National Transportation Safety Board
Aviation Accident Final Report

Location:	INDIAN SPRINGS, Nevada	**Accident Number:**	LAX99FA137
Date & Time:	April 3, 1999, 23:50 Local	**Registration:**	N105HH
Aircraft:	Mbb B0-105CBS-4	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The medical evacuation helicopter was on a positioning flight back to its remote base location on a dark night. The pilot received a weather briefing at 1700; however, there was no record of him receiving an update. The area forecast was for broken clouds, scattered light rain showers, instrument flight rules (IFR) conditions, strong northerly winds over rough terrain, light to occasional moderate rime icing in precipitation, and a freezing level between 7,000 and 9,000 feet mean sea level. A winter advisory was in effect for 2 to 3 inches of snow with winds from the southeast at 13 to 22 knots. A motorist saw the helicopter flying west over a highway leading to the accident site at 1,000 feet above ground level (AGL). The sky was overcast with freezing rain that turned into wet snow and then finally freezing sleet. A second motorist nearer the accident site saw the helicopter using its searchlight to follow the highway at 150 to 200 feet AGL in conditions of lower clouds and reduced visibility. A resident next to the accident site heard the helicopter flying back and forth for a few minutes followed by the crash. He drove in the direction of the sound and found the crash site in flames. Snow had reduced visibility to less than 50 yards at the time. The aircraft was not certified for flight in IFR conditions; however, it had full flight instruments, a radar altimeter, a GPS, and VHF navigational radios. The operator reported the pilot had undergone an inadvertent instrument meteorological conditions evaluation within the last 90 days; however, documentation of this training was not found.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's decision to continue VFR flight in deteriorating IFR conditions resulting in spatial disorientation and subsequent loss of control.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: MANEUVERING

Findings
1. WEATHER CONDITION - SNOW
2. LIGHT CONDITION - DARK NIGHT
3. UPDATING OF RECORDED WEATHER INFORMATION - NOT PERFORMED - PILOT IN COMMAND
4. (C) FLIGHT INTO ADVERSE WEATHER - ATTEMPTED - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: MANEUVERING

Findings
5. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
6. (C) SPATIAL DISORIENTATION - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
7. TERRAIN CONDITION - RISING

Factual Information

HISTORY OF FLIGHT

On April 3, 1999, about 2350 hours Pacific standard time, a Messerschmitt-Bolkow-Blohm (Mbb) BO-105CBS-4, N105HH, with the call sign Lifeguard 2, was en route to Pahrump, Nevada, when it collided with terrain and burned while maneuvering near Indian Springs, Nevada. The aircraft was destroyed and the certificated airline transport pilot and his two medical crewmembers received fatal injuries. The aircraft was operated as a positioning flight under 14 CFR Part 91 by Metro Aviation, Inc., when the accident occurred. The flight originated from Las Vegas, Nevada, about 2315 on April 3, 1999. Instrument meteorological conditions prevailed at the accident site and a company flight plan had been filed.

The aircraft departed Valley Hospital Medical Center in Las Vegas after delivering a patient. The purpose of the flight was to reposition the aircraft at its home base at Hidden Hills Airport, Pahrump, Nevada.

A motorist, who was westbound on U.S. highway 95 near the overpass at state highway 156, reported seeing a helicopter with a flashing strobe light flying over the highway in the same direction on the night of the accident. He estimated the aircraft's altitude at that time to be about 1,000 feet agl.

He stated that the sky was overcast with freezing rain that turned into wet snow and then finally freezing sleet. Within a few minutes, the freezing precipitation had obscured the forward vision through his windshield. His windshield wipers were unable to remove the frozen accumulation and he was forced to roll down his driver's side window in order to obtain any forward visibility. As the intensity of the snow increased, he slowed his speed from 70 mph to about 35 mph. During this time he passed another vehicle, with its emergency flashers on, that had stopped along the highway.

A second motorist was traveling southeast bound toward Las Vegas but had not reached Indian Springs when he saw a helicopter flying about 150 to 200 feet overhead in the opposite direction on the night of the accident. The helicopter was using its searchlight as it followed the highway but would then suddenly fly away from the highway only to return a short time later. At one point, the pilot illuminated another car with his searchlight and seemed to be following it for a time.

By the time the first motorist reached Indian Springs, he estimated that visibility was about 50 feet with winds from the south about 10 mph. He went inside his motor home and a few minutes later heard a "thump."

