National Transportation Safety Board
Aviation Accident Final Report

Location:	LONGMONT, CO	**Accident Number:**	FTW97LA088
Date & Time:	01/23/1997, 2050 MST	**Registration:**	N76GM
Aircraft:	Beech B90	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General Aviation - Ferry		

Analysis

The pilot had made a refueling stop at Vandalia, Illinois. She did not observe the refueling process, but the FBO also operated a King Air and she felt he knew the proper procedure to follow. The airplane was reportedly serviced with 235 gallons of Jet-A fuel (total capacity is 384 gallons). The pilot flew between 7,500 and 10,500 feet. When the airplane was 45 minutes from its destination, the fuel transfer pump lights illuminated, indicating the wing tanks were empty. The nacelle tank gauges registered 3/4 full and the pilot determined she had sufficient fuel to complete the flight. When the airplane was three minutes from its destination, both engines flamed out and the pilot made a wheels up forced landing. When the salvage company recovered the airplane, they reported finding no evidence of fuel aboard. The pilot was provided and used performance charts for the Beech 65-A90 instead of the Beech B90.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Failure of the pilot to refuel the airplane, resulting in fuel exhaustion. Factors were the pilot's reference to similar but different aircraft performance charts, and the operator's failure to provide the pilot with the proper performance charts.

Findings

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

Findings
1. (C) FLUID,FUEL - EXHAUSTION
2. (F) PERFORMANCE DATA - IMPROPER - PILOT IN COMMAND
3. (F) ACFT/EQUIP,INADEQUATE AIRCRAFT MANUALS - COMPANY/OPERATOR MANAGEMENT
4. (C) REFUELING - NOT PERFORMED - PILOT IN COMMAND

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

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: LANDING

Findings
5. WHEELS UP LANDING - INTENTIONAL - PILOT IN COMMAND

Factual Information

On January 23, 1997, approximately 2050 mountain standard time, N76GM, a Beech B90, registered to Fayard Enterprises, Inc., and operated by Mile High Skydiving Center, Inc., was substantially damaged during a forced landing in Longmont, Colorado. The commercial pilot sustained minor injuries. Visual meteorological conditions prevailed, and no flight plan was filed for the ferry flight conducted under Title 14 CFR Part 91. The flight originated at Vandalia, Illinois, on January 23, 1997, approximately 1800 central standard time.

The following is based on the Pilot/Operator Aircraft Accident Report. The pilot said she obtained a standard weather briefing and outlook prior to takeoff. Visual meteorological conditions (VMC) were forecast to exist along her route of flight. She departed Louisburg, North Carolina, approximately 1400 eastern standard time. She stopped in Louisville, Kentucky, where a passenger disembarked, then she proceeded to Vandalia, Illinois. While the airplane was being refueled, she obtained another weather forecast. VMC was forecast to continue for the remainder of the flight. The pilot said she had to fly in VMC because there were several inoperative instruments aboard the airplane.

The pilot said the distance between Vandalia, Illinois, and Longmont, Colorado, is 730 nm. Using the winds aloft forecast and a computed 195 knots groundspeed (which she experienced between Louisburg, North Carolina, and Vandalia, Illinois), the pilot estimated her time en route to Longmont to be 3.7 hours. The pilot said she estimated a cruise fuel consumption rate of 250 pounds per hour per engine, based on her previous flight experience in the airplane and a performance chart she submitted. The chart, "Maximum Cruise Power," indicates the engines will consume 507 gallons of fuel per hour at 18,000 feet at -29 degrees F. (-34 degrees C.). According to Freedom Aviation, the airplane was serviced to capacity with 235 gallons of Jet-A fuel. Total fuel capacity of the Beech B90 is 384 gallons, or approximately 2,573 pounds. The pilot said she believed she had sufficient fuel to complete the flight and still have a 45 minute reserve required for night flight. She said she departed Vandalia at 1800 central standard time.

The pilot said that during the first hour of the flight, she flew at 10,500 feet and received flight following services from air route traffic control center (ARTCC). Later, in order to remain in VMC, she was forced to descend to 9,500 feet, then to 7,500 feet. The fuel flow gauges indicated 300 pounds per hour (each engine), and she recalculated fuel consumption and fuel remaining data.

The pilot said she estimated she had consumed 520 pounds during the first hour of flight, leaving 2,053 pounds remaining, or approximately 2.7 hours endurance. Using a fuel burn of 300 pounds per hour per engine, the pilot estimated 1,620 pounds of fuel would be required to complete the flight, leaving 433 pounds reserve.

