Aviation Investigation Final Report

Location:	Farmingdale, New Jersey	**Accident Number:**	NYC03FA095
Date & Time:	May 5, 2003, 15:18 Local	**Registration:**	N111TW
Aircraft:	Beech A36	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a flight from Sarasota, Florida, to Bradley, Connecticut. After about 5 hours en route, the pilot requested to land at another airport, with the intention of refueling. Witness near the accident site observed the airplane in a slow descent, and reported that the propeller was not turning. One witness reported that the airplane's three propeller blades were "barely moving." The pilot did not report any problems to air traffic control. The airplane impacted trees and came to rest about 2 miles from the airport. Examination of the airplane did not reveal any pre-impact mechanical failures. Freshly cut tree branches were observed at the accident site, and engine damage was consistent with rotation. Examination of the airplane's fuel system revealed less than 1 gallon of fuel; however, portions of the fuel system were compromised. On site examination of the accident site did not reveled any evidence of a fuel spill around the accident site area.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's delayed decision to refuel, which resulted in fuel exhaustion and the subsequent loss of engine power.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: APPROACH

Findings
1. (C) FLUID,FUEL - EXHAUSTION
2. (C) IN-FLIGHT PLANNING/DECISION - INADEQUATE - PILOT IN COMMAND
3. (C) REFUELING - DELAYED - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: DESCENT - EMERGENCY

Findings
4. OBJECT - TREE(S)

Factual Information

HISTORY OF FLIGHT

On May 5, 2003, about 1518 eastern daylight time, a Beech A36, N111TW, was substantially damaged when it impacted terrain during approach to the Monmouth Executive Airport (BLM), Farmingdale, New Jersey. The certificated airline transport pilot was fatally injured, and a pilot rated passenger sustained serious injuries. Visual meteorological conditions prevailed and an instrument flight rules (IFR) flight plan was filed for the flight that departed the Sarasota International Airport (SRQ), Sarasota, Florida, destined for the Igor I. Sikorsky Memorial Airport (BDR), Bridgeport, Connecticut. The personal flight was conducted under 14 CFR Part 91.

The airplane was based at BDR. The passenger was the pilot's son. According to the pilot's wife, on May 1, 2003, the pilot flew the accident airplane to Pensacola, Florida, to pick up his son, and then returned to Sarasota. On May 5, the pilot and his son intended to return to BDR.

According to an employee at a fixed-base-operator at SRQ, the pilot telephoned and requested to have the airplane "topped off." The pilot also said that due to "storms up north," he wanted to leave as soon as possible. The airplane was refueled with 51 gallons of turbine jet fuel. According to the refueler, the pilot was present during the refueling, and fuel was added to the airplane's five fuel tanks. While refueling the last fuel tank, which was the fuselage tank, the pilot requested that the tank be filled until it overflowed.

According to air traffic control (ATC) information received from the Federal Aviation Administration (FAA), the airplane departed SRQ, about 1020, on an IFR clearance to Elizabethtown, North Carolina (EYF). At 1148, the pilot changed his destination to Salisbury, Maryland (SBY), and at 1206, he changed his destination to Atlantic City, New Jersey (ACY). At 1243, the pilot changed his destination to BDR. At 1456, the pilot requested to change his destination to BLM, with the intention of refueling. At 1513, air traffic control reported to the pilot that BLM, was at his "One O'clock," and "Five Miles." At 1514:14, the pilot reported that he had the airport in sight. The airplane was then cleared for a visual approach to BLM, and the pilot was instructed to contact the airport advisory frequency (unicom).

According to the BLM airport manager, the unicom was being monitored at the time of the accident and no transmissions were received from the accident airplane.

A witness who was located about 1/4 mile from the accident site, stated that he observed the airplane "exceptionally low and quiet." The airplane continued in a "slow gradual descent," and he noticed that the propeller was not turning. He estimated that he observed the airplane for a total of 10 seconds before it descended below the tree line, and was followed by the sound of an impact.

Another witness stated he observed an airplane above the trees. He did not hear any sound associated with the airplane. He stated that the propeller was "barely moving" and he could easily observe three propeller blades. The airplane descended into the trees at a 45 degree angle, and he then heard the sound of tree branches cracking.

The accident occurred during the hours of daylight approximately 40 degrees, 12.308 minutes north latitude, and 74 degrees, 8.722 minutes west longitude.

PERSONNEL INFORMATION

The pilot held an airline transport pilot certificate, with an airplane multi-engine land rating. He also held a commercial pilot certificate with ratings for single engine airplane land and sea, and gliders. The pilot held flight instructor certificate for single and multi engine airplanes, gliders and instrument airplane. He also held an airframe and powerplant mechanic certificate.

