

DEPARTMENT OF TRANSPORTATION**Federal Aviation Administration****14 CFR Part 39**

[Docket No. 98-ANE-32-AD]

RIN 2120-AA64

Airworthiness Directives; General Electric Company CF6-45/50 Series Turbofan Engines**AGENCY:** Federal Aviation Administration, DOT.**ACTION:** Notice of proposed rulemaking (NPRM).

SUMMARY: This document proposes the adoption of a new airworthiness directive (AD) that is applicable to General Electric Company (GE) CF6-45/50 series turbofan engines. This proposal would require initial and repetitive inspections for cracks in the stage 14 high pressure compressor (HPC) disk lock slots, and removal from service of certain disks, at the first piece-part level or HPC rotor module level exposure, after 6,000 cycles since new (CSN). This proposal is prompted by reports of stage 14 HPC disk lock slot cracks discovered during shop fluorescent penetrant inspections. The actions specified by the proposed AD are intended to prevent stage 14 HPC disk failure, which could result in an uncontained engine failure and damage to the aircraft.

DATES: Comments must be received by December 27, 1999.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, Attention: Rules Docket No. 98-ANE-32-AD, 12 New England Executive Park, Burlington, MA 01803-5299. Comments may also be sent via the Internet using the following address: "9-ane-adcomment@faa.gov". Comments sent via the Internet must contain the docket number in the subject line. Comments may be inspected at this location between 8:00 a.m. and 4:30 p.m., Monday through Friday, except Federal holidays.

The service information referenced in the proposed rule may be obtained from General Electric Company via Lockheed Martin Technology Services, 10525 Chester Road, Suite C, Cincinnati, Ohio 45215, telephone (513) 672-8400, fax (513) 672-8422. This information may be examined at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA.

FOR FURTHER INFORMATION CONTACT:

William S. Ricci, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7742, fax (781) 238-7199.

SUPPLEMENTARY INFORMATION:**Comments Invited**

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified above. All communications received on or before the closing date for comments, specified above, will be considered before taking action on the proposed rule. The proposals contained in this notice may be changed in light of the comments received.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the proposed rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each FAA-public contact concerned with the substance of this proposal will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket Number 98-ANE-32-AD." The postcard will be date stamped and returned to the commenter.

Availability of NPRM's

Any person may obtain a copy of this NPRM by submitting a request to the FAA, New England Region, Office of the Regional Counsel, Attention: Rules Docket No. 98-ANE-32-AD, 12 New England Executive Park, Burlington, MA 01803-5299.

Events Leading to This Proposed Rule

The Federal Aviation Administration (FAA) has received reports of stage 14 high pressure compressor (HPC) disk lock slot cracks discovered on General Electric Company (GE) CF6-45/50 series turbofan engines during routine shop fluorescent penetrant inspections. The investigation revealed higher stresses in the load and lock slots than prior analyses have predicted. Two populations or groups of disks have been identified. One group of disks was

produced from forgings with coarser grain sizes than the other group of disks and therefore is less resistant to fatigue crack initiation. The referenced GE CF6-50 Alert Service Bulletins (ASB) 72-A1144, dated March 19, 1998, or ASB 72-A1144, Revision 1, dated May 13, 1999, define these forging groups by serial numbers and describe the applicable inspection procedures for each disk forging group. This condition, if not corrected, could result in a stage 14 HPC disk failure, which could result in uncontained engine failure and damage to the aircraft. The stage 14 HPC rotor disks are no longer being manufactured, and have been replaced with a stage 11-14 spool shaft.

Since an unsafe condition has been identified that is likely to exist or develop on other products of this same type design, the proposed AD would require initial and repetitive inspections for cracks in the stage 14 HPC disk lock slots in accordance with procedures and intervals defined by forging group, and would require the removal from service of certain disks at the first piece-part level exposure or HPC rotor module level exposure above 6,000 CSN. The actions would be required to be accomplished in accordance with the ASB's described previously.

Cost Impact

There are approximately 1,538 engines of the affected design in the worldwide fleet. The FAA estimates that 460 engines installed on aircraft of U.S. registry would be affected by this proposed AD, that it would take approximately 22 work hours per engine to accomplish the proposed actions, and that the average labor rate is \$60 per work hour. Required parts would cost approximately \$3,600 per engine. Based on these figures, the total cost impact of the proposed AD on U.S. operators is estimated to be \$2,263,200.

Regulatory Impact

The regulations proposed herein would not have substantial direct effects 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. Therefore, in accordance with Executive Order 12612, it is determined that this proposal would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

For the reasons discussed above, I certify that this proposed regulation (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 copy of the draft regulatory evaluation prepared for this action 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.

The Proposed Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration proposes to amend 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.

§ 39.13 [Amended]

2. Section 39.13 is amended by adding the following new airworthiness directive:

General Electric Company: Docket No. 98-ANE-32-AD.

