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Rules and Regulations
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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 98-ANE-49-AD; Amendment 39-12707; AD 2002-07-12]

RIN 2120-AA64

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

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment supersedes an existing airworthiness directive (AD), that is applicable to General Electric Company (GE) CF6-80A, CF6-80C2, and CF6-80E1 series turbofan engines. That AD currently requires revisions to the Life Limits Section 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 amendment adds additional mandatory inspections for certain high pressure compressor (HPC), low pressure turbine (LPT), and high pressure turbine (HPT) parts. The mandatory inspections are needed to identify those critical rotating parts with conditions, which if allowed to continue in service, could result in uncontained failures. The actions specified by this AD are intended to prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane.

DATES: Effective date May 15, 2002.

ADDRESSES: This information may be examined, by appointment, at the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Karen Curtis, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7192, fax (781) 238-7199.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) by superseding AD 2000-08-12, Amendment 39-11698 (65 FR 21638, April 24, 2000), which is applicable to (GE) CF6-80A, CF6-80C2, and CF6-80E1 series turbofan engines was published in the Federal Register on October 5, 2001 (66 FR 50906). That action proposed to add to the revisions to the Life Limits section of the Engine Manuals, and for air carriers add to their approved continuous maintenance program, additional mandatory inspections for certain HPC, LPT, and HPT parts. The mandatory inspections are needed to identify those critical rotating parts with conditions, which if allowed to continue in service, could result in uncontained failures.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

Intent of AD Perceived to Supersede AD 95-18-14

Two commenters state that an existing AD (95-18-14) already requires fluorescent penetrant inspection (FPI) of certain CF6 HPC rotor stage 3-9 spools. These commenters suggest that this AD is intended to supersede AD 95-18-14 and, therefore, request that the final rule provide this clarification.

The FAA disagrees that the intent is to supersede AD 95-18-14, but agrees that clarification is needed to prevent potential confusion. AD 95-18-14 requires that a more detailed FPI of the HPC rotor stage 3-9 spool (as described by GE All Operators' Wire dated 8/10/95) be used whenever FPI of these spools is done. AD 95-18-14, however, does not specify when the FPI is to be conducted. This final rule requires FPI of all HPC rotor stage 3-9 spools at piece-part exposure. This FPI technique is now contained in the GE Standard Practice Manual as the recommended inspection for deep disk spools.

Typographical Error

Two commenters state that the proposal contains a typographical error in the task number for the CF6-80C2 No. 4R bearing FPI, and suggest that task number 72-31-10-200-000-A01 be changed to read task number 72-31-10-200-000-A001.

The FAA disagrees, and believes the commenters were referencing an electronic version of the engine manual for this task number. The task number in the paper copy of the engine manual is consistent with the proposal. GE has advised the FAA that an electronic formatting routine incorrectly converted the text for this task number thereby causing the noted discrepancy between the paper and electronic (e.g. CD-ROM) versions. This electronic formatting routine is being corrected and the next publication of the CD will reflect this correction. The paper version of the manual is correct. Therefore, no change will be made in the final rule.

Intent of AD Perceived to Supersede AD 2001-10-07

One commenter states that an existing AD (2001-10-07) already requires eddy current inspection (ECI) of the CF6-80C2 HPT stage 1 disk dovetail slot bottom. The commenter suggests that this proposal is intended to supersede AD 2001-10-07 and therefore requests that the final rule provide this clarification.

The FAA disagrees that the intent is to supersede AD 2001-10-07, but agrees that clarification on this issue is appropriate to prevent any potential for confusion. AD 2001-10-07 requires both an initial and repetitive ECI of dovetail slot bottoms, but only for certain CF6-80C2 HPT Stage 1 disk part numbers. The initial inspection is required within the time limits specified in that AD. This final rule requires only the repetitive ECI at each piece-part exposure for all current and future CF6-80C2 HPT Stage 1 disk dovetail slot bottoms. Repetitive ECI's performed on the HPT Stage 1 disks specified in AD 2001-10-07 will satisfy both the requirements of that AD and the requirements of this final rule.

Reference the Manual Revisions

One commenter states that engine manual task numbers and/or paragraph numbers are subject to change, and therefore, suggested this final rule should reference the specific date and revision of the manual to ensure compliance. The commenter noted that AD references to other manufacturer publications such as service bulletins, always reference revisions numbers and issue dates.

