

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2010-0068; Directorate Identifier 2010-NE-05-AD; Amendment 39-16331; AD 2010-12-10]

RIN 2120-AA64

Airworthiness Directives; General Electric Company CF6-45 and CF6-50 Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

SUMMARY: The FAA is superseding an existing airworthiness directive (AD) for General Electric Company (GE) CF6-45 and CF6-50 series turbofan engines with certain low-pressure turbine (LPT) rotor stage 3 disks installed. That AD required initial and repetitive borescope inspections of the high-pressure turbine (HPT) rotor stage 1 and stage 2 blades for wear and damage, including excessive airfoil material loss. That AD also required fluorescent penetrant inspection (FPI) of the LPT rotor stage 3 disk under certain conditions and removal of the disk from service before further flight if found cracked. This AD requires the same inspections at reduced intervals and additional borescope inspections. This AD also requires repetitive exhaust gas temperature (EGT) system checks. This AD results from reports received of two additional LPT rotor stage 3 disk events. 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: Effective June 24, 2010.

We must receive any comments on this AD by August 9, 2010.

ADDRESSES: Use one of the following addresses to comment on this AD.

- Federal eRulemaking Portal: Go to <http://www.regulations.gov> and follow the instructions for sending your comments electronically.
- Mail: Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.
- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- Fax: (202) 493-2251.

FOR FURTHER INFORMATION CONTACT: Christopher J. Richards, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: christopher.j.richards@faa.gov; phone: (781) 238-7133; fax: (781) 238-7199.

SUPPLEMENTARY INFORMATION: The FAA amends 14 CFR part 39 by superseding AD 2010-06-15, Amendment 39-16240 (75 FR 12661, March 17, 2010). That AD required initial and repetitive borescope inspections of the HPT rotor stage 1 and stage 2 blades for wear and damage, including excessive airfoil material loss. That AD also required FPI of the LPT rotor stage 3 disk under certain conditions and removal of the disk from service before further flight if found cracked. That AD was the result of three reports of uncontained failures of LPT rotor stage 3 disks and eight reports of cracked LPT rotor stage 3 disks found during shop visit inspections. That condition, if not corrected, could result in an uncontained engine failure and damage to the airplane.

Actions Since AD 2010-06-15 Was Issued

Since AD 2010-06-15 was issued, we received reports of two additional LPT rotor stage 3 disk events, bringing the total number of events to five. Additionally, the National Transportation Safety Board issued Safety Recommendations A-10-98 through A-10-101. These recommendations include performing a borescope inspection of the HPT rotor blades more frequently than was originally required in AD 2010-06-15.

FAA's Determination and Requirements of This AD

The unsafe condition described previously is likely to exist or develop on other GE CF6-45 and CF6-50 series turbofan engines of the same type design. For that reason, 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. This AD requires initial and repetitive borescope inspections of the HPT rotor stage 1 and stage 2 blades. This AD also requires additional borescope inspections and FPI of the LPT rotor stage 3 disk, depending on the results of the borescope inspection. This AD also requires repetitive EGT system checks.

FAA's Determination of the Effective Date

Since an unsafe condition exists that requires the immediate adoption of this AD, we have found that notice and opportunity for public comment before issuing this AD are impracticable, and that good cause exists for making this amendment effective in less than 30 days.

Interim Action

These actions are interim actions and we may take further rulemaking actions in the future.

Comments Invited

This AD is a final rule that involves requirements affecting flight safety and was not preceded by notice and an opportunity for public comment; however, we invite you to send us any written relevant data, views, or arguments regarding this AD. Send your comments to an address listed under ADDRESSES. Include "Docket No. FAA-2010-0068; Directorate Identifier 2010-NE-05-AD" in the subject line of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify it.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive

verbal contact with FAA personnel concerning this AD. Using the search function of the Web site, anyone can find and read the comments in any of our dockets, including, if provided, 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).

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 (phone: (800) 647-5527) is the same as the Mail address provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

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 the 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

Under 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.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by removing Amendment 39-16240 (75 FR 12661, March 17, 2010), and by adding a new airworthiness directive, Amendment 39-16331, to read as follows:

SUPERSEDED



2010-12-10 General Electric Company: Amendment 39-16331. Docket No. FAA-2010-0068; Directorate Identifier 2010-NE-05-AD.

Effective Date

- (a) This airworthiness directive (AD) becomes effective June 24, 2010.

Affected ADs

- (b) This AD supersedes AD 2010-06-15, Amendment 39-16240.

Applicability

(c) This AD applies to General Electric Company (GE) CF6-45A, CF6-45A2, CF6-50A, CF6-50C, CF6-50CA, CF6-50C1, CF6-50C2, CF6-50C2B, CF6-50C2D, CF6-50C2-F, CF6-50C2-R, CF6-50E, CF6-50E1, and CF6-50E2 series turbofan engines, with any of the following low-pressure turbine (LPT) rotor stage 3 disks installed:

9061M23P06	9061M23P07	9061M23P08	9061M23P09	9224M75P01
9061M23P10	1473M90P01	1473M90P02	1473M90P03	1473M90P04
9061M23P12	9061M23P14	9061M23P15	9061M23P16	1479M75P01
1479M75P02	1479M75P03	1479M75P04	1479M75P05	1479M75P06
1479M75P07	1479M75P08	1479M75P09	1479M75P11	1479M75P13
1479M75P14	N/A	N/A	N/A	N/A

These engines are installed on, but not limited to, Boeing 747-200/-300, DC-10, MD-10, and KC-10 aircraft, and Airbus A300 series aircraft.

