Aviation Investigation Final Report

Location:	KINGSTON, Ohio	**Accident Number:**	NYC01FA021
Date & Time:	October 20, 2000, 22:38 Local	**Registration:**	N7951L
Aircraft:	Beech BE-23-24	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	3 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane departed, and flew 54 minutes on a cross country flight before landing. Without refueling, the airplane departed for the return trip. 1 hour and 2 minutes into the flight home, the pilot reported a rough running engine and a loss of power. The airplane impacted a four-lane-interstate highway. On a standard day, the airplane would use 9.1 gph of fuel at 63 percent power and 6,500 feet. At 75 percent power, the airplane would use 12.3 gph. Witnesses reported that the day before the accident, the aircraft had 7.5 gallons in the left tank and 15 gallons in the right tank. The airplane was then flown 1.3 hours. After the flight, the airplane was not serviced until just before the accident flight when 13.2 gallons of fuel was added. The pilot's operating handbook requires the pilot to visually check the fuel quantity for both tanks during the preflight inspection. Examination of the wreckage revealed no preimpact failures or malfunctions. In addition, exanimation of the engine revealed evidence consistent with fuel starvation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to check both fuel tanks visually during the preflight inspection. A factor in the accident was the dark night.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: DESCENT

Findings
1. FLUID,FUEL - STARVATION
2. (C) PREFLIGHT PLANNING/PREPARATION - INADEQUATE - PILOT IN COMMAND

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

Occurrence #3: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
3. (F) LIGHT CONDITION - DARK NIGHT
4. TERRAIN CONDITION - ROADWAY/HIGHWAY

Factual Information

HISTORY OF FLIGHT

On October 20, 2000, at 2238 Eastern Daylight Time, a Beech BE-23-24, N7951L, was substantially damaged during a forced landing near Kingston, Ohio. The certificated airline transport pilot and two passengers were fatally injured. A third passenger was seriously injured. Night visual meteorological conditions prevailed for the personal flight that departed Burke Lakefront Airport (BKL), Cleveland, Ohio; destined for Ohio State University Airport (OSU), Columbus, Ohio. No flight plan was filed and the flight was conducted under 14 CFR Part 91.

Earlier that evening, the airplane departed Columbus at 1747, and flew to BKL, arriving at 1841. There was no record of the airplane being fueled while at BKL. The airplane then departed at 2130. Once airborne, the pilot contacted air traffic control and requested radar traffic advisories. A transponder code was assigned and the flight progressed with no report of difficulty. Once in the Columbus area, the airplane was handed-off to Columbus Approach Control, and at 2228, the pilot reported starting a descent from 6,500 feet msl.

Approximately 4 minutes after initiating a descent, the pilot reported a rough running engine, and requested vectors to the nearest airport. The controller advised the pilot that Delaware Municipal Airport (DLZ), Delaware, Ohio, was the closest airport at 265 degrees. The pilot acknowledged the transmission, and declared an emergency. The controller added that the airport was 13 miles away. At 2235, another pilot over Delaware reported the runway lights were on at the airport. The controller confirmed with the accident pilot that he had received the transmission. The accident pilot acknowledged the transmission, adding that he did not see the lights. At 2236, the controller advised the pilot he was about 12.5 miles from the runway. The pilot replied he would not make the airport, adding the engine was not even maintaining 1,000 rpm.

After receiving this transmission, the controller requested assistance from a Columbus Police Helicopter that was approximately 12 miles to the southwest. The helicopter pilot asked the location of the airplane, and radar vectors were provided. The controller advised the pilot that a police helicopter was en route. The pilot replied they were heading towards the interstate highway. This was the last transmission received from the accident airplane. Several minutes later, the helicopter pilot reported seeing traffic backed-up on the four-lane highway.

The accident happened during the hours of darkness. The wreckage was located 40 degrees, 20.536 minutes north latitude, 82 degrees, 52.452 minutes west longitude, and about 1,020 feet in elevation.

