Aviation Investigation Final Report

Location:	BLUEFIELD, Virginia	**Accident Number:**	BFO94FA071
Date & Time:	April 22, 1994, 14:45 Local	**Registration:**	N70AM
Aircraft:	BELL 412/SP	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

THE FLT HAD DEPARTED THE NORTH CAROLINA BAPTIST HOSPITAL IN WINSTON SALEM. IT ARRIVED FROM THE NE AND WAS VECTORED FOR THE ILS RWY 23 APCH. THE LAST VECTOR WAS 240 DEG, WHICH WAS INADEQUATE TO INTERCEPT THE LCLZ. THE PLT WAS CLEARED FOR AND INSTRUCTED TO MAINTAIN 7000 FT UNTIL ESTABLISHED ON THE APCH. RECORDED RADAR DATA SHOWS THE FLIGHT DID NOT INTERCEPT THE LCLZ BUT PARALLELED ON A SW COURSE, A MILE LEFT OF THE LCLZ, WHILE MAINTAINING 7000 FT. THE FLT CONTINUED THIS COURSE UNTIL ABEAM OF THE RWY DEPARTURE END, BEGAN TO DESCEND, TURNED NW, CROSSED THE EXTENDED RWY CENTLERLINE, AND THEN PROCEEDED OUTBOUND FROM THE RWY ON APRX 230 DEG COURSE UNTIL THE LAST RECORDED POSITION ABOUT 5 MI SW OF THE ARPT AT 4100 FT ALTITUDE. THE ACCIDENT SITE WAS ON A MOUNTAIN ABOUT 7.5 MI SW OF THE ARPT AT 3400 FT MSL. A WITNESS REPORTED THAT BEFORE HE HEARD THE CRASH HE COULD NOT SEE THE ACFT BECAUSE THE MOUNTAIN WAS OBSCURED BY FOG. BOTH NAV RADIOS WERE SET TO THE LCLZ FREQ. THE PUBLISHED IAP SHOWS A GLIDESLOPE INTERCEPT ALT OF 5000 FT, AND THE DH WAS 3157 FT. ACFT WAS OPERATED BY AIR METHODS CORPORATION.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: THE PILOT'S FAILURE TO INTERCEPT THE FINAL APPROACH COURSE, AND HIS IMPROPER EXECUTION OF THE INSTRUMENT APPROACH PROCEDURE. FACTORS WHICH CONTRIBUTED TO THE ACCIDENT WERE: THE WEATHER CONDITIONS, AND THE FAILURE OF THE AIR TRAFFIC CONTROLLER TO ADEQUATELY VECTOR THE FLIGHTCREW TO INTERCEPT THE FINAL APPROACH COURSE AT THE APPROACH GATE, AS SPECIFIED IN THE ATC HANDBOOK.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: APPROACH - FAF/OUTER MARKER TO THRESHOLD (IFR)

Findings
1. (F) WEATHER CONDITION - DRIZZLE/MIST
2. (F) WEATHER CONDITION - LOW CEILING
3. (F) WEATHER CONDITION - FOG
4. (C) IFR PROCEDURE - IMPROPER - PILOT IN COMMAND
5. (F) ARTCC SERVICE - INADEQUATE - ATC PERSONNEL(ARTCC)

Factual Information

HISTORY OF FLIGHT

On April 22, 1994, at 1445 eastern daylight time, a Bell 412 helicopter, N70AM, owned and operated by Air Methods Corporation of Denver, Colorado, collided with mountainous terrain during an instrument approach to Mercer County/Bluefield Airport Bluefield, West Virginia. All four occupants aboard the aircraft, the pilot, the co-pilot, and two flight nurses, received fatal injuries. The helicopter was destroyed. The flight originated in Winston Salem, North Carolina, at 1347 hours and was arriving at its destination to pick up a patient. Instrument meteorological conditions prevailed and an instrument flight plan was filed. The flight was operated under 14 CFR Part 91.

