

May 20, 2020

National Transportation Safety Board
Mr. Van McKenny
490 L'Enfant Plaza, SW
Washington, DC 20594

Subject: Submission for NTSB Accident # WPR16FA055

Aircraft: EC130 T2, S/N: 0870
Registration: N11VQ
Date: January 17, 2016
Location: Hanalei, Hawaii
Operator: Blue Hawaiian Helicopters

Dear Mr. McKenny,

Airbus Helicopters thanks the NTSB for the opportunity to participate in the investigation of the subject accident as a technical advisor to the French Bureau d'Enquêtes et d'Analyses (BEA). As the investigation concludes, Airbus Helicopters would like to take the opportunity to submit key findings and causal/contributing factors for the accident based on facts gathered during the investigation.

Findings:

Following are key findings:

1. According to Blue Hawaiian Helicopters, they utilize an FAA approved aircraft inspection program (AAIP) for the EC130 aircraft. As specified under their AAIP program, the starter-generator is to be inspected every 150 flight hours. Blue Hawaiian reported that during this inspection they remove the starter-generator. Thus, the starter-generator would have been removed 4 times more than what is requested by the Airbus Helicopters / Thales documentation (requesting to remove it each 600 flight hours for the same inspection).
2. According to Blue Hawaiian, a 150 hour inspection occurred approximately 60 flight hours before the accident. During this inspection, the starter generator was reportedly removed from the engine and checked for its general condition, terminal lug covers, and security clamp.
3. Blue Hawaiian stated that during this inspection at (AAIP 10.20), the brushes on the starter-generator are normally inspected and measured in accordance with the Component Maintenance Manual (CMM) 80.19.02. Per Blue Hawaiian's AAIP: *"If brush length is in the red (higher wear than in the yellow range), when utilizing the measuring tool, the starter is to be replaced if available, not brushes."*
4. The Blue Hawaiian AAIP criteria are different than those of Airbus Helicopters or the Thales CMM maintenance instruction which request to replace the brushes if they are in the yellow range and replace the complete starter generator if the brushes are in the red range of the measuring tool (note: THALES CMM 80-19-20 5003).

Discussion of causal and contributing factors:

The investigation team considered and researched the surrounding possible causes that could have led to the accident. As the investigation concludes, Airbus Helicopters submits the following discussion for consideration as the NTSB determines the probable cause and contributing factors of the accident:

1. According to the above noted information, if the starter-generator was indeed removed during the last 150 flight hour inspection (around 60 flight hours before the accident), Airbus Helicopters believes there should have been a detailed description of what was observed by the technician(s) who conducted the job during this inspection.
2. In addition to the starter-generator brushes check, during the 150 hour inspection, according to their AAIP, the technician(s) were also requested to perform a general inspection of the starter-generator. According to Blue Hawaiian's Director of Maintenance at the time, it was noted that they were familiar with some cases of radial play issues on the coupling shaft, and it appears that the starter-generators were already being removed for this reason; at the AAIP 150 inspection, the maintenance [technicians] would, "...also generally feel the starter-generator drive shaft for play as they have found other starter-generator with play in the shaft and removed them for this type of defect."
3. Considering what was observed during the removal of the starter-generator after the accident (significant amount of black oily/greasy substance composed of engine oil/bearing Loctite, grease, carbon powder and metal particles found in the vicinity of the engine to starter-generator interface and significant radial play), it seems improbable that, if the removal had been performed, no specific observation of anything like this would have been made during this inspection.
4. In addition, Airbus Helicopters believes there is a lack of clarity in the Blue Hawaiian FAA AAIP 150 hour inspection; it is noted that when a removal is requested, the word "Remove" is clearly indicated at the beginning of the task (Example task: 7.1, 7.15, 7.21, 9.10, etc...). And when there is a "check" or "inspect," it is implied there is no request to "remove" a component when there should be in order to accomplish the "inspection" or "check." On the contrary, Airbus Helicopters AMM 80-00-02, 4.1, "CHECK OF THE THALES STARTER GENERATOR BRUSHES makes it clear in the opening Job Set-up that one must "Remove the starter-generator" (Step 5) in order to check the brushes.
5. This lack of clarity and confusion of wording of the Blue Hawaiian FAA AAIP 150 hour inspection could misguide a technician's effort when performing the starter-generator inspection and brushes check. 1) The bold print words "**without removal**" at the end of the opening sentence of the Blue Hawaiian FAA AAIP 150 hour inspection related to the starter-generator refers not to the starter-generator itself, but to the brushes (reference AAIP Task: 10.20). 2) The task also begins with the words "check" (which again implies no removal, per the above) and later asks: "*If the brush length is in the red, change starter generator if available, not the brushes.*" The term "if available" is not in line with the Airbus Helicopters / Thales maintenance, as when the brushes are in the red, there is no alternative; the starter-generator must be replaced.
6. Airbus Helicopters is unsure why Blue Hawaiian decided to significantly increase the frequency and workload of removing the starter-generator in their AAIP program every 150 hours, 4-times

more than what is requested by the Airbus Helicopters / Thales documentation. This is usually not the objective of an AAIP for which the purpose is to allow a more efficient inspection program, reduce downtime and to be more cost effective when compared to the cost of a normal interval inspection. It is Airbus's position that greater maintenance operation than requested could introduce an unintended source of error and other consequences in maintenance even if this possible contributing factor has not been identified in the course of this investigation. Furthermore, there was no reason seen by Airbus Helicopters or Thales (based on the reported behavior of the starter-generator until the accident) to justify the reduced removal interval to 150 flight hours.

7. It was further noted that the removal of the starter-generator was not recorded anywhere in the N11VQ starter-generator documentation as it should be for such equipment with a log card. (Refer to the STANDARD PRACTICES MANUAL (MTC) 20-08-05 -101 and -102)

Airbus Helicopters respectfully requests that this submission be published in the NTSB's public docket for the subject accident.

Thank you for your consideration.

Sincerely,



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