[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2016-9592; Directorate Identifier 2016-NE-30-AD; Amendment 39-18952; AD 2017-14-08]

RIN 2120-AA64

Airworthiness Directives; CFM International S.A. Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for certain CFM International S.A. (CFM) CFM56-3, -3B, and -3C turbofan engines. This AD was prompted by a report of dual-engine loss of thrust control (LOTC) that resulted in an air turn back. This AD requires initial and repetitive checks of the variable stator vane (VSV) actuation system in the high-pressure compressor (HPC). We are issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact CFM International Inc., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: 877-432-3272; fax: 877-432-3329; email: aviation.fleetsupport@ge.com. You may view this service information at the FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125. It is also available on the internet at http://www.regulations.gov by searching for and locating Docket No. FAA-2016-9592.

Examining the AD Docket

You may examine the AD docket on the Internet at http://www.regulations.gov by searching for and locating Docket No. FAA-2016-9592; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: David Bethka, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7129; fax: 781-238-7199; email: david.bethka@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain CFM CFM56-3, -3B, and -3C turbofan engines. The NPRM published in the Federal Register on March 9, 2017 (82 FR 13077). The NPRM was prompted by a report of dual-engine LOTC that resulted in an air turn back. The NPRM proposed to require initial and repetitive checks of the VSV actuation system in the HPC. We are issuing this AD to maintain the actuators ability to fully reach commanded position, and prevent LOTC and reduced control of the airplane.

Comments

We gave the public the opportunity to participate in developing this final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request to Change Applicability

CFM, Boeing, Anonymous, and Jet2.com requested that the Applicability paragraph be limited to engines operating in the tropical regions specified in CFM Service Bulletin (SB) CFM56-3 S/B 72-1169, rather than fleet-wide. A change of applicability to specific regions would avoid unnecessary burden for operators that do not fly in tropical zones and do not fly less than 150 hours per month.

We disagree. Operators may experience high moisture environments outside of the specified tropical zone that is described in CFM SB CFM56-3 S/B 72-1169. Operators that are outside of the specified tropical zone have experienced restricted VSV movement events. We did not change this AD.

Request to Change Service Information

Milan Pavlovic requested that we include the CFM CFM56-3 Engine Shop Manual (ESM) 72-32-00 procedure for VSV pull force checks, as an acceptable method of compliance, in paragraph (f)(2) of this AD. The change is requested to allow the pull force check at the modular level, using the ESM procedure.

We partially agree. We agree that performing the pull force check of the VSV system per the ESM is acceptable. We disagree with including a statement in paragraph (f)(2) because paragraph (f)(2) does not refer to any service information.

Request to Change Compliance

Milan Pavlovic requested that we allow the replacement of an affected stator case with an HPC stator case (that passes the pull force check) in lieu of a repaired case. The proposed Compliance paragraph (f)(2)(i) states: "If any stage requires more than 100 lbs. force to move the actuation ring, ream the VSV bores and apply anti-corrosion coating to stage 1, 2 and 3, prior to further flight." This statement is interpreted as incorporation of CFM CFM56-3 ESM 72-32-01, Repair 031 is the mandated action and therefore the only acceptable action to satisfy the AD compliance requirements. Would replacement of the

stator case assembly with a serviceable stator case assembly, that has not had CFM CFM56-3 ESM 72-32-01, Repair 031 performed, be considered an acceptable alternate action providing the pull force check is performed on the replacement stator case assembly and is found to be less than 75 lbs. in each stage?

The commenter feels that replacement with a stator case that passes the pull force check is an additional action that would satisfy the AD requirements. The replacement case would be subject to the repetitive checks specified in paragraph (f)(3).

We partially agree. We disagree that using any specific service information to comply this AD is mandated. We agree that the installation of a replacement HPC stator case that passes the VSV pull force check with measurements of 75 lbs. or less is acceptable. We changed paragraph (f)(2)(i) of this AD accordingly.

