



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2024-2721; Project Identifier AD-2024-00610-E; Amendment 39-23045; AD 2025-10-11]

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 certain high-pressure turbine (HPT) stage 1 and HPT stage 2 disks were manufactured from powder metal material suspected to contain iron inclusion. This AD requires replacement of affected HPT stage 1 and HPT stage 2 disks with parts eligible for installation. The FAA is issuing this AD to address the unsafe condition on these products.

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

ADDRESSES:

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2024-2721; 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 was published in the *Federal Register* on January 30, 2025 (90 FR 8505). The NPRM was prompted by a manufacturer investigation that revealed the detection of iron inclusion in an HPT stage 2 disk manufactured from the same powder metal material used to manufacture certain HPT stage 1 and HPT stage 2 disks for GE Model CF6-80E1A2, CF6-80E1A3, CF6-80E1A4, and CF6-80E1A4/B engines. Further investigation by the manufacturer revealed that the iron inclusion is attributed to deficiencies in the manufacturing process and may cause reduced material properties and a lower fatigue life capability, which may result in premature fracture and uncontained failure. The manufacturer also informed the FAA that additional risk assessments showed that there were no failed events associated with the discovery of this iron inclusion material. However, it was concluded that replacement of the affected HPT stage 1 and HPT stage 2 disks is necessary to prevent any future failed events. In the NPRM, the FAA proposed to require replacement of affected HPT stage 1 and HPT stage 2 disks 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 three commenters. The commenters were Delta Air Lines, Inc. (DAL) and two individual commenters. The individual commenters supported the NPRM without change. DAL requested changes to the proposed AD. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Expand Applicability and Add Parts Prohibition Requirement

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. DAL noted that, according to the engine illustrated parts catalog, the HPT stage 1 and HPT stage 2 disks 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 parts 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.

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 reinstallation 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. 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, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Costs of Compliance

The FAA estimates that this AD affects one engine installed on an airplane of U.S. registry.

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 HPT stage 1 disk	8 work-hours x \$85 per hour = \$680	\$1,228,800 (prorated)	\$1,229,480	\$1,229,480
Replace HPT stage 2 disk	8 work-hours x \$85 per hour = \$680	\$201,600 (prorated)	\$202,280	\$202,280

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:
2025-10-11 General Electric Company: Amendment 39-23045; Docket No. FAA-2024-2721; Project Identifier AD-2024-00610-E.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to General Electric Company (GE) Model CF6-80E1A2, CF6-80E1A3, CF6-80E1A4, and CF6-80E1A4/B engines with an installed high-pressure turbine (HPT) stage 1 disk or HPT stage 2 disk 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 HPT Stage 1 and HPT Stage 2 Disks

Part Name	P/N	S/N
HPT stage 1 disk	1863M36G06	GWN0GP27
HPT stage 1 disk	1863M36G06	GWN0GPM8
HPT stage 1 disk	1863M36G06	GWN0GP26
HPT stage 1 disk	1863M36G06	TMT5SW61
HPT stage 1 disk	1863M36G06	TMT5SW59
HPT stage 1 disk	1863M36G06	TMT5SW64
HPT stage 1 disk	1863M36G06	TMT5SW82
HPT stage 1 disk	1863M36G06	GWN0GPMG
HPT stage 2 disk	1778M72P05	BTB77100
HPT stage 2 disk	1778M72P05	MUNLD123
HPT stage 2 disk	1778M72P05	MUNLD122
HPT stage 2 disk	1778M72P05	MUN5B794
HPT stage 2 disk	1778M72P05	BTB77102

(d) Subject

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

(e) Unsafe Condition

This AD was prompted by a manufacturer investigation that revealed certain HPT stage 1 and HPT stage 2 disks were subject to iron inclusion introduced during the manufacturing process. The FAA is issuing this AD to prevent fracture and potential uncontained failure of certain HPT stage 1 and HPT stage 2 disks. The unsafe condition, if not addressed, could result in uncontained debris release, damage to the engine, and damage to the airplane.

(f) Compliance

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

(g) Required Actions

(1) Before further flight after the effective date of this AD, remove any affected HPT stage 1 disk having P/N 1863M36G06 and S/N GWN0GP27 from service and replace with a part eligible for installation.

(2) Before further flight after the effective date of this AD, remove any affected HPT stage 2 disk having P/N 1778M72P05 and S/N BTB77100 from service and replace with a part eligible for installation.

(3) For affected HPT stage 1 disks identified in table 1 to paragraph (c) of this AD that are not included in paragraph (g)(1) of this AD, at the next piece part exposure or before the affected HPT stage 1 disk exceeds 8,600 cycles since new (CSN), whichever occurs first after the effective date of this AD, remove the affected HPT stage 1 disk from service and replace with a part eligible for installation.

(4) For affected HPT stage 2 disks identified in table 1 to paragraph (c) of this AD that are not included in paragraph (g)(2) of this AD, at the next piece part exposure or before the affected HPT stage 2 disk exceeds 12,000 CSN, whichever occurs first after the effective date of this AD, remove the affected HPT stage 2 disk from service and replace with a part eligible for installation.

(h) Definitions

For the purpose of this AD:

(1) A “part eligible for installation” is any HPT stage 1 disk or HPT stage 2 disk that does not have a P/N and S/N identified in table 1 to paragraph (c) of this AD.

(2) A “piece part exposure” is when the affected part is removed from the engine and completely disassembled.

(i) Grace Period for HPT Stage 1 Disk Replacement

For affected HPT stage 1 disks having greater than 8,550 CSN on the effective date of this AD, the replacement required by paragraph (g)(3) of this AD may be deferred up to 50 flight cycles after the effective date of this AD.

(j) 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 AIR-520 Continued Operational Safety Branch, send it to the

attention of the person identified in paragraph (k) of this AD and email to:

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.

(k) Additional 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.

(l) Material Incorporated by Reference

None

Issued on May 15, 2025.

Peter A. White,
Deputy Director, Integrated Certificate Management Division,
Aircraft Certification Service.

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