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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2024-0763; Project Identifier AD-2023-00924-E; Amendment 39-22785; AD 2024-14-04]

RIN 2120-AA64

Airworthiness Directives; International Aero Engines, LLC

AGENCY:

Federal Aviation Administration (FAA), DOT.

ACTION:

Final rule.

SUMMARY:

The FAA is adopting a new airworthiness directive (AD) for all International Aero Engines, LLC (IAE LLC) Model PW1122G-JM, PW1124G1-JM, PW1124G-JM, PW1127G1-JM, PW1127G1A-JM, PW1127G1B-JM, PW1127G-JM, PW1127GA-JM, PW1129G-JM, PW1130G-JM, PW1133G-JM, and PW1133GA-JM engines. This AD was prompted by an in-flight shutdown (IFSD) caused by the fracture of a low-pressure compressor (LPC) 1st-stage integrally bladed rotor (IBR-1). This AD requires removal and replacement of affected LPC key washers and affected LPC IBR-1 and installation of inlet guide vane (IGV) spacers. The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective August 20, 2024.

ADDRESSES:

AD Docket: You may examine the AD docket at *regulations.gov* under Docket No. FAA-2024-0763; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal

holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is 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:

Carol Nguyen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-7655; email: carol.nguyen@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend [14 CFR part 39](#) by adding an AD that would apply to all IAE LLC Model PW1122G-JM, PW1124G1-JM, PW1124G-JM, PW1127G1-JM, PW1127G1A-JM, PW1127G1B-JM, PW1127G-JM, PW1127GA-JM, PW1129G-JM, PW1130G-JM, PW1133G-JM, and PW1133GA-JM engines. The NPRM published in the **Federal Register** on March 25, 2024 ([89 FR 20551](#)). The NPRM was prompted by an incident involving an Airbus Model A320neo airplane powered by IAE LLC Model PW1127G-JM engines that experienced an IFSD. A manufacturer investigation determined that the IFSD was caused by a fractured LPC IBR-1, which resulted from an aerodynamic excitation. The most likely cause of the aerodynamic excitation was a misaligned IGV located directly upstream of the IBR-1. As a result, Pratt & Whitney (PW) redesigned the LPC IGV arm assembly by adding a spacer to provide additional torque capability and to prevent a misaligned vane. PW also redesigned the IBR-1 to better withstand an aerodynamic excitation from a misaligned IGV. In the NPRM, the FAA proposed to require removal and replacement of affected LPC key washers and affected LPC IBR-1 and installation of LPC IGV spacers. The FAA is issuing this AD to address the unsafe condition on these products.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from four commenters. The commenters were the Air Line Pilots Association, International (ALPA), All Nippon Airways CO., LTD. (ANA), Delta Air Lines, Inc (DAL), and Frontier Airlines (Frontier). ALPA supported the NPRM without change. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Update Paragraph (g)(1)

Frontier requested that the FAA update paragraph (g)(1) of the proposed AD to read as follows: “For engines that are pre-PW Service Bulletin (SB) PW1000G-C-72-00-0180-00A-930A-D, Issue No. 001, dated October 10, 2020 (PW SB PW1000G-C-72-00-0180-00A- 930A-D) with installed LPC key washers having P/N 5375416, at the next engine shop visit after the effective date of this AD, remove the affected LPC key washers and replace them with LPC key washers and LPC IGV spacers that are eligible for installation.” Frontier noted that tracking installed washers on engines is very difficult since they are not tracked parts, and post service bulletin engines have LPC key washers and LPT IGV spacers that are eligible for installation.

The FAA agrees to update paragraph (g)(1) of this AD to include reference to engines that have not incorporated PW SB PW1000G-C-72-00-0180-00A-930A-D.

Request To Update Paragraph (g)(2)

Frontier requested that the FAA update paragraph (g)(2) of the proposed AD to read as follows: “For engines that are pre-service bulletin SB PW1000G-C-72-00-0189-00A-930A-D, with an installed LPC IBR-1 having PN 5373831, at the next piece-part exposure after effective date of this AD, remove the affected LPC IBR-1 and replace with an LPC IBR-1 eligible for installation.”

