Aviation Investigation Final Report

Location:	FAIRFIELD, Virginia	**Accident Number:**	IAD99LA026
Date & Time:	January 5, 1999, 12:55 Local	**Registration:**	N3TH
Aircraft:	Piper PA-30	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane was in cruise flight at 6,000 feet in below zero temperatures when the right engine stopped producing power. The pilot entered a left-hand orbit and attempted an engine restart. After several orbits, the left engine stopped producing power. The pilot completed a forced landing to a field that destroyed the airplane. Examination of the wreckage revealed evidence of fuel at the scene with the left fuel selector in the 'Auxiliary' position and the right selector in the 'Main' position. The right fuel selector filter element bowl could not be freed after removal of the mount screws. The bowl was pried free and the filter element screens were found completely occluded with ice. An FAA Airworthiness Directive (AD), 'To eliminate water contamination of the aircraft fuel supply', that mandated compliance every 50 hours of operation, had not been complied with in 16 calendar months and 234 hours of operation. The Owner's Handbook stated auxiliary fuel and tip tank fuel should be used in level flight only, and that the single engine service ceiling was approximately 5,800 feet, at maximum gross weight. Both engines started and ran to rated power in a test cell.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The owner's failure to comply with the Airworthiness Directive and the subsequent fuel system filter blockage by ice leading to fuel starvation and power loss of the right engine. Additionally, the pilot's improper selection of the left auxiliary fuel tank position and the subsequent fuel starvation and power loss of the left engine. Contributing factors were low temperature (below freezing) conditions and the pilot's failure to follow procedures delineated in the Owner's Handbook.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: CRUISE - NORMAL

Findings
1. 1 ENGINE
2. (C) MAINTENANCE,SERVICE BULLETIN/LETTER - NOT COMPLIED WITH - OWNER/PILOT MECHANIC
3. (C) FUEL SYSTEM,FILTER - ICE
4. FUEL SYSTEM,SELECTOR/VALVE - BLOCKED(TOTAL)
5. FLUID,FUEL - STARVATION
6. (F) WEATHER CONDITION - TEMPERATURE,LOW

Occurrence #2: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: MANEUVERING

Findings
7. 1 ENGINE
8. (C) FLUID,FUEL - STARVATION
9. (C) FUEL TANK SELECTOR POSITION - IMPROPER - PILOT IN COMMAND
10. (F) PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND

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

Factual Information

On January 5, 1999, at 1255 eastern standard time, a Piper PA-30, N3TH, was destroyed during a forced landing to a field near Fairfield, Virginia. The certificated commercial pilot and one passenger were seriously injured. A second passenger received minor injuries. Visual meteorological conditions prevailed for the personal flight that originated at Martin State Airport (MTN), Baltimore, Maryland, at 1136, destined for Roanoke, Virginia (ROA). An instrument flight rules flight plan was filed for the flight conducted under 14 CFR Part 91.

According to Federal Aviation Administration (FAA) Air Traffic Control (ATC) records, N3TH was in cruise flight at 6,000 feet in the vicinity of Montebello, Virginia, when the pilot reported a loss of engine power. The pilot said he would attempt to land on Interstate Highway 81.

In a written statement, the pilot stated the airplane was serviced with 48 gallons of 100LL aviation gasoline just prior to departure from MTN. He said that each auxiliary tank was serviced with 15 gallons of fuel and that the balance of the fuel was pumped into the main fuel tanks. He said:

"At approximately 1 hour and 10 minutes into the flight, I lost my right engine. I advised center of my condition and checked my GPS for an emergency field I could use for landing. The only one that came up was a private strip with a turf runway 2000 [feet] long. I asked center if they were familiar with this airport and they advised that they did not have anything on it and the closest airport was 21 miles behind me, at Lewisberg, West Virginia. By this time I was losing my second engine and advised center that I was turning toward the valley to try and land on Interstate Highway 81. We were unable to make the distance and I put the aircraft in a farm field just off of the highway."

According to an FAA Aviation Safety Inspector who responded to the scene, the passenger in the back seat said that the airplane flew through a dense cloud prior to a loss of engine power on the right engine. He said that he liked to monitor the gauges during flight and noticed each engine consumed 9 gallons per hour while in cruise flight. The passenger said that the fuel flow gauge on the right engine went to zero when the engine stopped.

The back seat passenger said that at the time of the power loss, the pilot entered a left bank and attempted to re-start the right engine. He said the pilot selected the Interstate Highway for landing and continued the attempted restart while in a left descending orbit. The passenger said the left engine also stopped producing power and the pilot determined the highway could not be reached. While on final approach to land in a field, the airplane stalled, and the pilot accomplished a partial recovery from the stall prior to ground contact.

In a telephone interview, the front seat passenger said the outside air temperature in cruise

flight was "...forty below zero." He said both engines were "spitting and spattering" prior to the loss of power on the right engine. The passenger said the pilot entered the left descending orbit and accomplished a restart of the right engine before both engines lost power.

