



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Nahant, MA	<b>Accident Number:</b>	NYC01LA116
<b>Date &amp; Time:</b>	05/06/2001, 2015 EDT	<b>Registration:</b>	N3558G
<b>Aircraft:</b>	Piper PA 31-350	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	9 Minor
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

The pilot departed his home airport for a 90 mile personal flight with eight passengers. The pilot stated he departed with 24 gallons of fuel in the outboard tanks, and 80 gallons of fuel in the main tanks. After landing, the airplane was refueled with 100 low-lead aviation gasoline; 12 gallons in each main fuel tank. Before departing for the return flight, the pilot performed a preflight inspection of the airplane, which did not include a visual check of the airplane's fuel tanks. After takeoff, the pilot experienced a "small surge in both engines," while climbing through 1,150 and 3,300 feet, respectively. He further described the surges as "minor but still noticeable." About 30 minutes later, after the airplane had descended, and was leveling at 1,500 feet, the pilot experienced an intermittent illumination of the "right aux fuel pump light," which was followed by a total loss of power on the right engine. Shortly thereafter, the left engine began "surging," and after about "three or four minutes, at most," he feathered the left engine propeller. The pilot ditched the airplane in Massachusetts Bay. The airplane was recovered about 1 month later. The fuel selectors were positioned to the outboard tanks, and the airplane's fuel tanks revealed fluid consistent with seawater with "some odor of fuel;" however, no visible evidence of fuel was observed. According to the airplane's information manual, the airplane's total fuel capacity was 192 gallons, of which, 182 gallons were usable. Examination of the airframe and engine did not reveal evidence of any pre-impact mechanical malfunctions. The pilot reported he had purchased the airplane and attended 5-day type specific training course in March 2001. He reported about 1,050 hours of total flight experience, which included 800 hours in multi-engine airplanes, of which 65 hours was in the make and model. Additionally, the pilot reported he had not experienced any prior mechanical problems. He believed he had flown the airplane the day prior to the accident as well. The last documented refueling of the airplane prior to the date of the accident occurred on May 3, 2001, when the airplane was refueled with 128 gallons of aviation gasoline. The last flight documented in the pilot's logbook was on May 4, 2001, when the pilot logged 1.9 hours in the accident airplane. The pilot said he normally flew a 65 percent power, an "a little rich," and experienced a fuel burn of about 20 to 21 gallons per hour, for each engine.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power due to fuel exhaustion for undetermined reasons. A factor in this accident was the pilot's failure to visual check the airplane's fuel quantity prior to takeoff.

### Findings

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

#### Findings

1. (C) FLUID,FUEL - EXHAUSTION
2. (F) AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
3. (C) FLUID,FUEL - UNDETERMINED

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

## Factual Information

On May 6, 2001, about 2015 eastern daylight time, a Piper PA 31-350, N3558G, experienced a loss of engine power on both engines, and ditched in Massachusetts Bay, 3 miles southeast of Nahant, Massachusetts. The pilot and eight passengers sustained minor injuries. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the flight that departed Nantucket Memorial Airport (ACK), about 1945, destined for the Beverly Municipal Airport (BVY). The personal flight was conducted under 14 CFR Part 91.

The airplane was owned by the pilot and based at BVY. Earlier in the day, the pilot and the eight passengers departed BVY, and flew to ACK for dinner.

During a telephone interview, the pilot stated he departed BVY with 24 gallons of fuel in the outboard tanks, and 80 gallons of fuel in the main tanks. He used the main tanks for takeoff and landing, and conducted the majority of the flight utilizing the outboard fuel tanks. Additionally, he described the flight as "normal and uneventful."

After landing at ACK, the airplane was refueled with 24 gallons of 100 low-lead (100LL) aviation gasoline; 12 gallons in each main fuel tank. Before departing ACK, the pilot performed a preflight inspection of the airplane, which included a walk around inspection and a check of the control surfaces, engine cowlings, tires, and the underside of the airplane. He did not visually check or sump the airplane's fuel tanks.

The pilot described the takeoff from ACK as normal; however, he experienced a "small surge in both engines," while climbing through 1,150 and 3,300 feet, respectively. He further described the surges as "minor but still noticeable." About 30 minutes later, when the airplane had descended, and was leveling at 1,500 feet, the pilot experienced an intermittent illumination of the "right aux fuel pump light," which was followed by a total loss of power on the right engine. The pilot turned the electric fuel pump on, switched to the outboard tank, and pushed the throttle, propeller and mixture levers to the full forward position, with no response from the engine. He then elected to feather the right engine propeller. The airplane was not able to maintain altitude on one engine and began a slow descent.

Shortly thereafter, the left engine began "surging." The left engine manifold pressure was at 32 inches, when it began to drop and return. The surging continued regardless of the position of the throttle and caused the airplane to yaw and porpoise. He did not recall the engine's fuel flow, fuel pressure or rpm. The pilot said the left engine was producing "some power." The airplane continued to descend, yaw and porpoise, and after about "three or four minutes, at most," he feathered the left engine propeller.

