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**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2008-0952; Directorate Identifier 98-ANE-49-AD; Amendment 39-15816; AD 2009-04-10]**

**RIN 2120-AA64**

# Airworthiness Directives; General Electric Company CF6-80A, CF6-80C2, and CF6-80E1 Series Turbofan Engines

**AGENCY:** Federal Aviation Administration (FAA), Department of Transportation (DOT).

**ACTION:** Final rule.

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**SUMMARY:** The FAA is superseding an existing airworthiness directive (AD) for General Electric Company (GE) CF6-80A, CF6-80C2, and CF6-80E1 series turbofan engines. That AD required revisions to the Airworthiness Limitations Section (ALS) of the manufacturer's Instructions for Continued Airworthiness (ICA) to include required inspection of selected critical life-limited parts at each piece-part exposure. This AD requires revisions to the CF6-80A, CF6-80C2, and CF6-80E1 series engines ALS sections of the manufacturer's manuals and an air carrier's approved continuous airworthiness maintenance program to incorporate additional inspection requirements, and to update certain Engine Manual Inspection Task and Sub Task Number references. This AD results from the need to require enhanced inspection of selected critical life-limited parts of CF6-80A, CF6-80C2, and CF6-80E1 series engines. We are issuing this AD to prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane.

**DATES:** This AD becomes effective March 30, 2009.

**ADDRESSES:** The Docket Operations office is located at Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

**FOR FURTHER INFORMATION CONTACT:** Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: robert.green@faa.gov; telephone (781) 238-7754; (781) 238-7199.

**SUPPLEMENTARY INFORMATION:** The FAA proposed to amend 14 CFR part 39 by superseding AD 2002-07-12, Amendment 39-12707 (67 FR 17279, April 10, 2002), with a proposed AD. The proposed AD applies to GE CF6-80A, CF6-80C2, and CF6-80E1 series turbofan engines. We published the proposed AD in the Federal Register on October 23, 2008 (73 FR 63090). That action proposed to require revisions to the CF6-80A, CF6-80C2, and CF6-80E1 series engines ALS sections of the manufacturer's manuals and an air carrier's approved continuous airworthiness maintenance program to incorporate additional inspection requirements, and to update certain Engine Manual Inspection Task and Sub Task Number references.

**Examining the AD Docket**

You may examine the AD docket on the Internet at http://www.regulations.gov; or in person at the Docket Operations office 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 street address for the Docket Operations office (telephone (800) 647-5527) is provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

**Comments**

We provided the public the opportunity to participate in the development of this AD. We have considered the one comment received.

ABX Air requests that we add a statement to the AD, acknowledging that previously approved alternative methods of compliance (AMOCs) for AD 2002-07-12, the AD being superseded, are also approved for this AD.

We agree and added that statement to the AD.

**Conclusion**

We have carefully reviewed the available data, including the comment received, and determined that air safety and the public interest require adopting the AD with the change described previously. We have determined that this change will neither increase the economic burden on any operator nor increase the scope of the AD.

**Costs of Compliance**

We estimate that this AD will affect 315 CF6-80A series engines and 926 CF6-80C2 series engines installed on airplanes of U.S. registry. We also estimate that it will take about 5 work-hours per CF6-80A series engine and about 2 work-hours per CF6-80C2 series engine to do the additional inspections and that the average labor rate is $80 per work-hour. The total cost of the new inspections per CF6-80A series engine will be about $400. The total cost of the new inspections per CF6-80C2 series engine will be about $160. We estimate that there will be about 42 shop visits per year for CF6-80A series engines, and about 128 shop visits per year for CF6-80C2 series engines that result in piece-part-exposure of the added affected components. Therefore, we estimate the total annual cost for the additional inspections to be $37,280.

**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.

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 have 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 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); 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.

We prepared a summary of the costs to comply with this AD and placed it in the AD Docket. You may get a copy of this summary at the address listed under ADDRESSES.

