Aviation Investigation Final Report

Location:	BROOMFIELD, Colorado	**Accident Number:**	FTW98LA129
Date & Time:	February 14, 1998, 19:49 Local	**Registration:**	N5693M
Aircraft:	Enstrom F-28C-2	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	3 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot said he noticed that the LOW FUEL PRESSURE warning light had illuminated 'along with engine roughness.' Suspecting an imminent fuel pump failure, he turned on the electric fuel pump and diverted toward a nearby airport. While on the initial landing approach, the engine lost power. As the pilot made an autorotation towards an open field, the engine began to surge. Approaching the field, the pilot turned on the landing light and caught a glimpse of powerlines. To avoid a collision, he made a pedal turn to the right. While maneuvering to avoid a collision, the main rotor rpm decayed and the helicopter struck the ground. A postaccident fuel sample taken from the engine sump disclosed water in the fuel. The source of water contamination could not be determined. The helicopter had flown several times that day, and had been serviced by an airport refueling truck. No other reports of fuel contamination were received from aircraft operators serviced by the same truck.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: water contamination in the fuel, which resulted in loss of engine power and a forced (autorotative) landing. Factors relating to the accident were: darkness; and a high obstruction in the emergency landing area.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - NONMECHANICAL
Phase of Operation: CRUISE - NORMAL

Findings
1. (C) FLUID,FUEL - CONTAMINATION,WATER

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

Findings
2. AUTOROTATION - PERFORMED - PILOT IN COMMAND

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

Findings
3. (F) LIGHT CONDITION - DARK NIGHT
4. (F) TERRAIN CONDITION - HIGH OBSTRUCTION(S)
5. MANEUVER TO AVOID OBSTRUCTIONS - PERFORMED
6. ROTOR RPM - NOT ATTAINED

Factual Information

On February 14, 1998, at 1949 mountain standard time, an Enstrom F28C-2, N5693M, registered to and operated by Dominion Corporation, doing business as Denver Helicopter Service, was substantially damaged when it collided with terrain during a forced landing 4 miles west of Broomfield, Colorado. The commercial pilot and two passengers were not injured. Visual meteorological conditions prevailed, and no flight plan had been filed for the personal flight being conducted under Title 14 CFR Part 91. The flight originated at Englewood, Colorado, approximately 30 minutes before the accident.

The following is based on a telephone conversation with the pilot and this investigator, and the accident report submitted by the pilot. The pilot said the flight had proceeded normally for about 30 minutes. He then noticed the LOW FUEL PRESSURE warning light illuminate "along with engine roughness." Suspecting an imminent fuel pump failure, the pilot turned on the electric fuel pump and diverted to Jefferson County Airport. While on the initial landing approach, the engine lost power. As the pilot autorotated towards an open field, the engine began to "surge." As the pilot approached the field, he turned on the landing light and caught a glimpse of powerlines. Fearing a collision, he made a pedal turn to the right. Main rotor rpm decayed and the helicopter struck the ground.

According to Textron Lycoming, the LOW FUEL PRESSURE annunciator light will illuminate when the engine driven fuel pump fails or when fuel pressure drops below a preselected value (usually 3.2 pounds per square inch). Activation of the electric fuel pump is a checklist item before takeoff and landing. Acting independently, both the engine driven and electric fuel pumps will provide sufficient fuel pressure to sustain engine power.

The pilot said a postaccident fuel sample taken from the engine sump disclosed water in the fuel. The source of water contamination could not be determined. The helicopter had flown several times that day, and had been serviced by an airport refueling truck. No other reports of fuel contamination were received from aircraft operators serviced by the same truck.

Pilot Information

Certificate:	Commercial; Flight instructor; Military	**Age:**	33,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):	Airplane multi-engine; Airplane single-engine; Helicopter; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	May 16, 1997
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1331 hours (Total, all aircraft), 29 hours (Total, this make and model), 1114 hours (Pilot In Command, all aircraft), 104 hours (Last 90 days, all aircraft), 56 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Enstrom	**Registration:**	N5693M
Model/Series:	F-28C-2 F-28C-2	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	489-2
Landing Gear Type:	Skid	**Seats:**	3
Date/Type of Last Inspection:	January 22, 1998 100 hour	**Certified Max Gross Wt.:**	2350 lbs
Time Since Last Inspection:	48 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3974 Hrs	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	HIO-360-E1AD
Registered Owner:	DOMINION CORPORATION	**Rated Power:**	205 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:	DENVER HELICOPTER SERVICE	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	BJC ,5670 ft msl	**Distance from Accident Site:**	3 Nautical Miles
Observation Time:	19:48 Local	**Direction from Accident Site:**	10°
Lowest Cloud Condition:	Scattered / 18000 ft AGL	**Visibility**	25 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	70°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	4°C / -4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	ENGLEWOOD , CO (APA)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	19:00 Local	**Type of Airspace:**	Class E

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Scott, Arnold
Additional Participating Persons:	ROBERT M HOFER; DENVER , CO
Original Publish Date:	June 26, 1998
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=20538