Airworthiness Directive

AD No.: 2017-0056

Issued: 05 April 2017

Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) 216/2008 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.

This AD is issued in accordance with Regulation (EU) 748/2012, Part 21.A.3B. In accordance with Regulation (EU) 1321/2014 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [Regulation (EU) 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [Regulation (EC) 216/2008, Article 14(4) exemption].

Design Approval Holder's Name:
ROLLS-ROYCE plc

Type/Model designation(s):
Trent 1000 Engines

Effective Date: 19 April 2017
TCDS Number(s): EASA.E.036
Foreign AD: Not applicable
Supersedure: None

ATA 72 – Engine – Intermediate Pressure Turbine Blades – Inspection / Replacement

Manufacturer(s):
Rolls-Royce plc (RR)

Applicability:
Trent 1000-A, Trent 1000-A2, Trent 1000-AE2, Trent 1000-C, Trent 1000-C2, Trent 1000-CE2, Trent 1000-D, Trent 1000-D2, Trent 1000-E, Trent 1000-E2, Trent 1000-G, Trent 1000-G2, Trent 1000-H, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2 and Trent 1000-L2 engines, all serial numbers.

These engines are known to be installed on, but not limited to, Boeing 787 aeroplanes.

Reason:
During a recent flight of a Trent 1000-powered Boeing 787, following reports of N2 vibration and multiple other messages, the flight crew performed an engine in-flight shut-down (IFSD) and returned to the departure airport, landing uneventfully. The post-flight boroscope inspection of the affected engine revealed an intermediate pressure (IP) turbine blade missing at the shank. This is the fifth reported occurrence of an IP turbine blade failure on a Trent 1000 engine. The failures are driven by sulphidation corrosion cracking.

This condition, if not detected and corrected, could lead to IP turbine blades shank release, possibly resulting in an IFSD and consequent reduced control of the aeroplane.

To address this potential unsafe condition, RR issued Alert Non-Modification Service Bulletin (NMSB) TRENT 1000 72-AJ575 to provide instructions for engine removal from service when any IP turbine blade with a high level of sulphidation exposure is identified by corrosion fatigue life (CFL) model.

For the reason described above, this AD requires removal from service of certain engines, to be corrected in shop.

Required Action(s) and Compliance Time(s):
Required as indicated, unless accomplished previously:

Note 1: Where, in this AD, reference is made to an RR NMSB with an 'A' (Alert) in the number, it should be recognised that an earlier or later revision may not have that 'A'. This kind of change does not effectively alter the publication references for the purpose of this AD.

(1) From the effective date of this AD, within 80 engine flight cycles after receipt of an alert engine health monitoring (EHM) notification (as shown in Figure 1 of this AD) from the RR Operational Service Desk (OSD – see Note 2 of this AD), remove the affected engine from service.

Note 2: RR OSD manages the EHM process. CFL model is used to identify Trent 1000 engines that are at risk of IP turbine blade failure. RR OSD will send an alert EHM notification containing the wording as shown in Figure 1 of this AD.

Figure 1 – Alert EHM Notification

"Possible Causes The latest run of the CFL model has highlighted the above engine as being at increased risk of IP Turbine shank cracks as a result of sulphidation corrosion. Reaction Time 80 flight cycles Recommended Troubleshooting The engine should be removed within a maximum of 80 flight cycles in accordance with NMSB TRENT 1000 72-AJ575."

(2) After removing an engine from service as required by paragraph (1) of this AD, contact RR (see contact details in the Remarks section of this AD) for approved instructions and, before release to service of the engine, accomplish those instructions accordingly.

Ref. Publications:
Rolls-Royce Alert NMSB TRENT 1000 72-AJ575 original issue, dated 29 November 2016.

The use of later approved revisions of this document is acceptable for compliance with the requirements of this AD.

Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.

2. This AD was posted on 01 February 2017 as PAD 17-016 for consultation until 01 March 2017. The Comment Response Document can be found in the EASA Safety Publications Tool, in the compressed (zipped) file attached to the record for this AD.

3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.

4. For any question concerning the technical content of the requirements in this AD, please contact your designated Rolls-Royce representative, or download the publication from your Rolls Royce Care account at https://customers.rolls-royce.com.

   If you do not have a designated representative or Rolls Royce Care account, please contact **Corporate Communications** at **Rolls-Royce plc**, P.O. Box 31, Derby, DE24 8BJ, United Kingdom Telephone +44 (0)1332 242424,

   or send an email through http://www.rolls-royce.com/contact/civil_team.jsp identifying the correspondence as being related to **Airworthiness Directives**.