

[Federal Register, Volume 88 Number 25 (Tuesday, February 7, 2023)]

[Rules and Regulations]

[Pages 7859-7862]

From the Federal Register Online via the Government Publishing Office [www.gpo.gov]

[FR Doc No: 2023-02512]

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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2019-0766; Project Identifier 2019-NE-23-AD; Amendment 39-22312; AD 2023-02-05]**

**RIN 2120-AA64**

### **Airworthiness Directives; General Electric Company Turbofan Engines**

#### **AGENCY:**

Federal Aviation Administration (FAA), DOT.

#### **ACTION:**

Final rule.

#### **SUMMARY:**

The FAA is adopting a new airworthiness directive (AD) for all General Electric Company (GE) CF34-8C1, CF34-8C5, CF34-8C5A1, CF34-8C5B1, CF34-8C5A2, CF34-8C5A3, CF34-8E2, CF34-8E2A1, CF34-8E5, CF34-8E5A1, CF34-8E5A2, CF34-8E6, and CF34-8E6A1 model turbofan engines. This AD was prompted by a predicted reduction in the cyclic life of the combustion chamber assembly aft flange. This AD requires revisions to the airworthiness limitations section (ALS) of the existing engine manual (EM) and the operator's existing approved maintenance or inspection program, as applicable, to incorporate initial and repetitive fluorescent penetrant inspections (FPIs) of the combustion chamber assembly. The FAA is issuing this AD to address the unsafe condition on these products.

#### **DATES:**

This AD is effective March 14, 2023.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of March 14, 2023.

#### **ADDRESSES:**

*AD Docket:* You may examine the AD docket at *regulations.gov* by searching for and locating Docket No. FAA-2019-0766; 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.

#### *Material Incorporated by Reference:*

- For GE service information identified in this final rule, contact General Electric Company, 1 Neumann Way, Cincinnati, OH 45215; phone: (513) 552-3272; email: [aviation.fleetsupport@ge.com](mailto:aviation.fleetsupport@ge.com); website: *ge.com*.
- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110. It is also available at *regulations.gov* by searching for and locating Docket No. FAA-2019-0766.

#### **FOR FURTHER INFORMATION CONTACT:**

Scott Stevenson, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7132; email: [Scott.M.Stevenson@faa.gov](mailto:Scott.M.Stevenson@faa.gov).

#### **SUPPLEMENTARY INFORMATION:**

##### **Background**

The FAA issued a supplemental notice of proposed rulemaking (SNPRM) to amend [14 CFR part 39](#) by adding an AD that would apply to all GE CF34-8C1, CF34-8C5, CF34-8C5A1, CF34-8C5B1, CF34-C5A2, CF34-8C5A3, CF34-8E2, CF34-8E2A1, CF34-8E5, CF34-8E5A1, CF34-8E5A2, CF34-8E6, and CF34-8E6A1 (CF34-8C and GE CF34-8E) model turbofan engines, including engine models marked on the engine data plate as CF34-8C5/B, CF34-8C5/M, CF34-8C5A1/B, CF34-8C5A1/M, CF34-8C5B1/B, CF34-8C5A2/B, and CF34-8C5A2/M. The SNPRM published in the **Federal Register** on October 07, 2022 ([87 FR 60944](#)). The SNPRM was prompted by a predicted reduction in the cyclic life of the combustion chamber assembly aft flange. As a result, the manufacturer incorporated temporary revisions (TRs) into the GE CF34-8C and GE CF34-8E EMs for a scheduled maintenance check. In the SNPRM, the FAA proposed to require revisions to the ALS of the existing EM and the operator's existing approved maintenance or inspection program, as applicable, to incorporate initial and repetitive FPIs of the combustion chamber assembly. 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 Horizon Air, Japan Airlines (JAL), and SkyWest Airlines (SkyWest). The following presents the comments received on the

SNPRM and the FAA's response to each comment.

### **Request To Replace “ESM” Reference With “EM” Reference**

Horizon Air requested that the FAA replace all references of “ESM” with “EM” in this final rule. Horizon Air reasoned that the SNPRM only defines the acronym “EM,” and both acronyms are used interchangeably in the SNPRM.

