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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2007-28367; Directorate Identifier 2007-NE-19-AD; Amendment 39-15695; AD 2008-21-11]**

**RIN 2120-AA64**

#### **Airworthiness Directives; General Electric Company CF6-80C2 Series 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 adopting a new airworthiness directive (AD) for General Electric Company (GE) CF6-80C2 series and CF6-80E1 series turbofan engines. This AD requires installing skin doubler pads and deflectors on stage 5 of certain low-pressure turbine (LPT) cases, or replacing those LPT cases with LPT cases that have skin doubler pads and deflectors already installed. This AD results from four events in which hardware fragments were liberated into the engine flowpath and wore through LPT cases on CF6-80C2 and CF6-80E1 series engines. We are issuing this AD to prevent an uncontained release of engine debris and loss of the structural integrity of the mount system that supports the engine. Loss of the mount system structural integrity could result in the engine separating from the airplane.

**DATES:** This AD becomes effective November 28, 2008. The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of November 28, 2008.

**ADDRESSES:** You can get the service information identified in this AD from Customer Support Center, GE Aircraft Engines, M/D Center Rm 285, One Neumann Way, Cincinnati, OH 45216, U.S.A.; e-mail: [geae.csc@ae.ge.com](mailto:geae.csc@ae.ge.com); International phone No.: (513)-552-3272; U.S.A. phone No.: 877-432-3272.

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:** James Rosa, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: james.rosa@faa.gov; telephone (781) 238-7152; fax (781) 238-7199.

**SUPPLEMENTARY INFORMATION:** The FAA proposed to amend 14 CFR part 39 with a proposed AD. The proposed AD applies to CF6-80C2 series and CF6-80E1 series turbofan engines. We published the proposed AD in the Federal Register on September 19, 2007 (72 FR 53491). That action proposed to require installing skin doubler pads and deflectors on stage 5 of certain LPT cases, or replacing those LPT cases with LPT cases that have the skin doubler pads and deflectors already installed.

### **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 comments received.

### **Request To Eliminate the AD Action Compliance Date**

One commenter, a private citizen, requests that we eliminate the AD action compliance date, as it might cause premature removals of LPT modules and increase the anticipated cost of compliance.

We do not agree. The compliance date is necessary to maintain the airworthiness of the U.S. engine fleet. We did not change the AD.

### **Request for Previous Credit**

Three carriers and two private citizens request previous credit for complying with earlier versions of the applicable GE service documents, before the effective date of the AD. The commenters state that they have already modified some engines to correct the unsafe condition.

We agree. The original versions of the service bulletins (SBs) are technically the same as the Revision 1 versions. GE Repair Document (RD) No. 935-314-S2 and RD No. 935-314-S3 are technically the same as the RD No. 935-314-S4 version. We added a paragraph to allow for previous credit of these documents. GE issued RD No. 935-314-S4 after we issued the proposed AD, which we now reference in the AD.

### **Request To Increase the Compliance Period From 8 Years, to 10 Years or 11 Years**

One carrier requests that we increase the compliance period from 8 years to 10 years, and another carrier and a private citizen request we increase the compliance period to 11 years, after the effective date of the AD. The commenters point out that GE considered it acceptable to not specify any compliance period in their service bulletins. The commenters feel that increasing the compliance period does not negatively impact safety.

We do not agree. The 8-year AD compliance period will give the operators a total of 11 years from the introduction of the service bulletins. The compliance date is necessary to maintain the airworthiness of the U.S. engine fleet. We did not change the AD.

### **Request To Change the Compliance Description**

Two carriers and one private citizen request that we change the compliance description from "next time the LPT module is disassembled" to "next time the LPT module is completely disassembled to piece-part level", as the proposed AD compliance does not clearly describe the compliance requirement.

We agree. We changed the AD.

### **Request To Clear Up the Contradiction Between the All Operators Wire (AOW) and the Proposed AD**

One carrier requests that we clear up a contradiction between the AOW and the proposed AD regarding the compliance time. The commenter states that, although the FAA informed the operators through the AOW that compliance was required at the next disassembly of the LPT module, the proposed AD would require compliance the next time the LPT was disassembled or within the next 8 years after the effective date of the AD.

We do not agree. AOWs are published and distributed by the manufacturer, not the FAA. The proposed AD compliance requirement stated "the next disassembly of the LPT module", which has been changed in the AD to state "the next time the LPT module is completely disassembled to piece-part level." If the LPT module is not disassembled for 8 years after the effective date of the AD, the operator cannot operate the engine until the mandatory AD action is completed. The 8-year compliance date is necessary to maintain the airworthiness of the U.S. engine fleet. We did not change the AD.

### **Request To Delete the Revision and Date References to GE RD No. 935-314**

Three carriers and one private citizen request that we delete references to the issue date and revision number of GE RD No. 935-314, and also change the AD to allow use of future revisions of that document. This would eliminate having to revise the final rule if the document is revised.

