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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2023–1208; Project Identifier AD–2023–00325–E; Amendment 39–22545; AD 2023–18–04]

RIN 2120–AA64

Airworthiness Directives; General Electric Company Engines

AGENCY:

Federal Aviation Administration (FAA), DOT.

ACTION:

Final rule.

SUMMARY:

The FAA is adopting a new airworthiness directive (AD) for certain General Electric Company (GE) Model CF6–80E1A2, CF6–80E1A3, CF6–80E1A4, and CF6–80E1A4/B engines. This AD was prompted by a manufacturer investigation that revealed that a certain forward outer seal and certain high-pressure turbine rotor (HPTR) stage 1 disks and rotating seals were manufactured from material suspected to contain iron inclusion, which may cause reduced material properties and a lower fatigue life capability. This AD requires the replacement of the affected forward outer seal, HPTR stage 1 disks, and rotating seals. The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective October 19, 2023.

ADDRESSES:

AD Docket: You may examine the AD docket at *regulations.gov* under Docket No. FAA–2023–1208; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The

address for Docket Operations is 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:

Alexei Marqueen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238–7178; email: *alexei.t.marqueen@faa.gov*.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain GE Model CF6–80E1A2, CF6–80E1A3, CF6–80E1A4, and CF6–80E1A4/B engines. The NPRM published in the **Federal Register** on June 9, 2023 (88 FR 37812). The NPRM was prompted by a report from the manufacturer that a certain forward outer seal and certain HPTR stage 1 disks and rotating seals were made from billets manufactured from material that is suspected to contain iron inclusion. Such iron inclusion may cause premature fracture and subsequent uncontained failure. The FAA has determined that the operators with affected HPTR stage 1 disks have proactively removed these parts from service. As a result, the compliance time for removal and replacement of the affected HPTR stage 1 disks is before further flight. This condition, if not addressed, could result in uncontained debris release, damage to the engine, and damage to the aircraft. In the NPRM, the FAA proposed to require the removal of a certain forward outer seal and certain HPTR stage 1 disks and rotating seals from service and replacement with parts eligible for installation. The FAA is issuing this AD to address the unsafe condition on these products.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from two commenters. The commenters were Delta Air Lines, Inc. (DAL) and EVA Air. The following presents the comments received on the NPRM and the FAA's response to each comment.

No Affected Parts

EVA Air commented that its fleet does not have any affected parts. The FAA acknowledges this comment.

Request To Expand Applicability and Add Parts Prohibition Requirement

DAL commented that according to the engine illustrated parts catalog, the R88DT rotor on the CF6–80E1 fleet of engines could be installed on the CF6–80C2 fleet of engines, specifically on the –B2F, –B4F, –B6F, –B7F, and –B8F variants. The commenter reasoned that without a part installation prohibition in the proposed AD, the affected parts would be eligible for installation on the non-CF6–80E1 engines after the required removal action in the AD. DAL requested that the FAA revise the proposed AD to add certain engine variants to paragraph (c), Applicability, and to add a parts

installation prohibition to paragraph (g), Required Actions, to prevent installation of the removed parts on non-CF6–80E1 engines.

The FAA disagrees. This AD applies to engine models known to have affected parts installed. Paragraph (g) of this AD requires the removal of the affected parts from service. Since the FAA and the manufacturer know where these parts are, and parts removed from service by AD action are not serviceable and not eligible for re-installation on any engine, it is not necessary to revise paragraph (c) of this AD to add engine variants and revise paragraph (g) of this AD to prohibit installation of the removed parts. Additionally, adding new engine variants to this AD would delay final issuance of this AD, as such a change would increase the scope of this AD, requiring new notice and comment. We may consider separate rulemaking, however. The FAA did not change this AD as a result of these comments.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Interim Action

The FAA considers this AD to be an interim action. This unsafe condition is still under investigation by the manufacturer and, depending on the results of that investigation, the FAA may consider further rulemaking action.