**List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Safety.

**Adoption of the Amendment**

Accordingly, under the authority delegated to me by the Administrator, the Federal Aviation Administration 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 removing Amendment 39-12707 (67 FR 17279, April 10, 2002), and by adding a new airworthiness directive, Amendment 39-15816, to read as follows:

**2009-04-10 General Electric Company:** Amendment 39-15816. Docket No. FAA-2008-0952; Directorate Identifier 98-ANE-49-AD.

**Effective Date**

(a) This airworthiness directive (AD) becomes effective March 30, 2009.

**Affected ADs**

(b) This AD supersedes AD 2002-07-12, Amendment 39-12707.

**Applicability**

(c) This AD applies to General Electric Company CF6-80A, CF6-80C2, and CF6-80E1 series turbofan engines. These engines are installed on, but not limited to, Airbus A300, A310, and A330 series, Boeing 747 and 767 series, and McDonnell Douglas MD-11 series airplanes.

**Unsafe Condition**

(d) This AD results from the need to require enhanced inspection of selected critical life-limited parts of CF6-80A, CF6-80C2, and CF6-80E1 series engines. We are issuing this AD to prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane.

**Compliance**

(e) You are responsible for having the actions required by this AD performed within the compliance times specified unless the actions have already been done.

**Inspections**

(f) Within the next 180 days after the effective date of this AD, revise the Airworthiness Limitations Section (ALS) of the manufacturer's Instructions for Continued Airworthiness (ICA), and for air carrier operations revise the approved continuous airworthiness maintenance program, by adding the following: "MANDATORY INSPECTIONS"

(1) Perform inspections of the following parts at each piece-part opportunity in accordance with the instructions provided in the applicable manual provisions:

| Part Nomenclature | Part Number (P/N) | Inspect per Engine Manual Inspection Chapter |
|---|---|---|
| **For CF6-80A Engines:** | | |
| Disk, Fan Rotor, Stage 1 | All | 72-21-03 Paragraph 3. Fluorescent-Penetrant Inspect, and 72-21-03 Paragraph 4. Eddy Current Inspect |
| Fan Forward Shaft | All | 72-21-05 Paragraph 2. Magnetic Particle Inspect |

| | | |
|---|---|---|
| Fan Mid Shaft | All | 72-24-01 Paragraph 2. Magnetic Particle Inspect |
| Disk, HPC Rotor, Stage One | All | 72-31-04 Paragraph 3. Fluorescent-Penetrant Inspect |
| ** Disk, HPC Rotor, Stage Two | All | 72-31-05 Paragraph 4. Fluorescent-Penetrant Inspect |
| Spool, HPC Rotor, Stage3-9 | All | 72-31-06 Paragraph 3. Fluorescent-Penetrant Inspect |
| Disk, HPC Rotor, Stage 10 | All | 72-31-07 Paragraph 3. Fluorescent-Penetrant Inspect |
| Spool, HPC Rotor, Stage 11-14 | All | 72-31-08 Paragraph 3.A. Fluorescent-Penetrant Inspect |
| Rotating CDP Seal | All | 72-31-10 Paragraph 3. Fluorescent-Penetrant Inspect |
| Disk Shaft, HPT Rotor Stage One | All | 72-53-02 Paragraph 3. Fluorescent-Penetrant-Inspect per 70-32-02, and<br>72-53-02 Paragraph 6.C. Disk Rim Bolt Hole Eddy Current Inspection, and<br>72-53-02 Paragraph 6.D. Disk Bore Eddy Current Inspection |
| * Disk Shaft, HPT Rotor Stage One | All | 72-53-02 Paragraph 6.E. Disk Dovetail Slot Bottom Eddy Current Inspection |
| * Disk Shaft, HPT Rotor, Stage One | P/Ns 2047M33G01 thru G10, and P/N 9362M58G11 | 72-53-02 Paragraph 7. Disk Dovetail Slot Bottom Aft Corner Chamfers Eddy Current Inspection |
| Disk, HPT Rotor, Stage Two | All | 72-53-06 Paragraph 3. Fluorescent-Penetrant Inspection, and<br>72-53-06 Paragraph 6. Eddy Current Inspection of Rim Bolt Holes for Cracks, and<br>72-53-06 Paragraph 7. Disk Bore Eddy Current Inspection |
| Disk, LPT Rotor Stage 1-4 | All | 72-57-02 Paragraph 3. Fluorescent-Penetrant Inspection |
| Shaft, LPT Rotor | All | 72-57-03 Paragraph 3. Fluorescent-Penetrant Inspection, and<br>72-57-03 Paragraph 6. Eddy Current Inspection |
| **For All CF6-80C2 Engines:** | | |
| Disk, Fan Rotor, Stage 1 | All | Task 72-21-03-200-000-004 Fluorescent-Penetrant Inspection, and<br>Task 72-21-03-200-000-008 Eddy Current Inspect Fan Rotor Disk Stage 1 Bore, Forward and Aft Hub Faces, and Bore Radii |

