainous terrain. Related factors were: darkness, heavy snow, high winds, the pilot's perception of pressure that was induced by the conditions and events, and mountainous terrain.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

1. (F) LIGHT CONDITION - DARK NIGHT
2. (F) WEATHER CONDITION - SNOW
3. (F) WEATHER CONDITION - HIGH WIND
4. (C) FLIGHT INTO KNOWN ADVERSE WEATHER - INTENTIONAL - PILOT IN COMMAND
5. (F) PRESSURE INDUCED BY CONDITIONS/EVENTS - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: MANEUVERING

Findings

6. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY
7. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On January 11, 1998, approximately 2250 mountain standard time, a Bell 222UT, N222UH, operated by Air Methods Corporation of Englewood, Colorado, was destroyed when it collided with mountainous terrain in Little Cottonwood Canyon, near Sandy, Utah. The airline transport rated pilot, registered nurse, emergency medical technician, and patient were fatally injured. Instrument meteorological conditions prevailed, and no flight plan was filed for the air medical transport flight operating under Title 14 CFR Part 135. The flight originated a few minutes before the accident.

The following is based on the Salt Lake County Sheriff's Office report, University Hospital's tape recorded radio transmissions, dispatcher log entries, and a record of the pilot's cellular telephone calls.

At 1714 on the day of the accident, the Salt Lake County Sheriff's Office was notified by Snowbird Public Safety that a cross-country skier had been injured in an avalanche. The skier's companion told deputies the accident occurred at 1630 on the western face of Pink Pine Ridge, between the White Pine and Red Pine drainages, west of Snowbird, on the canyon's south wall. Search and rescue personnel arrived and a command post was established in Little Cottonwood Canyon. A ground team was then sent in to recover the victim.

At 1718, the Salt Lake County Fire Department dispatcher called University Hospital's dispatcher, requesting that a helicopter be sent to stand by at the site. N222UH, call sign AirMed 4, was dispatched at 1726. Weather conditions precluded the helicopter from going directly to the avalanche site, so the pilot landed on a road near the command center at 1731. When it was determined that it would be several hours before the patient could be brought down to the command center, the helicopter returned to the hospital, arriving there at 1804. At that time, a new pilot came on duty.

Rescue teams reached the injured skier approximately 2100. At 2141, the Salt Lake County Sheriff's Office requested that the helicopter return to the scene. The hospital dispatcher said it was not snowing in the hospital vicinity at that time. N222UH departed the hospital at 2150, and the University of Utah Hospital Communications Center provided flight following services. According to the sheriff's report, when the helicopter arrived at the landing zone, weather conditions were "gusty winds, approximately 30 to 35 miles per hour, and light to moderate snow." The pilot called the hospital dispatcher on his cellular telephone at 2203, and advised they were on the scene.

At 2206, the hospital dispatcher telephoned the pilot and advised him that it was "snowing at the Capitol. Everything behind the Capitol is white. It [the weather system] is coming this way fast." The pilot acknowledged the information and advised the dispatcher that rescuers had not yet arrived with the patient. The dispatcher said, "If you're there too long, you might not make it back." (Hospital officials demonstrated the closed-circuit television system for this investigator. The camera, mounted on the side of the hospital, is remotely controlled by the

dispatcher. Panning the camera up, Salt Lake City International Airport, about 9 miles away, could be seen as well as the state capitol building, about 3 miles away). At 2209, the hospital dispatcher telephoned the pilot again and told him, "It's snowing hard here. . .I can't see past Primary." (Hospital officials pointed out Primary Hospital to this investigator. It is located approximately 300 feet from the video camera). The pilot thanked her for the weather update.

