National Transportation Safety Board
Aviation Accident Final Report

Location:	MABIE, WV	**Accident Number:**	NYC97FA057
Date & Time:	03/06/1997, 0021 EST	**Registration:**	N54BT
Aircraft:	Beech E-18S	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

The flight had been delayed due to severe weather over the departure airport. The preflight weather briefing received by the pilot included AIRMETS and SIGMETS for icing and severe thunderstorms, possible tornadoes, hail to 2 inches, and wind gusts to 70 knots near the ground. The Beech 18 was not equipped with a storm scope or weather radar. Prior to takeoff, a passenger stated to a witness that the weather was 'really really bad,' and that they would have to 'do some deviating to get around it.' After takeoff, the airplane cruised at 10,000 feet uneventfully for 1 hour and 50 minutes, when a center controller advised that radar contact was lost, which the pilot acknowledged. The next and last transmission occurred 13 minutes later when the controller received a 'Mayday' radio transmission that the airplane was 'going down.' The last radar target revealed a 6,000 foot per minute rate of descent. Training records revealed the pilot, also the company chief pilot, had flown solo 6.3 hours in the Beech 18 and credited it as dual flight instruction. He then passed a Part 135 evaluation with the FAA Principal Operations Inspector (POI), which lasted 1.6 hours. The next day the POI issued the pilot check airmen authorization for the Beech 18, all models. According to the POI, the airplane was not approved for Part 135 operations; however, the company had a bogus approval for the airplane, signed by the POI, that allowed the company to apply to Canadian Authorities for authorization to operate in Canada. The bogus approval had been used to justify the accident flight.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's disregard of the preflight weather briefing for severe weather along his route of flight, and his departure into the known and forecasted severe weather. A factor in the accident was the inadequate FAA oversight of the operator, which fostered an attitude of rule bending.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: CRUISE - NORMAL

Findings
1. LIGHT CONDITION - NIGHT
2. WEATHER CONDITION - ICING CONDITIONS
3. WEATHER CONDITION - THUNDERSTORM
4. (C) HAZARDOUS WEATHER ADVISORY - DISREGARDED - PILOT IN COMMAND
5. (C) FLIGHT INTO KNOWN ADVERSE WEATHER - PERFORMED - PILOT IN COMMAND
6. (F) INADEQUATE SURVEILLANCE OF OPERATION - FAA(ORGANIZATION)

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

Factual Information

HISTORY OF FLIGHT

On March 6, 1997, at 0021 eastern standard time, a Beech E-18S, N54BT, owned and operated by Polaris Aviation, Sanford, North Carolina, was destroyed when it descended from cruise flight and impacted the ground near Mabie, West Virginia. The certificated airline transport pilot-in-command (PIC) and pilot rated passenger were fatality injured. Instrument meteorological conditions prevailed for the cargo flight that originated at the Sanford-Lee County Brick Field (W77), about 2217, destined for Detroit, Michigan. An instrument flight rules flight plan had been filed for the flight conducted under 14 CFR Part 135.

During an interview with the Sanford Airport Manager, also the Director of Maintenance for Polaris Aviation, he stated that the PIC was the Chief Pilot and Director of Operations for Polaris Aviation, and the passenger was the General Manager (GM) for Polaris. The flight was scheduled to depart Sanford, about 2100, with 550 pounds of automobile parts. During the day, the PIC had used a direct satellite link and a computer program at W77, to obtain weather information. About 2100, when the Airport Manager was about to leave, the passenger/GM approached him and stated that the weather was "really really bad," and that they would have to "do some deviating to get around it."

During the day, another pilot/witness not employed by Polaris, had spent the day at the airport with the PIC of the flight. The witness stated that the flight had been scheduled to depart about 2100, destined for Michigan, and was to return directly to Raleigh, North Carolina, for another cargo pick-up at 0600, the next morning. The witness stated that about 1900, he and the PIC had looked at a computer radar depiction of weather, which depicted a "squall line" just north of the Sanford area, with solid red areas. The witness stated that he had commented to the PIC, "you're not going to fly through that, are you?" The witness also commented to the PIC that the GM "wouldn't do that." The witness reported that the PIC responded that the GM would probably like the challenge.

Prior to the flight, severe weather had passed north of the Sanford area, and the GM had sent three FAX messages to the cargo receiving facility in Michigan. The first indicated a departure time of 2140 from W77. The second FAX indicated a departure time of 2215 from W77, and had a written message which stated, "Severe WX delay for all aircraft. No clearances issued until 2200 EST per Raleigh clearance delivery." A third FAX indicated a departure time of 2220 from W77, with a printed text of "Taxiing out Now."

