Aviation Investigation Final Report

Location:	SOUR LAKE, Texas	**Accident Number:**	FTW99TA194
Date & Time:	July 17, 1999, 16:30 Local	**Registration:**	N4002G
Aircraft:	Bell 47G-3B-1	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The helicopter lost engine power during takeoff due to contaminated fuel. The commercial helicopter pilot stated that the night before the accident flight, the fueling truck, which contained three tanks (one each for water, chemicals, and fuel), was checked. The pilot stated that the fuel appeared 'normal' that night. The following day, prior to the accident flight, the helicopter was 'refueled without sumping the tanks.' The pilot added that during takeoff, the engine lost power about 50 feet above the ground, at 30 miles per hour. He executed an autorotation to the ground where the main rotor blades impacted the tail boom and the tail rotor blades contacted the ground. The pilot stated that he found 20 gallons of water in the helicopter's fuel tank after the accident. He added that he discovered the fuel truck had a crack in between the water and fuel tanks. Approximately 80 gallons of water had leaked into the truck's fuel tank. The fuel truck was 'supposed to have an aqua stop filter installed that will not pump if water is present but the wrong filter was installed.'

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to adequately preflight the helicopter's fuel system resulting in the total loss of engine power as a result of water contamination. Factors were the incorrect filter installed on the fueling truck and the pilot's improper touchdown technique.

Findings

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

Findings
1. (F) AIRPORT FACILITIES,REFUELING TRUCK/EQUIPMENT - OTHER
2. (C) AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
3. (C) FUEL SYSTEM,TANK - CONTAMINATION,WATER

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

Findings
4. AUTOROTATION - INITIATED - PILOT IN COMMAND

Occurrence #3: HARD LANDING
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Findings
5. (F) TOUCHDOWN - IMPROPER - PILOT IN COMMAND
6. MISC ROTORCRAFT,TAIL BOOM - SEPARATION

Factual Information

On July 17, 1999, at 1630 central daylight time, a Bell 47G-3B-1 agricultural helicopter, N4002G, was substantially damaged during a forced landing following a loss of power during takeoff climb near Sour Lake, Texas. The commercial helicopter pilot, sole occupant, was not injured. The helicopter was owned and operated by Precision Air Services, Inc., of Selma, Alabama. Visual meteorological conditions prevailed and a flight plan was not filed for the 14 Code of Federal Regulations Part 137 aerial application flight. The helicopter was departing for a local flight at the time of the accident.

During a telephone interview conducted by the NTSB investigator-in-charge, the pilot reported that the night before the accident flight, he checked the fueling truck, which contained three tanks: one each for water, chemicals, and fuel. The pilot stated that the fuel appeared "normal" that night. The following day, prior to the accident flight, the helicopter was "refueled without sumping the tanks." The pilot stated that during takeoff, the engine lost power about 50 feet above the ground, at 30 miles per hour. He executed an autorotation to the ground where the main rotor blades impacted the tail boom and the tail rotor blades contacted the ground. The pilot reported that the main rotor blades were damaged, the tail rotor blades were "destroyed", and the tail boom was severed.

The pilot added that he found about "20 gallons of water in the helicopter's fuel tank" after the accident. The pilot examined the truck's tanks and found a crack between the water and fuel tanks. The pilot estimated that "80 gallons of water had leaked into the truck's fuel tank." In the enclosed Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1/2), the pilot added that the fueling truck was supposed to have an "aqua stop filter installed that will not pump if water is present but the wrong filter was installed."

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	52,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	December 14, 1998
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	11549 hours (Total, all aircraft), 500 hours (Total, this make and model), 11349 hours (Pilot In Command, all aircraft), 170 hours (Last 90 days, all aircraft), 85 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N4002G
Model/Series:	47G-3B-1 47G-3B-1	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	6529
Landing Gear Type:	Skid	**Seats:**	1
Date/Type of Last Inspection:	March 20, 1999 Annual	**Certified Max Gross Wt.:**	3200 lbs
Time Since Last Inspection:	155 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	10013 Hrs	**Engine Manufacturer:**	Allison
ELT:	Not installed	**Engine Model/Series:**	T63-A700
Registered Owner:	PRECISION AIR SERVICES, INC.	**Rated Power:**	317 Horsepower
Operator:		**Operating Certificate(s) Held:**	
Operator Does Business As:	PRECISION AIR SERVICES, INC.	**Operator Designator Code:**	ZIOG

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BPT ,16 ft msl	**Distance from Accident Site:**	22 Nautical Miles
Observation Time:	16:53 Local	**Direction from Accident Site:**	122°
Lowest Cloud Condition:	Scattered / 3000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	29°C / 24°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(NONE)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	16:29 Local	**Type of Airspace:**	Class G

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:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	30.130115,-94.400825(est)

Administrative Information

Investigator In Charge (IIC):	Lupino, Nicole
Additional Participating Persons:	JACOB D JOHNSON; HOUSTON , TX
Original Publish Date:	November 30, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=46855