The pilot, co-pilot, and two flight nurses departed North Carolina Baptist Hospital to pick up a patient at the airport in Bluefield, West Virginia. The pilot received air traffic control services from a radar controller at the Indianapolis Air Route Traffic Control Center (ARTCC), and he requested vectors to ILS runway 23. The last transmission between the pilot and the controller was for the flight to maintain seven thousand feet until established on approach, and to fly heading two four zero. The flight was also cleared for the instrument landing system (ILS) approach to runway 23 at Mercer County, an uncontrolled airport. The pilot was instructed to contact the specialist at the Bluefield Flight Service Station (FSS) and reportedly made "normal" transmissions, with no indication of a problem. The helicopter impacted a mountain located 7 1/2 miles from the departure end of runway 23 at the 3400 foot level.

There were several witnesses who heard the helicopter overfly their homes, but could not see it due to the fog. One of the witnesses reported that, "I could not see anything then I heard this low noise I thought maybe it was going to land." Another witness stated that the helicopter was flying parallel with the mountain. "...It sounded like it was very low. The fog was below the tree line on the mountain....I said to myself you better get it up if you plan to clear the mountain. Then I heard a tree break then an explosion."

The accident occurred at daylight, about 37 degrees 18 minutes North latitude and 81 degrees 12 minutes West longitude.

PERSONNEL INFORMATION

The pilot, age 45 years, held an airline transport pilot (ATP) certificate for helicopter operations. At the time of the accident, company records indicate that he had accumulated approximately 4094 total flying hours, of which 969 were in the Bell 412. He was issued a first class medical certificate with no limitations on December 16, 1993. In accordance with 14 CFR Part 135 requirements, he completed his last proficiency check on February 14, 1994 and he

received his last recurrent training on February 1, 1994.

The co-pilot, age 32 years, held a commercial pilot certificate for helicopter operations, and a private pilot certificate with single engine land rating for airplane. At the time of the accident, company records indicate that he accumulated approximately 1412 total flying hours, of which 712 were in the Bell 412. He was issued a first class medical certificate with no limitations on April 12, 1993. In accordance with 14 CFR Part 135 requirements, he completed his last proficiency check on December 21, 1993, which included a check of instrument proficiency.

AIRCRAFT INFORMATION

The 1989 year model Bell 412/SP, serial no 33206, was equipped with two Pratt & Whitney PT6T-3B engines, serial nos. CPP 63179 and CPP 63180 respectively. The aircraft had over 2086 hours including 10 hours since the last annual inspection on April 19, 1994.

METEOROLOGICAL INFORMATION

The 1450 hour surface weather observation for Bluefield Flight Service Station, about 7 miles east of the accident site was as follows:

"Sky condition, 500 feet overcast; visibility, 2 miles in fog and drizzle; temperature, 44 degrees (F); dew point, 44 degrees (F); wind condition, 010 degrees at 5 knots; and altimeter, 30.10 inches."

WRECKAGE AND IMPACT INFORMATION

The main wreckage lay inverted in a 25 foot diameter crater approximately 150 yards from the top of East River Mountain at the 3600 foot level. The wreckage was tied to a tree to avoid it from rolling down the 30-40 degree downslope. It was oriented on a magnetic heading of 335 degrees and strew a distance of about 200 feet. The initial impact point (IIP) was with trees at the 3400 foot level. At the IIP, paint chips, glass and plexiglass were found that matched the plexiglass from the helicopter.

A four foot section of the right skid tube forward section with a section of the front cross tube outboard saddle separated. The rotor head, main rotor blade mast, main transmission and associated flight control sump case separated and were located about 54 feet from the main wreckage. A one foot section of the main drive shaft with the data plate separated and was located about 33 feet from the main wreckage. The left and right horizontal stabilizer separated. A two foot section of the aft tail boom, 42 degree gearbox, vertical fin and 90 degree gearbox, and inboard portion of the output shaft separated and were located about 150 feet from the main wreckage. A two foot section of the tail rotor drive input shaft to the 42 degree gear box separated.