According to Air Traffic Control (ATC) records, the PIC contacted the Raleigh Automated Flight Service Station (AFSS) by telephone at 2050, and filed an IFR flight plan from W77 to Detroit, Michigan, but did not request a preflight briefing. At 2112, the PIC contacted Raleigh AFSS by telephone and obtained a preflight pilot briefing for the flight, and at 2131, called back to Raleigh AFSS and requested the IFR clearance from W77 to Detroit, and was placed on hold. At 2142, the PIC was issued an expect departure clearance time of 15 minutes, and at 2159, was issued an IFR clearance by Fayetteville ATC, through Raleigh AFSS.

After departure from W77, N54BT was instructed to climb to 10,000 feet, and to contact the Washington Air Route Traffic Control Center (ARTCC). According to the ARTCC transcripts and a review of the voice tape, all communications were routine until 0007, when the ARTCC controller advised N54BT that radar contact was lost, and requested that the

airplane report over the Elkins VOR. The PIC acknowledged the call, and stated that he would report over the VOR.

No other transmissions were received from N54BT, until 0020, when the controller received a radio transmission, "Mayday, Mayday, N54BT is going down, N54BT is going down." No further transmissions were received, and an emergency locator transmitter (ELT) was heard by other pilots about 55 seconds later. After several seconds, the ELT signal faded out. The last radar target of N54BT was recorded at 6,400 feet.

The airplane was located in a wooded area, about 1/2 mile from the last reported radar target. The accident occurred during the hours of darkness approximately 38 degrees, 52 minutes north latitude, and 80 degrees, 01 minutes west longitude.

PILOT INFORMATION

The pilot held an airline transport pilot certificate with a rating for airplane multiengine land, and a commercial pilot certificate with ratings for single engine land and instrument airplane. He also held a flight instructor certificate with ratings for airplane single and multiengine land and instrument airplane.

His most recent Federal Aviation Administration (FAA) second class medical certificate was issued on December 30, 1996.

Several pilot log books were located and reviewed. According to the log books and FAA records, the pilot obtained his commercial pilot certificate for airplane single engine land and instrument airplane, on January 7, 1994. He obtained his commercial pilot multiengine land rating on July 6, 1994, and he obtained his airline transport pilot certificate on April 1, 1996.

The pilot's log book (Book Two), that covered the period from February 1992, to April 1996, was reviewed. The log book ended on April 30, 1996, with 1667.6 hours of total flight experience logged, of which 244 hours were in multiengine airplanes. It also revealed that of the 244 hours, 170 hours were logged while flying with one of several flight instructors from which the pilot had obtained training.

The log book entries revealed that as of April 22, 1995, the pilot had logged 1,022.7 hours of total flight experience, of which 187.6 hours were in multiengine airplanes.

The most recent pilot log book (Book Three) began on April 22, 1995, and ended on July 21, 1996, which overlapped Book Two by 12 months. This log book began with 1,145.7 hours of total flight experience, 123 hours more than logged in Book Two. It also began with 292.6 hours of multiengine experience, verses the 187.6 hours that had been logged in Book Two. When Book Three reached the end date of the Book Two (April 30, 1996), all additional entries and changes increased the pilot's total flight experience by 162 hours, to 1,839.5 hours, and increased his multi engine experience by 161 hours, to 409 hours.

The pilot's log books, and his personal daily crew log which began July 1996, were used to determine the pilot's total flight experience. It was estimated that at the time of the accident, the pilot had accumulated about 2,000 hours of total flight experience, of which 450 hours were in multiengine airplanes, and 30 hours were in make and model.

The pilot rated passenger, also the General Manager of Polaris, held a commercial pilot certificate with a rating for airplane multiengine land, and a Private Pilot Certificate with a rating for airplane single engine land. He was not instrument rated, and his certificate

limitations included the statement, "Carrying passengers in airplanes for hire is prohibited at night and on cross country flight of more than 50 nautical miles."

His most recent FAA second class medical certificate was issued on January 23, 1997.

A review of the pilot's log book revealed that he had obtained his airplane multiengine rating on January 26, 1997. He had accumulated about 328 hours of total flying experience. The log book also revealed that he had accumulated a total of 97 hours of multiengine experience, of which all 97 hours were logged as dual instruction. The log book did not contain any flight experience in Beech 18 airplanes.

