

COMMENT RESPONSE DOCUMENT

EASA PAD No. 17-148

[Published on 19 October 2017 and officially closed for comments on 02 November 2017]

Commenter 1: Civil Aviation Authority of Singapore – Jonathan Tan – 01/11/2017

Comment # 1

We reviewed PAD No. 17-148 published by EASA on 19 October 2017 and have the following queries:

- A. Reference to paragraph (2) of the PAD, it refers to RR NMSB 72-A868. Can EASA confirm that for engines that had embodied RR NMSB 72-J871, there will be a new EHM alert at the various threshold mandating inspections (Table 1 of RR NMSB 72-AJ869 as extracted below)?

DETERMINE WHICH PART OF NMSB 72-J871 WAS EMBODIED	IS DACs CYCLES FOR IPC SHAFT ASSEMBLY FEATURE AA GREATER THAN 2000 DACs CYCLES?	DESCRIPTION OF WORKSCOPE	INITIAL INSPECTION THRESHOLDS (A)		
			INSPECTION THRESHOLD ROTOR 1 BLADES	INSPECTION THRESHOLD ROTOR 2 BLADES	INSPECTION THRESHOLD FOR ROTOR 2 DISC DOVETAIL POSTS
NMSB 72-J871 PART A	YES	SUM ROTOR 1 BLADES AUGMENTED WITH NEW BLADES TO REPLACE CRACKED BLADES	FOLLOWING NEW EHM ALERT @ 1000 DACs CYCLES SINCE SHOP VISIT ON IPC SHAFT ASSEMBLY FEATURE AA	INSPECT AT 200 FLIGHT CYCLES SINCE SHOP VISIT OR LAST INSPECTION WHICHEVER OCCURS FIRST IAW 72-AJ819	
NMSB 72-J871 PART A	NO	SUM ROTOR 1 BLADES AUGMENTED WITH NEW BLADES TO REPLACE CRACKED BLADES	FOLLOWING NEW EHM ALERT @ 1000 DACs CYCLES SINCE SHOP VISIT ON IPC SHAFT ASSEMBLY FEATURE AA WHERE NMSB 72-J871 WAS EMBODIED	FOLLOWING EHM ALERT @ 2000 DACs CYCLES SINCE NEW ON IPC SHAFT ASSEMBLY FEATURE AA	

B. Note 4 of the PAD refers to RR NMSB 72-AJ819 & NMSB 72-AJ814 (Table 1 and note 4 of the PAD as extracted below).

Table 1 – Initial Visual Inspection (see Note 4 of this AD)

Inspected	Compliance Time
No	Within 80 FC, or within the reaction time specified in the EHM Alert, whichever occurs first after receiving the EHM Alert
Yes	Within 200 FC after the last inspection, or within 30 FC after receiving the EHM Alert, whichever occurs later

Note 4: For the purpose of Table 1 of this AD, 'inspected' means that the affected engine has passed an inspection (no cracks identified) in accordance with the instructions of RR Technical Variation (TV) TV176758 or TV177125, or the original issue of **RR NMSB TRENT 1000 72-AJ814**, or TV177005, TV177006, TV177187, TV177623 or TV177659, or the original issue of **RR NMSB TRENT 1000 72-AJ819**, or NMSB TRENT 1000 72-J744, as applicable.

However, the following is stated under the compliance section for NMSB 72-AJ819 & NMSB 72-AJ814. There is no mention of any EHM Alert where the inspection must be completed within 30 FC. The requirement is only for a repeat inspection to be conducted within 200 FC since the last inspection and in the case of engines that had accumulated more than 200 FC since the last inspection, the inspection must be carried out within 30 FC.

Extracted from compliance section of NMSB 72-AJ819 & NMSB 72-AJ814

For engines/IPC modules that had previously been inspected to the instructions in TV177005, TV177187, TV177623 or NMSB 72-AJ819 without any cracks identified, if it is above the threshold, repeat inspections in accordance with NMSB 72-AJ819 must be carried out in less than 200 flight cycles from the last inspection. **If the engine/IPC module has completed more than 200 flight cycles since the last inspection, the inspection must be carried out in less than 30 flight cycles from the date of this NMSB publication.**

Can you clarify the applicable compliance time?