Applicability: General Electric Company (GE) Model CF6-45/50 series turbofan engines, installed on but not limited to Airbus Industrie A300 series, Boeing Company 747 series, and McDonnell Douglas Corporation DC-10 series airplanes.

Note 1: This airworthiness directive (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 (j) 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: Required as indicated, unless accomplished previously.

To prevent a stage 14 high pressure compressor (HPC) disk failure, which could result in uncontained engine failure and damage to the aircraft, accomplish the following:

Inspections

(a) Perform initial inspections of HPC stage 14 disks, part numbers (P/N's) 9080M34P03,

9080M34P04, 9080M34P05 and 9349M91P04, with serial number (SN) prefixes GWN, MPO, RRY, and SNL, and disk SN's SNE00001 through SNE00017, and disk SN's SNE01101 through SNE01110, in accordance with paragraphs 2.A. through 2.B. of GE CF6-50 ASB No. 72-A1144, dated March 19, 1998, or ASB No. 72-A1144, Revision 1, dated May 13, 1999, and the following schedule:

(1) Inspect disks with 6,500 cycles since new (CSN) or less on the effective date of this AD before accumulating 9,800 CSN.

(2) Inspect disks with more than 6,500 CSN on the effective date of this AD no later than the next engine shop visit (ESV) after the effective date of this AD or before accumulating an additional 3,300 cycles-in-service (CIS) after the effective date of this AD, whichever occurs first.

(b) Perform repetitive inspections of HPC stage 14 disks, P/N's 9080M34P03, 9080M34P04, 9080M34P05 and 9349M91P04, with SN prefixes GWN, MPO, RRY, and SNL, and disk SN's SNE00001 through SNE00017, and disk SN's SNE01101 through SNE01110, in accordance with paragraphs 2.A. through 2.B. of GE CF6-50 ASB No. 72-A1144, dated March 19, 1998, or ASB No. 72-A1144, Revision 1, dated May 13, 1999, and the following schedule:

(1) For disks with less than 9,800 CSN at the time of the last inspection, perform repetitive inspections no later than 9,800 CSN or before accumulating 3,300 cycles since last inspection (CSLI), whichever occurs later.

(2) For disks with 9,800 CSN or greater at the time of the last inspection, perform repetitive inspections no later than 3,300 CSLI.

(c) Perform initial inspections of HPC stage 14 disks, P/N's 9080M34P03, 9080M34P04, 9080M34P05 and 9349M91P04 with SN prefixes SNG and SNE, except disk SN's SNE00001 through SNE00017 and SNE01101 through SNE01110, in accordance with paragraphs 2.A. through 2.B. of GE CF6-50 ASB No. 72-A1144, dated March 19, 1998, or ASB No. 72-A1144, Revision 1, dated May 13, 1999, and the following schedule:

(1) Inspect disks with 4,200 CSN or less on the effective date of this AD before accumulating 7,500 CSN.

(2) Inspect disks with more than 4,200 CSN but less than 9,000 CSN on the effective date of this AD at the next ESV after the effective date of this AD, before accumulating an additional 3,300 CIS after the effective date of this AD, or before accumulating 11,000 CSN, whichever occurs first.

(3) Inspect disks with 9,000 CSN or greater on the effective date of this AD, at the next ESV after the effective date of this AD, or before accumulating an additional 2,000 CIS after the effective date of this AD, whichever occurs first.

(d) Perform repetitive inspections of HPC stage 14 disks, P/N's 9080M34P03, 9080M34P04, 9080M34P05 and 9349M91P04 with SN prefixes SNG and SNE, except disk SN's SNE00001 through SNE00017 and SNE01101 through SNE01110, in accordance with paragraphs 2.A. through 2.B. of GE CF6-50 ASB No. 72-A1144, dated March 19, 1998, or ASB No. 72-A1144, Revision 1,

dated May 13, 1999, and the following schedule:

(1) For disks with less than 7,500 CSN at the time of the last inspection, perform repetitive inspections no later than 7,500 CSN or before accumulating 3,300 CSLI, whichever occurs later.

(2) For disks with 7,500 CSN or greater at the time of the last inspection, perform repetitive inspections no later than 3300 CSLI.

Removal from Service

(e) Remove from service prior to further flight stage 14 HPC disks that equal or exceed the reject criteria established by GE CF6-50 ASB 72-A1144, dated March 19, 1998, or ASB No. 72-A1144, Revision 1, dated May 13, 1999.

(f) Remove from service, HPC stage 14 disks, P/N's 9080M34P03, 9080M34P04, 9080M34P05 and 9349M91P04 with SN prefixes SNG and SNE, except disk SN's SNE00001 through SNE00017 and SNE01101 through SNE01110, with greater than 6,000 CSN after the effective date of this AD, at the next piece-part level exposure or at the next HPC rotor module level exposure after the effective date of this AD.