A second resident of Indian Springs reported that he heard the sounds of an aircraft flying back and forth in what he thought was a north-south direction for about 10 minutes. Finally, the engine noise became so faint that he was unable to hear it; however, a few minutes later the engine noise returned. He heard the engine sounds for a few more minutes and then heard a "big thump." Thinking that the aircraft had crashed, he drove toward the origin of the sound

and found the crash site in flames. He estimated that snow had reduced visibility to less than 50 yards at the time.

PERSONNEL INFORMATION

The pilot was a former military pilot and had served in the Soviet Air Force. He had logged a total of 10,920 hours, 6,580 of which were in helicopters, with about 3,592 hours of instrument time. He had accumulated about 187 hours in this make and model helicopter and had flown about 3 hours during the preceding 24 hours. He had worked for the operator as an emergency medical services (EMS) pilot for about 1 year.

The operator reported that he had satisfactorily completed an inadvertent meteorological condition (IMC) evaluation within 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 was dated October 22, 1997; however, on that date inadvertent IMC procedures for the pilot were not evaluated. The operator did not provide any additional records.

AIRCRAFT INFORMATION

The aircraft was not certified for instrument flight; however, it was equipped with flight instruments to include an attitude indicator, a horizon situation indicator (HSI), a radar altimeter, a global positioning system (GPS), and very high frequency (VHF) navigational radios. The radar altimeter provides an aural warning as the aircraft descends through a predesignated altitude; however, continued operation below this altitude will not result in subsequent warnings regardless of terrain proximity.

The forward windscreen was equipped with external windshield wipers and an internal defroster utilizing engine bleed air.

The aircraft was approved for flight in wet snow, in accordance with airworthiness directive (AD) No. 90-23-08-RO, and Mbb service bulletin (SB)-BO 105-80-108.

A review of the aircraft maintenance forms and records by Safety Board investigators did not reveal any discrepancies.

The operator estimated that the aircraft had about 120 gallons of Jet A onboard at the time of the last departure.

METEOROLOGICAL INFORMATION

Federal Aviation Administration (FAA) records disclosed that the pilot had accessed the Data Transformation Corporation (DTC) commercial weather service at 1900 on the evening of the accident. The service allows pilots to obtain weather information on-line through a Direct User Access Terminal (DUAT) via the Internet, including color radar graphics. There were no

records of subsequent weather updates.

The destination, Hidden Hills Airport, Pahrump, does not have weather reports or forecasts issued for that location. The closest reporting station is Desert Rock Airport, Mercury, Nevada, 43 miles to the north; however, terminal forecasts, as such, are valid only within a 5-mile radius of the airport. The 2356 weather observation for Desert Rock Airport reported winds from 110 degrees at 3 knots; 9 miles visibility; an overcast ceiling of 1,900 feet agl; temperature of 36 degrees; and dew point of 32 degrees Fahrenheit. Unknown precipitation began at 2312. (Unknown precipitation is reported by automated systems when the system can not determine the type of precipitation that is falling, i.e., ice pellets, snow pellets, snow grain, graupel, ice needles, drizzle, freezing drizzle, or a combination of those listed.)

The closest upper air data observation was also located at Desert Rock Airport. At 2100, the sounding indicated that the air was saturated from the surface up to 16,000 feet msl. The freezing level was at the surface (3,310 feet msl), with winds from 210 degrees at 5 knots.

The current area forecast for southern Nevada had been issued at 1945, and was valid until 0800. It forecast broken clouds at 7,000 feet msl, scattered light rain showers, and light snow over the mountains.

AIRMET Sierra issued at 1845 forecast mountain obscuration in clouds and precipitation. AIRMET Sierra update No. 1 that was issued at 2335 forecast IFR conditions and mountain obscuration until 0600.

AIRMET Tango issued at 1845 forecast occasional moderate turbulence below 16,000 feet msl. AIRMET Tango update No. 1 that was issued at 2345 forecast moderate turbulence below 16,000 feet msl, as well as strong northerly winds over rough terrain.

AIRMET Zulu, issued at 1845, forecast light to occasional moderate rime icing in precipitation below 18,000 feet msl. AIRMET Zulu update No. 1 that was issued at 2345 forecast the freezing level to be between 7,000 and 9,000 feet msl.

At 2309, the National Weather Service (NWS) Las Vegas Regional Office issued a winter advisory for snow and blowing snow. With 4 inches of snow already reported to have fallen, an additional 2 to 3 inches was expected, with winds from the southeast at 13 to 22 knots.

AIDS TO NAVIGATION

A nondirectional radio beacon (NDB), Mercury, is located at Desert Rock Airport. There is no voice capability on the station frequency.

COMMUNICATIONS

After departure from Valley Hospital Medical Center, the pilot was scheduled to make position reports every 15 minutes while flight following on his company FM frequency. The first scheduled position report was due about 2330; however, there was no radio contact at anytime from the pilot.

