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DEPARTMENT OF TRANSPORTATION (DOT)

Federal Aviation Administration

14 CFR Part 39 FAA-2004-19463-3

[Docket No. FAA-2004-19463; Directorate Identifier 2004-NE-14-AD]

RIN 2120-AA64

Airworthiness Directives; General Electric Company CF6-45A, CF6-50A, CF6-50C, and CF6-50E Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to adopt a new airworthiness directive (AD) for General Electric Company (GE) CF6-45A, CF6-50A, CF6-50C, and CF6-50E series turbofan engines that have not incorporated GE Service Bulletin (SB) No. CF6-50 S/B 72-1239, Revision 1, dated September 24, 2003, or that have not incorporated paragraph 3.B. of GE SB No. CF6-50 S/B 72-1239, original issue, dated May 29, 2003. This proposed AD would require inspecting the stage 1 low pressure turbine (LPT) blades for damage and replacement of the LPT module if necessary. This proposed AD results from a report of a stud that separated from a turbine mid frame (TMF) strut and from an updated analysis of strut stud failures. We are proposing this AD to prevent an uncontained failure of the engine and possible damage to the airplane caused by failure of TMF strut studs.

DATES: We must receive any comments on this proposed AD by [insert date 60 days after date of publication in the FEDERAL REGISTER].

ADDRESSES: Use one of the following addresses to submit comments on this proposed AD.

- DOT Docket web site: Go to http://dms.dot.gov and follow the instructions for sending your comments electronically.
- Government-wide rulemaking web site: Go to http://www.regulations.gov and follow the instructions for sending your comments electronically.
- Mail: Docket Management Facility; US Department of Transportation, 400 Seventh Street, S.W., Nassif Building, Room PL-401, Washington, DC 20590-001.
- Fax: (202) 493-2251.
- Hand Delivery: Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, S.W., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

You can get the service information identified in this proposed AD 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.

You may examine the comments on this proposed AD in the AD docket on the Internet at http://dms.dot.gov.

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

SUPPLEMENTARY INFORMATION:

Docket Management System (DMS)

We have implemented new procedures for maintaining AD dockets electronically. As of May 17, 2004, we post new AD actions on the DMS and assign a DMS docket number. We track each action and assign a corresponding Directorate identifier. The DMS docket No. is in the form "Docket No. FAA-200X-XXXXX." Each DMS docket also lists the Directorate identifier ("Old Docket Number") as a cross-reference for searching purposes.

Comments Invited

We invite you to submit any written relevant data, views, or arguments regarding this proposal. Send your comments to an address listed under ADDRESSES. Include "Docket No. FAA-2004-19463; Directorate Identifier 2004-NE-14-AD" in the subject line of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of the proposed AD. We will consider all comments received by the closing date and may amend the proposed AD in light of those comments.

We will post all comments we receive, without change, to http://dms.dot.gov, including any personal information you provide. We will also post a report summarizing each substantive verbal contact with FAA personnel concerning this proposed AD. Using the search function of the DMS web site, anyone can find and read the comments in any of our dockets, including the name of the individual who sent the comment (or signed the comment on behalf of an association, business, labor union, etc.). You may review the

DOT's complete Privacy Act Statement in the Federal Register published on April 11, 2000 (65 FR 19477-78) or you may visit http://dms.dot.gov.

Examining the AD Docket

You may examine the docket that contains the proposal, any comments received and, any final disposition in person at the DMS Docket Offices between 9:00 a.m. and 5:00 p.m., Monday through Friday, except Federal holidays. The Docket Office (telephone (800) 647-5227) is located on the plaza level of the Department of Transportation Nassif Building at the street address stated in ADDRESSES. Comments will be available in the AD docket shortly after the DMS receives them.

Discussion

The FAA recently heard from GE of a TMF strut stud and an LPT stage 1-to-stage 2 disk joint bolt failure found during engine disassembly. GE reported one strut stud failure on a first-run engine, and three uncontained engine failures in 1984 and 1985, caused by reused strut studs. GE also reported nine strut stud failures on engines removed for other causes. Strut stud failures can result in hard debris in the LPT flowpath and cause damage to LPT airfoils. Borescope inspection for damage to the stage 1 LPT blades can identify the effects of a strut stud separation event. Ten unscheduled engine removals have occurred due to evidence of strut stud failure. Twenty strut stud failures have been found during routine shop inspections. GE issued SB No. 72-0897 in March 1987 that introduced an inspection and an improved strut stud configuration. Since that SB was issued, one uncontained engine failure occurred in 1996, two findings of stud failures on engines removed for other causes, and four unscheduled engine removals have occurred due to strut stud failures.

GE found that the cause of strut stud failure may be insufficient clearance between the LPT stage 1 nozzle support and the sleeve assembly that is fitted to the TMF. During engine operation, thermal growth differences can cause bending and reduced low-cycle-fatigue life of the strut studs that join the nozzle support to the TMF through the sleeve assembly. GE also found that the reuse of strut studs during LPT assembly can increase the probability of a strut stud failure.

GE's analysis shows that continued operation with one or more failed strut studs can result in LPT flow path damage, separation of adjacent strut studs, and separation of the bolts connecting the LPT stage 1 and stage 2 disks. GE's analysis also shows that continued operation with separated bolts can lead to overspeed and an uncontained failure of the stage 1 disk. This condition, if not corrected, could result in an uncontained failure of the engine and possible damage to the airplane.

