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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2012-0597; Directorate Identifier 2012-NM-054-AD; Amendment 39-17377; AD 2013-05-05]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for certain The Boeing Company Model 777-200, -200LR, -300, and -300ER series airplanes. This AD was prompted by reports of in-service events related to electrical power system malfunctions resulting in damage to electrical load management system (ELMS) P200 and P300 power panels and the surrounding area. This AD requires installing enclosure trays to contain debris in certain ELMS panels, and replacing certain ELMS contactors. We are issuing this AD to prevent contactor failures, which could result in uncontained hot debris flow due to ELMS contactor breakdown, consequent smoke and heat damage to airplane structure and equipment during ground operations, and possible injuries to passengers and crew.

DATES: This AD is effective April 25, 2013.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in the AD as of April 25, 2013.

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; Internet <https://www.myboeingfleet.com>. You may review copies of the referenced service information at the FAA, 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.

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 (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: Georgios Roussos, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, Seattle Aircraft Certification Office (ACO), FAA, 1601 Lind Avenue SW., Renton, Washington 98057-3356; phone: 425-917-6482; fax: 425-917-6590; email: georgios.roussos@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an AD that would apply to the specified products. That NPRM published in the Federal Register on June 18, 2012 (77 FR 36206). That NPRM proposed to require installing enclosure trays to contain debris in certain ELMS panels, and replacing certain ELMS contactors in the P200 and P300 ELMS panels.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the proposal (77 FR 36206, June 18, 2012) and the FAA's response to each comment.

Request To Allow Certain Installations of Removed Contactors

Cathay Pacific Airways (Cathay) and All Nippon Airways (All Nippon) requested that we clarify the proposed requirement to discard the removed contactors. The commenters requested that we identify certain inspection criteria that would allow further use of these contactors on non-AD-affected locations and ease the financial burden of discarding removed but serviceable power contactors.

We partially agree with the request. The note in paragraphs 3.B.3 and 3.B.4 of the Accomplishment Instructions of Boeing Special Attention Service Bulletin 777-24-0112, Revision 2, dated December 14, 2011, specifies discarding these parts. We agree that power contactors that have been appropriately overhauled to the manufacturer's original specifications may meet criteria for safe operation in non-AD-affected locations. But this AD applies to the affected airplanes, not the contactors; the AD therefore cannot mandate the disposition of contactors removed from the airplane. Further, power contactors that are removed from the AD-affected ELMS panel location are considered compromised parts and may not be installed "as is" in other non-AD-affected locations. We have added new paragraph (j)(2) in this final rule to provide for the re-installation of the contactors, provided they are first inspected and tested, and repaired if necessary, in accordance with a method approved by the Seattle Aircraft Certification Office (ACO).

Concern for Effect of Ongoing Maintenance on AD Compliance

Cathay was concerned that operators would have difficulty ensuring compliance with the proposed requirements in ongoing maintenance. According to Cathay, operators are unable to purge the stock with part number (P/N) ELM827-1 contactors still installed on the P100 panel.

We acknowledge Cathay's concern for allowing installation of the P/N ELM827-1 contactors within the P100 ELMS panel. We disagree, however, with Cathay's inference that this is difficult to accomplish on the other panel, because proper maintenance documentation and personnel training

can secure ongoing compliance with the AD requirements. Furthermore, we are not aware of any issues associated with these power contactors within the P100 ELMS panel that would warrant any regulatory action against this panel installation. We have not changed the final rule regarding this issue.

Request To Allow Contactor Replacement as Optional

Korean Air Lines and Air France requested that we reconsider the proposed requirement to replace the power contactors. Korean Air Lines stated that Boeing introduced, in addition to the tray installation, certain improvements to the ELMS panel, such as the installation of a cooling duct and internal inspection of the panel. Korean Air Lines considered these additional improvements sufficient to provide safety for the passengers. Korean Air Lines requested that the power contactor replacement become optional if the tray enclosures and the cooling duct were installed. Air France explained its choice to replace the power contactor within the P300 ELMS panel because inspections revealed a number of panels and contactors with evidence of overheating and/or silver deposits. Air France further pointed to inspections on the P200 ELMS panel that did not identify any damage. Air France asserted that there is no technical or reliability benefit to the requirement to replace the power contactors, and requested that we reconsider the requirement.