The FAA clarifies that the reference to “ESM” is not an acronym defined by the FAA in the proposed AD and used interchangeably with “EM.” “ESM” is part of GE's chapter title within each task reference and must be used for an accurate reference. The FAA did not change this AD as a result of this comment.

### **Request To Add the Date of the Task in Paragraph (g)(3)**

Horizon Air requested that the FAA include the task revision date for “TASK 05-21-03-200-801,” referenced in paragraph (g)(3)(ii) of the SNPRM. Horizon Air reasoned that adding the task revision date would make the wording consistent with the dates of the tasks in paragraphs (g)(1)(ii) and (2)(ii) of the SNPRM.

The FAA established a shorthand notation in paragraph (g)(2)(ii) of the SNPRM, which contains the full citation, including the task revision date, followed by the shorthand notation “TASK 05-21-03-200-801.” The FAA then used the established shorthand notation to reference the task in paragraph (g)(3)(ii) of the SNPRM. The FAA did not change this AD as a result of this comment.

### **Request To Revise Paragraph (g)(1)(ii), (2)(ii), and (3)(ii) of the AD**

Horizon Air requested that the FAA revise paragraphs (g)(1)(ii), (2)(ii), and (3)(ii) of the AD, as those paragraphs do not clearly include that performance of the inspection within 2,200 cycles from the effective date of this AD is only applicable to those combustion chamber assemblies that have exceeded the inspection threshold specified in the tables referenced in TASK 05-21-03-200-801. Similarly, JAL requested that the FAA revise paragraph (g)(1)(ii) for the same reasons articulated by Horizon Air.

In response to these comments, the FAA has revised the language in paragraphs (g)(1)(ii), (2)(ii), and (3)(ii) of this AD to clarify that where the notes to Tables 801, 802, 803, 804, and 805, included in TASK 05-21-03-200-801, specify to perform the inspection within 2,200 cycles from the issuance date of the TR, this AD requires performing the inspection within 2,200 cycles from the effective date of this AD. The FAA further clarifies that the notes are part of the task, and therefore, has removed “including the notes.”

### **Request To Correct an Incorrect Reference to a Task in Paragraph (g)(2)(i)**

SkyWest requested that the FAA correct an incorrect reference in paragraph (g)(2)(i) of this AD. SkyWest noted that Table 802 does not exist in TASK 05-11-25-200-801, which is specific to GE CF34-8C5 model turbofan engines with/B minor model designation.

In response to this comment, the FAA has revised paragraph (g)(2)(i) of this AD from “Table 801 in TASK 05-11-05-200-801 and Table 802 in TASK 05-11-25-200-801, dated November 3, 2020, from ESM 05-11-25 Static Structures—BJ Life Limits (TASK 05-11-25-200-801)” to “Tables 801 (for -8C1) and 802 (for -8C5) in TASK 05-11-05-200-801, dated March 4, 2021, from ESM 05-11-05 Static Structures—Life Limits (TASK 05-11-05-200-801).”

## 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 SNPRM. None of the changes will increase the economic burden on any operator.

## Related Service Information Under [1 CFR Part 51](#)

The FAA reviewed the following tasks:

- TASK 05-11-05-200-801, dated March 4, 2021, from ESM 05-11-05 Static Structures—Life Limits, of GE CF34-8C EM GEK105091, Rev 51, dated April 1, 2022;
- TASK 05-11-05-200-801, dated March 4, 2021, from ESM 05-11-05 Static Structures—Life Limits, of GE CF34-8E EM GEK112031, Rev 43, dated April 1, 2022; and
- TASK 05-11-25-200-801, dated November 3, 2020, from ESM 05-11-25 Static Structures—BJ Life Limits, of GE CF34-8C EM GEK105091, Rev 51, dated April 1, 2022.

These tasks, differentiated by GE CF34-8 turbofan engine model, identify the combustion chamber assembly part number, life limit cycles, and revised inspections.

The FAA also reviewed the following tasks:

- TASK 05-21-03-200-801, dated April 1, 2019, from ESM 05-21-03 Airworthiness Limitations—Mandatory Inspection 001, of GE CF34-8C EM GEK105091, Rev 51, dated April 1, 2022; and
- TASK 05-21-03-200-801, dated April 1, 2019, from ESM 05-21-03 Airworthiness Limitations—Mandatory Inspection 001, of GE CF34-8E EM GEK112031, Rev 43, dated April 1, 2022.

