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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2015-2984; Directorate Identifier 2015-NE-21-AD; Amendment 39-18405; AD 2016-04-11]

RIN 2120-AA64

Airworthiness Directives; General Electric Company Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for all General Electric Company (GE) GEnx-1B54, -1B58, -1B64, -1B67, and -1B70 turbofan engine models. This AD was prompted by reports of two separate, single engine in-flight shutdowns (IFSDs) caused by high-pressure turbine (HPT) rotor stage 1 blade failure. This AD requires inspection and conditional removal of affected HPT rotor stage 1 blades. We are issuing this AD to prevent failure of the HPT rotor stage 1 blades, which could lead to failure of one or more engines, loss of thrust control, and damage to the airplane.

DATES: This AD is effective April 1, 2016.

ADDRESSES: For service information identified in this final rule, contact General Electric Company, GE Aviation, Room 285, 1 Neumann Way, Cincinnati, OH 45215; phone: 513-552-3272; email: aviation.fleetsupport@ge.com. You may view this service information at the FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7125.

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-2015-2984; 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 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: Christopher McGuire, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7120; fax: 781-238-7199; email: chris.mcguire@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 all GE GEnx-1B54, -1B58, -1B64, -1B67, and -1B70 turbofan engine models. The NPRM published in the Federal Register on August 27, 2015 (80 FR 51965). The NPRM was prompted by reports of two separate, single engine IFSDs caused by HPT rotor stage 1 blade failure. The NPRM proposed to require inspection and conditional removal of affected HPT rotor stage 1 blades. We are issuing this AD to correct the unsafe condition that could result in failure of the HPT rotor stage 1 blades, which could lead to failure of one or more engines, loss of thrust control, and damage to the airplane.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the proposal and the FAA's response to each comment.

Support for the NPRM

The National Transportation Safety Board (NTSB) expressed support for the NPRM (80 FR 51965).

Request To Change Applicability

United Airlines (United) requested that the Applicability paragraph be changed to more appropriately address engine models. United stated that the GEnx-1B54 and GEnx-1B58 be removed and GEnx-1B64G03, 1B64G04, 1B67G03, 1B67G04, 1B70G03 and 1B70G04 be added to paragraph (c) Applicability. United indicated this change would improve clarity and accomplishment of the AD.

We disagree. This AD applies to all GE GEnx-1B54, -1B58, -1B64, -1B67, and -1B70 turbofan engine models, as listed in the GEnx type certificate data sheet. We did not change this AD.

Request To Change Compliance

United requested that the Compliance paragraph be changed to clarify maintenance actions. United requested that in paragraph (e) the phrase, " . . . remove the cracked blade" be changed to read, " . . . remove the engine containing the cracked blade." United reasoned that removing the cracked blade is not a maintenance option.

We partially agree. We agree with changing the compliance language to include disposition of a cracked blade. We disagree with using the phrase, " . . . remove the engine containing the cracked blade" because removal of the cracked blade addresses the unsafe condition.

We revised paragraphs (e)(1)(i) and (e)(1)(ii) of this AD to include, " . . . remove the cracked blade from service. . . ."

Request To Change the Summary and Unsafe Condition

Boeing and General Electric Company (GE) requested that the Summary and Unsafe Condition paragraphs be clarified to reflect that two separate, single engine IFSDs occurred, prompting the need for this AD.

We agree. We changed the Summary and Unsafe Condition paragraphs of this AD to read: "This AD was prompted by reports of two separate, single engine in-flight shutdowns, caused by HPT rotor stage 1 blade failure. . . ."

Request To Change the Cost of Compliance

Boeing requested that the Costs of Compliance paragraph specifically state that the projected costs are for only the initial inspection and not for repetitive inspections. Boeing indicated this is needed to clarify the cost of compliance.

We agree. We changed the Costs of Compliance paragraph of this AD to include, "We also estimate that it will take about 1 hour per engine to comply with the initial inspection in this AD."

Request To Change Compliance Time

Japan Airlines (JAL) and GE suggested that in paragraph (e)(1) Compliance, the need to inspect within 1,000 cycles since new (CSN) may not be representative of the fleet.

We disagree. The initial blade inspection compliance time was based on the safety evaluation of the known failures. Any person may make a request for an Alternative Method of Compliance (AMOC) to the compliance times of this AD using the procedures listed herein. We did not change this AD.