At 2315, the pilot called the Las Vegas air traffic control tower (ATCT). He requested clearance through Class B airspace to the northwest. He was cleared through the airspace and given the current altimeter setting. The controller then asked if he desired flight following. The pilot replied that he did not and that he would be "staying low." Radar services were terminated at 2321.

WRECKAGE AND IMPACT INFORMATION

Safety Board investigators arrived at the accident site, east of Old Ben Road, approximately 0.6 miles north of the intersection between Old Ben and Wilson Roads, on the morning of April 4, 1999.

The initial ground scar was found located at 36 degrees 33.656 minutes north latitude and 115 degrees 39.363 minutes west longitude. The site elevation was estimated to be about 3,200 feet msl. The site was located on gently rolling open desert terrain and sloped upward toward the south at about 10 to 15 degrees.

The wreckage distribution covered an area 466 feet in length. 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. A secondary ground scar was found beyond the fire area.

Both skid tubes and cross tubes were fractured and had separated from the aircraft. The fuselage floor had also separated from the aircraft.

The main rotor head, transmission, and the tail rotor had separated from the airframe and were found in the forward portion of the debris field. All four main rotor blades had separated from the hub near the blade grips.

Both engines showed evidence of foreign object damage (FOD) with compressor blades and vanes bent opposite the direction of rotation. Fuel was found between the fire shields and the fuel nozzle supply lines in both engines. Both engines remained attached to the engine decks.

The compressor case of the No. 1 engine was partially crushed along its left side. The accessory gearbox exhibited a puncture on its bottom, near the front. The power turbine governor body was separated from the accessory gearbox-mounting flange. The power turbine governor drive shaft was sheared at the accessory gearbox. The fuel control unit body was separated from the accessory gearbox-mounting flange. The fuel control unit drive shaft was sheared. The exhaust collector and power turbine section were separated from the accessory gearbox. The outer combustion case was crushed. Both compressor air discharge tubes were crushed. The exhaust collector was dented and crushed. The gas producer rotor turned freely when rotated by hand. Contact with a distorted exhaust collector prevented the power turbine from rotating.

The compressor of the No. 2 engine was crushed along its left side. The engine inlet de-ice was found in the "on" position. The bleed valve case was separated from the compressor. The accessory gearbox was fragmented; however, all the gears were located. The fuel control unit body was separated from the mounting flange with no apparent damage to the drive splines;

however, the drive shaft itself was bent. The power turbine governor body was separated from its mounting flange and the drive shaft was sheared. The engine-driven fuel pump remained attached to its mounting position with no visible damage noted. Both compressor air discharge tubes were crushed. The outer combustion case was crushed. The combustion liner was crushed. The gas producer rotor turned freely when rotated by hand. The exhaust collector was crushed. There was evidence of rotational contact between the fourth stage turbine wheel blade roots and the exhaust collector.

The main gearbox (MGB) case was separated at two points. The separations occurred at the lower MGB attachment point, and at the planetary gear/internal ring gear, exposing the sun gear. The main rotor head assembly remained attached to the top of the MGB case. The main rotor mast was hand rotated and produced movement of the planetary gear. The input quill and sun gear rotated slightly with force applied by hand in the direction of rotation. The freewheeling clutch engaged on both quills when rotated by hand. All drive shafts were sheered at the MGB attachment ends.

The vertical stabilizer separated from the tailboom at the 10L/11L frame. The intermediate gearbox rotated freely when turned by hand. The tail rotor drive shaft separated from the forward input coupling at the intermediate gearbox. Rotational scoring was found on the inner surface of the forward coupling.

The 90-degree gearbox was separated from the vertical stabilizer. The tail rotor assembly remained attached to the gearbox. The drive shaft separated at the output end of the intermediate gearbox and at the input end of the 90-degree gearbox. The 90-degree gearbox rotated freely when turned by hand.

The tailboom separated from the aircraft forward of the VOR antenna location. The remainder of the tailboom remained attached to fuselage mounting point.

The right horizontal stabilizer was separated from the tailboom. The bottom of the tailboom was crushed at the 7 o'clock position. The tail rotor drive shaft remained attached to the tailboom. The top of the tailboom aft of the horizontal stabilizers was crushed at the 12 o'clock position.

The tail rotor pitch slider moved freely when moved by hand. One pitch change link was bent; however, both pitch change links remained attached. The blade associated with the bent pitch change link had more visible damage that the opposite bade.

The fuselage crush line was higher on the left side than the right. All the lower control tubes were bent and broken. All the bolts on the control tube rod ends were in place.