In a telephone interview, a pilot rated witness stated he noticed the airplane overhead. He said:

"I noticed the airplane at a high angle of bank, high power setting, and high RPM. He circled about eight times. He looked like he was about 4,000 feet and, at the time, it didn't look like an emergency. I could not hear if it was one engine or two. There was no sputtering. It was putting out a lot of power. He was circling as if he was trying to observe something on the ground."

According to the Maryland Aviation Administration, the airplane was "topped off" with 48.8 gallons of fuel approximately 1 hour prior to departure from MTN.

Examination of the wreckage by the FAA revealed evidence of fuel at the scene. The Inspectors measured approximately 6 inches of fuel in each main tank and no fuel in either nacelle tank. The left auxiliary tank measured approximately 3 inches of fuel and the right auxiliary tank was ruptured. The left fuel selector was found in the 'aux' position and the right fuel selector was found in the 'main' position. Neither propeller was feathered and the propeller levers were found in the full forward position.

The wreckage was recovered from the scene and moved to Hagerstown, Maryland for further examination.

TESTS AND RESEARCH

The wreckage was examined at Hagerstown, Maryland on February 1, 1999. The wreckage was moved on a recovery trailer into a hanger for inspection. The finger screens from both the left and right engine fuel injectors were removed. Examination of the left finger screen revealed a small amount of dirt. Water poured from the housing of the right finger screen during its removal.

Both the left and right fuel selector quick-drain valves were actuated. Neither drain flowed fuel. Fuselage belly panels were removed to gain access to both the left and right fuel selector valve filter element sumps. The left filter element bowl was removed and found to contain a small amount of fuel, water, and sediment. The spring-loaded drain valve beneath the screen filter wafers was frozen with ice.

The right filter element bowl could not be freed after removal of the mount screws. The bowl was pried free and found to be completely full of ice. The filter element screens were wholly occluded with ice.

The engines were removed from the main wreckage for shipment to the Textron Lycoming engine factory for detailed examination and test runs.

Examinations and test runs were performed on both engines on March 15 & 16, 1999, at the Textron Lycoming engine factory, Williamsport, Pennsylvania. The left engine required a slave fuel nozzle on the # 1 cylinder and the right engine required a slave spark plug on the bottom side of the # 1 cylinder. Both replacements were due to impact damage.

Both engines started without difficulty and ran to rated power in the test cell.

ADDITIONAL INFORMATION

According to FAA Airworthiness Directive 79-12-08:

"To eliminate water contamination of the aircraft fuel supply, accomplish a check in accordance with...[Piper] Service Letter 851...Compliance required within 50 hours of operation after the effective date of this AD and at each 50 hours of operation thereafter."

According to Piper Service Letter 851:

"The accumulation of water in the fuel tanks and related lines could cause rough engine operation or complete power interruption if the water freezes during cold weather operation."

In a written statement, an FAA Airworthiness Inspector said examination of the airplane's maintenance records revealed that the last date of compliance for AD 79-12-08 was on September 18, 1997, at 4,016 aircraft hours.

At the time of the accident, the airplane's total time was 4,250 hours.

According to the Owner's handbook:

"If engine failure occurs during cruise flight, maintain airspeed and directional control...if power cannot be regained, the propeller on the inoperative engine should be feathered..."

"Fuel should be used from the main fuel cells during take-off, landing, climb and descent. Auxiliary fuel and tip tank fuel should be used in level flight only."

The Owner's handbook also listed the single engine service ceiling to be approximately 5, 800 feet, at maximum gross weight.

Pilot Information

Certificate:	Commercial	**Age:**	59,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	May 15, 1998
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	20000 hours (Total, all aircraft), 3500 hours (Total, this make and model), 20000 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N3TH
Model/Series:	PA-30 PA-30	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	7103002
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 2, 1998 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	60 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	4250 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	IO-320-B1A
Registered Owner:	WILSON OLIVER AGENCY INC	**Rated Power:**	150 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:**	Day
Observation Facility, Elevation:	ROA ,1160 ft msl	**Distance from Accident Site:**	40 Nautical Miles
Observation Time:	12:54 Local	**Direction from Accident Site:**	240°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	-6°C / -17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	BALTIMORE , MD (MTN)	**Type of Flight Plan Filed:**	IFR
Destination:	ROANOKE , VA (ROA)	**Type of Clearance:**	IFR
Departure Time:	11:36 Local	**Type of Airspace:**	Class G

Airport Information

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

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Serious, 1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious, 1 Minor	**Latitude, Longitude:**	37.880485,-79.300041(est)

Administrative Information

Investigator In Charge (IIC):	Rayner, Brian
Additional Participating Persons:	MANUEL CARVALHO; RICHMOND , VA
Original Publish Date:	January 18, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=45595

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