Aviation Investigation Final Report

Location:	SOMERSET, Kentucky	**Accident Number:**	NYC00FA067
Date & Time:	January 18, 2000, 12:02 Local	**Registration:**	N74CC
Aircraft:	Beech C-90	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Executive/Corporate		

Analysis

The pilot requested and received clearance to execute the SDF approach, and was instructed to maintain 4,000 feet until established on the approach. Radar data revealed the airplane was never established on the approach, and started to descend before reaching the IAF. The airplane passed the IAF at 2,900 feet, and continued in a descending left hand turn into unprotected airspace. The airplane disappeared from radar at 1,900 feet, as it completed 180 degrees of turn. The turn did not match any of the four instrument approaches to the airport. The airplane struck a guy wire on a lighted communications antenna 3.3 MN southeast of the airport on a heading of 360 degrees. No evidence of a mechanical failure or malfunction of the airplane or its systems was found. A flight check by the FAA confirmed no navigation signal was received for the approach, which had been turned off and listed as out of service for over 4 years. In addition, the pilot did not report the lack of a navigation signal to ATC or execute a missed approach. Interviews disclosed the ATC controller failed to verify the approach was in service before issuing the approach clearance.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the failure of the pilot to follow his approach clearance, and subsequent descent into unprotected airspace which resulted in a collision with the guy wire. Factors were the failure of the air traffic controller to verify the approach he cleared the pilot to conduct was in service, and the clouds which restricted the visibility of the communications antenna.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: APPROACH

Findings
1. (C) ATC CLEARANCE - NOT FOLLOWED - PILOT IN COMMAND
2. (F) PROCEDURES/DIRECTIVES - NOT FOLLOWED - ATC PERSONNEL(ARTCC)
3. (F) WEATHER CONDITION - CLOUDS
4. OBJECT - GUY WIRE

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On January 18, 2000, at 1202 Eastern Standard Time, a Beech C-90, N74CC, was destroyed after striking a guy wire on a communications tower, as it maneuvered near the Somerset-Pulaski County-J.T. Wilson Field Airport (SME), Somerset, Kentucky. The certificated airline transport pilot and three passengers were fatally injured. Instrument meteorological conditions prevailed for the corporate flight. The flight was operated on an instrument flight rules (IFR) flight plan, and conducted under 14 CFR Part 91.

On January 17th, the pilot and passengers flew from Northeast Philadelphia Airport (PNE), Philadelphia, Pennsylvania, to Ohio State University Airport (OSU), Columbus, Ohio, where they remained overnight. While there, the airplane was serviced with 210 gallons of Jet-A aviation grade fuel. The line person reported that the airplane was "topped" [filled to capacity].

According to transcripts from the Federal Aviation Administration (FAA), on the morning of January 18, at 0834, the pilot contacted the Dayton Automated Flight Service Station (AFSS), and filed an IFR flight plan from Columbus to Somerset. The pilot reported the airplane was a C-90 with the "I" equipment suffix, which indicated the airplane was equipped with LORAN, VOR/DME, or INS, and transponder with Mode C. After filing the flight plan, the pilot requested the Somerset forecast and winds aloft. The pilot was told that Somerset did not have a forecast, and was given the forecast for London, Kentucky (LOZ), located 26 nautical miles (NM) to the east which included:

"...five hundred scattered, occasional ceiling five hundred broken, one thousand overcast visibility five [statute] miles and mist, occasional [visibility] two miles, light drizzle, and mist, and winds from one forty at seven [140 degrees at 7 knots], and of course you're, i'm sure you're familiar with the fact that there's icing and maybe some turbulence across that route and occasional i f r conditions."

The pilot contacted the Dayton AFSS again at 1004, and requested more information on the latest forecast and temperature at Somerset. He was advised that the 0954 observation at Somerset reported a ceiling of 300 feet overcast, and the temperature and dewpoint were 2 degrees Celsius and -1 degree Celsius respectively. In addition, icing was forecast for the entire route, and the pilot was advised of pilot reports for both light rime ice and clear ice.