PERSONNEL INFORMATION

The pilot held an airline transport pilot certificate with a multi-engine-land rating, and a commercial pilot certificate with a single-engine-land rating. In addition, he held a certified flight instructor rating for airplane single-engine-land, multi-engine-land, and airplane instrument. His last Federal Aviation Administration (FAA) first class medical certificate was dated July 31, 2000. According to the pilot's latest logbook, he had 2,489.6 hours of total flight experience with 2,267.6 hours of that in single-engine-land airplanes. In addition, his logbook reflected that his last flight in a non-turbine-powered airplane was April 23, 2000, and his last flight in the accident airplane make and model was March 30, 2000, about six months before the accident. During the 30 day window that proceeded the accident, the pilot flew a total of 28.8 hours. In the 60 day window he flew 58.7 hours, and in the 90 day window he flew 100.2 hours. All of the flight time logged by the pilot during the 30, 60, and 90 day windows was in a Cessna 208B.

AIRCRAFT INFORMATION

According to the Pilot's Operating Handbook (POH), the airplane was a single engine, low wing, with fixed landing gear. It was primarily constructed of aluminum, and could seat up to four occupants. The airplane was capable of carrying 59.8 gallons of fuel. To facilitate partial fueling of the airplane, each of the two fuel tanks were equipped with a visual indicator called a "tab." When both fuel tanks were fueled to the base of the "tabs," the airplane would have a total of 30 gallons of fuel onboard, with approximately 1 gallon unusable.

According to performance data in the POH, on a standard day, the airplane would use 9.1 gph of fuel at 63 percent power and 6,500 feet. At 75 percent power, the airplane would use 12.3 gph of fuel. The POH also stated that start, runup, taxi, and the takeoff acceleration, would require about 0.8 gallons of fuel.

According to the preflight inspection section of the POH, the pilot was required to check the quantity of fuel in each tank, and to ensure that the filler caps are secure.

METEOROLOGICAL INFORMATION

At 2251, Port Columbus International Airport, Columbus, Ohio, (CMH) reported wind 160 degrees at 3 knots, visibility 10 miles, clear skies, temperature 55 degrees Fahrenheit, dew point 48 degrees Fahrenheit, and an altimeter setting of 30.13 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The wreckage was examined on October 21 and 22, 2000, at a recovery facility in Sunbury, Ohio. Both the left and right wings were attached to the fuselage, along with the horizontal stabilizer and the vertical stabilizer. All the flight control surfaces were accounted for, including the flaps. The majority of the impact damage was confined to the engine compartment, and the forward portion of the cockpit area. Flight control continuity was

verified from each of the control surfaces to the pilot station, and elevator trim was approximately neutral.

The fuel selector was set to the left tank. Approximately 1/16 of a gallon was drained from the left tank. The left tank fuel line fitting was broken consistent with impact damage. Approximately 1/8 of a gallon of fuel was drained from the right fuel tank. In addition, approximately 3 oz. of fuel was drained from the gascolator. A trace amount of fuel was recovered from the fuel line that connected the engine driven fuel pump to the airframe, and less than a teaspoon of fuel was recovered from the engine driven fuel pump. A trace amount of fuel was recovered from the line that connected the engine driven fuel pump to the fuel injector. The fuel screen was removed from the injector. No contaminates were identified, and a trace of fuel was recovered. The fuel injector was removed and held upside down. A trace of fuel was recovered. The fuel line that connected the fuel injector to the fuel manifold was removed, and no fuel was recovered. The manifold was opened and no fuel was found. In addition, no fuel was found in any of the four injector-lines. All four injectors were removed and no obstructions were identified.

Approximately 15 gallons of water was added to the right fuel tank. The fuel selector was set to the right tank, and electrical power was applied to the electric fuel boost pump. The pump activated, and water was expelled from the fuel bulkhead fitting at the firewall. Power to the electric fuel boost pump was removed, and the fuel selector was repositioned to the left tank. Because the left tank fuel line fitting had broken, the left inboard fuel tank feed line was submerged in a container of water. Again, electrical power was applied to the electric fuel boost pump. The pump activated and water was expelled from the fuel bulkhead fitting at the firewall.