The hydraulic pack was examined. The slide valve was found in the No. 1 position. The No. 2 slide valve was slightly bent. The measurement of the connecting link was 24.82 mm before straightening. After straightening it was measured as 25.36 mm. The control arm of the switchover actuator was fractured. All control rods at the lower connecting levers were separated from the control tube rod ends. All middle control tubes remained attached. All upper cyclic control tubes were separated. The collective control tube was separated from the

upper rod end.

All the main rotor blades separated near the roots. All the blades exhibited extensive spar damage.

The forward cross tube was spread to a greater extent than the rear cross tube. Both skids were separated from both cross tubes. The toe portion of both skids were flattened.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was conducted on April 5, 1999, by the Clark County Coroner's Office with specimens retained for toxicological examination. The toxicological test results were negative for alcohol and all screened drug substances with the exceptions of chlorpheniramine, phenylpropanolamine, and lidocaine.

According to current pharmacological literature, chlorpheniramine is a sedating antihistamine that is commonly found in over-the-counter cold and allergy products.

Phenylpropanolamine is a decongestant that is also commonly found in over-the-counter cold and allergy products.

Lidocaine is a local anesthetic used in certain over-the-counter skin preparations, and for minor surgical procedures. It is also given intravenously in emergency medical settings to control abnormal heart rhythms.

FIRE

Evidence of a ground fire was found fanning out beyond the initial ground scars. Witnesses reported that the fire did not spread and burned itself out within a few minutes. Fire damage to the wreckage was confined to the initial burn area, showing some charring and sooting of debris. There was no evidence of molten metal within the burn area.

TESTS AND RESEACH

A request for the retrieval of possible radar data by the FAA Western Region Quality Assurance was made through the FAA coordinator. Data was recovered that showed the pilot departing Valley Hospital Medical Center at 2315. The initial return showed the pilot at 2,100 feet msl. Radar contact was lost 6 minutes later, with the last contact showing the aircraft proceeding northwest bound at 3,000 feet msl.

ADDITIONAL INFORMATION

There was no reported emergency locator transmitter (ELT) signal that was associated with this accident. According to aircraft records, the aircraft was equipped with an ARTEX ELT110-4; however, it was not found in the wreckage.

At the completion of the on-site portion of the investigation on April 4, 1999, the wreckage was

transported to Phoenix, Arizona, by Air Transport, Inc., and stored in their facilities pending an additional examination. The investigation continued at the Phoenix location on April 5, 1999, with representatives of the aircraft and engine manufacturers present.

The wreckage was released to Ted Green of AIG Aviation Insurance Services, Los Angeles, California, a representative of the registered owner on July 26, 2000.

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	42,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):	Helicopter	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	July 21, 1998
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	10920 hours (Total, all aircraft), 187 hours (Total, this make and model), 7630 hours (Pilot In Command, all aircraft), 47 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mbb	**Registration:**	N105HH
Model/Series:	B0-105CBS-4 B0-105CBS-	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	0339
Landing Gear Type:	Skid	**Seats:**	3
Date/Type of Last Inspection:	March 10, 1999 AAIP	**Certified Max Gross Wt.:**	5512 lbs
Time Since Last Inspection:	29 Hrs	**Engines:**	2 Turbo shaft
Airframe Total Time:	5763 Hrs	**Engine Manufacturer:**	Allison
ELT:	Installed, not activated	**Engine Model/Series:**	250-C20B
Registered Owner:		**Rated Power:**	420 Horsepower
Operator:		**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:	METRO AVIATION, INC.	**Operator Designator Code:**	HDNA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	DRA ,3314 ft msl	**Distance from Accident Site:**	17 Nautical Miles
Observation Time:	12:56 Local	**Direction from Accident Site:**	280°
Lowest Cloud Condition:	Unknown	**Visibility**	9 miles
Lowest Ceiling:	Overcast / 1900 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	110°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	2°C
Precipitation and Obscuration:	N/A - None - Snow grains		
Departure Point:	LAS VEGAS , NV	**Type of Flight Plan Filed:**	Company VFR
Destination:	PAHRUMP , NV (L57)	**Type of Clearance:**	None
Departure Time:	23:15 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	3 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	36.509216,-115.640792(est)

Administrative Information

Investigator In Charge (IIC):	Crispin, Robert
Additional Participating Persons:	CARLOS FLORES; LAS VEGAS , NV DAVID CHAPEL; PHOENIX , AZ JOHN J SWIFT; INDIANAPOLIS , IN ROBERT REULAND; GRAND PRAIRIE , TX
Original Publish Date:	December 4, 2000
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=46117