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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2007-28281; Directorate Identifier 2006-NM-238-AD; Amendment 39-16076; AD 2009-23-04]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 767 Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for all Boeing Model 767 airplanes. This AD requires repetitive replacement of the internal electrical feed-through connectors of the boost pumps of the main fuel tank. This AD results from a report of cracking in the epoxy potting compound on the internal feed-through connector of the fuel boost pump in the area of the soldered wire connector lugs. We are issuing this AD to prevent a hazardous electrical path from the dry side to the wet side of the fuel boost pump through a cracked feed-through connector, or between pins or a pin and the shell on one side of the feed-through connector, which could create an ignition source on the wet side of the fuel boost pump or cause a fire in the fuel pump enclosure and lead to subsequent explosion of the fuel tank.

DATES: This AD is effective December 14, 2009.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in the AD as of December 14, 2009.

ADDRESSES: For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P.O. Box 3707, MC 2H-65, Seattle, Washington 98124-2207; telephone 206-544-5000, extension 1, fax 206-766-5680; e-mail me.boecom@boeing.com; Internet https://www.myboeingfleet.com.

Examining the AD Docket

You may examine the AD docket on the Internet at http://www.regulations.gov; 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 AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (telephone 800-647-5527) is the 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: Judy Coyle, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 917-6497; fax (425) 917-6590.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an airworthiness directive (AD) that would apply to all Boeing Model 767 airplanes. That NPRM was published in the Federal Register on May 25, 2007 (72 FR 29282). That NPRM proposed to require repetitive replacement of the internal electrical feed-through connectors of the boost pumps of the main fuel tank.

Comments

We gave the public the opportunity to participate in developing this AD. We considered the comments received.

Support for the AD

Continental Airlines states that it has accomplished the actions required by the NPRM on all affected airplanes; we infer from this statement that Continental concurs with the content of the NPRM.

Request To Withdraw AD

Boeing suggests that we should not issue the AD, not only because the risk is not to the wet tank side, as stated in the NPRM, but also in anticipation of the fact that an AD will soon be issued to require protection of the fuel boost pumps from electrical threats through implementing a ground fault interrupter (GFI) on fuel boost pump installations. Boeing adds that affected Model 767 GFI relays have been qualified, and Boeing issued Service Bulletin 767-28A0085, dated January 10, 2008; and Revision 1, dated June 25, 2009; which include procedures for the pump relay removal and replacement.

Although we understand Boeing's concern, we do not agree to withdraw the NPRM. The installation of GFI circuit protection is a significant design improvement to prevent repetitive and prolonged arcing due to an electrical fault; however, GFI circuit protection does not eliminate the potential for an electrical fault to create an ignition source at the time the fault initially occurs. The potential ignition sources resulting from any single failure in the fuel tanks must be fully mitigated by design change or other acceptable means, e.g., repetitive inspections, or life-limited parts. The implementation of GFI circuit protection provides partial mitigation for this particular design problem, and it provides at least partial mitigation for electrical failure modes that may not have been identified. However, we have determined that it is necessary to require a specific action to eliminate the ignition threat presented by this connector failure issue, in addition to eventually adding GFI circuit protection. We took a similar position on the fuel boost pump power supply conduits and fuel tank float switch conduits affecting certain other Boeing airplanes. Due to these factors, we have determined that this AD must be issued without further delay.

Requests To Change Compliance Time

ABX Air asks that the limits (compliance times) required by paragraphs (f) and (g) of the NPRM be specified in pump hours and calendar time relating to an installed pump, and not airframe hours and calendar time relating to the airframe. ABX Air states that safe operation of the fuel boost pump will be ensured by a 40,000-flight-hour pump replacement interval, and an interval of 96 months while the pump is installed on the wing. ABX Air adds that the calendar-based replacement interval is vague and could be misinterpreted; the 96-month interval could start when the feed-through connector is manufactured or installed in a pump in a repair shop, or when the pump is installed on the airplane. ABX Air notes that determining and tracking the manufacture date of the connectors would be a burdensome task for operators and would change the scope of the NPRM and necessitate issuance of a supplemental NPRM. ABX Air states that unless there is proof that the connector's epoxy develops cracks while in storage, the calendar time should include/consider the time when the pump is installed on the airplane. ABX Air adds that the intent of these actions should be clarified.

Japan Airlines (JAL) asks that we clarify the compliance time specified in the NPRM for replacement of the feed-through connector to specify that the interval is related to in-service operating time. JAL notes that it started fuel boost pump replacements during maintenance, before the referenced service information was issued. JAL adds that a maintenance records review of the pumps should be added to the compliance time to confirm previous replacement of the connector.

