[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2015-3778; Directorate Identifier 2015-NE-27-AD; Amendment 39-18391; AD 2016-03-04]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce plc Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for all Rolls-Royce plc (RR) RB211-535E4-37, RB211-535E4-B-37, and RB211-535E4-C-37 turbofan engines. This AD requires recalculating the cyclic life for certain engine life-limited rotating parts and removing those parts that have exceeded their cyclic life limit within specified compliance times. This AD was prompted by a review of operational data that determined certain RR RB211-535E4-37 engines have been operated to a more severe flight profile than is consistent with the flight profile used to establish the cyclic life limits for the rotating parts. We are issuing this AD to prevent failure of life-limited rotating parts, uncontained parts release, damage to the engine, and damage to the airplane.

DATES: This AD becomes effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE24 8BJ; phone: 011–44–1332–242424; fax: 011–44–1332–249936; email: http://www.rolls-royce.com/contact/civil_team.jsp; Internet: https://customers.rolls-royce.com/public/rollsroycecare. You may view this service information at the FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125. It is also available on the Internet at http://www.regulations.gov by searching for and locating Docket No. FAA-2015-3778.

Examining the AD Docket

You may examine the AD docket on the Internet at http://www.regulations.gov by searching for and locating Docket No. FAA-2015-3778; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the mandatory continuing airworthiness information (MCAI), the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7754; fax: 781-238-7199; email: robert.green@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to the specified products. The NPRM was published in the Federal Register on November 4, 2015 (80 FR 68284). The NPRM proposed to correct an unsafe condition for the specified products. The MCAI states:

> A review of operational flight data has revealed that some RB211-535 engines may have been operated beyond the flight profile (FP) assumed by the operator when establishing the operational limits (life limits) within which the corresponding critical parts are allowed to remain installed.
>
> This condition, if not corrected, may lead to critical part failure, possibly resulting in release of high energy debris, damage to the aeroplane and/or injury to the occupants.

To preclude failure of an engine life-limited part, the MCAI specifies, and this AD would require, recalculating the cyclic life for certain parts and removing from service those parts that have exceeded their cyclic life limit within specified compliance times. This AD would establish a new default Flight Profile G for RR RB211-535E4-37 engine life-limited parts. If, however, operators meet the requirements of Appendix 6 of RR Alert Non-Modification Service Bulletin (NMSB) No. RB.211-72-AH972, Revision 3, dated August 28, 2015, they may operate to Flight Profile A or B. You may obtain further information by examining the MCAI in the AD docket on the Internet at http://www.regulations.gov by searching for and locating Docket No. FAA-2015-3778.

Related Service Information under 1 CFR Part 51

We reviewed RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015. The Alert NMSB describes a new flight profile, provides procedures for the consumed cyclic life corrections for prior operation of affected parts, and provides the removal from service recommendations for parts that have exceeded their cyclic life limit. This service information is reasonably available because the interested parties have

access to it through their normal course of business or by the means identified in the ADDRESSES section of this AD.

Comments

We gave the public the opportunity to participate in developing this AD. We considered the comments received.

Support for the NPRM (80 FR 68284, November 4, 2015)

The Boeing Company, FedEx, United Airlines, and American Airlines expressed support for the NPRM.

Request to Change Actions and Compliance

United Parcel Service (UPS) requested that the NPRM recognize digital flight data taken from either the digital flight data recorder (DFDR) or the digital flight data acquisition unit (DFDAU) as valid data for RR RB211 flight profile monitoring purposes. The data captured by the DFDAU is recorded on the DFDR, but DFDAUs are regularly downloaded for UPS' flight operations quality assurance program. The DFDAU data is easier to access than pulling a DFDR for data download purposes.

We agree. We added a new paragraph to paragraph (e)(1) of this AD as follows: "(e)(1)(iv) You may use data from either a digital flight data acquisition unit or a digital flight data recorder for flight profile monitoring.".

Conclusion

We reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously. We determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

Costs of Compliance

We estimate that this AD affects 107 engines installed on airplanes of U.S. registry. Pro-rated cost of the lost cyclic life as a result of the corrections would be about

$25,417,324. We estimate it will take 1 hour to recalculate the consumed cyclic life and revise the engine records which include 5 minutes (0.083 hours) for record entries. The average labor rate is $85 per hour. Based on these figures, we estimate the cost of this AD on U.S. operators to be $25,426,419.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. "Subtitle VII: Aviation Programs," describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in "Subtitle VII, Part A, Subpart III, Section 44701: General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this AD:

(1) Is not a "significant regulatory action" under Executive Order 12866,

(2) Is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),

(3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, and

(4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

2016-03-04 Rolls-Royce plc: Amendment 39-18391; Docket No. FAA-2015-3778; Directorate Identifier 2015-NE-27-AD.

(a) Effective Date

This AD becomes effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to all Rolls-Royce plc (RR) RB211-535E4-37, RB211-535E4-B-37, and RB211-535E4-C-37 turbofan engines.

(d) Reason

This AD was prompted by a review of operational data that determined that certain RR RB211-535E4-37 engines have been operated to a more severe flight profile than is consistent with the flight profile used to establish the cyclic life limits for the rotating parts. We are issuing this AD to prevent failure of life-limited rotating parts, which could result in uncontained parts release, damage to the engine, and damage to the airplane.