EASA response:

- A. Comment agreed: RR will issue a new EHM Alert to advise an operator when they have reached the new inspection threshold. The only exception to this is for NMSB 72-J871 Part A for IPC rotor 2 inspections since the blades have not been changed/repared so they are still subject to the repeat inspections every 200 FC since the original inspection.**
- B. Comment agreed: The relevant compliance time in Table 1, "or within 30FC...etc." has been removed from the Final AD, as this was initially used to cover engines that were inspected via TVs more than 200 FC since NMSB issue.**

Commenter 2: All Nippon Airways Co., Ltd. – Daisuke Yamazumi – 02/11/2017**Comment # 2**

- A. Pre-NMSB TRENT 1000 72-J871 Repetitive Inspections: mandate to accomplish an ultrasonic inspection in accordance with the instructions of the applicable NMSB. The NMSB 72-AJ819 instructs a borescope inspection. Could you remove "ultrasonic" or amend to "an ultrasonic inspection and/or a borescope inspection"? Table 1 – Initial Visual Inspection (see Note 4 of this AD). The title says "Visual". Could you remove "Visual" or amend to "Initial ultrasonic inspection and/or borescope inspection"?
- B. Table 1 – Initial Visual Inspection (see Note 4 of this AD). The Compliance Time for Inspected is "Within 200 FC after the last inspection, or within 30 FC after receiving the EHM Alert, whichever occurs later". The NMSB 72-AJ814 and 72-AJ819 instructs "If the engine/IPC module has previously been inspected when the EHM Alert is received, the next inspection must be carried out in less than 200 flight cycles since the last inspection. If the inspection was carried out more than 200 flight cycles ago, the inspection must be carried out in less than 80 flight cycles or the EHM Alert reaction time, whichever occurs sooner. Does EASA have any intention to reduce to "within 30 FC" from "in less than 80 flight cycles or the EHM Alert reaction time"? Could you amend to "Within 200 FC after the last inspection, or within 80 FC after receiving the EHM Alert, or within the reaction time specified in the EHM Alert, whichever occurs later"?
- C. Post-NMSB TRENT 1000 72-J871 Repetitive Inspections: mandate to inspect "before exceeding the threshold as specified in RR NMSB TRENT 1000 72-AJ869". NMSB 72-AJ869 Table1 instructs the the initial thresholds of the rotor 2 blades and disc dovetail posts for NMSB 72-J871 part A with greater than 2000 DACs cycles as "Inspect at 200 flight cycles since shop visit or last inspection whichever occurs first IAW 72-AJ819". I believe "at" means the same time, and it is impossible to control to inspect just at 200 flight cycles. I believe the choose faster is the incorrect, because there is no mandate requirement to inspect the IPC rotor 2 blades and disc dovetail posts inspection IAW 72-AJ819 at shop visit.
- Can we treat that "Inspect at 200 flight cycles since shop visit or last inspection whichever occurs first IAW 72-AJ819" is "Inspect within 200 flight cycles since last inspection IAW 72-AJ819"(amend "at" to "within", remove "shop visit or" and "whichever occurs first")?



D. Post-NMSB TRENT 1000 72-J871 Repetitive Inspections: affected engine is limited "that engine in accordance with the instructions of RR NMSB TRENT 1000 72-J871". Some engine had been replaced the blades in accordance with the TV173846, TV177578 and/or TV177657.

Could you add note as followings to equivalent these TVs to NMSB 72-J871?

"TV177578: Procedure to replace up to three (3) IP Compressor Rotor Stage 1 Blades, without disassembling the IP Compressor Module, is equivalent to NMSB 72-J871 Part A.

TV177657: Procedure on an engine rejected for IP Compressor Rotor Stage 1 and 2 Blade replacement - New Blades only, is equivalent to NMSB 72-J871 Part C."

There is no equivalent part in NMSB 72-J871 for TV173846: Disassemble and Assemble the IPC Rotor Assembly to fit new IPCR1 Blades. This engine has replaced all IP Compressor Rotor Stage 1 Blades with new but not replaced any IP Compressor Rotor Stage 2 Blades.

Can we treat the TV173846 is equivalent to NMSB 72-J871 Part B?

EASA response:

A. Comment agreed: The word "visual" has been removed in the Final AD.

B. Comment agreed: See response to Comment #1 point B above.

C. Partially agreed. Note 5 has been introduced in the Final AD, making clear that, where the NMSB specifies 'at', this can be read as 'within'. RR agrees that 'at' should be read as 'within'. However, RR will retain 'since shop visit' as, although there may be no requirement to inspect at shop visit this may be carried out to ensure the engine does not leave the shop with cracked R2 blades.

D. Partially agreed: RR will be revising NMSB 72-J871 to include a table listing all the TVs that have been issued for IPC blade replacements and which part of NMSB 72-J871 they are equivalent to. Once NMSB 72-J871 Rev 1 is issued, RR can stop working to TVs as the revised NMSB will include Parts B, C and D. The NMSB at Rev 2 will contain the equivalency table. TV173846 is not equivalent to any part of NMSB 72-J871 as it was the first case of Rotor 1 blade replacement; the inspection threshold for IPC Rotor 1 iaw NMSB 72-AJ814 is 1500 DACs cycles since shop visit and the IPC Rotor 2 blades must be inspected every 200 FC since the initial inspection in accordance with NMSB 72-AJ819 as they were not replaced/repared.