At 2225, the pilot telephoned the dispatcher and asked, "How's it looking where you're at?" He was told it was "snowing really hard, wind is blowing at twenty-three according to our machine...oh, thirty-three, now thirty-seven." The pilot then asked the dispatcher to tune her scanner radio to frequency 124.75 MHz. He listened to a last portion of Salt Lake City International Airport's ATIS (Automatic Terminal Information Service) Information Mike, then asked that someone go to the hangar and get the covers for the helicopter in case they got stranded. The pilot said it was snowing in the canyon and that he would be able to takeoff in the next 5 or 10 minutes, but he would have to go to another hospital. The dispatcher told him she could "hardly see the helipad." The pilot said the patient had not arrived. This was the last communication the dispatcher had with the pilot.

A sheriff's deputy said the helicopter remained on the ground for 15 to 20 minutes before the patient arrived. The deputy and the pilot discussed the weather conditions, and the pilot asked what the conditions were at the mouth of Little Cottonwood Canyon "in order to determine what type of weather was on its way." They were advised that there was "rain and snow mix, and the snow was just starting to stick on the road."

At the pilot's request, the White Pine parking lot, where the command center was located, was cleared of vehicles and the patient was loaded aboard the helicopter. The deputy said that at that time, "the weather had changed slightly, in that it was snowing heavier and there was some local lightning and thunder."

The deputy said the helicopter lifted off "in a straight up fashion," then "turned towards the valley and began a slow circle" around the White Pine parking lot. The pilot said he was going to "look at his options." One observer said he heard the pilot say he was going to "grab some altitude." The deputy said the landing light was on. The helicopter circled again and appeared to be gaining altitude. It turned north (right) and disappeared from view. Seconds later, he heard "a slight muffled boom. . . The weather had grown steadily worse and the snow was falling very heavily." Another deputy said it was "blizzard conditions. It was snowing and the wind was gusting to 35 knots."

Approximately 0330, when visibility had improved, a fire was sighted on the south face of Dromedary Peak, near Little Pine, at the 8,500 foot level (about 1,500 feet above the highway). Shortly after 0700, a sheriff's helicopter found the burning wreckage of N222UH. The victims were removed later that afternoon.

CREW INFORMATION

The pilot, Clifford Stanley Berg, age 48, was born on April 18, 1949. He held Airline Transport Pilot Certificate No. 528768567, dated March 4, 1990, with ratings for airplane multiengine land and rotorcraft-helicopter, type ratings in the Bell 205 and Bell 206, and commercial

privileges in airplanes single engine land. He held a Flight Instructor Certificate, dated August 6, 1997, with airplane single/multiengine, rotorcraft-helicopter, and instrument airplane and instrument helicopter ratings. He also held a Ground Instructor Certificate, dated March 23, 1989, with Advanced and Instrument ratings. His first class airman medical certificate, dated February 11, 1997, contained the restriction: "Must wear corrective lenses." His last FAR 135 flight proficiency and instrument competency check was accomplished on September 29, 1997, in the Bell 222UT.

Mr. Berg was employed by Air Methods Corporation in 1990. Prior to being appointed lead pilot for the company's Salt Lake City operation, he managed their helicopter program in Rockford, Illinois, and their fixed wing program in Billings, Montana.

According to Air Methods' flight and duty time records, Mr. Berg worked 12 hour shifts, with 12 hours off, for each day in January 1998. During this 10-day time period, he had flown 2.4 hours. Records also showed that Mr. Berg had accrued 6,257 total flight hours, of which 4,871 hours were in rotorcraft and 318 hours were in the Bell 222UT.

AIRCRAFT INFORMATION

N222UH (s/n 47545), a Bell 222UT, was manufactured in 1984. It was powered by two Lycoming LTS-101-750C1 turboshaft engines (s/n LE-47026AE, left; LE-47147AE, right), each rated at 735 horsepower. The helicopter has a gross weight of 8,250 pounds, and was fully IFR equipped and certified for single pilot IFR operations.

METEOROLOGICAL INFORMATION

Frontal passage was recorded by the National Weather Service using weather radar located at Salt Lake International Airport. The data was archived and retrieved by the University of Utah's Meteorological Department. System position plots for a 1-hour period were made for every 5 minutes, beginning at 2200. These plots are attached as exhibits to this report.