Request to Change Service Information Date

CFM requested that we cite the latest revision date of CFM SB CFM56-3 S/B 72-1169, in the Service Information section.

We agree. The NPRM included an earlier revision date. This AD now references CFM SB CFM56-3 S/B 72-1169, Revision 01, dated November 4, 2016.

Request to Change Service Information Date

CFM requested that we refer to the latest revision of CFM CFM56-3 ESM 72-32-01, Repair 031, in the Service Information section. The latest CFM CFM56-3 ESM 72-32-01, Repair 031, revision is dated December 15, 2016.

We agree. The NPRM referenced an out of date ESM repair. This AD now references CFM CFM56-3 ESM 72-32-01, Repair 031, dated December 15, 2016.

Request to Change Applicability

CFM and Milan Pavlovic noted that early configurations of the CFM56-3 engines were released with titanium HPC stator cases, which are not susceptible to corrosion in VSV bores. An additional commenter asks if the AD should affect steel stator cases only.

CFM recommends applicability be noted as CFM56-3 engines with steel HPC cases with P/Ns 1499M30G01, 1499M30G02, 1499M30G03, or 1676M88G01. CFM's experience indicates that the titanium HPC cases do not experience VSV bore corrosion, and therefore do not experience restricted VSV movement due to bore corrosion.

We agree. Titanium HPC cases do not experience restricted VSV movement due to VSV bore corrosion. We changed this AD to specify that it is applicable to CFM56-3, -3B, and -3C turbofan engines with steel HPC stator cases, P/Ns 1499M30G01, 1499M30G02, 1499M30G03, or 1676M88G01, installed.

Request to Change the Unsafe Condition Paragraph

CFM proposes that we change the language in the Discussion section to state that the VSV resistance due to the corrosion may lead to an inability of the actuator to fully reach commanded position. The description should more accurately describe the problem. VSV actuators do not fail due to corrosion, but do exhibit limited range of movement.

We agree. The statement of "failure of VSV actuators" is an incomplete description of the problem. We revised the Discussion section and paragraph (e) of this AD to clarify.

Request to Change Related Service Information

CFM requested that we change the Related Service Information section, which highlights that CFM SB CFM56-3 S/B 72-1169, Revision 01, dated November 4, 2016, describes a procedure to examine the VSV bore on the inside of the HPC case. While this is correct, CFM proposes that this section highlight that CFM SB CFM56-3 S/B 72-1169 describes a procedure to check the resistance of the VSV system as this portion of the SB is most relevant.

We agree. This AD requires a pull force check of VSV actuators. We changed the Related Service Information section to state that CFM SB CFM56-3 S/B 72-1169,

Revision 01, dated November 4, 2016 describes a procedure to check the resistance of the VSV system.

Request to Allow Special Flight Permits

Boeing recommends allowing a ferry flight instead of requiring repair prior to further flight, if a pull force check exceeds 100 lb on one engine. They stated that a ferry flight should be allowed if take-off rated thrust can be achieved during a ground run, and the sister engine is within SB VSV pull force limits.

We partially agree. We agree with allowing special flight permits because a dual engine LOTC due to VSV restricted movement is unlikely to occur if the sister engine is within the pull force limit. We disagree with changing this AD, because as written, this AD does not limit or prohibit special flight permits. Special flight permits are allowed under 14 CFR 39.23. We did not change this AD.

Request to Change Applicability

A commenter asked why the Bahrain region is not listed as an affected zone for applicability of CFM SB CFM56-3 S/B 72-1169, Revision 01, dated November 4, 2016. The commenter stated that regions other than tropical climate zones listed in the SB may also expose an engine to humid environments.

We agree. We recognize that operation in more than one climate zone may contribute to VSV bore corrosion. However, this AD is applicable to all CFM56-3, -3B, and -3C turbofan engines with a steel HPC stator case, part numbers (P/Ns)1499M30G01, 1499M30G02, 1499M30G03, or 1676M88G01, installed, regardless of their operating environment. We did not change this AD.