The pilot stated he thought carefully about not stalling the airplane during the ditching and he maintained an airspeed of about 85 knots. He stated that it was "dark"; however, he was able to see the water due to the moonlight. After touchdown, he exited the airplane via the pilot's seat window exit, and inflated a raft. The passengers then exited the airplane and the airplane sank within "40 to 45 seconds."

The airplane was located on May 9, 2001, by Massachusetts State Police divers and the Army Corp. of Engineers. The airplane came to rest inverted, at a depth of about 100 feet. The airplane was recovered on June 7, 2001, and was examined by a Federal Aviation Administration (FAA) inspector, with representatives of Textron Lycoming, and The New Piper Aircraft Company.

The landing gear and flaps were found in the retracted position. Flight control continuity was verified to all control surfaces. The fuel selectors were positioned to the outboard fuel tanks, and the throttle, propeller and mixture levers were full forward. The airplane's fuel tanks remained intact, and all fuel caps were in-place. Samples from the airplane's fuel tanks taken just after the airplane was recovered revealed fluid consistent with seawater with "some odor of fuel;" however, no visible evidence of fuel was observed. All fuel valves were tested and found to be operational. Additionally, the supply lines between the fuel valves and fuel pumps were removed and found to be unobstructed. Both engine fuel filters were corroded, consistent with saltwater corrosion.

Both propellers were observed in the feathered positions. The dual magneto cases were destroyed by corrosion and could not be examined. Both engine crankshafts rotated freely, and compression and valve train continuity was attained for all cylinders. Both oil filters were filled with a mixture of oil and seawater, however, internal examination of the filter elements did not reveal any contamination.

Examination of the airframe and engine did not reveal evidence of any pre-impact mechanical malfunctions.

According to the airplane information (AIM) manual, the airplane was equipped with four flexible fuel cells, with two fuel cells located in each wing panel. The outboard fuel cells held 40 gallons each, and the inboard fuel cells held 56 gallons each, for a total of 192 gallons, of which 182 gallons was "usable."

The ACK airport manager reported that several other airplanes were refueled from the same fuel supply, which was added to the accident airplane. Additionally, a sample of the fuel was tested and found to meet or exceed the specifications for 100LL aviation gasoline.

The pilot reported he had purchased the airplane and attended 5-day type specific training course in March 2001. He reported about 1,050 hours of total flight experience, which included 800 hours in multi-engine airplanes, of which 65 hours was in the make and model of the accident airplane.

Additionally, the pilot reported he had been flying the airplane often during the past few weeks, and had not experienced any prior mechanical problems. He believed he had flown the airplane the day prior to the accident as well. The last documented refueling of the airplane prior to the date of the accident occurred on May 3, 2001, when the airplane was refueled with 128 gallons of aviation gasoline. The last flight documented in the pilot's logbook was on May 4, 2001, when the pilot logged 1.9 hours in the accident airplane. The pilot said he normally flew a 65 percent power, a "a little rich," and experienced a fuel burn of about 20 to 21 gallons per hour, for each engine.

According to maintenance records, the airplane's most recent annual inspection was performed on February 7, 2001. At that time, the airplane had been operated for about 2,920 total hours, and both engines had been operated for about 1,300 hours since major overhaul.

The weather reported at an airport about 7 miles west of the accident site, at 2054, was: wind from 090 degrees at 6 knots; visibility 10 statute miles; clear skies; temperature 7 degrees C; dew point 2 degrees C; altimeter 30.58 in/hg.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	50, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	10/17/2000
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	03/01/2001
<b>Flight Time:</b>	1030 hours (Total, all aircraft), 65 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N3558G
<b>Model/Series:</b>	PA 31-350	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	31-8052068
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	8
<b>Date/Type of Last Inspection:</b>	03/01/2001, Annual	<b>Certified Max Gross Wt.:</b>	7045 lbs
<b>Time Since Last Inspection:</b>	65 Hours	<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	3000 Hours as of last inspection	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	TIO-540-J2BD
<b>Registered Owner:</b>	Northeast Equipment Leasing Corp.	<b>Rated Power:</b>	350 hp
<b>Operator:</b>	Dana Lake	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night
Observation Facility, Elevation:	BOS, 19 ft msl	Distance from Accident Site:	7 Nautical Miles
Observation Time:	0754 EDT	Direction from Accident Site:	45°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	90°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.57 inches Hg	Temperature/Dew Point:	7°C / 2°C
Precipitation and Obscuration:			
Departure Point:	NANTUCKET, MA (ACK)	Type of Flight Plan Filed:	IFR
Destination:	BEVERLY, MA (BVY)	Type of Clearance:	IFR
Departure Time:	1945 EDT	Type of Airspace:	Class E

## Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	8 Minor	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	9 Minor	Latitude, Longitude:	42.397778, -70.866389

## Administrative Information

Investigator In Charge (IIC):	Luke Schiada	Report Date:	06/18/2002
Additional Participating Persons:	Chris Mehegan; Bedford, MA Dave Moore; Ardsley, PA Robert Martellotti; Vero Beach, FL		
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 <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).