All Nippon Airways (ANA) asks that the compliance time specified in the NPRM for replacement of the fuel boost pump on which the feed-through connector was replaced prior to issuance of the referenced service information be extended to 96 months or 40,000 flight hours after connector replacement.

UAL recommends that we consider the date of manufacture or total in-service hours of the pump for the compliance time in paragraphs (f) and (g) of the NPRM. UAL states that although the proposed compliance time pertains to the airplane, the FAA intention is to limit the time in service of the component feed-through connector to 96 months or 40,000 flight hours, whichever comes first. UAL adds that pumps older than 96 months or having more than 40,000 hours' time-in-service could be available; however, it is possible that airplanes having less than 96 months or 40,000 total flight hours will have these high-time pumps installed. UAL states that this will result in the pumps continuing to be used beyond the 96-month or 40,000-flight-hour compliance time recommended in the NPRM, without having the feed-through connector replaced.

We agree with the commenters. We do not have supporting data to show that deterioration of the feed-through connector leading to cracking begins at manufacture; such deterioration could result from aging of the material. We consider it more likely that the cracking is due to the changes in pump temperature that occur with each flight during normal operation, and/or vibration of the fuel boost pump during operation. However, potted connectors have a longer life in more benign operating environments. We have changed the compliance times in paragraphs (f) and (g) of this AD so that the compliance times are based on the time accrued since installation of a fuel boost pump after the feed-through connector is replaced. This can be determined through a maintenance records review or, optionally, based on the date the connector was replaced.

In addition, we have re-organized paragraph (g) of this AD and added paragraph (h) of this AD for clarity. We have revised the subsequent paragraph identifiers accordingly.

Request To Clarify Paragraph (h) of the NPRM

ABX Air asks that we revise the NPRM to clarify the parts installation information specified in paragraph (h) of the NPRM. ABX states that, to comply with paragraph (h) of the NPRM, the connector must be replaced with a new connector any time a pump is removed and reinstalled. ABX notes that a pump could be removed for maintenance action unrelated to the internal connector, and the removed pump may have had a new connector installed 10,000 flight hours prior to removal. ABX adds that to comply with the actions in paragraph (h), the pump cannot be reinstalled without

replacing the internal connector with a new connector, even though the connector has not exceeded the 40,000-flight-hour limit. ABX Air suggests that the parts installation requirements in paragraph (h) be changed for clarification.

We agree that paragraph (i) of this AD (referred to as paragraph (h) in the NPRM) should be further clarified in light of the previously identified changes we made to paragraphs (f) and (g) of this AD. We have clarified the parts installation information specified in paragraph (i) accordingly.

Request To Perform Actions in Paragraph (g) of the NPRM at Different Times

JAL asks that we allow replacement of the feed-through connector in the pumps on the left and right main fuel tanks to be done at different times, and asks that an informational note be added to the NPRM to include this language. JAL provides no justification for its request.

We infer that JAL would like more flexibility in maintaining its airplanes, and we agree that replacement of the connectors in individual fuel pumps can be done separately. We have added a new Note 1 to the AD indicating that it is acceptable to replace the connectors in different pumps at different times, provided the compliance times required by paragraph (f) of this AD are met for each pump.

Request To Change Unsafe Condition

Boeing asks that we change the description of the unsafe condition in the Summary and Discussion sections of the NPRM, which read as follows:

> We are proposing this AD to prevent a hazardous electrical path from the dry side to the wet side of the fuel boost pump through a cracked feed-through connector, which could create an ignition source on the wet side of the fuel boost pump and lead to subsequent explosion of the fuel tank.

Boeing requests that we change the unsafe condition to the following:

> We are proposing this AD to address a concern with the existence of epoxy potting cracks in the dry side area of the soldered wire connector lugs on the feed-through connector. Cracked epoxy on the feed-through connector can create an area for conductive debris to accumulate that could lead to an ignition source in the Flammable Leakage Zone (FLZ) which is the dry site of the pump installation.

Boeing states that the change to the description of the unsafe condition would align the description with that contained in Boeing Alert Service Bulletins 767-28A0095 and 767-28A0096, for consistency. Boeing adds that the failure does not propagate to the wet side of the pump, and the wet side is designed to contain ignition sources.

