Aviation Investigation Final Report

Location:	Clear, Alaska	**Accident Number:**	ANC01TA076
Date & Time:	June 26, 2001, 18:58 Local	**Registration:**	N5017H
Aircraft:	Bell 212	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	3 None
Flight Conducted Under:	Public aircraft		

Analysis

The pilot was flying a twin engine helicopter that was lightly loaded. He was flying in close proximity to a helipad, waiting for another helicopter to leave the pad, when he reported he had a loss of engine power in the number two engine. Although the helicopter's operations manual specified that the helicopter was easily capable of sustaining flight, and even of initiating a rate of climb somewhere between 550 and 700 feet per minute, the pilot elected to make an immediate landing into a confined area. During the descent, the helicopter collided with trees, and sustained substantial damage. An examination of the engines disclosed that an improper bleed air flow jet was left installed in the engine's automatic fuel control unit (AFCU), contrary to a service bulletin from the manufacturer. The presence of the air flow jet resulted in a substandard fuel flow pressure, and the potential for a loss of engine power.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's selection of an unsuitable landing site following a partial loss of power during approach to landing in a multiengine helicopter. Factors associated with the accident are an automatic fuel control unit that had a restricted fuel flow due to an improperly complied with service bulletin, and the pilot's improper single engine emergency procedures.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF
Phase of Operation: APPROACH

Findings
1. (F) FUEL SYSTEM,FUEL CONTROL - FLOW RESTRICTED
2. (F) MAINTENANCE,SERVICE BULLETIN/LETTER - NOT COMPLIED WITH

Occurrence #2: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: EMERGENCY LANDING

Findings
3. OBJECT - TREE(S)
4. (C) UNSUITABLE TERRAIN OR TAKEOFF/LANDING/TAXI AREA - SELECTED - PILOT IN COMMAND
5. (F) EMERGENCY PROCEDURE - IMPROPER - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On June 26, 2001, about 1858 Alaska daylight time, A Bell model 212 helicopter, N5017H, owned by Evergreen Equity, Inc., McMinnvinville, Oregon, and operated by the State of Alaska under an extended exclusive-use contract, sustained substantial damage following a reported loss of engine power, and a subsequent precautionary landing to an off-airport site about 8 miles east-northeast of Clear, Alaska. The airline transport certificated pilot and the two passengers were not injured. The public use flight was being operated in support of a fire suppression effort by the State of Alaska, Division of Forestry. Visual meteorological conditions prevailed at the time of the accident, and company flight following procedures were in effect. Postaccident inspection of the helicopter disclosed damage to both main rotor blades, and the left horizontal stabilizer.

The pilot was interviewed by the NTSB investigator-in-charge (IIC) on June 29, at the offices of Evergreen Helicopters of Alaska, Anchorage, Alaska. Present during the interview were all parties to the investigation. According to the pilot, he was tasked with transporting fire fighters from helipad 30. He departed with two passengers from his nearby base of operations about 1850 for the short flight. As he approached helipad 30, he said he saw another helicopter occupying the landing area, and he began a close orbit, waiting for the other helicopter to leave. Shortly thereafter, while flying approximately 400 feet above the ground at 50 knots indicated airspeed, he reported he heard what he believes was a low-rotor rpm warning, saw a master caution light illuminate on the annunciator panel, and that the number 2 engine torque indicator was low. He said he elected to land the helicopter at a nearby field. During the landing approach, he said ground debris and ashes blown by the rotor obscured his vision, and the helicopter's main rotor blades struck unseen trees. The pilot also said prior to the loss of engine power, he had been busy monitoring and talking on the helicopter's radio, and may have missed the initial rotor speed rpm decline. He said he had no idea what had caused the loss of engine power, and that he was unaware of any pre-existing mechanical problems with the helicopter.

The helicopter was inspected at the accident site on June 27 by an FAA aviation safety inspector, and on June 28 by an air safety investigator from the Office of Aircraft Services (OAS). Both individuals reported to the NTSB IIC that there were no obvious signs of what precipitated the loss of engine power, and that there was an adequate amount of fuel aboard to operate the helicopter's two (twin-pack) turbine engines. The OAS investigator arranged for a quantity of fuel from the helicopter's internal fuel tanks, and the tank from which the helicopter had been fueled, to be tested for contamination and conformity. Both samples were uncontaminated and met specificity standards.

The helicopter was transported to the owner's maintenance facility in Anchorage, Alaska, on July 5, and inspected by an NTSB investigator from the Anchorage office on July 12. Also present at the inspection were all the parties to the investigation, except the OAS investigator, who had returned to his headquarters in Boise, Idaho. The inspection and partial disassembly disclosed no apparent preimpact mechanical anomalies. The engines were removed from the fuselage and sent, still assembled in their twin-pack configuration, to Dallas Airmotive, Dallas, Texas. Dallas Airmotive is a Pratt and Whitney authorized overhaul facility.

