



COMMENT RESPONSE DOCUMENT

EASA PAD No. 18-108

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Commenter 1: Delta Air Lines – Seth Bremmon – 23/08/2018

Comment # 1

[EASA] PAD [18-108] proposes to require removal of the affected engine from service and, before release to service, modify the engine by replacing the affected assembly with a serviceable assembly in accordance with Part C of RRD Alert NMSB SB-BR700-72A900640. A serviceable assembly is defined as New HP turbine stage 1 blades, having P/N FW75735; assembled in combination with HP turbine stage 1 blade dampers, having P/N KH82098. The time of accomplishment is 1) before exceeding 10,000 flight cycles (FC) since first installation of that affected HPT turbine stage 1 blade, or within 50 FC after the effective date of the AD, whichever occurs later; or 2) For engines that have previously been inspected in accordance with RRD NMSB SB-BR700-72-900118, within 1 500 FC after the latest inspection, or within 10 FC after the effective date of this AD, whichever occurs later.

DELTA'S COMMENTS

Delta has the following comments/questions regarding the PAD:

Delta does not agree with the AD as written for the following reasons:

- A. The damper P/N KH82098 has not been proven, with in-service experience, to slow down the deposition of particles in the HP turbine stage 1 blade shank cavity, intended to reduce the susceptibility to sulphidation at the blade shank. Actual in-service experience may show the damper worsens the issue. If the subject damper works as intended, however, it serves only to delay the sulphidation. Sulphidation attack and subsequent liberation of the blade are likely to continue after compliance with RRD Alert NMSB SB-BR700-72A900640 as there is no HP turbine stage 1 blade redesign offered.
- B. In practicality, the 10,000 FC limit proposed by the PAD would not have prevented any one of the four events that led to the creation of the subject PAD (based on their FC since installation). Instead the 10,000 FC limit seems to effectively lower the conditional probability for dual-engine failure, a probability based on an unstable weibull that is subject to change with each new failure point.
- C. Under the Definitions section, serviceable assembly is described as “New HP turbine stage 1 blades, having P/N FW75735; assembled in combination with HP turbine stage 1 blade dampers, having P/N KH82098.” Under the Required Actions and Compliance Times section, paragraphs (2) and (3) require modification of the engine by replacing the affected assembly with a serviceable assembly; and paragraphs (5) and (6) allow installation of an HP turbine stage 1 blades and damper that is a serviceable assembly, as defined in this AD. Delta requests clarification in the AD that a



serviceable assembly constitutes terminating action. If not agreed, Delta requests the definition of a serviceable assembly be revised to include future use of serviceable used HP turbine stage 1 blades that have only been run in an engine having damper P/N KH82098 installed.

- D. Under the Definitions section, Group 1 and Group 2 engine definitions are given. Under the Required Actions and Compliance Times section, Replacement / Modification paragraph (2) there is a potential to incorrectly interpret whether Group 2 applies. To eliminate this potential ambiguity Delta requests that the AD clarifies that Group 2 does not apply to paragraph (2) rather than paragraph (2) simply referring to paragraph (1).

EASA response:

A. and B. Comments noted, but not agreed. In EASA view, sufficient information and investigative evidence is available to justify this action.

C. Comment partially agreed. The definition of ‘serviceable assembly’ has been amended in the Final AD to include used assemblies.

Regarding the replacement being terminating action, since the AD requires a one-time action (i.e. no repetitive actions included) only, using the wording ‘terminating action’ is inappropriate. However, it should also be noted that the AD requires, each time an assembly (as defined) is replaced, a determination that the replacement assembly is a serviceable assembly (as defined). How an operator complies with that ‘continuous’ requirement is deliberately left unspecified, as the method should be subject to approval/acceptance by the competent authority of the State of Registry of the aircraft on which the affected engine is (to be) installed, related to AD compliance verification (enforcement).

D. Comment not agreed. Please note that the requirement of §(2) is a follow-up on a determination “as required by paragraph (1) of this AD”, and §(1) affects only Group 1 engines, as clearly indicated. Consequently, there can be no doubt that Group 2 engines are not affected by §(2).

For Group 2 engines, only paragraphs (4) and (6) are relevant, as clearly indicated.

No changes have been made to the Final AD in response to points A, B and D of this comment.