These tasks, differentiated by GE CF34-8 turbofan engine model, describe revised inspection threshold limits and re-inspection interval limits for the combustion chamber assembly.

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 **ADDRESSES** .

## Costs of Compliance

The FAA estimates that this AD affects 1,633 GE CF34-8C turbofan engine models and 857 GE CF34-8E turbofan engine models installed on airplanes of U.S. registry.

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

### Estimated Costs

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Revise the ALS of the EM and operator's existing approved maintenance or inspection program (GE CF34-8C and CF34-8E)	1 work-hour × \$85 per hour = \$85	\$0	\$85	\$211,650

### 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:

**2023-02-05 General Electric Company:** Amendment 39-22312; Docket No. FAA-2019-0766; Project Identifier 2019-NE-23-AD.

#### **(a) Effective Date**

This airworthiness directive (AD) is effective March 14, 2023.

#### **(b) Affected ADs**

None.

#### **(c) Applicability**

This AD applies to General Electric Company (GE) CF34-8C1, CF34-8C5, CF34-8C5A1, CF34-8C5B1, CF34-8C5A2, CF34-8C5A3, CF34-8E2, CF34-8E2A1, CF34-8E5, CF34-8E5A1, CF34-8E5A2, CF34-8E6, and CF34-8E6A1 model turbofan engines, including engine models marked on engine data plate as CF34-8C5/B, CF34-8C5/M, CF34-8C5A1/B, CF34-8C5A1/M, CF34-8C5B1/B, CF34-8C5A2/B, and CF34-8C5A2/M.

#### **(d) Subject**

Joint Aircraft System Component (JASC) Code 7240, Turbine Engine Combustion Section.

#### **(e) Unsafe Condition**

This AD was prompted by a predicted reduction in the cyclic life of the combustion chamber assembly aft flange. The FAA is issuing this AD to prevent failure of the combustion chamber assembly. The unsafe condition, if not addressed, could result in combustion chamber assemblies failing before reaching their published life limit, uncontained release of the combustion chamber assembly, 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**

Within 90 days after the effective date of this AD, revise the airworthiness limitations section (ALS) of the existing engine manual (EM) and the operator's existing approved maintenance or inspection

program, as applicable, to incorporate the following requirements for fluorescent penetrant inspections of the combustion chamber assembly aft flange.

(1) For combustion chamber assemblies with part numbers (P/Ns) 4145T11G08, 4145T11G09, 4180T27G01, or 4180T27G03 installed on GE CF34-8E model turbofan engines:

(i) Replace Table 801, Static Structures—Life Limits (Table 801), with the revised Table 801 in TASK 05-11-05-200-801, dated March 4, 2021, from ESM 05-11-05 Static Structures—Life Limits (TASK 05-11-05-200-801), of GE CF34-8E EM GEK112031, Rev 43, dated April 1, 2022 (GE CF34-8E EM GEK112031), and

(ii) Add TASK 05-21-03-200-801, dated April 1, 2019, from ESM 05-21-03 Airworthiness Limitations—Mandatory Inspection 001 (TASK 05-21-03-200-801), of GE CF34-8E EM GEK112031. Where the notes to Tables 801 and 802, included in TASK 05-21-03-200-801 of GE CF34-8E EM GEK112031, specify to perform the inspection within 2,200 cycles from the issuance date of the temporary revision (TR), this AD requires performing the inspection within 2,200 cycles from the effective date of this AD.

(2) For combustion chamber assemblies with P/Ns 4126T87G04, 4126T87G05, 4126T87G07, 4126T87G08, 4180T27G04, 4923T82G01, or 4923T82G02 installed on GE CF34-8C1 model turbofan engines, or with P/Ns 4145T11G08, 4145T11G10, 4180T27G02, 4180T27G04, or 4923T82G02 installed on GE CF34-8C5, CF34-8C5/M, CF34-8C5A1, CF34-8C5A1/M, CF34-8C5A2, CF34-8C5A2/M, CF34-8C5A3, or CF34-8C5B1 model turbofan engines:

(i) Replace Tables 801 (for -8C1) and 802 (for -8C5) Static Structures—Life Limits (Table 801 and Table 802), with the revised Tables 801 and 802 in TASK 05-11-05-200-801, dated March 4, 2021, from ESM 05-11-05 Static Structures—Life Limits (TASK 05-11-05-200-801), of GE CF34-8C EM GEK105091, Rev 51, dated April 1, 2022 (GE CF34-8C EM GEK105091); and