The pilot's most recent FAA third class medical certificate was issued on March 7, 2003. At that time, he reported 21,600 hours of total flight experience, which included 75 hours during the previous 6 months.

The passenger held a private pilot certificate with ratings for single and multi-engine land ratings. He was also instrument rated. He reported 2,411 hours of total flight experience on his most recent application for an FAA third class medical certificate, which was issued on August 6, 2001.

The pilot's wife reported that both pilots had been flying the airplane; since it was purchased during August 1998; however, she added that the pilot flew "all the time."

AIRCRAFT INFORMATION

The airplane was equipped with an Alison 250-B17F turbine engine that was installed per a supplemental type certificate by Tradewind Turbines Corporation, Amarillo, Texas, on July 22, 1991. At the time of the accident, the airplane had been operated for about 1,375 hours. The engine had accumulated about 1,333 hours since new.

The airplane was equipped with two fuel boost pumps, one of which was changed the day prior to the accident flight. The airplane had been operated for about 41 hours since it's most recent annual inspection, which was performed on December 11, 2002. The observed Hobbs time at the time of the accident was 1373.15.

METEOROLOGICAL INFORMATION

A weather observation taken at BLM, about the time of the accident, reported: winds from 140

degrees at 7 knots; 10 statue miles visibility; few clouds at 9,000 feet; temperature 55 degrees F; dew point 25 degrees F; altimeter 30.19 in/hg.

WRECKAGE AND IMPACT INFORMATION

The airplane struck trees and came to rest upright in a wooded area on a heading of 070 degrees, approximately 1.8 miles northwest of BLM. A debris path which consisted of a portion of the airplane's right wing, the entire left wing, the left horizontal stabilizer, and several broken tree branches, was observed on a heading of about 265 degrees, and extended about 100 feet. Several cut tree branches, with black paint transfer on the cut surfaces, were observed along the debris path.

All major components of the airplane were accounted for at the accident site.

Approximately 6 feet of the outboard right wing, which included the right wingtip fuel tank, was located about 100 feet from the main wreckage. The left wing, which was separated at the root, was located about 10 feet in front of the outboard right wing. A 30-inch aft circular compression was observed approximately 63 inches from the wing root and the skin in the area outboard of the landing gear wheel-well was deformed. The left horizontal stabilizer was located about 60 feet from the main wreckage and contained a 2-foot wide aft circular compression to the spar. The inboard 111-inches of the right wing remained attached to the airframe and was bent upward.

The right yoke was separated from the control column. The left yoke was turned toward the right. The right elevator cable was intact from the forward cockpit area to the control surface. The left rudder cable was intact from the forward cockpit area to the control surface. The right rudder cable was separated aft of the right forward facing seat. Left and right aileron control continuity could not be confirmed due to impact damage.

The left and right wing flap actuator measured approximately 4.5 inches, which corresponded to a zero degree flap setting.

The propeller was separated from the engine, and partially buried in the ground. All three blades remained attached to the hub and were observed at or near a feathered position. The outboard portion of the blade tips were bent opposite the direction of rotation. The engine remained attached to the airframe. The first stage compressor was filled with dirt and bending opposite the direction of rotation was observed on the compressor blades. The second stage compressor wheel was not observed. The propeller gear shaft rotated freely when the power turbine was rotated by hand. The starter generator was removed. The shaft and splines were intact and rotated freely. The gearbox metallic chip detector was removed and absent of debris. Approximately 5 ml of fuel was observed in the fuel nozzle supply line, and about 80 ml of fuel was observed in the fuel pump filter bowl. The airframe fuel filter was about half full. The engine was retained for further examination.

The airplane was configured with five fuel tanks. A 40 gallon main fuel tank was located in each wing. The airplane also had an optional 20 gallon fuel tank on each wingtip, and an optional 24.8 gallon fuselage fuel tank. The airplane's fuel system capacity included 7 gallons of "unusable fuel."

All fuel tank caps were found secured to their respective tank structure. Both wingtip tanks and the fuselage tank remained intact and contained a total of less than one cup of fuel. The fuselage tank was removed and did not exhibit any evidence of leaking. Both main fuel tanks were compromised. During the recovery, the main fuel line at the right wing root was cut and yielded about one cup of fuel. No fuel was observed in the left wing fuel tank.

Due to impact damage, the total fuel on board the airplane at the time of the accident could not be confirmed; however, it was noted that examination of the area surrounding the accident site did not reveal any evidence of a fuel spill on the ground, or on the surrounding foliage.

The airplane was equipped with a fuel totalizer; however, it was damaged during the accident.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot, on May 6, 2003, by the Monmouth County Medical Examiners Office, Freehold, New Jersey.

Toxicological testing was performed by the FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma.