Additionally, between 1100 and 1500, Lexington, Kentucky (LEX), was forecast for winds from 330 degrees at 7 knots, visibility 6 statue miles, ceilings of 800 feet overcast, with occasionally visibility 5 statue miles in mist or light fog, and ceilings of 500 feet overcast. The forecast for London was revised at 0915, and up to 1300, called for ceilings as low as 100 feet overcast,

and visibility one statue mile with mist.

At the end of the call, the pilot was offered the winds aloft and notices to airmen (NOTAMS), and he replied that he already had them.

The airplane departed Ohio State University airport at 1047, and was instructed to contact Columbus Departure Control. Later, control was transferred to the Indianapolis Air Route Traffic Control Center (ARTCC). No problems were reported during the departure or en route phases of the flight.

At 1140, the ARTCC controller asked the pilot if he had the Somerset weather. The pilot replied that he did. The controller then asked him what approach he was planning for, and the pilot replied that he wanted the "SDF" (simplified directional finding) approach.

At 1145:15, the controller stated, "november seven four charlie charlie, cleared for the s d f approach to uh somerset, maintain four thousand until your established on the approach." The pilot replied, "ok maintain four till established (unintelligible), thank you four charlie charlie." The controller then repeated the approach clearance and this time specified the SDF RWY 4 approach, and the pilot again repeated that he was to maintain 4,000 feet until established and was cleared for the SDF RWY 4 approach at Somerset.

At 1148:01, the pilot transmitted, "ah indy four charlie charlie." The call was not answered by Indianapolis ARTCC, and there were no further transmissions between Indianapolis ARTCC and the airplane.

Several witnesses resided in an area northeast of the communications tower, and at a lower elevation than the hill on which the tower was erected. Two of the witnesses were inside their residences, and upon hearing a noise, went to the door and saw an airplane descend to the ground, after which, it erupted in fire. One witness thought the airplane was on fire before ground impact. Another witness reported he heard a noise and looked up. He saw the airplane spinning as it descended. He also thought it was missing part of one wing, and was on fire prior to ground impact.

An additional witness, located to the west of the accident site, reported that the airplane passed very low over his residence and a power line to his residence. He could hear the engine(s), spitting and sputtering like they were out of gas. He saw the airplane top a mountain and drop over the hill, after which, he lost sight of the airplane. He heard three loud noises about 3 to 5 seconds later, and believed the airplane had crashed.

The accident occurred during the hours of daylight, at 37 degrees, 0 minutes, 30 seconds north latitude, and 84 degrees, 34 minutes, 40 seconds west longitude.

OTHER DAMAGE

A microwave communications tower operated by Eastern Kentucky Power Cooperative, about 3.3 miles southeast (148 degrees) of SME, was destroyed. The tower was located on a hill, with a base elevation of 1,250 feet, and was 460 feet high. Red obstruction lights were mounted on the tower, which was painted with alternating red and white 35-foot segments. Guy wires radiated out from the tower in three directions. At the base, they extended out 372 feet in each direction. The angle of the outboard wires was 51 degrees upward toward the top of the tower. One outer wire, which measured 5/8 inch in diameter, was found on the northwest side of the tower, with a freshly scrapped area, and a slight bend. This was located about 300 feet from the wire's base-attach point.

PERSONNEL INFORMATION

The pilot held an airline transport pilot certificate for multi-engine land airplanes, and a commercial pilot certificate for single engine land and sea airplanes. His last FAA first class airman medical certificate was issued on April 26, 1999, and contained a limitation to wear corrective lenses for near and intermediate vision. On his airmen medical application, he listed his total flight experience as 19,200 hours with 140 hours in the preceding 6 months. On his insurance application dated May 12, 1999, he listed his total pilot-in-command flight experience as 15,345 hours with 1,150 hours in make and model. When he attended SIMCOM training in August 1998, he listed his total flight experience as 18,000 hours with 14,000 multi-engine, and 1,950 hours of instrument time. Based upon previous flight experience, the pilot was estimated to have accumulated at least an additional 120 hours of flight experience since his insurance application. The pilot last received instrument and recurrent system training from SIMCOM on November 1999.

In addition, the pilot held a mechanics certificate with airframe and powerplant ratings.