We disagree. Our data indicate a number of in-service failures of power contactors installed within the P200 and P300 ELMS panels. While installation of the tray enclosures may limit the extent of the damage within the affected power panel, power contactor failures nevertheless generate excessive heat and smoke that may lead to aircraft emergency evacuation and potential passenger injuries. While the cooling duct provides a better operating environment for the power contactors, its installation does not necessarily address the kind of internal contactor failures that may result from operating at power levels so near the rated capacity and could lead to thermal degradation of materials, which further reduce contactor protection and can lead to loose parts within the contactor that may increase the probability of arcing. We have not changed the final rule regarding this issue.

Request To Clarify Cost Estimate

United Airlines questioned the high cost of the replacement parts relative to parts outsourcing and liability concerns. Air France considered that the cost of the replacement is not justified by any technical or reliability benefit, and offered two solutions: (1) a substantially reduced contactor price or (2) use of P/N ELM827-1 as spares, provided certain preventive measures were taken.

We partially agree. We have been informed that Boeing is negotiating certain price reductions with its contactor supplier. However, we have determined that replacement of these parts is necessary for continued safe flight, and we have therefore not changed the final rule regarding this issue. Regarding use of P/N ELM827-1 as spares, as discussed previously, we have added new paragraph (j)(2) in this final rule to provide for re-installation of the contactors, if done using a method approved by the Seattle ACO.

Request To Allow Credit for Certain Revised Service Information

Boeing requested that we revise Note 1 to paragraph (g) of the NPRM (77 FR 36206, June 18, 2012) to include prior revisions of the specified Smiths service information. Boeing added that Boeing Special Attention Service Bulletin 777-24-0106, dated July 20, 2007 (referenced in the NPRM as the appropriate source of service information for the tray installation), does not identify a specific revision level of the Smiths service information. Boeing reported that the next revision of Boeing Service Bulletin 777-24-0106 will include the revision levels per the proposed AD, but that the subsequent changes, which are related to ease of installation only, were not necessary to ensure safety.

We agree that the changes introduced to the referenced revised GE Aviation (Smiths) service information are not necessary to ensure safety. We have determined that the information in Note 1 to paragraph (g) of the NPRM (77 FR 36206, June 18, 2012), as well as Note 2 to paragraph (h) of the NPRM, is unnecessary; these notes have been removed from the AD.

Concern Regarding Quality Oversight

Recognizing the proposed requirement to upgrade to the more robust contactors, as specified in the NPRM (77 FR 36206, June 18, 2012), and noting the benefits of containment trays, United Airlines expressed its hope that the NPRM addressed all compromised areas of concern regarding the equipment. The commenter also expressed concern about contactor quality oversight.

We infer that the commenter agrees with the requirements of this final rule. We also recognize the importance of parts quality oversight to prevent failures on high-power contactors that could potentially cause significant airplane damage. We understand that both Boeing and the parts supplier have increased their quality oversight of the contactors. There is no need to change the final rule regarding this issue.

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 and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM (77 FR 36206, June 18, 2012) for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM (77 FR 36206, June 18, 2012).

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

We estimate that this AD affects 128 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 |
|-----------------------|--------------------------------------|-------------------|-------------------------|-------------------------------|
| Tray installation | 3 work-hours × \$85 per hour = \$255 | \$1,729 | \$1,984 | \$253,952 |
| Contactor replacement | 6 work-hours × \$85 per hour = \$510 | 49,317 | 49,827 | 6,377,856 |

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, 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):



2013-05-05 The Boeing Company: Amendment 39-17377; Docket No. FAA-2012-0597;
Directorate Identifier 2012-NM-054-AD.