Relevant Service Information

We have reviewed and approved the technical contents of GE Alert Service Bulletin (ASB) No. CF6-50 S/B 72-A1251, dated September 24, 2003, that describes procedures for initial and repetitive borescope inspections of stage 1 blades for damage caused by separated strut studs, and replacement of the LPT module if stage 1 LPT blade damage exceeds aircraft maintenance manual limits.

GE CF6-45A, CF6-50A, CF6-50C, and CF6-50E series turbofan engines that have incorporated GE SB No. CF6-50 S/B 72-1239, Revision 1, dated September 24, 2003, or that have incorporated paragraph 3.B. of GE SB No. CF6-50 S/B 72-1239, original issue, dated May 29, 2003, are exempt from this proposed AD. Those

incorporations increase the clearance of the stage 1 LPT nozzle and the sleeve fitted to the turbine mid frame, which eliminates the cause of failure of TMF strut studs.

Differences Between the Proposed AD and the Manufacturer's Service Information

GE ASB No. CF6-50 S/B 72-A1251, dated September 24, 2003, does not provide for inspection of engines that have already accumulated more than 3,000 cycles-since-new (CSN) or 500 cycles-since-last-inspection (CSLI). This proposed AD would allow up to 150 cycles-in-service after the effective date of the AD for compliance for these engines.

FAA's Determination and Requirements of the Proposed AD

We have evaluated all pertinent information and identified an unsafe condition that is likely to exist or develop on other products of this same type design. We are proposing this AD, which would require initial and repetitive borescope inspections of stage 1 LPT blades for damage and replacement of the LPT module if damage exceeds aircraft maintenance manual limits.

The proposed AD would require you to use GE ASB No. CF6-50 S/B 72-A1251, dated September 24, 2003, to perform these actions.

Costs of Compliance

There are about 2,079 GE CF6-45A, CF6-50A, CF6-50C, and CF6-50E series turbofan engines of the affected design in the worldwide fleet. We estimate that 790 engines installed on airplanes of U.S. registry would be affected by this proposed AD. We also estimate that it would take about one work hour per engine to perform the proposed actions, and that the average labor rate is $65 per work hour. Based on these

figures, we estimate the total cost of the proposed AD to perform one inspection to U.S. operators to be $51,350.

Regulatory Findings

We have determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD 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.

For the reasons discussed above, I certify that the 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. Would 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 proposal 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.

The Proposed Amendment

Under the authority delegated to me by the Administrator, the FAA proposes to amend 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 Federal Aviation Administration (FAA) amends § 39.13 by adding the following new airworthiness directive (AD):

General Electric Company: Docket No. FAA-2004-19463; Directorate Identifier 2004-NE-14-AD.

Comments Due Date

(a) The FAA must receive comments on this AD action by [insert date 60 days after date of publication in the FEDERAL REGISTER].

Affected ADs

(b) None.

Applicability

(c) This AD applies to General Electric Company (GE) CF6-45A, CF6-50A, CF6-50C, and CF6-50E series turbofan engines that have not incorporated GE Service Bulletin (SB) No. CF6-50 S/B 72-1239, Revision 1, dated September 24, 2003, or that have not incorporated paragraph 3.B. of GE SB No. CF6-50 S/B 72-1239, original issue, dated May 29, 2003. These engines are installed on, but not limited to, Boeing DC10 and 747 series airplanes, and Airbus Industrie A300 series airplanes.

Unsafe Condition

(d) This AD results from a report of a stud that separated from a turbine mid frame (TMF) strut and from an updated analysis of strut stud failures. We are issuing this

AD to prevent an uncontained failure of the engine and possible damage to the airplane caused by failure of TMF strut studs.

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.

Initial Inspection

(f) Borescope-inspect the low pressure turbine (LPT) stage 1 blades within 3,000 cycles-since-new (CSN), or 3,000 cycles-since-replacement of the TMF strut studs, or 150 cycles-in-service (CIS) after the effective date of this AD, which ever occurs later. Use paragraph 3.A.(2) of the Accomplishment Instructions of GE Alert Service Bulletin (ASB) No. CF6-50 S/B 72-A1251, dated September 24, 2003, to do the inspection.

(g) Replace any LPT module that has stage 1 LPT blade damage exceeding aircraft maintenance manual limits.

Repetitive Inspections

(h) Borescope-inspect the LPT stage 1 blades within intervals of 500 cycles-since-last-inspection or within 500 cycles-since-last shop visit, or within 150 CIS after the effective date of this AD, whichever occurs later. Use paragraph 3.A.(3) of the Accomplishment Instructions of GE ASB No. CF6-50 S/B 72-A1251, dated September 24, 2003 to do the inspections.

(i) Replace any LPT module that has stage 1 LPT blade damage exceeding aircraft maintenance manual limits.

Optional Terminating Action

(j) Engines incorporating GE SB No. CF6-50 S/B 72-1239, Revision 1, dated September 24, 2003, or incorporating paragraph 3.B. of GE SB No. CF6-50 S/B 72-1239, original issue, dated May 29, 2003, ends the repetitive inspection requirements in paragraph (h) of this AD.

Alternative Methods of Compliance

(k) 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.

Related Information

(l) None.

Issued in Burlington, Massachusetts, on October 21, 2004.

Jay J. Pardee,
Manager, Engine and Propeller Directorate,
Aircraft Certification Service.