TESTS AND RESEARCH

The engine was examined at Rolls-Royce, Indianapolis, Indiana, on June 4, 2003, under the supervision of the Safety Board investigator. The N1 compressor assembly rotated freely after it was separated from the accessory gearbox. The N2 compressor rotated freely and was continuous through the accessory gearbox, and to the output shaft. The compressor rotor had 7 separated blades from the first stage wheel, and one separated blade from the third stage wheel. The remainder of the blades exhibited foreign object damage, and several were bent opposite the direction of rotation. A circumferential rub was observed on the compressor impeller shroud and impeller blades. Dirt and miscellaneous debris was observed in the outer combustion case, and between the outer combustion case and combustion liner.

All accessory component drive shafts and drive splines were intact. The engine driven fuel pump rotated normally and contained an undetermined amount of fuel.

The propeller and power turbine governors, were examined at Woodward Governor Company, Rockford, Illinois, on July 23, 2003, under the supervision of an FAA inspector. Testing of the propeller and power turbine governors did not reveal any pre-impact failures or malfunctions.

The engine fuel control unit was examined on August 27, 2003, at Honeywell, South Bend, Indiana, under the supervision of an FAA inspector. The examination found no condition that would have resulted in an un commanded reduction of fuel flow under normal operating conditions.

ADDITIONAL INFORMATION

Global Positioning System and Radar Information

A handheld Garmin global positioning system (GPS) receiver was recovered from the accident site. The receiver was downloaded by representatives of Garmin International Inc., in Olathe, Kansas, under the supervision of an FAA inspector. The unit contained track data for the entire accident flight; however, it did not record altitude. The unit also contained data for a flight to Sarasota, Florida, on May 1, 2003. On the date of the accident, the GPS receiver began recording at 1011:38, and continued until 1518:52. The GPS data revealed that the airplane approached BLM from the west, and flew in the vicinity of the approach end of runways 3, and 32, about 1516. Shortly thereafter, the airplane made a left turn to the north-northwest. At 1516:57, the airplane was on a heading of 332 degrees, and at a ground speed of 140 knots. The airplane continued on a northwest heading for about the next minute and it's ground speed decreased to 107 knots. The airplane then turned to the south-southwest. At 1518:16, the airplane was on a heading of 197 degrees, at a ground speed of 74 knots. The airplane's ground speed continue to decrease until the accident. The last target was near the location of the main wreckage, and displayed a ground speed of 69 knots. FAA radar data depicted the airplane to an altitude of 900 feet, at 1517:32, approximately 2.2 miles north-northwest of BLM.

FAA Approved Flight Manual Supplement

The FAA approved Flight Manual Supplement for the Turbine Power Bonanza did not contain any charts or performance data which could be used to calculate the fuel burn for a given flight.

Emergency Locator Transmitter (ELT)

The airplane was equipped with an Artex ELT model 110-4, with a battery expiration date of May 2004. The ELT activated during the accident sequence.

Wreckage Release

The airplane wreckage was released on May 15, 2003, to a representative of the owners insurance company.

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	75,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Glider	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Glider; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	March 7, 2003
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	21600 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N111TW
Model/Series:	A36	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Utility	**Serial Number:**	E2555
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	December 11, 2002 Annual	**Certified Max Gross Wt.:**	3850 lbs
Time Since Last Inspection:	41 Hrs	**Engines:**	1 Turbo prop
Airframe Total Time:	1375 Hrs	**Engine Manufacturer:**	Allison
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	250-B17F
Registered Owner:	J. R. Morris Inc.	**Rated Power:**	440 Horsepower
Operator:	Paul A. Bray	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BLM,159 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	15:15 Local	**Direction from Accident Site:**	135°
Lowest Cloud Condition:	Few / 9000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.19 inches Hg	**Temperature/Dew Point:**	13°C / -4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Sarasota, FL (SRQ)	**Type of Flight Plan Filed:**	IFR
Destination:	Bridgeport, CT (BDR)	**Type of Clearance:**	IFR
Departure Time:	10:15 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Monmouth Executive BLM	**Runway Surface Type:**	Asphalt
Airport Elevation:	159 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	14	**IFR Approach:**	Visual
Runway Length/Width:	7300 ft / 80 ft	**VFR Approach/Landing:**	Forced landing;Full stop

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	40.205001,-74.145278

Administrative Information

Investigator In Charge (IIC):	Schiada, Luke
Additional Participating Persons:	Ken Symons; FAA Teterboro FSDO; Saddle Brook, NJ Timothy D Rainey; Raytheon Aircraft Company; Wichita, KS John J Swift; Rolls-Royce Corporation; Indianapolis, IN Gerard A Leipfinger; New Jersey Division of Aeronautics; Trenton, NJ
Original Publish Date:	December 28, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=56931