Communication Summary

Information from: Mr. Xavier de Gastines, BEA

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Summary & Factual Information: Mr. de Gastines was asked to have the examination of the 4 actuators and hydraulic pump overseen. Additionally, the BEA reviewed and analyzed the sound from the parking lot cameras and from the Appareo unit.

He, in part, provided information that reported the pump was received complete and disassembled. The pump's label was missing. However, the assembly screws present were used after October 1999. Part of the driving gear assembly was machined in April 2010. Visual examination of the components of the pump showed no abnormal indications, obvious wear, or defect. The seals were visually in good condition. The pump was reassembled in order to be tested on a hydraulic test bench. The pump met the specification a new pump.

The examination of the 3 main rotor actuators and the tail rotor actuator revealed the damage they sustained was consistent with impact damage. No pre impact damage was found.

The spectral analysis showed that the acoustic signature of both the main and the tail rotors seems to be nominal until the end of the recording. Engine condition and speed could not be determined from the data provided to the BEA.

The sudden decrease of the frequencies detected 7.5s before the end of the flight (at 32.5s video surveillance time) was most likely due to a change of the helicopter heading; it was then followed by a slight reduction of the rotor speed. About 3.5 seconds before the impact the helicopter experienced a sharp increase of its rotor speed reaching in 2.5 seconds the average value of 125% NR.

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I can attest that the above summary is correct to the best of my knowledge:

**Edward F. Malinowski**
**National Transportation Safety Board**
**Air Safety Investigator**