| | | |
|---|---|---|
| Shaft, Fan Forward | All | Task 72-21-05-200-000-001 Fluorescent Penetrant Inspection, and<br>Task 72-21-05-200-000-005 Vent Hole Eddy Current Inspection |
| Fan Mid Shaft | All | Task 72-24-01-200-000-003 Magnetic Particle Inspection |
| HPCR Stage 1 Disk | All | Task 72-31-04-200-000-002 Fluorescent Penetrant Inspection |
| HPCR Stage 2 Disk | All | Task 72-31-05-200-000-002 Fluorescent Penetrant Inspection |
| HPCR Stage 3-9 Spool | All | Task 72-31-06-200-000-001 Fluorescent Penetrant Inspection |
| HPCR Stage 10 Disk | All | Task 72-31-07-200-000-001 Fluorescent Penetrant Inspection |
| HPCR Stage 11-14 Spool/Shaft | All | Task 72-31-08-200-000-002 Fluorescent Penetrant Inspection |
| No. 4 Bearing Rotating (CDP) Air Seal | All | Task 72-31-10-200-000-001 Fluorescent Penetrant Inspection or<br>Task 72-31-10-200-000-A01 Fluorescent Penetrant Inspection |
| HPCR Stage 10-14 Spool/Shaft | All | Task 72-31-22-200-000-002 Fluorescent Penetrant Inspection |
| ** Disk/Shaft, HPT Rotor, Stage One | All | Task 72-53-02-200-000-001 (Inspection – Configuration 1), or Task 72-53-02-230-801 (Inspection – Configuration 2), Fluorescent-Penetrant Inspect, and<br>Task 72-53-02-200-000-005 (Inspection – Configuration 1), or Task 72-53-02-250-802 (Inspection – Configuration 2), Disk Rim Bolt Hole Eddy Current Inspection, and<br>Task 72-53-02-200-000-006 (Inspection – Configuration 1), or Task 72-53-02-250-803 (Inspection – Configuration 2), Disk Bore Area Eddy Current Inspection, and<br>Task 72-53-02-200-000-007 (Inspection – Configuration 1), or Task 72-53-02-250-804 (Inspection – Configuration 2), Disk Dovetail Slot Bottom Eddy Current |
| * Disk/Shaft, HPT Rotor, Stage One | P/N 1531M84G12 and P/Ns 2047M32G01 thru G07 | Task 72-53-02-250-801 (Inspection – Configuration 1), Disk Dovetail Slot Bottom Aft Corner Chamfers Eddy Current Inspection |