AIRCRAFT INFORMATION.

Company documents and airplane records were reviewed, and Polaris personnel were interviewed concerning the airworthiness of N54BT. According to the documents and personnel statements, the airplane was purchased on January 5, 1997, from a company that had operated the airplane in accordance with 14 CFR Part 135. The airplane had received an annual inspection by the previous operator within the past 2 months and was within the last 100 hour inspection. The airplane was ferried to Sanford by the accident pilot, and was inspected for compliance with Airworthiness Directives and component overhaul requirements. During the inspection by the Director of Maintenance (DOM), the records were updated to reflect that some items listed in the airplane's records were not installed in the airplane. Examples of the items not installed included: the autopilot, weather radar, and storm scope.

In order to place the airplane on the Polaris Operations Specifications (OpSpecs), an initial inspection of the airplane was conducted on January 8, 1997, by the FAA Winston-Salem Flight Standards District Office (FSDO), which provided the oversight of the Polaris operation. On January 9, 1997, the FSDO sent a letter to the Polaris DOM, which listed 29 line items of "concerns and action items." The FSDO required a formal response that listed the actions taken, and on March 4, 1997, the DOM sent a letter to the FSDO with the actions taken in response to the discrepancies listed in the FSDO letter. The only discrepancies that remained were a compass check was overdue, and the legality of the cargo net installed could not be established, which would require a new net.

On March 5, 1997, the DOM overheard the Chief Pilot (PIC of the accident flight) and GM discuss a cargo flight to be conducted later that day in N54BT. The DOM reminded both of them that the airplane was not yet on the OpSpecs. The GM showed the DOM a page from the OpSpecs that included the E18S airplane and the signature of the FAA Principal Operations Inspector (POI), dated February 5, 1997. N54BT was the only E18S owned by Polaris. The DOM then discussed the issue of the cargo net, and was told by the GM that, "he wasn't going to let that stop them from making the trip." The Chief Pilot took the same position.

METEOROLOGICAL INFORMATION

The PIC contacted the Raleigh Automated Flight Service Station (AFSS) by telephone about 2050, and filed an instrument flight rules flight plan from Sanford, North Carolina, to Detroit, Michigan. A preflight weather briefing was not requested at the time. The proposed departure time was 2100.

At 2112, the PIC telephoned Raleigh AFSS again. A review of the certified voice tape of the briefing revealed that the PIC requested a standard IFR briefing for a flight from W77 to

Detroit, and that the proposed takeoff was in 15 to 20 minutes. The AFSS briefer then provided the pilot a briefing which included an overview, general outlook, and several AIRMETS, SIGMETS, and Center weather advisories. These included severe thunderstorm watch number 97, for central North Carolina and Virginia, and SIGMET 3E which included the Sanford (W77) area.

SIGMET 3E: Line of severe thunderstorms 20 nautical miles wide, moving from 270 degree at 40 knots. Tops to flight level 350. Tornadoes, hail to 2 inches, wind gusts to 70 knots possible.

AIRMETS included: IFR conditions from W77 to Ohio, with moderate turbulence below 10,000 feet; moderate to isolated severe turbulence over Michigan; occasional moderate rime or mixed icing from 10,000 to 24,000 feet, over northern Virginia, West Virginia, and Ohio, lowering to 5,000 feet over northern Ohio.

A review of the winds aloft forecast for Elkins at 9,000 feet was performed. The forecast, valid until 0100, called for the winds to be from 250 degrees at 59 knots, with an air temperature of 4 degrees centigrade.

WRECKAGE INFORMATION

The airplane wreckage was examined at the accident site on March 6 and 7, 1997. The examination revealed that all major components of the airplane were accounted for at the scene. The airplane came to rest in a wooded area, on an approximate magnetic heading of 225 degrees, at a ground elevation of about 2,500 feet above mean sea level (MSL). The wreckage was contained within an area about 50 feet in diameter.

The nose section of the airplane was imbedded in the ground, on the northeast side of a 16-inch-diameter tree. Tree limbs that extended from the trees surrounding the accident site were intact, except for a few broken limbs directly overhead the nose section of the airplane. A significant amount of dirt was splattered to the southwest of the wreckage, parallel to the wing span. A lighter amount of dirt was splattered on the ground to the northeast of the wing span, toward the location of the airplane's tail section. The left and right engines were imbedded in dirt and rock, propeller hub side down. The engines remained attached to their respective sections of the airplane's wings. The wings extended outward from the wreckage, southeast (left side) to northwest (right side). The leading edges of the wings were crushed inward and compressed aft.