The pilot's son was also an airline transport pilot, who worked as a simulator instructor in corporate turbine airplanes. He described his father as a pilot who was more comfortable with conventional cockpit displays than the glass cockpit displays. He also said that he had flown with his father several times, and based upon his instructing background, he had not seen a problem with his father's flying.

AIRCRAFT INFORMATION

The airplane was maintained under the manufacturer's inspection program, which consisted of four phase checks. The recommended time interval between phases was 200 hours with a requirement to complete all phases within 24 months. The airplane had last received a phase one inspection on November 16, 1999, with an airframe time of 9,057.9 hours. The last prior phase check was conducted on April 2, 1999, with an airframe total time of 8,841.8 hours. The maintenance records, which included airframe, engine, and propeller logbooks for the airplane, were not located. The pilot's son reported the log books were kept in a leather case. Further, a search of the pilot's vehicle, the hanger where the airplane was kept, and the pilot's residence failed to find them. There was no evidence of burned leather case in the airplane wreckage.

The airplane was estimated to have flown about 60 hour since the last inspection.

According to FAA microfilm records, on October 31, 1995, a Garmin GPS155 was installed. The FAA Form 337 noted that the GPS system was placarded "GPS Not Approved For IFR", pending flight manual supplement approval. There were no further records to indicate IFR approval or subsequent removal of the unit.

According to an avionics shop, the week before the accident flight, the airplane had been in the shop for installation of a new flight director. According to the person who performed the installation, the existing flight director could not be coupled to the autopilot, and was changed to eliminate that problem. The maintenance release was dated January 13, 2000.

The pilot accepted the airplane after the change in flight directors, and returned it to his home base at Northeast Philadelphia Airport. There were no other flights in the airplane until the morning of January 17, when the airplane departed to Columbus, Ohio.

METEOROLOGICAL INFORMATION

Somerset airport was 927 feet above mean sea level (MSL), and was equipped with an automatic weather observation system (AWOS). The 1141, and 1201 observations reported a ceiling of 700 feet overcast, visibility 10 statute miles, temperature 36 F, dewpoint 31 F, and winds from 320 degrees at 7 knots.

AIDS TO NAVIGATION

Both Jeppesen Sanderson and the U.S. Government, National Ocean Service (NOS) published instrument approach procedure charts. There were four instrument approach procedures published for Somerset, which included a SDF RWY 4 approach, a Non-Directional Beacon NDB RWY 4 approach, a Global Positioning System GPS RWY 4 approach, and a GPS RWY 22 approach. According to the airport facility directory (AFD), the NDB RWY 4 carried the notation that it was unmonitored, and the SDF RWY 4 approach was listed as "OTS" [out of service] - Indefinitely. Neither note was published on the instrument approach procedures, nor were they required to be.

The SDF RWY 4 approach specified a minimum safe altitude of 3,600 feet for a 25 nautical mile radius from the Cumberland River non-directional radio beacon, which was also designated as the initial approach fix (IAF). The outbound heading specified was 226 degrees. A procedure turn was depicted on the left hand side of the outbound course with headings of 181 degrees outbound and 001 degrees inbound. The minimum altitude specified for the procedure turn was 3,000 feet. The inbound final approach course was 046, toward the Cumberland River non-directional radio beacon. The minimum altitude over the beacon was 2,500 feet inbound. The minimum descent altitude was 1,460 feet (600 feet AGL) for a straight-in approach to Runway 04, and 1,720 feet (793 feet AGL) for a circling approach with category B, C, and D aircraft. The published missed approach specified a climb to 3,000 feet,

then a right turn direct to the Cumberland River non-directional radio beacon, and hold. A right-handed holding pattern was depicted on the instrument approach procedure.

AIRPORT INFORMATION (Destination)

A check of the airport manager's office found the control boxes for both the NDB RWY 4 approach and SDF RWY 4 approach in an unlocked cabinet. The NDB was turned on, and the Morse code identification could be heard in the background. A light flickered on the control box as the Morse code was transmitted. The SDF control box was turned off at both the control box in the airport office, and at the transmitter.