We do not agree. We are legally required to specify the complete identification of the service document, including its revision number and issue date. We cannot legally reference future revisions of a document, as we have no way of knowing the accuracy or applicability of such documents. We did not change the AD.

### **Request To Distinguish Between Doubler Pads and Deflectors**

One carrier and one private citizen request that we distinguish between "doubler pads" and "deflectors" in the AD. The proposed AD implies that they are the same part, but they are not the same.

We agree. We clarified in the AD that these parts are distinct and separate.

### **Request To Correct a Temperature Conversion Error in the GE RD No. 935-314**

One carrier requests that we correct a temperature conversion error in paragraph F.6.(a) of GE RD No. 935-314-S3.

We agree there is a temperature conversion error in that document. GE issued RD No. 935-314-S4, dated January 28, 2008, which corrected that error. We now reference RD No. 935-314-S4 in the AD.

### **Request To Change the Compliance To Occur When the Turbine Rear Frame Is Removed From the LPT Case**

One carrier requests that we change the compliance to occur when the turbine rear frame is removed from the LPT case, as the LPT module consists of the LPT case and turbine rear frame. The commenter states that the proposed AD, as written, will overburden their maintenance system by requiring the AD modification every time an LPT module is removed.

We do not agree. The AD must be complied with when the LPT module is completely disassembled to piece-part level. Removal of the LPT module to service the turbine rear frame will not require compliance with this AD. We did not change the AD.

### **Request To Withdraw the Proposed AD**

The Air Transport Association requests that we withdraw the proposed AD. The commenter states that a hazardous or unsafe condition does not exist, and there is no need for an AD. The commenter quotes figures derived from probability calculations, among them Table 1 of the Risk Guidelines from FAA Advisory Circular (AC) 39-8 as "Long-term acceptable risk" for the subject of the proposed AD, and therefore indicates that the regulations do not require an AD.

We do not agree. The purpose of the Risk Guidelines in the AC is to determine how quickly action should be taken to maintain the airworthiness of an aircraft engine; not to decide if action is to be taken. Paragraph 1.(c) of the AC states "Continued Airworthiness Assessment Methodologies (CAAM) assist the FAA in making decisions concerning the priority in which unsafe conditions should be addressed. The FAA may issue an AD for a particular unsafe condition before a risk assessment is performed, or without having an assessment performed at all." Furthermore, determination of an unsafe condition is the responsibility of the FAA Administrator, and we have found there is adequate evidence indicating an unsafe condition exists in this case.

14 CFR Part 33.19 requires that "Engine design and construction must minimize the development of an unsafe condition of the engine between overhaul periods. The design of the compressor and turbine rotor cases must provide for the containment of damage from rotor blade failure." Instances of LPT case holes have been recorded, making those LPT cases unable to contain liberated stage five blades (or other engine hardware).

We have no data to indicate that the mount system would function as intended after an incident when the LPT case was rubbed through completely. We did not change the AD.

### **Request To Allow Exemption From the AD**

One carrier requests that they be allowed an exemption from the AD, as they have complied with all primary-cause correction ADs.

We do not agree. Similar LPT case failures could occur during the time allowed to comply with primary-cause ADs, or as a result of future unforeseen events. Since the LPT case has shown to be unable to withstand engine failures, we are required to mandate that the LPT case be changed to meet airworthiness requirements. We do not exempt the operator from the AD.

### **Conclusion**

We have carefully reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously.

We have determined that these changes 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 854 GE CF6 engines installed on airplanes of U.S. registry. We also estimate that it will take about 30 work-hours per engine to perform the actions, and that the average labor rate is \$80 per work-hour. Required parts will cost about \$10,170 per engine. Based on these figures, we estimate the total cost of the AD to U.S. operators to be \$10,734,780.

### **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, Incorporation by reference, 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 adding the following new airworthiness directive:



**2008-21-11 General Electric Company:** Amendment 39-15695. Docket No. FAA-2007-28367; Directorate Identifier 2007-NE-19-AD.

**Effective Date**

(a) This airworthiness directive (AD) becomes effective November 28, 2008.

**Affected ADs**

(b) None.

**Applicability**

(c) This AD applies to the General Electric Company (GE) CF6-80C2 and CF6-80E1 engines specified in the following Table 1 of this AD. These engines are installed on, but not limited to, Airbus A300, A310, and A330 series airplanes, Boeing 747 and 767 series airplanes, and McDonnell Douglas MD11 series airplanes.