Control continuity was established from the pilot's yoke and rudder pedals to all airplane primary control surfaces. The elevator trim was measured at an approximate neutral setting. The rudder trim was measured to be 2 to 3 degrees tab right, and the aileron trim was measured at 6 degrees tab up. The landing gear and flaps were retracted.

An impact hole that began between the wings section, and extended northeast toward the tail section, measured about 6 feet across and about 3 feet deep at the center. The hole contained several hundred small rectangle shaped metal objects. A cargo strap tie down end was found attached to a floor tie down fitting. The left rear cargo door was examined and the door locking pins were found extended.

The cockpit area, the fuselage section between the wings, the back of the left and right engines, and the main fuselage section, were consumed by a post crash fire. The last 8 feet of the airplane's tail section remained intact and was northeast of the impact hole. The end of the

tail section nearest the impact hole contained burned and melted metal along its edges. The tail-section contained the elevator and rudders. The elevator moved freely up and down, and the top of the elevator contained a layer of fire soot, while the underside of the elevator and fuselage contained no soot. The twin vertical rudders were intact and moved freely back and forth by hand. The inboard and outboard sides of both rudders, above the elevator, contained soot. The inboard and outboard sides of the rudders below the elevator were soot free. The lower sections of the rudders were wrinkled horizontal to the ground.

The emergency locator transmitter (ELT) that had been located in the tail section, was found in the northeast side of the impact hole. The ELT was fire damaged.

On the ground, about 3 to 4 feet north of the tail, were sections of 3/4 inch plywood with seat tracks. These sections were not fire damaged. Also northeast of the tail section were trees that were soot covered on their southwest side.

Examination of the cockpit area revealed two sets of lap seat belts which remained buckled. The pilot's airspeed indicator cover glass was broken, and the airspeed needle was stuck in a position indicating about 190 miles per hour, or 165 knots. The co-pilot's airspeed indicator was broken and fire damaged with dark soot; however, the instrument face plate contained a line of light gray soot that extended from the center of the instrument across an area between 180 and 200 miles per hour.

An electric gyro was found broken out of its case. Examination of the gyro revealed rotational scoring. A vacuum gyro was removed from its case, and rotational scoring was observed on the inside of the case and the gyro. The co-pilot's altimeter was observed to read 2,650 feet.

The engine and propellers were removed for further examination.

MEDICAL AND PATHOLOGICAL INFORMATION

Autopsies were performed on the pilot and pilot rated passenger on March 10 and 11, 1997, by Dr. Irvin Sopher, of the West Virginia Medical Examiner's Office, South Charleston, West Virginia. TESTS AND RESEARCH

On March 19 and 20, 1997, the engines and propellers were examined at Alphin Aircraft Inc., Hagerstown, Maryland, under the supervision of the Safety Board Investigator. Parties to the investigation were also present during the examination.

The examination did not disclose any evidence of a preimpact failure of either engine.

The propeller hubs and blades were removed from each engine. No evidence of preimpact failure of either propeller assembly was observed. The blades from both engines displayed chordwise scratches and S bending. The three stop pins on the left hub were retracted inside of their respective tubes. Two of three stop pins of the right hub were also retracted, the third pin was broken away from the hub. According to the Hartzell Propeller representative, the pins retracted from centrifugal force, which required the propeller hubs to be turned at a minimum of 800 RPM

ADDITIONAL INFORMATION

A review of Beech 18 performance data revealed that a typical cruise true airspeed, for weight and environment conditions similar to the accident airplane's, would have been about 160 knots.

Radar Data

A Recorded Radar Study was performed by the NTSB Office of Research and Engineering. The radar data displayed the target airplane at 10,400 feet, approximately 100 knots ground speed (GS), at 0509:05. The airplane continued for the next 9 mile at or above 10,000 feet, and between 100 and 110 knots GS, until 0513:52. At that time the target altitude was about 9,700 feet, and the calculated GS was about 104 knots.

The data revealed that during the next 6 miles the altitude varied from 9,800 feet, to a low of 9,300 feet, which occurred at 0518:42. The target speed varied from 92 knots down to 60 knots GS at 0518:01. The last several radar targets were spaced close together on the graph, and were in random directions. The GS also varied from 60 knots down to about 40 knots. An altitude readout of 8,900 feet was recorded at 0519:06, and the last altitude readout of 6,400 feet was recorded at 0519:31. The airplane was located about 1/2 mile from the last reported radar target. The last target altitudes revealed a rate of descent of 6,000 feet per minute.