We partially agree with the commenter. We agree that clarification of the unsafe condition is appropriate because a fire external to the fuel boost pump enclosure is also a concern, and may be the more likely failure scenario. We disagree that external fire is the only risk associated with this design problem. Cracking of the connector potting material can eventually lead to corrosion, or a collection of contaminants that creates a conductive path between the wet and dry sides of the pump connector. If the fuel boost pump is operated under dry conditions, such as a forward boost pump during a go-around condition, or during defueling on the ground, an ignition source could occur inside the pump, resulting in ignition of fuel tank vapor. In addition, a leak of the connector due to cracking, combined with an ignition source due to a conductive path, could lead to a fire in the aluminum pump housing. A fire could cause an ignition source due to burn-through or a hot spot on the housing or the wiring conduit. We have changed the description of the unsafe condition in the Summary section and

paragraph (d) of this AD to include some of the commenter's suggestions. The Discussion section of the NPRM is not restated in the final rule.

Request To Remove Interim Action

Boeing states that this AD is final action because the combination of life limits on the connector and eventual installation of ground-fault circuit protection provides an acceptable level of safety. Boeing notes that no activity is under way regarding redesign of the feed-through connector, and adds that no additional rulemaking is necessary at this time.

We agree with the commenter's request. We have evaluated the information provided, and we have removed the Interim Action paragraph in this AD. However, if further necessary action is later identified, we might consider further rulemaking then.

Request To Extend Grace Period

Delta Airlines asks that the grace period required by paragraph (f)(2) of the NPRM be extended to 36 months to coincide with the deadline for AD 2007-04-16, amendment 39-14948 (72 FR 7572, February 16, 2007). Delta adds that allowing the extension would better coordinate the maintenance between the NPRM and AD 2007-04-16.

We disagree with the commenter's request. AD 2007-04-16 was not identified in the NPRM as a related AD because those actions are not dependent upon the actions required by this AD. Replacing a fuel boost pump with a pump that has a new connector can be done during an overnight out-of-service period. In developing the 24-month compliance time for this AD action, we considered not only the safety implications of the identified unsafe condition, but the average utilization rate of the affected fleet, and the practical aspects of an orderly modification of the fleet during regular maintenance periods. In addition, we considered the manufacturer's recommendation for an appropriate compliance time. We have made no change to the AD in this regard.

Request To Change Paragraph (g)(2) of the NPRM

ANA states that the feed-through connector replacement was recommended in a preliminary revision of the referenced service information, but the re-identification method was not. ANA has replaced several fuel boost pumps but has not yet done the re-identification. ANA notes that, for this reason, the words "and re-identified" should be deleted from paragraph (g)(2) of the AD. ANA adds that if those words are left in that paragraph, a new optional paragraph should be added with the following compliance time: "Within 96 months since the last replacement date of feed-through connector or before the accumulation of 40,000 flight hours after the last replacement of feed-through connector, whichever comes first."

We do not agree with the commenter's requests. As noted previously, we have changed the compliance times in paragraphs (f) and (g) of this AD to set life limits based on the time accrued. Further, we consider re-identifying the pumps to be important for tracking the status of the fuel boost pumps. However, if operators have adequate maintenance records for the pumps, and a program is in place to ensure that feed-through connector replacements are done in a timely manner and endorsed by the FAA, we would consider a request for approval of an alternative method of compliance (AMOC) to the AD requirements according to the provisions of paragraph (j) of this AD. We have made no change to the AD in this regard.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously. We also

determined that these changes will not increase the economic burden on any operator or increase the scope of the AD.

Costs of Compliance

There are about 941 airplanes of the affected design in the worldwide fleet. This AD affects about 414 airplanes of U.S. registry, at an average labor rate of $80 per work hour.

The fuel boost pump replacement will take about 3 work hours per boost pump (4 boost pumps per airplane) or up to 12 work hours per airplane, per replacement cycle. The parts cost for replacement fuel boost pumps will be offset by returning the existing fuel boost pumps to the manufacturer for rework. Based on these figures, the estimated cost of the AD for U.S. operators to replace the fuel boost pumps is up to $397,440, or up to $960 per airplane, per replacement cycle.

The feed-through connector replacement will take about 3 work hours per connector (4 connectors per airplane) or up to 12 work hours per airplane, per replacement cycle. Required parts will cost $691 per connector (up to $2,764 per airplane). Based on these figures, the estimated cost of the AD for U.S. operators to replace the feed-through connectors is up to $1,541,736, or up to $3,724 per airplane, per replacement cycle.

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), 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.

You can find our regulatory evaluation and the estimated costs of compliance in the AD Docket.

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 AD:

2009-23-04 Boeing: Amendment 39-16076. Docket No. FAA-2007-28281; Directorate Identifier 2006-NM-238-AD.

Effective Date

(a) This airworthiness directive (AD) is effective December 14, 2009.

Affected ADs

(b) None.

Applicability

(c) This AD applies to all Boeing Model 767-200, -300, -300F, and -400ER series airplanes, certificated in any category.

