Aviation Investigation Final Report

Location:	NASHUA, New Hampshire	**Accident Number:**	IAD98LA053
Date & Time:	May 11, 1998, 18:20 Local	**Registration:**	N7795Q
Aircraft:	Cessna 310Q	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Ferry		

Analysis

The airplane had been flown about 3 hours and 50 minutes since being refueled and was observed on approach to the airport. A witness stated the airplane appeared to be right of centerline and about 200 feet above the trees, when its descent rate increased and it descended wings level into the trees. No pre-impact damage was found to the engines and the propeller blades sustained minimal scratching. The main tanks and auxiliary tanks had ruptured and there was no evidence of fuel in the vicinity of these tanks. Approximately 11 1/2 gallons of fuel was drained from the right wing locker fuel tank and the wing locker fuel transfer switch was found in the OFF position. The left engine fuel selector valve was in the left auxiliary position and the right engine fuel selector valve was in the left main position; however, the valve was found in the right main position and the push pull rod was bent at the point of impact damage on the wing. Fuel controls for both engines displayed no fuel and the screens were clean.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper fuel management which led to fuel starvation.

Findings

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

Findings
1. (C) FLUID,FUEL - STARVATION
2. (C) FUEL MANAGEMENT - IMPROPER - PILOT IN COMMAND

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

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

Factual Information

On May 11, 1998, about 1820 eastern daylight time, a Cessna 310Q, N7795Q, was destroyed during a collision with terrain on final approach to Boire Field Airport (ASH), Nashua, New Hampshire. The certificated airline transport pilot was seriously injured. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the ferry flight conducted under 14 CFR Part 91.

According to a Federal Aviation Administration (FAA) Inspector, the airplane was refueled at Charleston Yeager Airport (CRW), Charleston, West Virginia on Thursday, May 7, 1998, with 76.8 gallons of fuel to fill the tanks to 163 total gallons. The airplane then flew from CRW to Benedium Airport (CKB), Clarksburg, West Virginia, approximately a 40 minute flight. The airplane remained on the ramp until Monday, May 11, 1999, when it departed CKB for ASH.

The flight departed Benedium Airport at 1510, arrived in the Nashua area with no reported problems, and was cleared for the Instrument Landing System (ILS) approach to runway 14 at ASH. The pilot reported the runway in sight, and was cleared to land on runway 14. The pilot requested a wind check, and after the controller's response, stated that "it seems a little worse here." Shortly thereafter, the controller reported that the airplane disappeared into the trees. A witness, who was waiting for the airplane to arrive, stated that "the airplane appeared a little lower than normal, and all of a sudden, the airplane just dropped out of sight."

A witness working at the airport observed the approach of the airplane. He stated that the airplane appeared to be "right of the centerline." He further stated "at about 200 feet above the trees, the aircraft's descent rate increased considerably and descended wings level into the trees."

The airplane was found 1 1/2 miles from the end of the runway 14 and approximately 150 feet to the right of the glide path centerline. Both wing tip tanks, the left wing from the engine nacelle outboard, and the empennage were separated from the fuselage. The fuselage came to rest approximately 100 feet from the first contact with trees, on a heading of 330 degrees. Flight control continuity was confirmed to the wing and empennage separation areas. No evidence of pre-impact damage was observed in the engines. The propeller blades sustained impact damage, but minimal scratching. The FAA Inspector reported that there was a "minimal smell of fuel throughout the wreckage area."

The airplane was equipped with two main (tip) fuel tanks, two auxiliary fuel tanks, one on each wing, and a wing locker fuel tank on the right nacelle. Examination by an FAA Inspector revealed, both main tanks and both auxiliary tanks were ruptured, and there was "no evidence of fuel" (liquid, fumes, or vegetation burn damage) in the vicinity of these tanks. Approximately 11 1/2 gallons of fuel was drained from the right wing locker fuel tank. The fuel

controls for both engines displayed no fuel and the fuel screens were clean. The spark plugs for all cylinders were clean and dry. The left engine fuel selector valve was in the left auxiliary position and the valve in the wing corresponded with this position. The right engine fuel selector valve was in the left main position; however, the right wing fuel valve was found in the right main position and the push pull rod was bent at the point of tree impact damage on the wing. The wing locker fuel transfer switch was found in the OFF position.

According to the Cessna 310 Owner's Manual, "...Since part of the fuel from the auxiliary tanks is diverted to the main tanks instead of being consumed by the engines, the auxiliary tanks will run dry sooner than anticipated. The auxiliary tanks are designed for cruising flight, and are not equipped with pumps and are not recommended for use near the ground." The manual further stated "...the wing locker fuel is pumped directly into the main tanks with a fuel transfer pump, and the wing locker fuel should not be transferred until there is 180 pounds or less in the main fuel tanks to prevent overflow of the main fuel tank. The transfer pump should be tuned ON only to transfer fuel and turned OFF when the fuel has been transferred."

The Cessna 310 Owner's Manual stated that the endurance for the airplane at 75% BHP, an altitude of 9,000 feet and with 978 pounds of fuel onboard, was 4.75 hours. At 65% BHP, the endurance was 5.3 hours.

In a statement to an FAA Inspector, the pilot said he "does not recall anything about the flight"; however, he stated that his normal procedure for long flights was to "take off on the main tanks, switch to the auxiliary tanks, and land on the main tanks." He further stated that he received his multi-engine rating in the Cessna 310 in 1974, and that he had most of his time in the airplane in the 70's or early 80's. The pilot stated the last time he flew this airplane (make and model) was in the late 80's or possible early 1990.

A special weather observation was reported at 1820, at Boire Field, which indicated variable winds from 010 to 120 degrees at 5 knots, gusting to 12 knots. The observation also contained light rain in progress. At 1855, winds were reported from 340 degrees at 5 knots.

The ILS was flight checked by the FAA and found to be within operational limits. The pilot reported approximately 8,000 total flight hours, 165 hours of which were in this make and model.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	62,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):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	November 6, 1997
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	8000 hours (Total, all aircraft), 200 hours (Total, this make and model), 6524 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N7795Q
Model/Series:	310Q 310Q	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	310Q0405
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	May 5, 1997 Annual	**Certified Max Gross Wt.:**	5200 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-470
Registered Owner:	BARBARA GRAYS	**Rated Power:**	260 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:	BARBOUR GRAYS, INC.	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	ASH ,200 ft msl	**Distance from Accident Site:**	2 Nautical Miles
Observation Time:	18:20 Local	**Direction from Accident Site:**	140°
Lowest Cloud Condition:	Unknown	**Visibility**	7 miles
Lowest Ceiling:	Overcast / 4000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots / 12 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	30°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	10°C / 8°C
Precipitation and Obscuration:	N/A - None - Rain		
Departure Point:	CLARKSBURG , WV (CKB)	**Type of Flight Plan Filed:**	IFR
Destination:	(ASH)	**Type of Clearance:**	IFR
Departure Time:	15:10 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	BOIRE FIELD AIRPORT ASH	**Runway Surface Type:**	Asphalt
Airport Elevation:	200 ft msl	**Runway Surface Condition:**	Dry;Vegetation
Runway Used:	14	**IFR Approach:**	ILS
Runway Length/Width:	5500 ft / 100 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	Cain, Jim
Additional Participating Persons:	TOM SCHULTZ; PORTLAND , ME
Original Publish Date:	March 31, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=28294