Terminating Action

(g) Replacement of the stage 14 HPC disk, P/N's 9080M34P03, 9080M34P04, 9080M34P05, 9349M91P04, with a stage 11-14 spool shaft is terminating action for the inspection requirements of this AD.

Reporting Requirements

(h) Report the results of inspections that equal or exceed the reject criteria within five days of the inspection to: Manager, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299. The following information must be included in the report:

- (1) HPC Stage 14 rotor disk P/N,
- (2) HPC Stage 14 rotor disk SN,
- (3) HPC Stage 14 rotor disk CSN,
- (4) HPC Stage 14 rotor disk CSLI, and
- (5) Date and location of inspection.

Reporting requirements have been approved by the Office of Management and Budget (OMB) and assigned OMB control number 2120-0056.

Definitions

(i) For the purpose of this AD, the following definitions apply:

(1) HPC Rotor disassembly occurs if any of the HPC

Rotor bolted flange joints are separated, such as the Stage 2 joint to accomplish the Stage 3-9 Spool inspection.

(2) Piece-part exposure is defined as disassembly and removal of the stage 14 disk from the HPC rotor structure, regardless of any blades, locking lugs, bolts or balance weights assembled to the disk.

(3) An engine shop visit is defined as the introduction of an engine into a shop where a major engine flange is separated. The following maintenance actions are not considered engine shop visits for the purpose of this AD:

(i) Introduction of an engine into a shop solely for removal or replacement of the Stage 1 Fan Disk;

(ii) Introduction of an engine into a shop solely for replacement of the Turbine Rear Frame;

(iii) Introduction of an engine into a shop solely for replacement of the Accessory Gearbox or Transfer Gearboxes;

(iv) Introduction of an engine into a shop for any combination of exceptions specified in paragraphs (i)(3)(i) through (i)(3)(iii).

Alternate Methods of Compliance

(j) 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 Manager, Engine Certification Office. Operators shall submit their request through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Engine Certification Office.

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

Special Flight Permit

(k) Special flight permits may be issued in accordance with §§ 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the aircraft to a location where the requirements of this AD can be accomplished.

Issued in Burlington, Massachusetts, on October 20, 1999.

David A. Downey,

Assistant Manager, Engine and Propeller Directorate, Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 98-ANE-79-AD]

RIN 2120-AA64

Airworthiness Directives; General Electric Company CF6-80C2 Series Turbofan Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This document proposes the adoption of a new airworthiness directive (AD) that is applicable to General Electric Company (GE) CF6-80C2 series turbofan engines. This proposal would require removal from service of affected fan mid shafts prior to reaching a new, lower cyclic life limit, and replacement with serviceable parts. This proposal is prompted by

recent component test data. The actions specified by the proposed AD are intended to prevent fan mid shaft failure, which could result in an uncontained engine failure and damage to the aircraft.

DATES: Comments must be received by December 27, 1999.

ADDRESSES: Submit comments to the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, Attention: Rules Docket No. 98-ANE-79-AD, 12 New England Executive Park, Burlington, MA 01803-5299. Comments may also be sent via the Internet using the following address: "9-ad-engineprop@faa.gov". Comments sent via the Internet must contain the docket number in the subject line. Comments may be inspected at this location between 8:00 a.m. and 4:30 p.m., Monday through Friday, except Federal holidays.

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SUPPLEMENTARY INFORMATION:

Comments Invited

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Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the proposed rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each FAA-public contact concerned with the substance of this

proposal will be filed in the Rules Docket.

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Availability of NPRMs

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Discussion

General Electric Company (GE), the manufacturer of CF6-80C2 series turbofan engines, recently conducted component tests and analysis of low pressure rotor shafts that resulted in the need to reduce the cyclic life limit of fan mid shafts, part number (P/Ns) 9326M74P04 and P/N 9326M74P05. The analysis revealed high stress in the fan mid shaft spline teeth, which results in reduced component cyclic life. This condition, if not corrected, could result in fan mid shaft failure, which could result in an uncontained engine failure and damage to the aircraft.

Proposed Actions

Since an unsafe condition has been identified that is likely to exist or develop on other engines of this same type design, the proposed AD would require removal from service of affected fan mid shafts prior to reaching a new, lower cyclic life limit, and replacement with serviceable parts.

Economic Analysis

There are approximately 1,796 engines of the affected design in the worldwide fleet. The FAA estimates that 230 engines installed on aircraft of US registry would be affected by this proposed AD and that required parts would cost approximately \$90,085 per engine. Based on these figures, the total cost impact of the proposed AD on US operators is estimated to be \$20,719,600.

Regulatory Impact

The regulations proposed herein would not have substantial direct effects 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. Therefore, in accordance with Executive Order