The FAA disagrees. Compliance with this AD is achieved by incorporating the schedule of inspections into the Life Limits Section of the Instructions for Continued Airworthiness (ICA). Each specific piece-part inspection is therefore done by following the operator's approved maintenance program, not by the AD itself, and, therefore, the AD need not make specific reference to a particular version of the manual. In addition, all revisions to the Life Limits Section of the manufacturer's ICA's are approved by the FAA. Any engine shop manual change that results in a change to the task number of a task in that section of the ICA's would require a change that would require FAA approval.

Final Rule Effectivity Date

Two commenters state that the manufacturer has not yet released all of the engine manual changes necessary to comply with the final rule. One of these commenters suggests that the effective date of the final rule should be set for 30 days after release of the manual revisions.

The FAA partially agrees. The FAA has worked closely with the manufacturer to ensure that any new procedures required for the additional inspections are incorporated in the engine shop manuals (ESM) in a timely fashion. These shop manual changes must be published (either by formal or temporary revision to the manual) prior to or simultaneous with the publication of revisions to the manufacturer's Life Limits Section of the Instructions for Continued Airworthiness (ICA). The AD allows up to 30 days after the effective date of the AD for the manufacturer to issue the necessary revisions to their ICA. The majority of the inspections added by this rule already exist in the ESM. Operators were made aware of any new inspections via the notice of proposed rulemaking (NPRM) process and separate communications from the manufacturer. Since publication of the NPRM, the manufacturer has issued temporary revisions to their manuals to add the new inspections (CF6-80C2; TR's 72-0842, -0843, -0844, and "0845 dated 12/14/01, and CF6-80E1; TR's 72-0057, -0058, -0059, and -0060 dated 12/18/01). Therefore no changes are deemed necessary to the effective date for this AD.

Task Number Inconsistencies

One commenter states that there are inconsistencies between the task numbers in the proposal and the manufacturer's engine manual for certain components, and requests that the final rule correct these inconsistencies.

The FAA agrees. At the time of publication of the NPRM, the engine manual changes for the new inspections, specifically for certain HPT rotor R88DT turbine components, were not yet available and therefore the task numbers were not yet defined. Since then, the manufacturer has issued temporary revisions to the engine manuals to add these inspections including the correct task numbers (CF6-80C2, TR's 72-0842, -0843, -0844, and "0845 dated 12/14/01 and CF6-80E1 TR's 72-0057, -0058, -0059, -0060 dated 12/18/01). The corresponding changes to the ICA's have also been prepared to reflect these final task numbers. The final rule will reflect the correct task numbers for the new inspections.

Approved As-Written

Three commenters state their approval of the rule as-written, and request no changes.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Economic Analysis

The FAA estimates that 790 engines installed on airplanes of US registry would be affected by this AD, that it would take approximately 10 work hours per engine to accomplish the additional inspections and that the average labor rate is \$60 per work hour. The total cost of the new inspections per engine would be approximately \$600. The FAA estimates that there will be approximately 327 shop visits per year that result in piece-part exposure of the added affected components, therefore, the total annual cost for the additional inspections is estimated to be \$196,200.

Regulatory Analysis

This final rule does not have federalism implications, as defined in Executive Order 13132, because it would 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. Accordingly, the FAA has not consulted with state authorities prior to publication of this final rule.

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) if promulgated, 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. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (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.

Sec. 39.13 [Amended]

2. Section 39.13 is amended by removing Amendment 39-11698 (65 FR 21638, April 24, 2000) and by adding a new airworthiness directive, Amendment 39-12707, to read as follows:

AIRWORTHINESS DIRECTIVE



Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
**Federal Aviation
Administration**

We post ADs on the internet at "www.airweb.faa.gov/rgl"

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2002-07-12 General Electric Company: Amendment 39-12707. Docket No. 98-ANE-49-AD.
Supersedes AD 2000-08-12, Amendment 39-11698

Applicability

This airworthiness directive (AD) is applicable to General Electric Company (GE) CF6-80A, CF6-80C2, and CF6-80E1 series turbofan engines, installed on but not limited to Airbus Industrie A300, A310, and A330 series, Boeing 747 and 767 series, and McDonnell Douglas MD-11 series airplanes.

Note 1: This AD applies to each engine identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For engines that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (c) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance

Compliance with this AD is required as indicated, unless already done.

To prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane, accomplish the following:

Inspections

(a) Within the next 30 days after the effective date of this AD, revise the manufacturer's Life Limits Section of the 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 No. (P/N)	Inspect per engine manual 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 Shaft 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 3. Fluorescent-Penetrant Inspect.
Spool, HPC Rotor, Stage 3-9	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 72-53-02 Paragraph 6.C. Eddy Current Inspection, and 72-53-02 Paragraph 6.D. Disk Bore Area Eddy Current Inspection.
Disk, HPT Rotor, Stage Two	All	72-53-06 Paragraph 3. Fluorescent-Penetrant Inspection, and 72-53-06 Paragraph 6. Eddy Current Inspection of Rim Boltholes for Cracks, and 72-53-06 Paragraph 7. Disk Bore Area 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 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 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 Task 72-21-05-200-000-005 Vent Hole Eddy Current 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 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.
Fan Mid Shaft	All	Task 72-24-01-200-000-003 Magnetic Particle Inspection.
Disk Shaft, HPT Rotor, Stage One	All	Task 72-53-02-200-000-001 Fluorescent-Penetrant Inspect, and Task 72-53-02-200-000-005 Disk Rim Bolt Hole Eddy Current Inspection, and Task 72-53-02-200-000-006 Disk Bore Area Eddy Current Inspection, and Task 72-53-02-200-000-007 Disk Dovetail Slot Bottom Eddy Current Inspection.

Disk, HPT Rotor, Stage Two	All	Task 72-53-06-200-000-002 Fluorescent-Penetrant Inspect, and Task 72-53-06-200-000-006 Disk Rim Bolt Hole Eddy Current Inspection Rim Boltholes, and Task 72-53-06-200-000-007 Disk Bore Area 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 Task 72-57-03-200-000-006 Eddy Current Inspection.

For CF6-80C2 Engines configured with the R88DT Turbine (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 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 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 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 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 Sub Task 72-21-03-250-051 or 72-21-03-250-052 Disk Bore Eddy Current Inspection.
Shaft, Fan Forward	All	Sub Task 72-21-05-230-051 Fluorescent-Penetrant Inspection, and 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.
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 Sub Task 72-53-02-250-051 Eddy Current Inspection, Rim Bolt Holes, and Sub Task 72-53-02-250-054 Eddy Current Inspection, Disk Bore Area.

HPT Disk, Stage 2	All	Sub Task 72-53-06-230-051 Fluorescent-Penetrant Inspection, and Sub Task 72-53-06-250-051 Eddy Current Inspection, Rim Bolt Holes, and Sub Task 72-53-06-250-054 Eddy Current Inspection, Disk Bore Area.
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	All	Sub Task 72-53-16-230-052 Fluorescent-Penetrant Inspect, and 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 Sub Task 72-53-18-250-051 Disk Bore Area Eddy Current Inspection.
HPT Rotor Rotating Interstage Seal (R88DT).	All	Sub Task 72-53-17-230-051 Fluorescent-Penetrant Inspect, and 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 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."

(b) Except as provided in paragraph (c) 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 Life Limits Section of the manufacturer's ICA.

Alternative Methods of Compliance

(c) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Engine Certification Office (ECO). Operators must submit their requests through an appropriate FAA Principal Maintenance Inspector (PMI), who may add comments and then send it to the ECO.

Note 2: Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the ECO.

Continuous Airworthiness Maintenance Program

(d) FAA-certificated air carriers that have an approved continuous airworthiness maintenance program in accordance with the record keeping requirement of Sec. 121.369 (c) of the Federal Aviation Regulations (14 CFR 121.369 (c)) of this chapter must maintain records of the mandatory inspections that result from revising the Life Limits Section of the Instructions for Continuous Airworthiness (ICA) and the air carrier's continuous airworthiness program. Alternately, certificated air carriers may establish an approved system of record retention that provides a method for

preservation and retrieval of the maintenance records that include the inspections resulting from this AD, and include the policy and procedures for implementing this alternate method in the air carrier's maintenance manual required by Sec. 121.369 (c) of the Federal Aviation Regulations (14 CFR 121.369 (c)); however, the alternate system must be accepted by the appropriate PMI and require the maintenance records be maintained either indefinitely or until the work is repeated. Records of the piece-part inspections are not required under Sec. 121.380 (a) (2) (vi) of the Federal Aviation Regulations (14 CFR 121.380 (a) (2) (vi)). All other Operators must maintain the records of mandatory inspections required by the applicable regulations governing their operations.

Note 3: The requirements of this AD have been met when the engine manual changes are made and air carriers have modified their continuous airworthiness maintenance plans to reflect the requirements in the engine manuals.

Effective Date

(e) This amendment becomes effective on May 15, 2002.

Issued in Burlington, Massachusetts, on April 3, 2002.

Jay J. Pardee,

Manager, Engine and Propeller Directorate, Aircraft Certification Service.

[FR Doc. 02-8641 Filed 4-9-02; 8:45 am]

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