Unsafe Condition

(d) This AD results from a report of cracking in the epoxy potting compound on the internal feed-through connector of the fuel boost pump in the area of the soldered wire connector lugs. We are issuing this AD to prevent a hazardous electrical path from the dry side to the wet side of the fuel boost pump through a cracked feed-through connector, or between pins or a pin and the shell on one side of the feed-through connector, which could create an ignition source on the wet side of the fuel boost pump or cause a fire in the fuel boost pump enclosure and lead to subsequent explosion of the fuel tank.

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.

Compliance Times for Initial Replacement

(f) For each main tank fuel boost pump: At the latest of the times specified in paragraphs (f)(1), (f)(2), and (f)(3) of this AD, do the actions specified in paragraph (g) of this AD, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 767-28A0095 or 767-28A0096; both dated September 15, 2005; as applicable.

(1) Within 96 months since the date of the first installation of the fuel boost pump or before the accumulation of 40,000 flight hours on the fuel boost pump, whichever comes first.

(2) Within 96 months since the date of replacement of the feed-through connector, or before the accumulation of 40,000 flight hours on the fuel boost pump since the date of replacement of the feed-through connector, whichever comes first.

(3) Within 24 months after the effective date of this AD.

Replacement of Fuel Boost Pump Feed-Through Connector

(g) At the compliance time specified in paragraph (f) of this AD: Replace the feed-through connector of each fuel boost pump as described in paragraph (g)(1) or (g)(2) of this AD.

(1) Replace the fuel boost pump with a new fuel boost pump.

(2) Replace the fuel boost pump with a modified and re-identified fuel boost pump having a new feed-through connector installed.

Note 1: Replacing the feed-through connector of each fuel boost pump, as required by paragraph (g) of this AD, may be done in different fuel boost pumps at different times provided the compliance times required by paragraph (f) of this AD are met for each pump.

Note 2: Boeing Alert Service Bulletins 767-28A0095 and 767-28A0096, both dated September 15, 2005, refer to Hamilton Sundstrand Alert Service Bulletin 5006003-28-A4, dated May 9, 2005, as a source of guidance for replacing the feed-through connector and re-identifying the fuel boost pump.

Repetitive Replacements

(h) Repeat the replacement required by paragraph (g) of this AD thereafter at intervals not to exceed the applicable times specified in paragraphs (h)(1) and (h)(2) of this AD:

(1) For airplanes on which the replacement specified in paragraph (g)(1) of this AD is done: Within 96 months since the date of the first installation of the fuel boost pump or before the accumulation of 40,000 flight hours on the fuel boost pump, whichever comes first.

(2) For airplanes on which the replacement specified in paragraph (g)(2) of this AD is done: Within 96 months since the date of replacement of the feed-through connector or before the accumulation of 40,000 flight hours on the fuel boost pump since the date of replacement of the feed-through connector, whichever comes first.

Parts Installation

(i) As of the effective date of this AD, no person may install a fuel boost pump on any airplane, unless that pump has a feed-through connector that meets the requirements of paragraphs (f) and (g) of this AD.

Alternative Methods of Compliance (AMOCs)

(j)(1) The Manager, Seattle Aircraft Certification Office (ACO), FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. Send information to Judy Coyle, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 917-6497; fax (425) 917-6590. Or, e-mail information to 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) To request a different method of compliance or a different compliance time for this AD, follow the procedures in 14 CFR 39.19. Before using any approved AMOC on any airplane to which the AMOC applies, notify your principal maintenance inspector (PMI) or principal avionics inspector (PAI), as appropriate, or lacking a principal inspector, your local Flight Standards District Office. The AMOC approval letter must specifically reference this AD.

Material Incorporated by Reference

(k) You must use Boeing Alert Service Bulletin 767-28A0095, dated September 15, 2005; or Boeing Alert Service Bulletin 767-28A0096, dated September 15, 2005; as applicable; to do the actions required by this AD, unless the AD specifies otherwise.

(1) The Director of the Federal Register approved the incorporation by reference of this service information under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P.O. Box 3707, MC 2H-65, Seattle, Washington 98124-2207; telephone 206-544-5000, extension 1, fax 206-766-5680; e-mail me.boecom@boeing.com; Internet https://www.myboeingfleet.com.

(3) You may review copies of the service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington. For information on the availability of this material at the FAA, call 425-227-1221 or 425-227-1152.

(4) You may also review copies of the service information that is incorporated by reference 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/code_of_federal_regulations/ibr_locations.html.

Issued in Renton, Washington, on October 26, 2009.
Stephen P. Boyd,
Acting Manager, Transport Airplane Directorate,
Aircraft Certification Service.