

Newsletter Human Factors recurrent training – February 2018

The DHC Dash 8 airplane was on its flight from airport A, just released from the paint shop, to airport B where it was scheduled for a base maintenance event.

During the flight, the flight crew experienced a significant oil leak from the RH engine, suddenly followed by the loss of oil pressure. They decided to shut down the engine and to proceed their flight to the destination airport.

Suddenly, the flight crew noticed oil leaks from LH engine too, together with fluctuating oil pressure. They immediately started the diversion to a nearby alternate airport where they managed to land safely.

The subsequent investigation revealed that the oil leaks were caused by damaged O-rings at the oil cooler fittings on both engines.

Both the oil coolers had been removed and refitted during a previous maintenance event at airport B, just before leaving for the painting. It's almost sure that the O-rings were damaged during the oil coolers installation.

Further investigation revealed that both oil coolers were removed for a defect rectification and then refitted by the same person who was also working overtime.

Despite the AMM calls for an engine ground run to be carried out to check for oil leaks, the person forgot to enter the requirement into the job card he was using. In fact, each task on the "defect job card" was written by the individual who performed it, rather than all tasks being pre-planned. So the engine ground runs and oil leak checks were not carried out.

Six recommendations were issued by the UK-CAA at the end of their investigation.



Oil leaks from one of the engines



Some of the damaged O-rings

One aspect that I'd like to stress is the concept of "critical maintenance tasks" and the requirement given on Part 145.A.48:

"The organisation shall establish procedures to ensure that:

- (a) after completion of maintenance a general verification is carried out to ensure that the aircraft or component is clear of all tools, equipment and any extraneous parts or material, and that all access panels removed have been refitted;*
- (b) an error capturing method is implemented after the performance of any critical maintenance task;*
- (c) the risk of multiple errors during maintenance and the risk of errors being repeated in identical maintenance tasks are minimised; and,*
- (d) ... "*

Items (b) and (c) are very important and they have played a role on this event. A maintenance organization:

- shall plan in advance for the tasks to be performed, allowing for the availability of the resources needed, including the personnel with the required competence and in the proper quantity;
- shall not leave the preparation of the job cards to the mechanics as their focus may not be on planning and they may be distracted by different tasks to be completed, even under time-pressure;
- shall plan in advance for the need of carrying out additional inspections, including the availability of properly qualified personnel for such inspections;
- shall have a system in place to capture errors and use this system as a source for determining which are their own critical maintenance tasks (that may not only be limited to flight and engine controls, as many are considering).

This event came into my mind because I've recently been assigned to inspect the airworthiness of a DHC Dash 8 airplane on behalf of a customer.



The aircraft today has a new life in Kenia

The aircraft registration remembered me something and I've finally found that my aircraft was actually the one who had the event described.

Just a little piece of the history of human factors in aviation who was in my hands.

As usual, your feedback is very important to me but more important is the use you'll do of this leaflet for discussion within your organisation.

Full report is available at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/384823/AAIB_Bulletin_6-2011.pdf

DISCLAIMER

This document is not to be intended as an investigation report.

This document is only a personal and partial view of a real case as seen by the author, aimed to highlight a particular aspect of the application of human factors, useful to diffuse a just culture throughout Organisations and their employees.

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