

INVESTIGATION REPORT	Preliminary ☐ Final ☒
-----------------------------	---

Accident ☒

Incident ☐

Reference	RA-2013-295	Commercial File	
Accident / Incident report	A-2013-017 / WPR14LA038	Preliminary Information report A(I)	

Data				
Date of occurrence	Occurrence place	Operator		
29OCT13	Kailua/Kona, Hawaii	Hawaii Life Flight		
Aircraft type	S/N	Registration		
Eurocopter AS350B3	3332	N985EW		
Engine type	S/N	TSN	TSO	
Arriel 2B	22155	2634.0	N/A	
Accessories				
Designation, P/N	S/N	Work performed	TSN	TSO
P/N:70BMB01030	799	Download	N/A	N/A
Circumstances reported to TURBOMECA				
During the approach, at approximately 400 ft from the ground, during a training flight in manual mode, the NR started decreasing. The pilot moved the twist grip to the maximum fuel flow, but the engine did not respond. The aircraft forcefully hit the ground and lost the tail boom.				
Conclusion				
The engine was tested in attempt to confirm the pilot's report that the engine quit while performing governor failure training in manual mode. Several tests were performed in both automatic and manual mode intended to simulate the potential conditions of the accident flight. No anomalies or un-commanded shutdowns were experienced and the engine tested within all OEM parameters examined. The DECU was also examined but no faults were recorded during the accident flight. The pilot's report of an un-commanded shutdown could not be duplicated.				

VALIDATION		APPROVAL	
DATE		DATE	
16DEC13	DVO / TEA		

SUMMARY

1 HISTORY

1.1 TECHNICAL DOCUMENTATION

Modular composition:

Modules	S/N	TSN	TSO	CSN	CSO	Remarks
70BMO12000	00435	2634	N/A	N/A	N/A	
70BMO22010	00440	2634	N/A	N/A	N/A	
70BMO32010	00456	2634	N/A	N/A	N/A	
70BMO41720	00434	2634	N/A	N/A	N/A	
70BMO52000	00439	2634	N/A	N/A	N/A	
Items	P/N	S/N	Remarks			
HMU	0292860750	271B				

Remarks:

1.2 UPDATED CIRCUMSTANCES

On October 29, 2013, at 1717 Hawaiian standard time, a Eurocopter France AS-350 B3 helicopter, N985EW, was substantially damaged when it landed hard following a loss of main rotor rpm at Kona International Airport, Kailua/Kona, Hawaii. The flight instructor received minor injuries and the commercial pilot receiving training was not injured. The helicopter was being operated by Air Medical Resource Group under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the local instructional flight, which had been airborne for about 17 minutes. A flight plan had not been filed for the flight.

The flight instructor reported that the purpose of the flight was to practice the emergency procedure for failure of the engine's electronic fuel governor. The instructor moved the Auto/Man switch to the Man (manual) position when the helicopter was on the ground with the engine running. The pilot receiving instruction took off and flew for about 10 minutes to gain familiarity with operating the twist-grip throttle. While on final approach, the pilot receiving training noted a drop in the main rotor rpm. He applied full wrist-grip throttle, but the rotor rpm continued to decline. The flight instructor then attempted to increase his wrist-grip throttle, but it was already in the full position. The helicopter landed hard, and the tail boom separated from the fuselage.

1.3 RESULTS OF FIELD INVESTIGATION (ACCIDENT)

Turbomeca Accident Investigation did not travel to the accident site.

2 REVIEW OF INVESTIGATION

Description of equipment	P/N S/N	Date of review	Work performed	In the presence of
DECU	70BMB01030 / 799	12DEC13	Download	FAA RD
Engine	0292	12DEC13	Bench Test	FAA RD

2.1 ENGINE EXAMINATION

2.1.1 Findings on arrival

A boroscope was used to determine the internal condition of the engine to ensure it was safe to run on the test bench. The boroscope did not reveal any damage that had been caused by the accident.

2.1.2 Engine testing

The engine was configured for the test cell by removing airframe equipment and free wheel shaft. The engine was left as undisturbed as possible (fuel filter ect) to best represent any conditions that were present during the accident flight. Preliminary checks were performed such as oil pressure and vibration check and were satisfactory in accordance with OEM documentation. The engine was then auto-started and the following tests were performed:

Stability – Checks the stability of the HMU effect on gas generator speed at flight idle. Criteria = < 2%. Results 0.43% Conforming

Ancillary System – Checks the operation of the manual emergency throttle by checking the minimum flameout position of the HMU to ensure no flameout and by accelerating from minimum torque load to T45M of 1123K in less than 1 second with no surge.