(ii) Add TASK 05-21-03-200-801, dated April 1, 2019, from ESM 05-21-03 Airworthiness Limitations—Mandatory Inspection 001 (TASK 05-21-03-200-801), of GE CF34-8C EM GEK105091. Where the notes to Tables 801, 802, 803, 804, and 805, included in TASK 05-21-03-200-801 of GE CF34-8C EM GEK105091, specify to perform the inspection within 2,200 cycles from the issuance date of the TR, this AD requires performing the inspection within 2,200 cycles from the effective date of this AD.

(3) For combustion chamber assemblies with P/Ns 4145T11G08, 4145T11G10, 4180T27G02, 4180T27G04, or 4923T82G02 installed on GE CF34-8C5B1/B, CF34-8C5/B, CF34-8C5A1/B, or CF34-8C5A2/B model turbofan engines:

(i) Replace Table 801 (for/B -8C5) Static Structures—Life Limits with the revised Table 801 in TASK 05-11-25-200-801, of GE CF34-8C EM GEK105091; and

(ii) Add TASK-05-21-03-200-801, of GE CF34-8C EM GEK105091. Where the notes to Tables 801, 802, 803, 804, and 805, included in TASK 05-21-03-200-801 of GE CF34-8C EM GEK105091, specify to perform the inspection within 2,200 cycles from the issuance date of the TR, this AD requires performing the inspection within 2,200 cycles from the effective date of this AD.

(4) After performing the actions required by paragraphs (g)(1) through (3) of this AD, except as provided in paragraph (i) of this AD, no alternative life limits may be approved.

### **(h) Credit for Previous Actions**

You may take credit for revising the ALS of the existing EM and the operator's existing approved maintenance or inspection program, as applicable, required by paragraphs (g)(1) through (3) of this AD if the actions were completed before the effective date of this AD using GE CF34-8E EM TR 05-0085, dated February 21, 2019; GE CF34-8C TR 05-0141, dated February 21, 2019; GE CF34-8C TR 05-0143, dated February 13, 2019; GE CF34-8E TR 05-0086, dated February 13, 2019; or GE CF34-8C TR 05-0142, dated February 13, 2019.

### **(i) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, ECO 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 certification office, send it to the attention of the person identified in paragraph (j) of this AD and email it to: [ANE-AD-AMOC@faa.gov](mailto: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 Scott Stevenson, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7132; email: [Scott.M.Stevenson@faa.gov](mailto:Scott.M.Stevenson@faa.gov).

### **(k) 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) TASK 05-11-05-200-801, dated March 4, 2021, from ESM 05-11-05 Static Structures—Life Limits, of GE CF34-8C EM GEK105091, Rev 51, dated April 1, 2022.

(ii) TASK 05-11-05-200-801, dated March 4, 2021, from ESM 05-11-05 Static Structures—Life Limits, of GE CF34-8E EM GEK112031, Rev 43, dated April 1, 2022.

(iii) TASK 05-11-25-200-801, dated November 3, 2020, from ESM 05-11-25 Static Structures—BJ Life Limits, of GE CF34-8C EM GEK105091, Rev 51, dated April 1, 2022.

(iv) TASK 05-21-03-200-801, dated April 1, 2019, from ESM 05-21-03 Airworthiness Limitations—Mandatory Inspection 001, of GE CF34-8C EM GEK105091, Rev 51, dated April 1, 2022.

(v) TASK 05-21-03-200-801, dated April 1, 2019, from ESM 05-21-03 Airworthiness Limitations—Mandatory Inspection 001, of GE CF34-8E EM GEK112031, Rev 43, dated April 1, 2022.



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

(4) You may view this service information at FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: [fr.inspection@nara.gov](mailto:fr.inspection@nara.gov), or go to: [www.archives.gov/federal-register/cfr/ibr-locations.html](http://www.archives.gov/federal-register/cfr/ibr-locations.html).

Issued on January 19, 2023.

Ross Landes,

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

[[FR Doc. 2023-02512](#) Filed 2-6-23; 8:45 am]

BILLING CODE 4910-13-P