(a) Effective Date

This AD is effective April 25, 2013.

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 777-200, -200LR, -300, and -300ER series airplanes; certificated in any category; as identified in Boeing Special Attention Service Bulletin 777-24-0106, dated July 20, 2007; and Boeing Special Attention Service Bulletin 777-24-0112, Revision 2, dated December 14, 2011.

(d) Subject

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 24, Electrical power.

(e) Unsafe Condition

This AD was prompted by reports of in-service events related to electrical power system malfunctions resulting in damage to electrical load management system (ELMS) P200 and P300 power panels and the surrounding area. We are issuing this AD to prevent contactor failures, which could result in uncontained hot debris flow due to ELMS contactor breakdown, consequent smoke and heat damage to airplane structure and equipment during ground operations, and possible injuries to passengers and crew.

(f) Compliance

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

(g) Tray Installation

For airplanes identified in Boeing Special Attention Service Bulletin 777-24-0106, dated July 20, 2007: Within 36 months after the effective date of this AD, install enclosure trays to contain debris in the ELMS panels, in accordance with the Accomplishment Instructions of Boeing Special Attention Service Bulletin 777-24-0106, dated July 20, 2007.

(h) Contactor Replacement

For airplanes identified in Boeing Special Attention Service Bulletin 777-24-0112, Revision 2, dated December 14, 2011: Within 60 months after the effective date of this AD, replace specified electrical power contactors in the ELMS P200 and P300 power panels with new contactors, in accordance with the Accomplishment Instructions of Boeing Special Attention Service Bulletin 777-24-0112, Revision 2, dated December 14, 2011, except as provided by paragraph (j)(2) of this AD.

(i) Credit for Previous Actions

This paragraph provides credit for the replacement of the ELMS contactors required by paragraph (h) of this AD, if those actions were performed before the effective date of this AD using Boeing Special Attention Service Bulletin 777-24-0112, dated February 19, 2009; or Revision 1, dated June 30, 2011. These service bulletins are not incorporated by reference in this AD.

(j) Parts Installation

(1) Except as required by paragraph (j)(2) of this AD: As of the effective date of this AD, no person may install, on any airplane, a contactor having part number ELM827-1 in the ELMS panels and locations identified in this AD, except as required by paragraph (j)(2) of this AD.

(2) This paragraph provides operators with the option not to discard the removed power contactors, in contrast with the note in steps 3.B.3 and 3.B.4 of the Accomplishment Instructions of Boeing Special Attention Service Bulletin 777-24-0112, Revision 2, dated December 14, 2011. This AD allows re-installation of removed power contactors, if done using a method approved in accordance with the procedures specified in paragraph (k) of this AD.

(k) Alternative Methods of Compliance (AMOCs)

(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. 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 the ACO, send it to the attention of the person identified in the Related Information section of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@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.

(l) Related Information

(1) For more information about this AD, contact Georgios Roussos, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, Seattle Aircraft Certification Office (ACO), FAA, 1601 Lind Avenue SW., Renton, Washington 98057-3356; phone: 425-917-6482; fax: 425-917-6590; email: georgios.roussos@faa.gov.

(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; Internet <https://www.myboeingfleet.com>.

(m) Material Incorporated by Reference

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

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Boeing Special Attention Service Bulletin 777-24-0106, dated July 20, 2007.

(ii) Boeing Special Attention Service Bulletin 777-24-0112, Revision 2, dated December 14, 2011.

(3) 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; Internet <https://www.myboeingfleet.com>.

(4) You may view this 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.

(5) You may view this 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/cfr/ibr-locations.html>.

Issued in Renton, Washington, on February 28, 2013.

Ali Bahrami,
Manager, Transport Airplane Directorate,
Aircraft Certification Service.