Request To Change Compliance

GE requested that the Compliance paragraph be changed to clarify that the criteria of multiple cracks should be based on an individual blade and not multiple blades, each with a single crack.

We agree. We changed paragraph (e)(1)(i) of this AD to read: ". . . , or if more than one axial crack of any length is found on one blade, remove the cracked blade from service before further flight."

Revision to Service Information

We revised the service information in the Related Information section of this AD to Revision 01 of GE GEnx-1B Service Bulletin (SB) No. 72-0267 R01, dated August 10, 2015. GE made an editorial change to this SB that did not affect its contents.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM (80 FR 51965) for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM (80 FR 51965).

We also 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 will affect 4 engines installed on airplanes of U.S. registry. We also estimate that it will take about 1 hour per engine to comply with the initial inspection in this AD. The average labor rate is $85 per hour. Based on these figures, we estimate the total cost of this AD to U.S. operators to be $340.

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

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 that this AD:

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

(2) Is not a "significant rule" under 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):

2016-04-11 General Electric Company: Amendment 39-18405; Docket No. FAA-2015-2984; Directorate Identifier 2015-NE-21-AD.

(a) Effective Date

This AD is effective April 1, 2016.

(b) Affected ADs

None.

(c) Applicability

This AD applies to all General Electric Company (GE) GEnx-1B54, -1B58, -1B64, -1B67, and -1B70 turbofan engine models with high-pressure turbine (HPT) rotor stage 1 blade, part number 2305M26P06, installed.

(d) Unsafe Condition

This AD was prompted by reports of two separate, single engine in-flight shutdowns, caused by HPT rotor stage 1 blade failure. We are issuing this AD to prevent failure of the HPT rotor stage 1 blades, which could lead to failure of one or more engines, loss of thrust control, and damage to the airplane.

(e) Compliance

Comply with this AD within the compliance times specified, unless already done.

(1) Perform an initial borescope inspection (BSI) of the convex surface of the HPT rotor stage 1 blades for axial cracks from the platform to 30% span, within 1,000 blade cycles since new or 25 cycles after the effective date of this AD, whichever occurs later, and disposition as follows:

(i) If any axial crack with a length greater than or equal to 0.3 inch is found, or if any axial crack of any length turning in a radial direction is found, or if more than one axial crack of any length is found on one blade, remove the cracked blade from service before further flight.

(ii) If an axial crack is found with a length greater than or equal to 0.2 inch and less than 0.3 inch, remove the cracked blade from service within 10 blade cycles.

(iii) If an axial crack is found with a length greater than or equal to 0.1 inch and less than 0.2 inch, inspect the cracked blade within 50 blade cycles since last inspection (CSLI).

(iv) If an axial crack is found with a length less than 0.1 inch, inspect the cracked blade within 100 blade CSLI.

(v) If no cracks were found, perform a BSI of the blades within 125 blade CSLI.

(2) Thereafter, perform a repetitive BSI of the convex surface of the HPT rotor stage 1 blades for axial cracks from the platform to 30% span within 125 blade CSLI and disposition as specified in paragraphs (e)(1)(i) through (e)(1)(v) of this AD, or remove the blades from service.

(f) Definition

For the purpose of this AD, a "blade cycle" is defined as the number of engine cycles that a set of rotor blades has accrued, regardless of the engine(s) in which they have operated.

(g) Alternative Methods of Compliance (AMOCs)

The Manager, Engine Certification Office, FAA, may approve AMOCs to 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.

(h) Related Information

(1) For more information about this AD, contact Christopher McGuire, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7120; fax: 781-238-7199; email: chris.mcguire@faa.gov.

(2) GE GEnx-1B Service Bulletin No. 72-0267 R01, dated August 10, 2015 can be obtained from GE using the contact information in paragraph (h)(3) of this AD.

(3) For service information identified in this AD, contact General Electric Company, GE Aviation, Room 285, 1 Neumann Way, Cincinnati, OH 45215; phone: 513-552-3272; email: aviation.fleetsupport@ge.com.

(4) 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.

Issued in Burlington, Massachusetts, on February, 18, 2016.
Ann C. Mollica,
Acting Manager, Engine & Propeller Directorate,
Aircraft Certification Service.