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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2014-0428; Directorate Identifier 2014-NM-067-AD; Amendment 39-18205; AD 2015-14-07]

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 airplanes. This AD was prompted by reports of deficiencies in the flight control module (FCM) software. This AD requires installing certain FCM software. We are issuing this AD to correct deficiencies in the FCM software, which, if not corrected, could prevent continued safe flight and landing.

DATES: This AD is effective August 20, 2015.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of August 20, 2015.

ADDRESSES: For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P.O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may view this referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, WA. For information on the availability of this material at the FAA, call 425-227-1221. It is also available on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2014-0428.

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-2014-0428; 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: Douglas Tsuji, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, Seattle Aircraft Certification Office (ACO), FAA, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6546; fax: 425-917-6590; email: douglas.tsuji@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 The Boeing Company Model 787-8 airplanes. The NPRM published in the Federal Register on July 2, 2014 (79 FR 37684). The NPRM was prompted by reports of deficiencies in the FCM software. The NPRM proposed to require installing certain FCM software. We are issuing this AD to correct deficiencies in the FCM software, which, if not corrected, could prevent continued safe flight and landing.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM (79 FR 37684, July 2, 2014) and the FAA's response to each comment.

Support for the NPRM (79 FR 37684, July 2, 2014)

United Airlines Engineering, the Air Line Pilots Association International (ALPA), and Boeing expressed support for the NPRM (79 FR 37684, July 2, 2014). United Airlines Engineering also indicated that all of its airplanes were modified as of April 2, 2014, with no adverse effects.

Request To Issue Alternative Methods of Compliance (AMOCs)

Boeing requested that we issue AMOCs for several items it identified in Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 001, dated February 6, 2014. Boeing requested AMOCs to do the following actions.

- Install the FCM operational program software (OPS) in the Mass Storage Device 1 only.
- To identify the existing FCM OPS software as either part number HNP5E-AL01-5010 (Block Point 1) or part number HNP5F-AL01-5011 (Block Point 2) software.
- To specify that the FCM loadable diagnostic information (LDI) database (DB) and FCM air data reference function (ADRF) DB software are not required to be reloaded if the FCM OPS software part number HNP5C-AL01-5012 can be successfully loaded without reloading the databases.

We agree that the issues raised by the commenter should be addressed. The issues are addressed in a new revision to Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 001, dated February 6, 2014. We have revised paragraphs (c), (g), and (h) of this AD to reference Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 002, dated February 12, 2015, as the appropriate source of service information for accomplishing the required actions. There has been no expansion to the applicability or scope of this AD. Use of either Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 001, dated February 6, 2014, or Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 002, dated February 12, 2015, is acceptable. No further work is necessary on airplanes on which operators have done the actions described in Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 001, dated February 6, 2014. We have added new paragraph (j) of this

AD to provide credit for actions required by paragraph (g) of this AD, if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 001, dated February 6, 2014. We have re-designated subsequent paragraphs accordingly.

However, we disagree with issuing AMOCs at this time. AMOCs provide an alternative method of compliance to the methods required to be used in the associated AD. An AMOC is issued only after an AD has been issued and only after data are provided to show that the proposed solution is complete and addresses the unsafe condition.

Request To Issue an AMOC for Later Software Versions

Boeing requested that we issue an AMOC to allow installation of the FCM Block Point 4 software or later FCM software in lieu of the FCM Block Point 3 software proposed by the NPRM (79 FR 37684, July 2, 2014). Boeing explained that the FCM Block Point 4 software or later FCM software updates are an alternative to the Block Point 3 software, and that operators may wish to install Block Point 4 or later FCM software due to the additional product improvements provided in the later software versions.

We agree that FCM Block Point 4 (or later FAA-approved FCM software versions) includes the Block Point 3 updates and therefore corrects the unsafe condition identified in this AD. We have retained the compliance time specified in paragraph (g) of the proposed AD (79 FR 37684, July 2, 2014); clarified and moved the required software installation from paragraph (g) of the proposed AD to new paragraph (g)(1) of this AD; and added new paragraphs (g)(2), (g)(3), and (g)(4) of this AD, which specify to install FCM Block Point 4 in accordance with the Accomplishment Instructions of Boeing Service Bulletin B787-81205-SB270023-00, Issue 001, dated July 24, 2014, or to install FCM Common Block Point 1 in accordance with the Accomplishment Instructions of Boeing Service Bulletin B787-81205-SB270027-00, Issue 002, dated March 9, 2015, or to install any later FAA-approved FCM software version using a method approved in accordance with the procedures specified in paragraph (k) of this AD. As stated previously, an AMOC is issued only after an AD has been issued and only after data are provided to show that the proposed solution is complete and addresses the unsafe condition. Also, as previously stated, we have added new paragraph (j) of this AD to provide credit for actions required by paragraph (g) of this AD, if those actions were performed before the effective date of this AD using Boeing Service Bulletin B787-81205-SB270027-00, Issue 001, dated September 26, 2014.