Deceleration from 850°C T45 to minimum fuel flow position in manual mode. Criteria = 32 – 40 l/h no flameout. Results 37.3 l/h no flameout Conforming

Acceleration from minimum torque (flight idle) to 850°C T45 in manual mode. Criteria = No surging. Results No Surging. Conforming

Mixed mode test – Checks that in automatic mode if the emergency throttle is moved inadvertently < 8° that it will have no effect on fuel flow.

Criteria Throttle decrease < 250 rpm Ng. Results 25.7 rpm. Conforming

Criteria Throttle increase < 250 rpm Ng. Results 32.1 rpm. Conforming

Engine removed from Test Cell and a post run inspection was performed. The engine was then placed back in the shipping crate along with the VEMD and DECU and placed back in secure storage.

2.2 EQUIPMENT

2.2.1 Testing (equipment)

Prior to the engine test, a DECU download was performed. A real time check of the DECU hardware / software was performed to ensure the DECU was operating properly, which checked good. A download of the recorded faults did not reveal any discrepancies during the accident flight. A fault was artificially generated in order to determine that the last faults shown were sequential with past power ups. A download of the VEMD at American Eurocopter matched the results of the DECU download at Turbomeca USA.

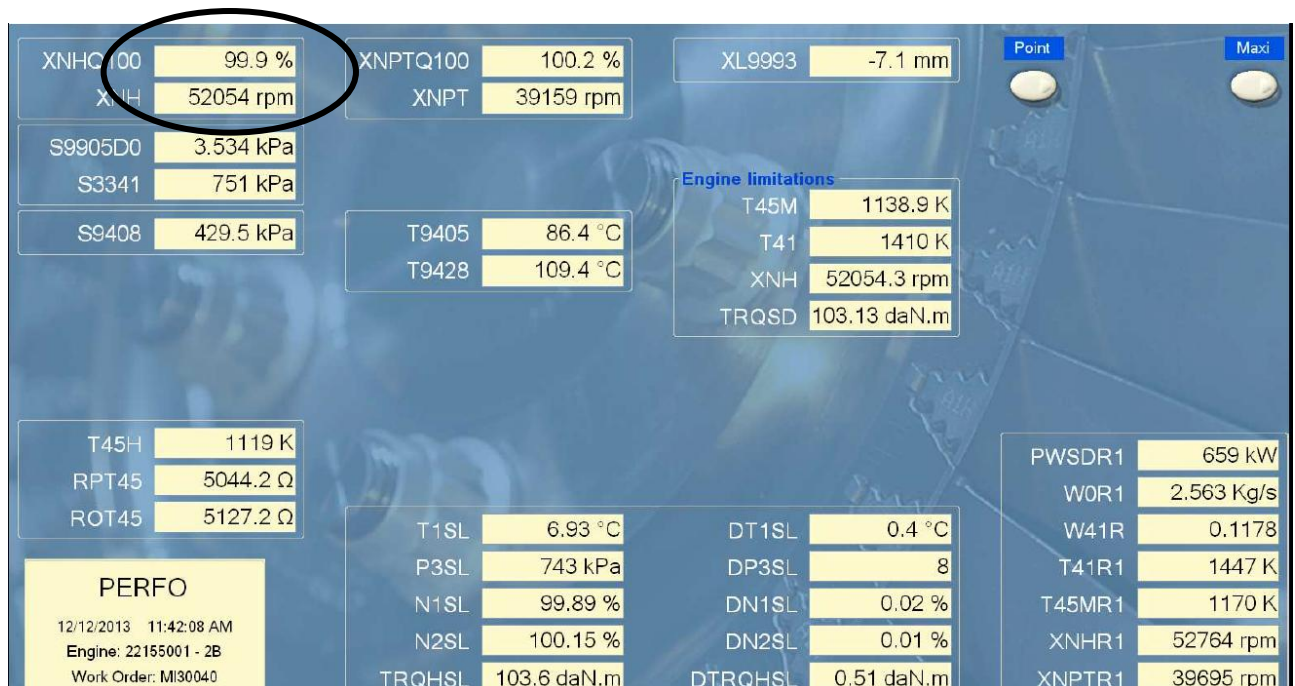
(DECU) Digital Engine Control Unit

2.3 ADDITIONAL EXAMINATIONS

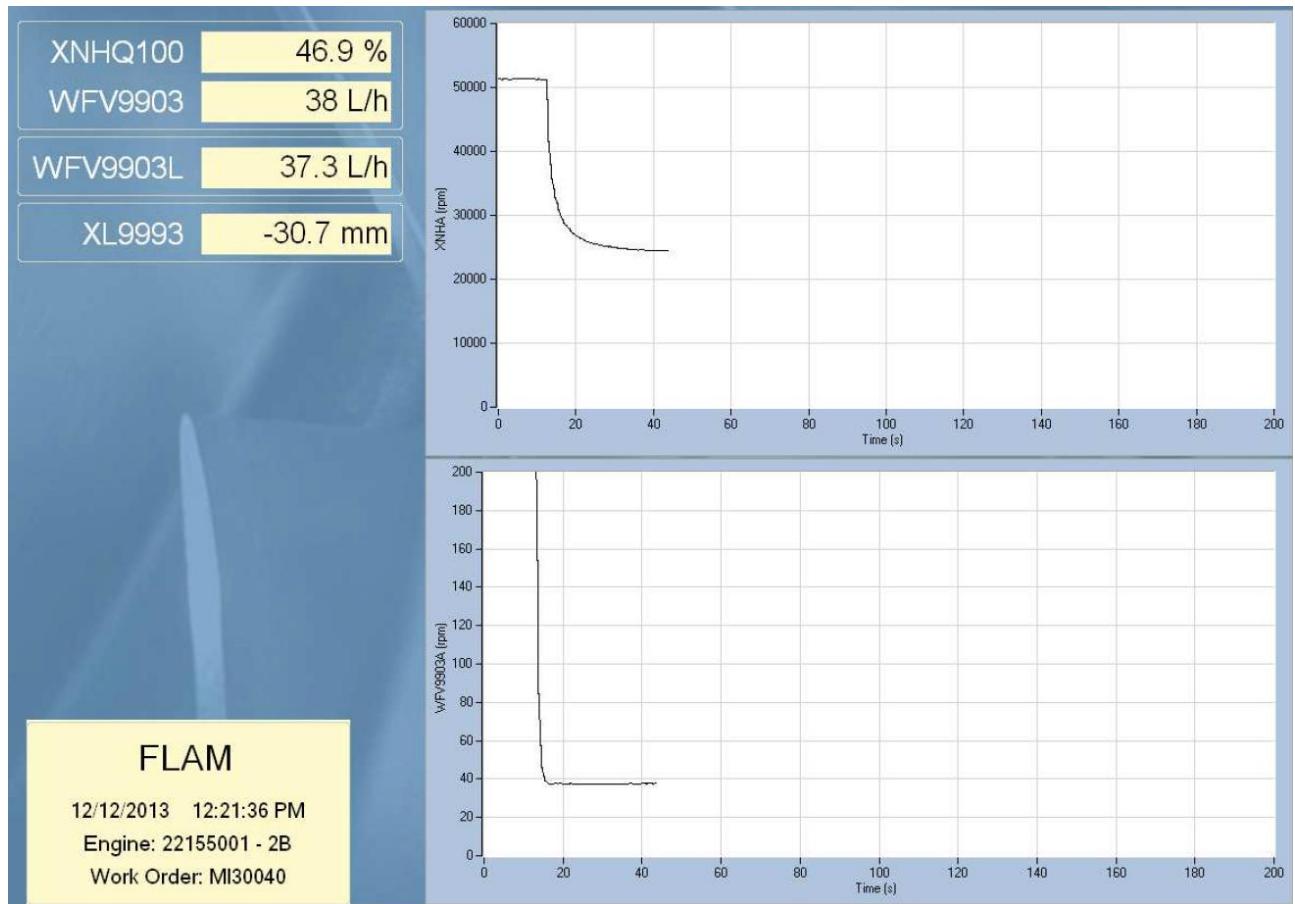
VEMD examination at American Eurocopter. Please see Eurocopter report for details.

(VEMD) Vehicle Engine Multi Display

3 PICTURES



Engine at 99.9% Ng



Minimum fuel flow. No flameout. (Manual Mode)



Point accelerated to from min torque load in < 1 second (Manual Mode)

Commercial file:

ENR 0699_H

This document and the information contained are Turbomeca property and shall not be copied or disclosed to any third party without Turbomeca prior written authorization.