Examination of the engine and accessories revealed that the engine driven fuel pump had partially separated from the engine. The pump was removed and disassembled. No pre-impact failures were identified. The vacuum pump was removed, and the sheer coupling was intact. The pump was disassembled, and the vanes and vane housing were intact. All of the spark plug electrodes, except for two, were grayish in color. The number 2 cylinder bottom sparkplug could not be removed because of impact damage, and was not examined. The number 1 cylinder bottom sparkplug electrode was covered in non-combusted oil.

A rotational force was applied to the engine crankshaft. Thumb compression was obtained on all four cylinders and spark was observed on all eight magneto-towers. Continuity of the ignition leads could not be verified because of impact damage. In addition, the engine driven fuel pump pad articulated, and the vacuum pump pad rotated.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was not preformed on the pilot at the request of the pilot's father for religious reasons. The father did consent to toxicological testing of the pilot. A toxicological test was performed on the pilot by the FAA Toxicology and Accident Research Laboratory, Oklahoma

City, Oklahoma, on January 24, 2001.

ADDITIONAL INFORMATION

According to the owner of the recovery company that removed the airplane from the interstate highway, there was no evidence of spilled fuel on the road were the airplane came to rest, nor did he find any fuel on the bed of the truck used to move the airplane. He added that besides not seeing any fuel, he did not detect the aroma of fuel.

According to the president of the flying club that owned the airplane, the pilot went to work for a cargo company flying a Cessna 208B in March of 2000. After that, the pilot did not rent the accident airplane, or one of the same make and model. In addition, the president flew the accident airplane the day before the accident with a student. Before the flight, the president's student estimated the left tank had approximately 7 1/2 gallons of fuel, and the right had 15 gallons. The student also noted that his observation matched the fuel quantity gauges. The president then flew the airplane for about 1.3 hours. After the flight was completed, the airplane was not serviced until the next day when the accident pilot requested it be fueled to the "tabs."

On October 23, 2000, an interview was conducted with the line attendant that serviced the airplane at Columbus. The attendant was asked to complete a written statement, and was advised he would be asked a few questions afterwards.

According to the attendant, he received a fuel order around 1745, to fuel both tanks to the "tabs" on the accident airplane. After fueling the tanks to the "tabs," he replaced the fuel caps. He then watched the pilot open the left fuel cap, and check the fuel level. The pilot told the attendant he was surprised it only took 13.2 gallons to service the airplane. The attendant added that the airplane was on level terrain when it was serviced, and that he only remembered seeing the pilot check the left fuel tank.

In a statement given to an Ohio State Trooper, the passenger that survived the accident stated that she did not remember seeing the pilot visual check either fuel tank while the airplane was in Cleveland. She added that right before the accident, the pilot started getting "nervous," and then the airplane went "crazy."

The entire wreckage was released to the owner's representative on October 25, 2000.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	29,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):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	July 31, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	2491 hours (Total, all aircraft), 2364 hours (Pilot In Command, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N7951L
Model/Series:	BE-23-24 BE-23-24	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	MA-127
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	August 31, 2000 Annual	**Certified Max Gross Wt.:**	2550 lbs
Time Since Last Inspection:	873 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3133 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed	**Engine Model/Series:**	IO-360-A2B
Registered Owner:	NATIONAL FLYERS ASSOCIATION	**Rated Power:**	200 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	CMH ,815 ft msl	**Distance from Accident Site:**	25 Nautical Miles
Observation Time:	10:51 Local	**Direction from Accident Site:**	185°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	14°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	CLEVELAND , OH (BKL)	**Type of Flight Plan Filed:**	None
Destination:	COLUMBUS , OH (OSU)	**Type of Clearance:**	None
Departure Time:	21:30 Local	**Type of Airspace:**	Class G

Airport Information

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

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Fatal, 1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal, 1 Serious	**Latitude, Longitude:**	40.239555,-82.860191(est)

Administrative Information

Investigator In Charge (IIC):	Muzio, David
Additional Participating Persons:	JESUS ZUBIA; COLUMBUS , OH DAVID MOORE; WILLIAMSPORT , PA EDDIE WEBBER; WICHITA , KS MIKE BESS; COLUMBUS , OH
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Investigation Class:	Class
Note:	
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