The FAA disagrees with the request because the LPC IBR-1 is a tracked life-limited part, so adding qualifying language for “pre-PW SB PW1000G-C-72-00-0189-00A-930A-D” engines is unnecessary. The FAA did not change this AD as a result of this comment.

Request To Add “Credit for Previous Actions” Paragraph

DAL requested that the FAA add a “Credit for Previous Actions” paragraph to the proposed AD to allow credit for the actions required by paragraph (g)(1) if PW SB PW1000G-C-72-00-0180-00A-930A-D was previously accomplished. ANA also requested that accomplishment of PW SB PW1000G-C-72-00-0180-00A-930A-D be accepted as credit for paragraph (g)(1) of the proposed AD, and accomplishment of PW SB PW1000G-C-72-00-0189-00A-930A, Issue 001, dated January 26, 2022, PW SB PW1000G-C-72-00-0189-00A-930A, Issue 002, dated March 15, 2022, and PW SB PW1000G-C-72-00-0189-00A-930A, Issue 003, dated November 28, 2022, be accepted as credit for paragraph (g)(2) of the proposed AD if these actions were performed before the effective date of the proposed AD. DAL noted that because the proposed AD does not provide credit for installing the post-SB spacers and washers, operators must physically verify that all 61 spacers are present and all 61 washers are post-SB on all engines, regardless of whether or not the engine records show accomplishment of PW SB PW1000G-C-72-00-0180-00A-930A-D. DAL also noted that this is a very manual, time-intensive task that should be avoided considering PW SB PW1000G-C-72-00-0180-00A-930A-D installs key washers P/N 5375416 and LPC spacers P/N 5375433, and those parts comply with the “part eligible for installation” definitions listed in paragraphs (h)(3) and (h)(4) of the proposed AD.

The FAA disagrees with the request to add a “Credit for Previous Actions” paragraph to this AD. This AD references affected engines with specific P/Ns installed in paragraph (g) of this AD, and if the service bulletins related to this AD have already been performed on the engine, then the affected P/Ns are no longer installed and the AD is no longer applicable to those engines. Therefore, previous credit is not necessary because the engine no longer has an affected P/N installed. The FAA notes that paragraph (g)(1) of this AD has been changed to reference PW SB PW1000G-C-72-00-0180-00A-930A-D and to reduce the burden on operators. The FAA did not change this AD as a result of this comment.

Request To Clarify Meaning of “At the Next Piece-Part Exposure”

ANA requested that the FAA clarify the meaning of “at the next piece-part exposure” in paragraph (g) (2) of the proposed AD. ANA asks if LPC IBR-1 is already separated from the LPC module and assembly has already begun by the effective date of this AD, should the requirement of paragraph (g)

(2) not be performed in this shop visit? ANA also wondered about the same scenario if the assembly had not begun by the effective date of this AD.

To clarify, the FAA's meaning of “at the next piece-part exposure” covers both cases. Paragraph (h)(2) of this AD defines a “piece-part exposure” as when the LPC IBR-1 is separated from the LPC module. The FAA considers the “next” exposure to include any separation of the LPC IBR-1 from the LPC module after the effective date of this AD. If the LPC IBR-1 is assembled into the module on the effective date of this AD, then it is not a “piece-part exposure.” If the LPC IBR-1 is separated from the LPC module after the effective date of the AD, then paragraph (g)(2) of this AD will need to be performed because it will meet the definition of “piece-part exposure”. The FAA is not concerned if the assembly of the LPC module has started or not.

The FAA did not change this AD as a result of this comment.

Request To Clarify “Major Mating Engine Flanges”

ANA requested that the FAA clarify if “major mating engine flanges” referenced in paragraph (h)(1) of the proposed AD are considered as flanges E through P.

To clarify, the FAA considers the major mating engine flanges referenced in paragraph (h)(1) of this AD as flanges E through P, inclusive. The FAA did not change this AD as a result of this comment.