Unsafe Condition

(d) This AD results from reports received of two additional LPT rotor stage 3 disk events. 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.

Borescope Inspections of High-Pressure Turbine (HPT) Rotor Stage 1 and Stage 2 Blades

(f) Borescope-inspect the HPT rotor stage 1 and stage 2 blades from the forward and aft directions within 10 cycles from the effective date of this AD. You can find further guidance about borescoping in Table 2 of this AD.

(g) Thereafter, borescope-inspect the HPT rotor stage 1 and stage 2 blades from the forward and aft directions within every 75 cycles-since-last-inspection (CSLI). You can find further guidance about borescoping in Table 2 of this AD.

Additional Borescope Inspections

(h) Borescope-inspect the HPT rotor stage 1 and stage 2 blades from the forward and aft directions within the cycle limits after the engine has experienced the events specified in Table 1 of this AD. You can find further guidance about borescoping in Table 2 of this AD.

Table 1 – Additional Borescope Inspection Criteria

If The Engine Has Experienced:	Then Borescope Inspect:
(1) An exhaust gas temperature (EGT) above redline.	Within 10 cycles.
(2) A shift in the smoothed EGT trending data that exceeds 18° F (10° C), but is less than or equal to 36° F (20° C).	Within 10 cycles.
(3) A shift in the smoothed EGT trending data that exceeds 36° F (20° C).	Before further flight.
(4) A flightcrew reported vibration determined to be caused by the high-pressure rotor (N2).	Within 10 cycles from the report.

Actions Required for Engines With Damaged HPT Rotor Blades

(i) Remove the engine before further flight if the engine fails the borescope inspection in paragraph (f), (g), or (h) of this AD.

(j) Before returning the engine to service, fluorescent penetrant inspect the inner diameter surface forward cone body (forward spacer arm) of the LPT rotor stage 3 disk. If a crack is found or if a circumferential band of fluorescence appears, permanently remove the disk from service.

EGT System Checks

(k) Inspect the turbine midframe (TMF) liner for clocking and subsequent damage to the EGT probes, within 50 cycles from the effective date of this AD or before accumulating 750 CSLI of the TMF liner for clocking, whichever occurs later. You can find further guidance about TMF liner inspections in Table 2 of this AD.

(l) Thereafter, inspect the TMF liner for clocking and subsequent damage to the EGT probes within every 750 CSLI. You can find further guidance about TMF liner inspections in Table 2 of this AD.

(m) If the engine shows TMF liner clocking resulting in wear through 100% of the wall thickness of the thermocouple guide sleeve, remove the engine and repair the TMF and any damage to the EGT probes before further flight. You can find further guidance about TMF liner inspections in Table 2 of this AD.

(n) Check the resistance of the EGT system within 50 cycles from the effective date of this AD or before accumulating 750 cycles-since-the-last-resistance check of the EGT system, whichever occurs later. You can find further guidance about the EGT resistance check in Table 2 of this AD.

(o) Thereafter, check the resistance of the EGT system within every 750 CSLI. You can find further guidance about EGT resistance checks in Table 2 of this AD.

(p) Repair or replace any EGT system component that fails this check, before further flight. You can find further guidance about the EGT resistance check in Table 2 of this AD.

Definitions

(q) For the purposes of this AD, an EGT above redline is a confirmed over temperature indication that is not a result of EGT system error. You can find further guidance about troubleshooting EGT above redline in Table 2 of this AD.

(r) For the purposes of this AD, a shift in the smoothed EGT trending data is a shift in a rolling average of EGT that can be confirmed by a corresponding shift in the trending of fuel flow or fan speed/core speed relationship. You can find further guidance about evaluating EGT trend data in GE Company Service Rep Tip 373 "Guidelines For Parameter Trend Monitoring."

Table 2 - AMM References For Further Guidance

Engine Inspections	Boeing 747/CF6-50/-45 AMM ATA	Boeing DC-10/CF6-50 AMM ATA	Boeing MD-10/ CF6-50 AMM ATA	Airbus A300/CF6-50 AMM ATA
Borescope Inspection of HPT Rotor Stage 1 and Stage 2 Blades	72-00-00, 601	72-53-00	72-53-00	72-53-00
Exceeded EGT Limit	72-00-00, 601	72-00-00, 601	72-00-00, 6-1	72-00-00, 601
EGT Resistance Check	77-21-00, 501	77-21-00	77-21-01	77-21-00
TMF Liner Clocking	72-00-00, 601, and 72-52-00	72-54-00	72-54-00 and 77-21-01	72-54-00

Previous Credit

(s) A borescope inspection performed before the effective date of this AD using AD 2010-06-15 and within the last 75 cycles, satisfies the initial borescope inspection requirement in paragraph (f) of this AD.

Alternative Methods of Compliance

(t) Alternative methods of compliance previously approved for AD 2010-06-15, are not approved for this AD.

(u) 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

(v) Contact Christopher J. Richards, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: christopher.j.richards@faa.gov; phone: (781) 238-7133; fax: (781) 238-7199, for more information about this AD.

Material Incorporated by Reference

(w) None.

Issued in Burlington, Massachusetts, on June 4, 2010.
Peter A. White,
Assistant Manager, Engine and Propeller Directorate,
Aircraft Certification Service.

SUPERSEDED