Weather conditions did not improve and the pilot was unable to climb to a higher altitude. Groundspeed remained between 195 and 200 knots. When the Global Positioning System (GPS) indicated the airplane was 45 minutes from Longmont, the left and then the right fuel transfer pump lights illuminated, indicating that the wing tanks were empty (according to a Beech Aircraft Company spokesman, 262 gallons of fuel had been consumed, leaving 122 gallons or 61 gallons in each nacelle tank). The pilot said that at that time, the nacelle fuel tank gauges registered 3/4-full. If this had had been an accurate indication of fuel remaining, the pilot estimated approximately 450 pounds of fuel would be required for the 150 nm remaining,

and that she had adequate fuel to complete the flight.

As the airplane approached Longmont, Denver ARTCC advised that Jeffco Airport (located about 16 miles south of Longmont) was reporting instrument meteorological conditions. [According to the Denver ARTCC, the pilot did not declare an emergency, did not declare a flow fuel state, and did not request priority handling.] The pilot said that when the GPS indicated she was 3 minutes away from Longmont, the left and then the right boost pump failure lights illuminated, followed shortly thereafter by both engines flaming out. The pilot made a wheels up forced landing in the 9500 block of Rogers Road, at its intersection with Hover Road. A spokesman for Beegles Aircraft Service, the salvage company that recovered the wreckage, said they found no fuel on the airplane.

The pilot concluded her report by listing factors that may have contributed to increased fuel consumption and eventual fuel exhaustion, to wit:

1. She was forced to fly the CDI (course deviation indicator) on the GPS because the HSI (horizontal situation indicator) was inoperative (she said it failed in flight and, in addition to the GPS, she referred to the copilot's direction indicator). This resulted in a zigzag course of +5 degrees to +10 degrees.

2. The cabin heater, which normally burns 5 gallons per hour, malfunctioned. The heater would not cycle but burned continuously to the point of overheating. The pilot eventually turned it off.

The pilot said she did not observe the refueling process at Vandalia because she was obtaining a telephone weather briefing from the Flight Service Station. She said the fixed base operator also uses a King Air for parachutists and she felt he knew the proper procedure to follow when refueling the airplane.

Beech Aircraft Corporation was contacted and furnished the facts surrounding the accident. A company spokesman said the performance chart provided to and used by the pilot was the wrong chart. The performance chart was for a Beech 65-A90, not a B90. Although both airplanes use the Pratt & Whitney PT6A-20 engine, the 65-A90 engine is rated at 500 shp (shaft horsepower) at 1,192 foot-pounds of torque, whereas the B90 engine is rated at 550 shp at 1,315 foot-pounds of torque.

Pilot Information

Certificate:	Commercial; Private	**Age:**	25, Female
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Glider	**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	09/26/1996
Occupational Pilot:		**Last Flight Review or Equivalent:**	
Flight Time:	1310 hours (Total, all aircraft), 42 hours (Total, this make and model), 1225 hours (Pilot In Command, all aircraft), 67 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N76GM
Model/Series:	B90 B90	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	LJ-498
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	01/22/1997, AAIP	**Certified Max Gross Wt.:**	9650 lbs
Time Since Last Inspection:	8 Hours	**Engines:**	2 Turbo Prop
Airframe Total Time:	10530 Hours	**Engine Manufacturer:**	P&W
ELT:	Installed	**Engine Model/Series:**	PT6A-20
Registered Owner:	FAYARD ENTERPRISES, INC.	**Rated Power:**	550 hp
Operator:	MILE-HI SKYDIVING CENTER, INC.	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night/Dark
Observation Facility, Elevation:	BJC, 5671 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	2045 CST	**Direction from Accident Site:**	166°
Lowest Cloud Condition:	Scattered / 2000 ft agl	**Visibility**	7 Miles
Lowest Ceiling:	Broken / 8000 ft agl	**Visibility (RVR):**	0 ft
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	-2°C / -3°C
Precipitation and Obscuration:			
Departure Point:	VANDALIA, IL (VLA)	**Type of Flight Plan Filed:**	None
Destination:	(2V2)	**Type of Clearance:**	None
Departure Time:	1800 CST	**Type of Airspace:**	Class E

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	ARNOLD W SCOTT	**Report Date:**	08/25/1997
Additional Participating Persons:	BUDDY R MAKIN; DENVER, CO		
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/.		