**Table 1. – Applicable Engines by Engine Model**

<b>Engine Model</b>	<b>With Low-Pressure Turbine (LPT) Case Part No. (P/N) Installed</b>
CF6-80C2A1, -80C2A2, -80C2A3, -80C2A5, -80C2A5F, -80C2A8, -80C2B1, -80C2B1F, -80C2B1F1, -80C2B1F2, -80C2B2, -80C2B2F, -80C2B3F, -80C2B4, -80C2B4F, -80C2B5F, -80C2B6, -80C2B6F, -80C2B6FA, -80C2B7F, -80C2B8F, -80C2D1F, and -80C2L1F	1336M99G01, 1336M99G02, 1336M99G03, 1336M99G04, 1336M99G06, 1336M99G07, 1336M99G08, 1336M99G09, 1336M99G10, 1336M99G12, 1336M99G13, or 1336M99G15 1647M68G05, 1647M68G08, 1647M68G09, or 1647M68G15 1713M73G01, 1713M73G02, or 1713M73G05 9367M99G11 or 9367M99G17
CF6-80E1A1, -80E1A2, -80E1A3, -80E1A4, -80E1A4/B	1647M68G02, 1647M68G04, 1647M68G07, 1647M68G12, or 1647M68G13

**Unsafe Condition**

(d) This AD results from four events in which hardware fragments were liberated into the engine flowpath and wore through LPT cases on CF6-80C2 and CF6-80E1 series engines. We are issuing this AD to prevent an uncontained release of engine debris and loss of the structural integrity of the mount system that supports the engine. Loss of the mount system structural integrity could result in the engine separating from the airplane.

## **Compliance**

(e) You are responsible for having the actions required by this AD performed the next time the LPT module is completely disassembled to piece-part level, but not to exceed 8 years after the effective date of this AD, unless the actions have already been done.

### **CF6-80C2 Engines**

(f) For CF6-80C2 engines specified in Table 1 of this AD that have an LPT case with a P/N specified in Table 1 of this AD, do either of the following:

(1) Rework the LPT case to install skin doubler pads and deflectors. Use the Accomplishment Instructions of GE Service Bulletin (SB) No. CF6-80C2 S/B 72-1171, Revision 1, dated February 1, 2006, and Repair Document (RD) No. 935-314-S4, dated January 28, 2008, to rework the LPT case, or

(2) Install an LPT case that has skin doubler pads and deflectors.

### **CF6-80E1 Engines**

(g) For CF6-80E1 engines specified in Table 1 of this AD that have an LPT case with a P/N specified in Table 1 of this AD, do either of the following:

(1) Rework the LPT case to install skin doubler pads and deflectors. Use the Accomplishment Instructions of SB No. CF6-80E1 S/B 72-0303, Revision 1, dated February 1, 2006, and RD No. 935-314-S4, dated January 28, 2008, to rework the LPT case, or

(2) Install an LPT case that has skin doubler pads and deflectors.

### **Previous Credit**

(h) If you previously performed the actions specified in paragraphs (f) through (g)(2) of this AD, using the rework procedures in the following service documents before the effective date of this AD, you have satisfied the compliance requirements of this AD:

(1) GE SB No. CF6-80C2 S/B 72-1171, dated May 25, 2005 and RD No. 935-314-S2, dated January 4, 2006, or RD No. 935-314-S3, dated August 10, 2006.

(2) GE SB No. CF6-80E1 S/B 72-0303, dated June 1, 2005 and RD No. 935-314-S2, dated January 4, 2006, or RD No. 935-314-S3, dated August 10, 2006.

### **Parts Identification**

(i) LPT case skin doubler pads and deflectors are distinct and separate parts. For identification purposes, a deflector pad is a square-shaped plate with no threaded stud on it, and a deflector has a threaded stud on it.

### **Alternative Methods of Compliance**

(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.

### **Related Information**

(k) Contact James Rosa, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail:



james.rosa@faa.gov; telephone (781) 238-7152; fax (781) 238-7199, for more information about this AD.

### Material Incorporated by Reference

(l) You must use the service information specified in Table 2 of this AD to perform the rework required by this AD. The Director of the Federal Register approved the incorporation by reference of the documents listed in Table 2 of this AD in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Contact Customer Support Center, GE Aircraft Engines, M/D Center Rm 285, One Neumann Way, Cincinnati, OH 45216, U.S.A.; e-mail: [geae.csc@ae.ge.com](mailto:geae.csc@ae.ge.com); International phone No.: (513) 552-3272; U.S.A. phone No.: 877-432-3272, for a copy of this service information. You may review copies at the FAA, New England Region, 12 New England Executive Park, Burlington, MA; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

**Table 2 – Incorporation by Reference**

<b>GE Service Bulletin/Repair Document No.</b>	<b>Page</b>	<b>Revision</b>	<b>Date</b>
CF6-80C2 S/B 72-1171 Total Pages: 10	ALL	1	February 1, 2006
CF6-80E1 S/B 72-0303 Total Pages: 7	ALL	1	February 1, 2006
Repair Document (RD) 935-314-S4 Total Pages: 39	ALL	4	January 28, 2008

Issued in Burlington, Massachusetts, on October 10, 2008.

Peter A. White,  
Assistant Manager, Engine and Propeller Directorate,  
Aircraft Certification Service.