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|---|---|---|
| Disk, HPT Rotor, Stage Two | All | Task 72-53-06-200-000-002 Fluorescent-Penetrant Inspect, and<br>Task 72-53-06-200-000-006 Disk Rim Bolt Hole Eddy Current Inspection, and<br>Task 72-53-06-200-000-007 Disk Bore Eddy Current Inspection |
| LPTR Stage 1-5 Disks | All | Task 72-57-02-200-000-001 Fluorescent-Penetrant Inspection |
| LPTR Shaft | All | Task 72-57-03-200-000-002 Fluorescent-Penetrant Inspect, and<br>Task 72-57-03-200-000-006 Eddy Current Inspection |
| **For CF6-80C2 Engines configured with the R88DT Turbine<br>(Models CF6-80C2B2F, 80C2B4F, 80C2B6F, 80C2B7F, 80C2B8F):** | | |
| Disk/Shaft, HPT Rotor, Stage One (R88DT, No Rim Bolt Holes) | All | Task 72-53-16-200-000-001 Fluorescent-Penetrant Inspect, and<br>Task 72-53-16-200-000-005 Disk Bore Area Eddy Current Inspection |
| Disk, HPT Rotor, Stage Two (R88DT, No Rim Bolt Holes) | All | Task 72-53-18-200-000-002 Fluorescent-Penetrant Inspect, and<br>Task 72-53-18-200-000-005 Disk Bore Area Eddy Current Inspection |
| Rotating Interstage Seal (R88DT) | All | Task 72-53-17-200-000-001 Fluorescent-Penetrant Inspect, and<br>Task 72-53-17-200-000-005 Seal Bore Area Eddy Current |
| Forward Outer Seal (R88DT) | All | Task 72-53-21-200-000-001 Fluorescent-Penetrant Inspect, and<br>Task 72-53-21-200-000-004 Seal Bore Area Eddy Current |
| **For CF6-80E1 Engines:** | | |
| Disk, Fan Rotor, Stage One | All | Sub Task 72-21-03-230-051 Fluorescent-Penetrant Inspection, and<br>Sub Task 72-21-03-250-051 or 72-21-03-250-052 Disk Bore Eddy Current Inspection |
| Shaft, Fan | All | Sub Task 72-21-05-230-051 Fluorescent Penetrant Inspection, and<br>Sub Task 72-21-05-250-051 Vent Hole Eddy Current Inspection |
| Compressor Rotor, Stage 1 Disk | All | Sub Task 72-31-04-230-051 Fluorescent Penetrant Inspection, |

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|---|---|---|
| Compressor Rotor, Stage 2 Disk | All | Sub Task 72-31-05-230-051 Fluorescent Penetrant Inspection |
| Compressor Rotor, Stage 3-9 Spool | All | Sub Task 72-31-06-230-051 Fluorescent Penetrant Inspection |
| Compressor Rotor, Stage 10 Disk (Pre SB 72-0150) | All | Sub Task 72-31-07-230-051 Fluorescent Penetrant Inspection |
| Compressor Rotor Spool/Shaft, Stage 11-14 (Pre SB 72-0150) | All | Sub Task 72-31-08-230-051 Fluorescent Penetrant Inspection |
| Compressor Rotor Spool/Shaft, Stage 10-14 (SB 72-0150) | All | Sub Task 72-31-23-230-052 Fluorescent Penetrant Inspection |
| Compressor Rotor No. 4 Bearing Rotating Air Seal (CDP Rotating Seal) | All | Sub Task 72-31-10-230-051 Fluorescent Penetrant Inspection |
| HPT Disk/Shaft, Stage 1 | All | Sub Task 72-53-02-230-051 Fluorescent-Penetrant Inspection, and<br>Sub Task 72-53-02-250-051 Eddy Current Inspection, Rim Bolt Holes, and<br>Sub Task 72-53-02-250-054 Eddy Current Inspection, Disk Bore |
| HPT Disk, Stage 2 | All | Sub Task 72-53-06-230-051 Fluorescent-Penetrant Inspection, and<br>Sub Task 72-53-06-250-051 Eddy Current Inspection, Rim Bolt Holes, and<br>Sub Task 72-53-06-250-054 Eddy Current Inspection, Disk Bore |
| LPT Rotor Shaft | All | Sub Task 72-55-01-240-051 Magnetic Particle Inspect |
| LPT Disks, Stages 1-5 | All | Sub Task 72-57-02-230-051 Fluorescent-Penetrant Inspect |
| LPT Rotor Torque Cone | All | Sub Task 72-57-03-220-051 Fluorescent-Penetrant Inspect |
| **For CF6-80E1 Engines configured with the R88DT Turbine:** | | |
| Disk/Shaft, HPT Rotor, Stage 1 (R88DT, No Rim Bolt Holes) | All | Sub Task 72-53-16-230-052 Fluorescent-Penetrant Inspect, and<br>Sub Task 72-53-16-250-051 Disk Bore Area Eddy Current Inspection |