A flight check of all the instrument approaches was conducted on January 20, 2000. No signal was received when the navigation receiver was tuned to the frequency for the SDF-4 approach at Somerset.

There was no control tower at Somerset; however, there was a UNICOM. There was no record of any person hearing the pilot make any transmission on the UNICOM frequency.

RADAR AND OTHER REMOTELY RECORDED DATA

Radar data, furnished by the Indianapolis Air Traffic Control Center, revealed the airplane approached the Somerset Airport from the northeast. At 1154, the airplane passed abeam of the airport, about 1/2-mile away, on the northwest side, at an altitude of 4,000 feet. As the airplane passed abeam of the airport, it began a descent. At 1155:35, the airplane, still descending, passed the Cumberland River non-directional radio beacon (CDX) on the northwest side, at an altitude of 2,900 feet, and initiated a turn to the left. The airplane had completed about 180 degrees of turn and descended to an altitude of 1,900 feet, when it disappeared from radar at 1159:40. At that time the airplane was 5.0 nautical miles (NM) southeast of the airport, and 1.9 NM south of the communications antenna, which was, depicted on all the approach procedures for Somerset.

When the radar track was overlaid on the four-instrument approach procedures, it did not match any of their profiles.

WRECKAGE AND IMPACT INFORMATION

The airplane was examined at the accident site on January 19th and 20th. The examination revealed that the debris path was on a heading of 360 degrees, and stretched for about 2,500 feet.

The first items found were the collapsed communications tower, and near the tower, the outboard 9 feet, 7 inches of the right wing, and outboard section of the right wing flap. In addition, small pieces of wing skin and fuel bladder were found in the same area. An additional 5-foot section of the right wing, which had burned, was found about 200 feet beyond

the outboard wing panel.

The start of the ground contact was 2,100 feet from the base of the collapsed tower. Broken tree limbs were on a 30-degree descending angle to the ground contact. The first items found at ground contact, in the direction the airplane was traveling, were the right horizontal stabilizer and elevator. In addition, the right engine and propeller were found nearby. The left engine and propeller were found about 150 feet from the start of the ground contact, on the right side of the debris path. A fire consumed the right wing, and fuselage. The main cabin door had separated from the fuselage, and was found toward the end of the debris path.

The right propeller was buried in the dirt, and had separated from the engine. Three propeller bolts were recovered at the accident site, still safety wired, and the threads were stripped. The propeller blades of the right engine were wavy in appearance. On the right engine, there was circumferential scoring on the compressor turbine disk for 360 degrees.

The blades of the left propeller, which had separated from the engine, were wavy in appearance. The separation occurred behind the propeller flange, and was characterized by a 45-degree slope on the propeller shaft, consistent with a torsional shear. On the left engine, the first stage compressor had tip curl on the blades throughout their circumference.

The radios were fragmented, and destroyed by fire.

The landing gear selector was found in the down position. However, the portion of the instrument panel that the selector handle was attached to was separated from surrounding structure. In addition, the landing gear were separated from their associated wings structure. The left main landing gear was found in the down and locked position and the position of the nose and right main landing gear was not determined.

The rudder trim was found with the trailing edge tab 20 degrees left, and the elevator trim position was 10 degree trailing tab up. Flight control cables and trim cables had multiple breaks in the system and the flight control surfaces had been separated from surrounding structure.

MEDICAL AND PATHOLOGICAL INFORMATION

The toxicological testing report from the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma, was negative for drugs and alcohol for the pilot.

Autopsies were conducted on the pilot and passengers on January 20, 2000, by Greg Davis MD, and John Hunsaker MD, medical examiners for the Commonwealth of Kentucky, Frankfort, Kentucky.