Request To Clarify “Induction of an Engine”

ANA requested that the FAA clarify the meaning of “induction of an engine” in paragraph (h)(1) of the proposed AD. ANA asked if an engine is already in-shop for maintenance involving the separation of pairs of major mating engine flanges at the effective date of this AD, does paragraph (g)(1) need to be performed in this shop visit?

To clarify, the FAA's meaning of “induction of an engine” when using the example provided by ANA is: “if the engine was already at an engine shop visit on the effective date of this AD, the requirements of paragraph (g)(1) would apply at the next engine shop visit after the effective date of this AD.” The FAA did not change this AD as a result of this comment.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Costs of Compliance

The FAA estimates that this AD affects 215 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this AD:

Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Replace LPC IBR-1	1 work-hours × \$85 per hour = \$85	\$36,350	\$36,435	\$7,833,525
Replace IGV key washers and install IGV spacers	20 work-hours × \$85 per hour = \$1,700	4,392	6,092	1,309,780

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.

The FAA is 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) Will not affect intrastate aviation in Alaska, 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.

List of Subjects in [14 CFR Part 39](#)

- Air transportation
- Aircraft
- Aviation safety
- Incorporation by reference
- Safety

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:

2024-14-04 International Aero Engines, LLC: Amendment 39-22785; Docket No. FAA-2024-0763; Project Identifier AD-2023-00924-E.

(a) Effective Date

This airworthiness directive (AD) is effective August 20, 2024.

(b) Affected ADs

None.

(c) Applicability

This AD applies to International Aero Engines Model PW1122G-JM, PW1124G1-JM, PW1124G-JM, PW1127G1-JM, PW1127G1A-JM, PW1127G1B-JM, PW1127G-JM, PW1127GA-JM, PW1129G-JM, PW1130G-JM, PW1133G-JM, and PW1133GA-JM engines.

(d) Subject

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

(e) Unsafe Condition

This AD was prompted by an in-flight shutdown caused by the fracture of a low-pressure compressor (LPC) 1st-stage integrally bladed rotor (IBR-1). The FAA is issuing this AD to prevent the failure of the LPC IBR-1. The unsafe condition, if not addressed, could result in damage to the engine, damage to the airplane, and possible loss of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) For affected engines that have not incorporated Pratt & Whitney Service Bulletin PW1000G-C-72-00-0180-00A-930A-D (initial issue or any revision), and with installed LPC key washers having part

number (P/N) 5375416, at the next engine shop visit after the effective date of this AD, remove the affected LPC key washers and replace them with LPC key washers and LPC inlet guide vane (IGV) spacers that are eligible for installation.

(2) For affected engines with an installed LPC IBR-1 having P/N 5373831, at the next piece-part exposure after the effective date of this AD, remove the affected LPC IBR-1 and replace with an LPC IBR-1 eligible for installation.

(h) Definitions

For the purposes of this AD:

(1) An “engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine flanges, except that the separation of engine flanges solely for the purposes of transportation without subsequent engine maintenance does not constitute an engine shop visit.

(2) A “piece-part exposure” is when the LPC IBR-1 is separated from the LPC module.

(3) “LPC key washers eligible for installation” are any LPC key washers having P/N 5375434 or later-approved P/N.

(4) “LPC IGV spacers eligible for installation” are any LPC IGV spacers having P/N 5375433 or later-approved P/N.

(5) An “LPC IBR-1 eligible for installation” is any LPC IBR-1 having P/N 5373841 or later-approved P/N.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, AIR-520 Continued Operational Safety Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in [14 CFR 39.19](#). In accordance with [14 CFR 39.19](#), send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of AIR-520 Continued Operational Safety Branch, send it to the attention of the person identified in paragraph (j) of this AD and email to: AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(j) Additional Information

For more information about this AD, contact Carol Nguyen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-7655; email: carol.nguyen@faa.gov.

(k) Material Incorporated by Reference

None.

Issued on July 10, 2024.

Peter A. White,

Deputy Director, Integrated Certificate Management Division, Aircraft Certification Service.

[[FR Doc. 2024-15466](#) Filed 7-15-24; 8:45 am]

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