Support for the NPRM

The Air Line Pilots Association expressed support for the NPRM as written.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule with the changes described previously. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this final rule.

Related Service Information

We reviewed CFM SB CFM56-3 S/B 72-1169, Revision 01, dated November 4, 2016. This SB describes a procedure to check the resistance of the VSV system. We also reviewed CFM CFM56-3 ESM 72-32-01, Repair 031, dated December 15, 2016. This ESM repair describes procedures for reaming and applying anti-corrosion paint to the VSV bores.

Costs of Compliance

We estimate that this AD affects 460 engines installed on airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inspection of the HPC VSV actuation system	2 work-hours X $85 per hour = $170	$0	$170	$78,200

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

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),

(3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, and

(4) 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.

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 FAA 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 (AD):

2017-14-08 **CFM International S.A.**: Amendment 39-18952; Docket No. FAA-2016-9592; Directorate Identifier 2016-NE-30-AD.

(a) Effective Date

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to CFM International S.A. (CFM) CFM56-3, -3B, and -3C turbofan engines with steel high-pressure compressor (HPC) stator case, part numbers (P/Ns)1499M30G01, 1499M30G02, 1499M30G03, or 1676M88G01, installed.

(d) Subject

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

(e) Unsafe Condition

This AD was prompted by a report of dual engine loss of thrust control (LOTC) that resulted in an air turn back. We are issuing this AD to maintain the actuators ability to fully reach commanded position, and prevent LOTC and reduced control of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done. Within 12 months after the effective date of this AD:

(1) Inspect the affected engines to determine if the compressor front stator case is marked with "RP031" adjacent to the part number. If the case is marked with "RP031," no further action is required. If the case is not marked with "RP031," follow the remaining steps in paragraph (f) of this AD.

(2) Perform an initial pull force check of stage 1, stage 2, and stage 3 of the compressor variable stator vane (VSV) actuation system.

(i) If any stage requires more than 100 lb force to move the actuation ring, ream the VSV bores and apply anti-corrosion coating to stages 1, 2, and 3, prior to further flight, or replace with an HPC stator case that is eligible for installation and passes the VSV pull force check with measurements of 75 lb or less.

(ii) If any stage requires more than 75 lb, but less than or equal to 100 lb force to move the actuation ring, repeat the inspection within 3 months since last inspection.

(iii) If all stages require 75 lb force or less to move the actuation rings, repeat the inspection within 12 months since last inspection.

(3) Thereafter, continue to perform repetitive pull force checks of stages 1, 2, and 3 of the compressor VSV actuation system and disposition as specified in paragraphs (2)(i) through (iii) of this AD.

(g) Optional Terminating Action

Reaming the VSV bores and applying anti-corrosion coating, as specified in paragraph (f)(2)(i) of this AD, is terminating action to the repetitive inspections required by paragraph (f)(3) of this AD.

(h) Alternative Methods of Compliance (AMOCs)

The Manager, Engine Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request. You may email your request to: ANE-AD-AMOC@faa.gov.

(i) Related Information

(1) For more information about this AD, contact David Bethka, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7129; fax: 781-238-7199; email: david.bethka@faa.gov.

(2) CFM Service Bulletin CFM56-3 S/B 72-1169, Revision 01, dated November 4, 2016; and CFM CFM56-3 Engine Shop Manual 72-32-01, Repair 031, dated December 15, 2016, can be obtained from CFM using the contact information in paragraph (i)(3) of this proposed AD.

(3) For service information identified in this AD, contact CFM International Inc., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: 877-432-3272; fax: 877-432-3329; email: aviation.fleetsupport@ge.com.

(4) You may view this service information at the FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

Issued in Burlington, Massachusetts, on July 6, 2017.

Robert J. Ganley,
Acting Manager, Engine & Propeller Directorate,
Aircraft Certification Service.
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