ADDITIONAL INFORMATION

The investigation revealed that Somerset Airport and its instrument approaches were under the control of Pulaski County, Commonwealth of Kentucky. FAA procedures required that any request for removal of the instrument approach be initiated by the controlling agency for the instrument approach. Once the instrument approach was removed from the system, it could not be reinstated without going through the same procedure required for the certification of a new approach. In case the instrument approach did not pass a flight check, and it was not desired to permanently remove it, a NOTAM would be issued indicating it was out of service. Once the NOTAM had been in effect through one complete cycle (56 days), it was removed from the list of active NOTAMS, and the data transferred to the airport facility directory, also on a 56-day cycle. Even though the SDF RWY 4 approach was carried as out of service in the airport facility directory, no warning or advisory was printed on the approach procedure to indicate that status, nor was it required. If the approach had been returned to service, a NOTAM would have been issued, and the NOTAM would have been carried until the airport facility directory had been changed.

A flight check was conducted of the instrument approaches at Somerset. The flight check crew reported that no signal was received when they tuned their navigation radios to the listed frequency for the SDF RWY 4 approach. However, signals were received for the other approaches, and they passed the flight check.

According to the Aeronautical Information Manual (AIM): Section 1-1-12:

"During periods of routine or emergency maintenance, coded identification (or code and voice, where applicable) is removed from certain FAA NAVAID's."

"Removal of identification serves as a warning to pilots that the facility is officially off the air for tune-up or repair and may be unreliable even though intermittent or constant signals are received."

An Air Traffic Group was formed after the accident. The group conducted interviews with the FAA controllers involved, and the person who maintained the navigation radios at Somerset.

According to the Air Traffic Group Chairman's Report:

"The pilot had been receiving air traffic control services from the Indianapolis Air Route Traffic Control Center (ARTCC). The pilot asked for and was issued clearance for the simplified directional facility (SDF-4) approach to runway 04 when approximately 25 miles northeast of the airport...."

"The Hazard and London Low [altitude] sectors were combined at Hazard Low at the time the approach clearance was issued. These combined sectors were staffed with both a radar controller and an associate radar controller...The pilot of N74CC was never advised to change to the airport advisory frequency. The radar controller told Safety Board investigators that he had forgot that the SDF-4 approach was out of service; although a status information sheet for

the sector indicated the approach was out of service. The radar controller told Safety Board investigators that he had not reviewed the status information sheet. The associate radar controller told Safety Board investigators that he thought that he heard the radar controller clear the pilot for a global positioning system (GPS-4) approach and had marked the flight strip accordingly. It was not until the facility inquired about the status of the airplane and learned of the crash was it discovered that the radar controller had cleared the airplane for the SDF-4 approach."

The aircraft wreckage was released to a representative of the insurance company on January 20, 2000.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	72,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	April 26, 1999
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	19320 hours (Total, all aircraft), 1270 hours (Total, this make and model), 15456 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N74CC
Model/Series:	C-90 C-90	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	LJ-620
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	November 16, 1999 Continuous airworthiness	**Certified Max Gross Wt.:**	9650 lbs
Time Since Last Inspection:	60 Hrs	**Engines:**	2 Turbo prop
Airframe Total Time:	9118 Hrs	**Engine Manufacturer:**	P&W
ELT:	Installed	**Engine Model/Series:**	PT6A-20
Registered Owner:	HART CORP. DELAWARE DIV.	**Rated Power:**	550 Horsepower
Operator:	HART CORP. DELAWARE DIV.	**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SME ,927 ft msl	**Distance from Accident Site:**	3 Nautical Miles
Observation Time:	12:01 Local	**Direction from Accident Site:**	328°
Lowest Cloud Condition:	Unknown	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 700 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	320°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	2°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	COLUMBUS , OH (OSU)	**Type of Flight Plan Filed:**	IFR
Destination:	(SME)	**Type of Clearance:**	IFR
Departure Time:	15:47 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	SOMERSET-PULASKI COUNTY SME	**Runway Surface Type:**	Asphalt
Airport Elevation:	927 ft msl	**Runway Surface Condition:**	
Runway Used:	4	**IFR Approach:**	SDF
Runway Length/Width:	5600 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	In-flight
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	37.079814,-84.599624(est)

Administrative Information

Investigator In Charge (IIC):	Hancock, Robert
Additional Participating Persons:	JEFFREY M JENNINGS; LOUISVILLE , KY HAROLD BARRENTINE; WICHITA , KS PAUL CROSBY; BRIDGEPORT , WV
Original Publish Date:	July 17, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
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