



MEMORANDUM FOR RECORD

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Office of Aviation Safety – Western Pacific Region

NTSB Accident Number: WPR21LA268
Aircraft Registration & Make/Model: N911KW Bell 212
Accident Location: Weed, California
Accident Date: July 7, 2021

Narrative:

The following are excerpts from the twin-pack [2 power sections and 1 combine reduction gearbox] examination report that was performed from November 21-23, 2022, at the Pratt and Whitney Canada (P&WC) Service Investigation Facility, in Saint-Hubert, Quebec, Canada. A Transport Safety Board investigator provided oversight.

Twin Pack Assembly Information: PT6T-3B

No.1 Power Section (PS), Left Engine
Serial No.: CP-PS 63039

No. 2 Power Section (PS), Right Engine
Serial No.: CP-PS 62106

Combine Reduction Gearbox (RGB)
Serial No. CP-GB 2529

Accident Synopsis

On July 7th, 2021, about 1450 pacific daylight time, a Bell 212 helicopter, N911KW, was substantially damaged when it was involved in an accident near Weed, California State, USA. The pilot was not injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 133, external load flight. The pilot reported that he was on approach to a lake to retrieve water for a water bucket drop operation. As he continued the approach, about 400 feet above the ground, the instruments scanned normal. When the helicopter crossed the

shoreline, he placed his head in the left door bubble and visualized that the 100-foot line and bucket were slightly trailing the helicopter. Shortly after, he felt a “stronger than typical” lateral “one per” revolution vibration. He aborted the water retrieval and intended to return to base, however, the helicopter began to settle. He applied forward cyclic input and raised the collective, but the helicopter continued to descend. He quickly realized that he would not fly out of the descent, so he concentrated on a forced water landing. After he leveled the helicopter and the skids touched down on the water, he made a last attempt to takeoff, but the helicopter settled in the lake. He reduced both throttle settings to idle in preparation to ditch the helicopter and applied right cyclic as the main rotors slowed. The helicopter rolled right, and the main rotor blades struck the water. He waited for movement to cease and then exited out the left door and swam safely to shore. The helicopter was submerged in the lake.

Summary of Findings

Both Power Sections (PS) N1 (Compressor Speed) and N2 (Power turbine speed) spools and the Combine Reduction Gearbox (RGB) were seized due to internal corrosion resulting from the Twin-pack water immersion and long-term storage. During the disassembly water was drained from various housings and tubes, sludge / organic debris was observed in various PS and RGB cavities.

The deformation observed to the no.1 PS Gas Generator Case (GGC) and to the no.2 PS exhaust case, suggest that a torsional deformation of the airframe upper deck occurred between the PS and the RGB attaching point during the aircraft impact / accident.

In addition to the observed external deformations, the 9 o'clock movement contact signature observed to both PS power turbine disk and blades with their respective adjacent parts, suggest that the RGB airframe upper deck attaching points had moved towards the airframe port side during the impact / accident.

The no.1 PS contact signature observed between the compressor turbine (CT) blades firtree and the power turbine (PT) vane ring inner rim / baffle leading edge side is believed to be secondary to the GGC deformation.

The CT blades tip contact is believed to be secondary to the CT vane ring and the CT shroud segments housing crack and burnt area which is resulting from the engine operation.

Due to the degrees of corrosion observed to the no.1 engine hardware, it has not been possible to identify the origin of the particles collected on the AGB chip detector. However, since the hardware integrity was visually acceptable, it is not believed that the particle origin would have impacted the engine operability.

The damage observed to the automatic fuel control unit (AFCU) Pg (Pneumatic pressure to N1 governor) damper and to the fuel pump shaft seal drain tubes are secondary to the AFCU and manual fuel control unit (MFCU) to fuel pump retaining flange fracture at impact.

The fact that there is no oil leakage indication noticed adjacent to the no.1 PS fuel oil heat exchanger (FOHE) hardware, suggest that the partially extracted inserts are secondary to the event.

Conclusion

The review of the engine hardware did not show indication that would have prevented normal operation of the engine prior to the accident.

Remark

This PT6T-3B Twin-pack was submerged in fresh water and was at rest for 16 months after been extracted from water and before being investigated. During the Twin-pack disassembly, water was drained from various cavities and tubes. The long-term water exposure had induced corrosion and sludge / organic matter formation. Therefore, corrosion was observed on various internal hardware (gears, bearings & shafts), while sludge / organic matter was observed inside housings and cavities. Note, this report will not provide additional comments regarding the corrosion resulting from the post event water exposure and will therefore purposely evaluate and concentrate on the hardware integrity and functionality.