The tail rotor and hub with a section of the output shaft and crosshead assembly separated.

Control continuity of the drive train was confirmed by rotating the rotor in the direction of rotation. The engine to transmission drive shaft gears teeth, and the drive shaft to the 90 degree gearbox sheared. Control continuity of the tail rotor drive shaft and the drive shaft to the 90 degree gearbox was confirmed.

The cyclic control separated from the pilot's cyclic control stick at the base. The pilot's collective pitch control separated at the joint between the number one and two engines.

The wreckage was transported to Summitt Helicopters in Roanoke, Virginia. The engine was examined and there was no evidence of any mechanical malfunction that would have precluded operation.

MEDICAL AND PATHOLOGICAL INFORMATION

An examination was done by Dr William Massello III, Office of the Chief Medical Examiner in Roanoke, Virginia, on April 24, 1994. Toxicological tests did not detect alcohol, drugs, or carbon monoxide.

TESTS AND RESEARCH

The navigation instruments for the pilot and co-pilot including the VOR/localizer receiver and marker beacon receiver were sent to Allied Signal in Olathe, Kansas for examination. The examination included retrieving the frequencies and codes from non-volatile memory. Both VOR/localizers for the pilot and co-pilot were tuned to the localizer frequency of 109.5, with 110.0 for the Bluefield Vortac on the standby mode. The marker beacon sensitivity in the LO sense mode was within specifications. The sensitivity in the HI sense mode was 300 microvolts. The specification according to Allied Signal is for 200 microvolts. There was a BHT label on the case of the unit which indicated that the HI sensitivity was set to 300 microvolts. The test could not reveal the position of the marker beacon switch due to impact damage.

ADDITIONAL INFORMATION

Wreckage Release: The aircraft wreckage was released to Marshall B. Dean of the USAIG insurance company, the owner's insurance representative on October 15, 1994.

Pilot Information

Certificate:	Airline transport	**Age:**	45,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	December 16, 1993
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	4094 hours (Total, all aircraft), 969 hours (Total, this make and model), 56 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BELL	**Registration:**	N70AM
Model/Series:	412/SP 412/SP	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	33206
Landing Gear Type:	Skid	**Seats:**	6
Date/Type of Last Inspection:	April 19, 1994 Annual	**Certified Max Gross Wt.:**	11900 lbs
Time Since Last Inspection:	10 Hrs	**Engines:**	2 Turbo shaft
Airframe Total Time:	2086 Hrs	**Engine Manufacturer:**	P&W
ELT:	Installed	**Engine Model/Series:**	PT6T-3B
Registered Owner:	AIR METHODS CORPORATION	**Rated Power:**	1800 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:**	Day
Observation Facility, Elevation:	BLF ,2857 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	14:50 Local	**Direction from Accident Site:**	59°
Lowest Cloud Condition:		**Visibility**	2 miles
Lowest Ceiling:	Overcast / 500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	10°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	7°C / 7°C
Precipitation and Obscuration:	N/A - None - Fog		
Departure Point:	WINSTON SALEM	**Type of Flight Plan Filed:**	IFR
Destination:	(BLF)	**Type of Clearance:**	IFR
Departure Time:	13:47 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	MERCER COUNTY BLF	**Runway Surface Type:**	
Airport Elevation:	2857 ft msl	**Runway Surface Condition:**	
Runway Used:	23	**IFR Approach:**	ILS
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	37.229415,-81.260185(est)

Administrative Information

Investigator In Charge (IIC):	Johnson, Beverley
Additional Participating Persons:	KENNETH LEIGHTON; CHARLESTON , WV DAVID C DOSKER; FORT WORTH , TX TIM HARDEE; OLATHE , KS
Original Publish Date:	May 10, 1995
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=8841