Costs of Compliance

The FAA estimates that this AD affects 1 engine installed on airplanes of U.S. registry. This engine requires replacement of the rotating seal. The FAA estimates that there are no engines installed on airplanes of U.S. registry that requires replacement of the forward outer seal or HPTR stage 1 disk.

The FAA estimates the following costs to comply with this AD:

Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Replace HPTR stage 1 disk	8 work-hours × $85 per hour = $680	$1,479,623 (prorated)	$1,480,303	$0
Replace rotating seal	8 work-hours × $85 per hour = $680	$732,517 (prorated)	733,197	733,197
Replace forward outer seal	8 work-hours × $85 per hour = $680	$1,290,000 (prorated)	1,290,680	0

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.

The FAA is 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) Will not affect intrastate aviation in Alaska, and

(3) 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

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:

2023–18–04 General Electric Company: Amendment 39–22545; Docket No. FAA–2023–1208; Project Identifier AD–2023–00325–E.

(a) Effective Date

This airworthiness directive (AD) is effective October 19, 2023.

(b) Affected ADs

None.

(c) Applicability

This AD applies to General Electric Company Model CF6–80E1A2, CF6–80E1A3, CF6–80E1A4, and CF6–80E1A4/B engines with an installed forward outer seal, high-pressure turbine rotor (HPTR) stage 1 disk, or rotating seal having a part number (P/N) and serial number (S/N) identified in Table 1 to paragraph (c) of this AD.

Table 1 to Paragraph (c)—Affected Forward Outer Seal, HPTR Stage 1 Disks, and Rotating Seals

Part name	P/N	Part S/N
Forward outer seal	1778M70P03	NCU65340
HPTR stage 1 disk	1863M36G06	TMT5TD23
		TMT5TD26
		TMT5TD27
Rotating seal	1778M69P06	BTB20610
		BTB20611
		BTB20612
		BTB26650

(d) Subject

Joint Aircraft System Component (JASC) Code 7250, Turbine Section.

(e) Unsafe Condition

This AD was prompted by a manufacturer investigation that revealed that a certain forward outer seal and certain HPTR stage 1 disks and rotating seals were manufactured from material suspected to contain iron inclusion, which may cause reduced material properties and a lower fatigue life capability. The FAA is issuing this AD to prevent fracture and subsequent uncontained failure of a certain forward

outer seal and certain HPTR stage 1 disks and rotating seals. The unsafe condition, if not addressed, could result in uncontained debris release, damage to the engine, and damage to the aircraft.

(f) Compliance

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

(g) Required Actions

(1) At the next piece-part exposure of the affected forward outer seal or before the affected forward outer seal exceeds 5,400 cycles since new (CSN), whichever occurs first after the effective date of this AD, remove the affected forward outer seal from service and replace with a part eligible for installation.

(2) At the next piece-part exposure of the affected rotating seal or before the affected rotating seal exceeds 5,200 CSN, whichever occurs first after the effective date of this AD, remove the affected rotating seal from service and replace with a part eligible for installation.

(3) Before further flight after the effective date of this AD, remove the affected HPTR stage 1 disk from service and replace with a part eligible for installation.

(h) Definitions

(1) For the purpose of this AD, a "part eligible for installation" is any forward outer seal, HPTR stage 1 disk, or rotating seal that does not have a P/N and S/N identified in Table 1 to paragraph (c) of this AD.

(2) For the purpose of this AD, "piece-part exposure" is when the affected part is removed from the engine and completely disassembled.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, AIR–520, Continued Operational Safety Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the branch, send it to the attention of the person identified in paragraph (j) of this AD and email to: *ANE-AD-AMOC@faa.gov*.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(j) Related Information

For more information about this AD, contact Alexei Marqueen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238–7178; email: *alexei.t.marqueen@faa.gov*.

(k) Material Incorporated by Reference

None.

Issued on September 7, 2023.

Ross Landes,

Deputy Director for Regulatory Operations, Compliance & Airworthiness Division, Aircraft Certification Service.

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