| | | |
|---|---|---|
| Disk, HPT Rotor, Stage 2 (R88DT, No Rim Bolt Holes) | All | Sub Task 72-53-18-230-051 Fluorescent-Penetrant Inspect, and<br>Sub Task 72-53-18-250-051 Disk Bore Area Eddy Current Inspection |
| ** HPT Rotor Rotating Interstage Seal (R88DT) | All | Sub Task 72-53-17-230-056 Fluorescent-Penetrant Inspect, and<br>Sub Task 72-53-17-250-051 Seal Bore Area Eddy Current |
| HPT Rotor Forward Outer Seal (R88DT) | All | Sub Task 72-53-21-230-051 Fluorescent-Penetrant Inspect, and<br>Sub Task 72-53-21-250-051 Seal Bore Area Eddy Current |

(2) For the purposes of these mandatory inspections, piece-part opportunity means:

(i) The part is considered completely disassembled when accomplished in accordance with the disassembly instructions in the manufacturer's engine manual; and

(ii) The part has accumulated more than 100 cycles-in-service since the last piece-part opportunity inspection, provided that the part was not damaged or related to the cause for its removal from the engine."

(g) The parts added to the table of this AD are identified by an asterisk (*) that precedes the part nomenclature. Also, parts that have an Engine Manual Inspection Task and or Sub Task Number reference updated in the table of this AD, are identified by two asterisks (**) that precede the part nomenclature.

(h) Except as provided in paragraph (i) of this AD, and notwithstanding contrary provisions in section 43.16 of the Federal Aviation Regulations (14 CFR 43.16), these mandatory inspections shall be performed only in accordance with the ALS of the manufacturer's ICA.

**Alternative Methods of Compliance (AMOC)**

(i) You must perform these mandatory inspections using the ALS of the ICA and the applicable Engine Manual unless you receive approval to use an AMOC under paragraph (j) of this AD. Section 43.16 of the Federal Aviation Regulations (14 CFR 43.16) may not be used to approve alternative methods of compliance or adjustments to the times in which these inspections must be performed.

(j) The Manager, Engine Certification Office, has the authority to approve alternative methods of compliance for this AD if requested using the procedures found in 14 CFR 39.19.

(k) AMOCs previously approved for AD 2002-07-12, are also approved for this AD.

**Maintaining Records of the Mandatory Inspections**

(l) You have met the requirements of this AD when you revise the ALS of the manufacturer's ICA as specified in paragraph (f) of this AD. For air carriers operating under part 121 of the Federal Aviation Regulations (14 CFR part 121), you have met the requirements of this AD when you modify your continuous airworthiness maintenance plan to reflect those changes. You do not need to record each piece-part inspection as compliance to this AD, but you must maintain records of those inspections according to the regulations governing your operation. For air carriers operating under

part 121, you may use either the system established to comply with section 121.369 or an alternative accepted by your principal maintenance inspector if that alternative:

(1) Includes a method for preserving and retrieving the records of the inspections resulting from this AD; and

(2) Meets the requirements of section 121.369(c); and

(3) Maintains the records either indefinitely or until the work is repeated.

(m) These recordkeeping requirements apply only to the records used to document the mandatory inspections required as a result of revising the ALS of the manufacturer's ICA as specified in paragraph (f) of this AD. These record keeping requirements do not alter or amend the record keeping requirements for any other AD or regulatory requirement.

**Related Information**

(n) Contact Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: robert.green@faa.gov; telephone (781) 238-7754; fax (781) 238-7199, for more information about this AD.

**Material Incorporated by Reference**

(o) None.

Issued in Burlington, Massachusetts, on February 5, 2009.
Peter A. White,
Assistant Manager, Engine and Propeller Directorate.