A retired U.S. Army helicopter pilot, who lived near the mouth of Little Cottonwood Canyon about 7 miles west of the accident site, was a witness to the weather conditions. He was watching the 10 o'clock evening news on television when he experienced "the most violent storm" in the eighteen years he had lived at that location. "The wind increased rapidly to an estimated 50 knots, with gusts to an estimated 70 knots, in less than a minute." Although the storm passed over within a few minutes, conditions were such that he considered evacuating his family room.

The following pertinent weather observations were made at Salt Lake City International Airport, located approximately 23 nm northwest of the accident site, and reflect the frontal approach and passage:

0503Z (2203 MST) - WIND 340 DEGREES AT 28 KNOTS, GUSTS TO 41 KNOTS; VISIBILITY 10 SM, LIGHT SNOW SHOWERS; SCATTERED CLOUDS 3,000 FEET; OVERCAST 5,000 FEET; TEMPERATURE 43 DEGREES F., DEW POINT 34 DEGREES F.; ALTIMETER SETTING 29.83 INCHES OF MERCURY; REMARKS: WIND SHIFT AT 2203, FRONTAL

PASSAGE AT 2203.

0510Z (2210 MST) - WINDS 350 DEGREES AT 26 KNOTS, GUSTS TO 41 KNOTS; VISIBILITY 4 SM, LIGHT SNOW SHOWERS; SCATTERED CLOUDS, 3,000 FEET; OVERCAST 5,000 FEET; TEMPERATURE 37 DEGREES F., DEW POINT 36 DEGREES F.; ALTIMETER SETTING 29.84 INCHES OF MERCURY.

0516 (2216 MST) - WINDS 350 DEGREES AT 24 KNOTS, GUSTS TO 34 KNOTS; VISIBILITY 2 SM, LIGHT SNOW SHOWERS; BROKEN CLOUDS 3,000 FEET; OVERCAST 5,000 FEET; TEMPERATURE 36 DEGREES F., DEW POINT 34 DEGREES F.; ALTIMETER SETTING 29.85 INCHES OF MERCURY.

0528Z (2328 MST) - CORRECTED REPORT; WIND 350 DEGREES AT 18 KNOTS, GUSTS TO 28 KNOTS; VISIBILITY 1 SM, LIGHT SNOW SHOWERS; FEW CLOUDS, 1,000 FEET, BROKEN CLOUDS, 3,000 FEET; OVERCAST, 5,000 FEET; TEMPERATURE 34 DEGREES F., DEW POINT 43 DEGREES F.; ALTIMETER SETTING 29.86 INCHES OF MERCURY; REMARKS: TOWER VISIBILITY 2 MILES.

0550Z (2250 MST) - WIND 350 DEGREES AT 10 KNOTS; VISIBILITY 10 SM, LIGHT SNOW SHOWERS; SCATTERED CLOUDS, 1,000 FEET; OVERCAST, 3,000 FEET; TEMPERATURE 32 DEGREES F., DEW POINT 32 DEGREES F.; ALTIMETER SETTING 29.88 INCHES OF MERCURY; REMARKS: PEAK WIND 330 DEGREES AT 41 KNOTS AT 2203; WIND SHIFT AT 2203; FRONTAL PASSAGE AT 2203; SNOW SHOWERS BEGAN AR 2203; PRESSURE RISING RAPIDLY; SEA LEVEL PRESSURE 1011.7 MILIBARS.

The following weather alerts were in effect. AIRMET (Airman Meteorology) Sierra called for "mountains occasionally obscured in clouds, precipitation, and mist. Conditions continuing beyond 0200 through 0800." It was updated at 2245 to include "occasional ceilings below 1,000 feet, visibility below 3 miles in precipitation and mist. Conditions continuing beyond 0200, shifting southeastward through 0800." AIRMET Tango called for "occasional moderate to severe turbulence below FL (flight level) 180 (18,000 feet msl). Conditions spreading slowly southward and continuing beyond 0200 through 0800." AIREMT Zulu called for "occasional rime or mixed icing in clouds and precipitation between freezing level and FL220. Freezing level extends from the surface to 7,000 feet in the northern and coastal points area, and between 7,000 and 10,000 feet in the remainder of the area. Conditions continuing beyond 0200 through 0800."