Inspection of the engines was overseen by an FAA airworthiness inspector from the Dallas Flight Standards District Office. Inspection disclosed no evidence of catastrophic mechanical failure. The number two engine automatic fuel control unit (AFCU) was flow tested in an as-received condition prior to disassembly. It was noted that a Px jet was placed in the AFCU's bleed air system, and the AFCU did not meet factory acceptable calibration specifications. Specifically, it had reduced fuel flow, approximately 25 pounds per hour below the minimum limits. According to a report issued by the Dallas Airmotive manager of project engineering, this discrepancy " would predominantly affect starting fuel flow but probably also caused the drop in power turbine speed. Subsequent disassembly, with an FAA representative witnessing, revealed installation of a Px jet, part number 2525107-54, in the Px fitting; this jet should not have been installed, as the fuel control had been modified in accordance with Service Bulletin 73-15 which, among other things, removes the jet. Once the jet was removed from the fitting, fuel flows returned to normal."

The number two engine's AFCU, part 3244721-9, was manufactured by Honeywell-Allied Signal Aerospace, and according to an FAA Airworthiness Approval Tag, was repaired and functionally tested on October 7, 1997, at Allied Signal Aerospace, Burbank, California. It was installed on the accident helicopter July 30, 1999, and at the time of the accident, had 1,541 service hours remaining until overhaul limits. The service bulletin noted above, 3020530-73-15, was dated January 15, 1988, and was issued by Allied Signal Aerospace.

A review of the helicopter's maintenance records for the previous 30 days prior to the accident disclosed no evidence of any significant mechanical anomalies.

PERSONNEL INFORMATION

The pilot of the helicopter reported that his total flight experience was in excess of 10,000 hours, with over 8,000 hours in helicopters, and over 1,000 hours in the Bell 212. Company training records show that his VFR pilot-in-command check ride, to comply with FAA regulation 135.293, was administered in a Bell 212 by a company check airman on August 22, 2000. Emergency procedures, including single engine operations, were noted as being included in the flight check. Company records also disclosed that the pilot received ground instruction on March 7, 2001, that included a review of the single engine emergency operations contained in the Bell 212's flight operations manual.

ADDITIONAL INFORMATION

Information provided by the pilot and operator indicated that the helicopter's gross weight at the time of the accident was approximately 9,170 pounds, and the pressure altitude approximately 700 feet. The accident helicopter's Flight Operations Manual, under "Emergency-Engine Failure" states, in part: "Flight can be continued on remaining engine until a desirable landing site is available. Refer to performance charts in section 5." Section 5 notes single engine performance specifications. At a gross weight of 9,000 pounds, at a pressure altitude of 700 feet, and an outside air temperature of 80 degrees F; the performance tables indicate the helicopter should be capable of a single engine rate of climb of approximately 700 feet per minute. At a gross weight of 10,000 pounds, the maximum rate of climb is approximately 550 feet per minute.

Pilot Information

Certificate:	Airline transport; Commercial	**Age:**	50,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Glider; Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	October 31, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	February 10, 2001
Flight Time:	10000 hours (Total, all aircraft), 1000 hours (Total, this make and model), 8000 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft), 47 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N5017H
Model/Series:	212	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	30930
Landing Gear Type:	Skid	**Seats:**	9
Date/Type of Last Inspection:	June 25, 2001 AAIP	**Certified Max Gross Wt.:**	11200 lbs
Time Since Last Inspection:	5.6 Hrs	**Engines:**	2 Turbo shaft
Airframe Total Time:	10002 Hrs at time of accident	**Engine Manufacturer:**	P&W
ELT:	Installed, not activated	**Engine Model/Series:**	PT6T-3
Registered Owner:	Evergreen Equity, Inc.	**Rated Power:**	1290 Horsepower
Operator:	State of Alaska, Division of Forestry	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Scattered / 2500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	27°C
Precipitation and Obscuration:	N/A - None - Smoke		
Departure Point:	Clear, AK	**Type of Flight Plan Filed:**	Company VFR
Destination:	Clear, AK	**Type of Clearance:**	None
Departure Time:	18:50 Local	**Type of Airspace:**	Class G

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:**	64.33361,-148.85028

Administrative Information

Investigator In Charge (IIC):	La belle, James
Additional Participating Persons:	Scott R Erickson; NTSB; Anchorage, AK Larry Brosan; Office of Aircraft Services (DOI); Boise, ID Matt Tomter; State of Alaska, Division of Forestry; Anchorage, AK Rodney Russell; State of Alaska, Division of Forestry ; Anchorage, AK Gerald Rock; Evergreen Helicopters; Anchorage, AK Bruce McWhorter; Evergreen Helicopters; Anchorage, AK Antonio Estrada; FAA; Dallas, TX
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