(e) Actions and Compliance

Comply with this AD within the compliance times specified, unless already done. Within 21 days after the effective date of this AD:

(1) For RR RB211-535E4-37 engines, establish a new flight profile, Flight Profile G, as the new default profile for flight operations and new part lives for life-limited parts.

(i) Use Appendix 6 of RR Alert Non-Modification Service Bulletin (NMSB) No. RB.211-72-AH972, Revision 3, dated August 28, 2015, to define Flight Profile G.

(ii) Use the definition of Flight Profile G in Appendix 6 and the maximum approved cyclic lives in Appendix 2 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, to identify the new lives for life-limited parts.

(iii) If operators meet the requirements of Appendix 6 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, they may operate to Flight Profile A or B.

(iv) You may use data from either a digital flight data acquisition unit or a digital flight data recorder for flight profile monitoring.

(2) For all RR RB211-535E4-37, RB211-535E4-B-37, and RB211-535E4-C-37 engines, determine if any part identified by part number and serial number in Appendix 4 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, is installed on the engine.

(i) Do not return to service any engine with a part identified in paragraph (e)(2) of this AD after the part reaches the "Compliance Time" date or cycles, whichever occurs first, as specified in Appendix 4 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015.

(ii) For each part identified in paragraph (e)(2) of this AD without a "Compliance Time" that has a lifing correction identified, apply the lifing correction for each part using the "Additional Life Consumed Flight Cycles" specified in Appendix 4 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015.

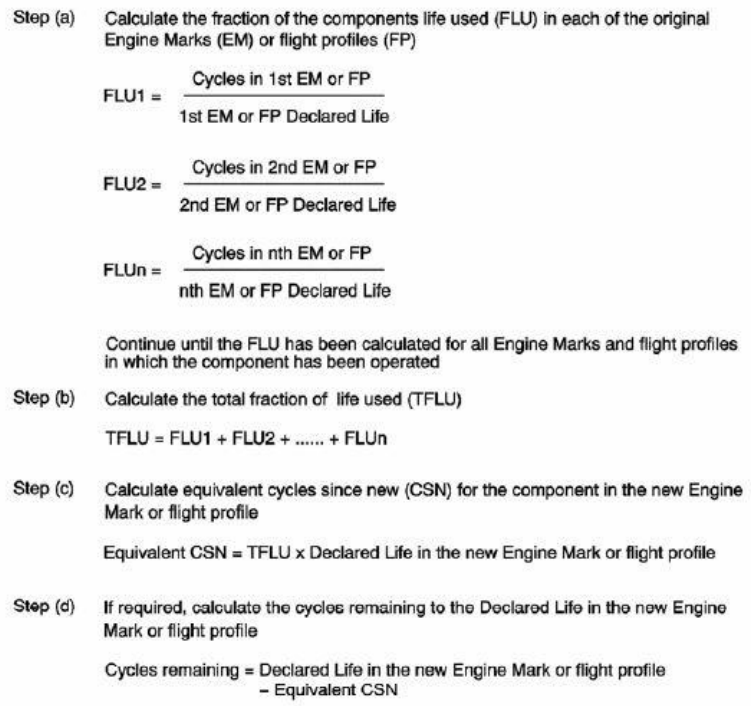
(3) For RR RB211-535E4-37 engines operated to Flight Profile G with parts listed in Appendix 4 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, do the following:

(i) Re-calculate the consumed cyclic life of the low-pressure (LP) compressor shaft, LP turbine shaft, LP turbine disk Stage 2, intermediate-pressure compressor rotor shaft Stage 1 to 6, high-pressure (HP) compressor rotor disk Stage 1 and 2, HP compressor rear rotor shaft assembly, and HP turbine disk as follows.

(ii) Determine the Flight Profile G cycles in service (CIS). Count all CIS accumulated since April 1, 2015, inclusive.

(iii) Use the Flight Profile G cycles in service from paragraph (e)(3)(ii) of this AD, the maximum approved lives in Appendix 2 of RR Alert NMSB No. RB.211-72-AH972, Revision 3, dated August 28, 2015, and Figure 1 to paragraph (e) of this AD to calculate the new consumed cyclic lives.

Figure 1 to Paragraph (e), Calculations to Move Group 'A' and Group 'B' Parts Between Engine Marks and/or Flight Profiles



(f) Alternative Methods of Compliance (AMOCs)

The Manager, Engine Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request. You may email your request to: ANE-AD-AMOC@faa.gov.

(g) Related Information

(1) For more information about this AD, contact Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7754; fax: 781-238-7199; email: robert.green@faa.gov.

(2) Refer to MCAI European Aviation Safety Agency AD 2015-0148, dated July 23, 2015 (Corrected July 24, 2015), for more information. You may examine the MCAI

in the AD docket on the Internet at http://www.regulations.gov by searching for and locating it in Docket No. FAA-2015-3778.

(h) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Rolls-Royce (RR) Alert Non-Modification Service Bulletin No. RB.211-72-AH972, Revision 3, including Appendices 1 through 6, dated August 28, 2015.

(ii) Reserved.

(3) For RR service information identified in this AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE24 8BJ; phone: 011–44–1332–242424; fax: 011–44–1332–249936; email: http://www.rolls-royce.com/contact/civil_team.jsp; Internet: https://customers.rolls-royce.com/public/rollsroycecare.

(4) You may view this service information at FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

(5) You may view this service information at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued in Burlington, Massachusetts, on February 2, 2016.

Colleen M. D'Alessandro,
Manager, Engine & Propeller Directorate,
Aircraft Certification Service.
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