Company BE-18 Training

A review of the company training records and the pilot's log books, revealed that the PIC's first flight in a Beech 18 or TC-45, occurred on November 25, 1996, where the pilot logged 1 flight hour in a TC-45, N45861. The PIC then logged 2 hours on November 28, and 0.5 hour on November 29. He then flew 1.7 hours in N45861 on December 6, 0.3 of an hour on December 7, and 0.8 of an hour on December 8. The PIC's total TC-45 flight experience as of December 8, 1996, was 6.3 hours. According to interviews and the pilot's crew log, all flights originated and terminated at W77, and the pilot did not fly with another flight instructor.

The Polaris crewmember training records for the PIC's transition into the TC-45J were reviewed. The records revealed that the PIC had logged 6.3 hours of flight training, and 16 hours of transition ground training. The flight training record revealed that the training was accomplished on November 25 (1 hour), November 28 (2 hours), November 29 (0.5 hour), December 6 (1.7 hours) and December 8 (1.1 hours).

In the instructor's initial block for the flight instruction and ground school was written "self." At the bottom of the form was a certification of training box which stated, "I certify that the individual named above has successfully completed the training requirements specified by the approved training program." The form was dated December 8, 1996, and signed by the PIC.

FAA Oversight

On December 9, 1996, the PIC was administered a Part 135 airman competency/proficiency check by the FAA POI in N45861, the TC-45. The duration of the flight was 1.6 hours, and all maneuvers were listed as completed satisfactory. In the remarks section it stated, "Initial qualification on this make/model."

A letter dated December 10, 1996, issued by the FAA POI, was titled Designation of Check Airman. The letter stated that the PIC, was approved as a check airman for employees of Polaris Aviation, which included the "BE-18 (All Series)," and was effective December 9, 1996, the date that the PIC passed his competency check with the FAA POI. The PIC's total flight experience in the Beech 18 at the time was 7.9 hours.

On March 5, 1997, when the accident flight originated, N54BT was not on the Polaris OpSpecs for use under Part 135. However, on February 5, 1997, the FAA POI for Polaris, issued

a signed amendment to the OpSpecs which authorized the types of airplanes the operator could use. The approval included the "BE-18-E18S," of which N54BT was the only one owned by Polaris. In a memo from the POI to the NTSB Investigator, he stated that this was done to allow the operator to apply to Canadian Authorities for authorization to operate in Canada. The bogus document was issued by the FAA POI with the understanding that the Beech E18S was not to be used until the Principal Maintenance Inspector issued the approval for the airplane.

The airplane wreckage was released on May 8, 1997, to James McArthur, a representative of the owner's insurance company.

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	**Age:**	44, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	12/30/1996
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	2000 hours (Total, all aircraft), 30 hours (Total, this make and model), 1980 hours (Pilot In Command, all aircraft), 59 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N54BT
Model/Series:	E-18S E-18S	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	BA-56
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	10/29/1996, Annual	**Certified Max Gross Wt.:**	10100 lbs
Time Since Last Inspection:	38 Hours	**Engines:**	2 Reciprocating
Airframe Total Time:	11196 Hours	**Engine Manufacturer:**	P&W
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	R-985-AN14B
Registered Owner:	POLARIS AVIATION	**Rated Power:**	450 hp
Operator:	POLARIS AVIATION	**Operating Certificate(s) Held:**	On-demand Air Taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	EKN, 1987 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	0026 EST	**Direction from Accident Site:**	80°
Lowest Cloud Condition:	Unknown / 0 ft agl	**Visibility**	6 Miles
Lowest Ceiling:	Broken / 1200 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	26 knots / 35 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	8°C / 7°C
Precipitation and Obscuration:			
Departure Point:	SANFORD, NC (W77)	**Type of Flight Plan Filed:**	IFR
Destination:	DETROIT, MI (DET)	**Type of Clearance:**	IFR
Departure Time:	2217 EST	**Type of Airspace:**	Class C

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	ROBERT L PEARCE	**Report Date:**	04/24/1998
Additional Participating Persons:	JAMES POOL; CHARLESTON, WV PAUL E YOOS; WICHITA, KS DAN SWANSON; SANFORD, NC ROGER W STALLKAMP; PIQUA, OH		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		