Other than contacting the hospital dispatcher, there was no record that the pilot obtained a formal weather briefing from either the Flight Service Station or the National Weather Service.

WRECKAGE AND IMPACT INFORMATION

Weather conditions and the danger of an avalanche precluded 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 cabin area had been consumed by fire. Several tree tops had been severed.

MEDICAL AND PATHOLOGICAL INFORMATION

A gross examination of the pilot (#R199800064) was made by Dr. Edward A. Leis of the Utah State Medical Examiner's Office. The toxicology screen was negative for alcohol and basic, neutral, and acidic drugs.

TESTS AND RESEARCH

The helicopter was recovered and transported to the facilities of Air Transport in Phoenix, Arizona, where, on February 18, 1998, the airframe was examined. The cabin area, main fuselage, transmission, No. 2 drive shaft, and forward portion of both engines and the firewall were either consumed by fire or exhibited extensive thermal damage. All fractures were consistent with overload failures. No evidence of preimpact failure was found.

The engines were examined on April 8 and 9 at the facilities of Allied Signal in Phoenix. No evidence of preimpact failure was found that would have precluded the development of power.

ADDITIONAL INFORMATION

In addition to the Federal Aviation Administration, parties to investigation included Bell Helicopter Textron, Allied Signal, and Air Methods Corporation.

The wreckage was released to the insurance company on April 13, 1998.

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	Age:	48, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter; Instrument airplane; Instrument helicopter	Toxicology Performed:	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	Last FAA Medical Exam:	February 11, 1997
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	6257 hours (Total, all aircraft), 318 hours (Total, this make and model), 6257 hours (Pilot In Command, all aircraft), 42 hours (Last 90 days, all aircraft), 31 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	Registration:	N222UH
Model/Series:	222UT 222UT	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Utility	Serial Number:	47545
Landing Gear Type:	Skid	Seats:	7
Date/Type of Last Inspection:	November 3, 1997 Annual	Certified Max Gross Wt.:	8250 lbs
Time Since Last Inspection:	72 Hrs	Engines:	2 Turbo shaft
Airframe Total Time:	6308 Hrs	Engine Manufacturer:	Lycoming
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	LTS-101-750C1
Registered Owner:		Rated Power:	735 Horsepower
Operator:		Operating Certificate(s) Held:	On-demand air taxi (135)
Operator Does Business As:		Operator Designator Code:	QMLA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	Condition of Light:	Night/dark
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Unknown	Visibility	1 miles
Lowest Ceiling:	Unknown	Visibility (RVR):	
Wind Speed/Gusts:	35 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	270°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:		Temperature/Dew Point:	
Precipitation and Obscuration:	N/A - Blowing - Snow		
Departure Point:	(NONE)	Type of Flight Plan Filed:	None
Destination:	SALT LAKE CITY , UT (UT21)	Type of Clearance:	None
Departure Time:	23:30 Local	Type of Airspace:	Class G

Airport Information

Airport:		Runway Surface Type:	
Airport Elevation:		Runway Surface Condition:	
Runway Used:	0	IFR Approach:	
Runway Length/Width:		VFR Approach/Landing:	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	3 Fatal	Aircraft Fire:	On-ground
Ground Injuries:	N/A	Aircraft Explosion:	On-ground
Total Injuries:	4 Fatal	Latitude, Longitude:	40.569736,-111.890121(est)

Administrative Information

Investigator In Charge (IIC):	Scott, Arnold
Additional Participating Persons:	JOHN E RICHTER; SALT LAKE CITY , UT LEROY G JACKSON; ENGLEWOOD , CO MATTHEW J RIGSBY; FORT WORTH , TX MICHAEL A CUMMINS; PHOENIX
Original Publish Date:	October 30, 1998
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=20399

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).