In addition, we recommend that Boeing incorporate the provision for later approved parts in its service information, when appropriate. This provision is described in FAA Advisory Circular (AC) 20-176A, dated June 16, 2014. (See [http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/979ddd1479e1ec6f86257cfc0052d4e9/\\$FILE/AC%2020-176A.PDF](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/979ddd1479e1ec6f86257cfc0052d4e9/$FILE/AC%2020-176A.PDF).)

Request To Clarify the Minimum Concurrent Requirement

Boeing requested that we revise paragraph (h) of the NPRM (79 FR 37684, July 2, 2014) to clarify that the minimum concurrent requirement for Group 1 airplanes identified in Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 001, dated February 6, 2014, is to install the FCM LDI DB software and central maintenance computer function (CMCF) LDI DB software. Boeing stated that the updated FCM OPS software is installed per Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 001, dated February 6, 2014, and therefore, the previous FCM OPS software version specified in Boeing Alert Service Bulletin B787-81205-SB270017-00, Issue 001, dated September 18, 2013, does not need to be installed.

We agree with the commenter's request for clarification. This clarification was addressed in the new revision of Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 002, dated February 12, 2015, which we have replicated in the final rule by revising paragraph (h) to include the statement

". . . or at a minimum install the FCM LDI DB and CMCF LDI DB software, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin B787-81205-SB270017-00, Issue 001, dated September 18, 2013.

Request To Revise the Discussion Section of the NPRM (79 FR 37684, July 2, 2014)

Boeing requested that we revise the source of the deficiency provided in the first sentence of the Discussion section of the NPRM (79 FR 37684, July 2, 2014), which stated, in part, "We have received reports of in-service incidents and identified an indicating system shortcoming due to. . . ." Boeing stated that the issues are with the flight control system, not the indicating system.

We agree with the commenter that the shortcoming is in the flight control system, not the indicating system. However, this section is not repeated in the final rule. Therefore no change is needed to this AD.

Request To Clarify Paragraph (i) of the Proposed AD (79 FR 37684, July 2, 2014)

Boeing requested that we revise paragraph (i) of the proposed AD (79 FR 37684, July 2, 2014), which referred to installation of "new" software. Boeing requested that we remove the word "new" from that sentence. Boeing stated that only the FCM OPS software is new, and that the FCM LDI DB, FCM ADRF DB, and CMCF LDI DB software identified in Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 001, dated February 6, 2014, are previous software versions.

We agree with the request, for the reasons provided by the commenter. We have revised paragraph (i) of this AD accordingly.

Conclusion

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

- [Agr]re consistent with the intent that was proposed in the NPRM (79 FR 37684, July 2, 2014) for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM (79 FR 37684, July 2, 2014).

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

Related Service Information Under 1 CFR Part 51

Boeing has issued the following service bulletins.

- Boeing Alert Service Bulletin B787-81205-SB270017-00, Issue 001, dated September 18, 2013. This service information describes procedures for installing FCM OPS, FCM LDI DB, and CMCF LDI DB software, and doing a software configuration check.
- Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 002, dated February 12, 2015. This service information describes procedures for installing FCM OPS, FCM LDI DB, and FCM ADRF DB software, and doing a software configuration check.
- Boeing Service Bulletin B787-81205-SB270023-00, Issue 001, dated July 24, 2014. This service information describes procedures for installing FCM OPS, FCM LDI DB, FCM ADRF DB, and CMCF LDI DB software, and doing a software configuration check.
- Boeing Service Bulletin B787-81205-SB270027-00, Issue 002, dated March 9, 2015. This service information describes procedures for installing FCM OPS, FCM LDI DB, FCM Compatibility DB, and CMCF LDI DB software, and doing a software configuration check.

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section of this or AD.

Costs of Compliance

We estimate that this AD affects 11 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
FCM BP3 software installation	2 work-hours × \$85 per hour = \$170	\$0	\$170	\$1,870
Concurrent FCM BP2 software installation (Group 1 airplanes)	2 work-hours × \$85 per hour = \$170	630	800	8,800

According to the manufacturer, all of the costs of this AD may be covered under warranty, thereby reducing the cost impact on affected individuals. We do not control warranty coverage for affected individuals. As a result, we have included all costs in our cost estimate.

The parts cost for the FCM BP3 software installation is not included in our cost estimate. It is considered Boeing-provided loadable software, which is referenced in Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 002, dated February 12, 2015, under "Parts & Materials Supplied by the Operator."

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):



2015-14-07 The Boeing Company: Amendment 39-18205; Docket No. FAA-2014-0428; Directorate Identifier 2014-NM-067-AD.

(a) Effective Date

This AD is effective August 20, 2015.

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 787-8 airplanes, certificated in any category, as identified in Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 002, dated February 12, 2015.

(d) Subject

Air Transport Association (ATA) of America Code 27, Flight Controls.

(e) Unsafe Condition

This AD was prompted by reports of deficiencies in the flight control module (FCM) software. We are issuing this AD to correct deficiencies in the FCM software, which, if not corrected, could prevent continued safe flight and landing.

(f) Compliance

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

(g) FCM Software Installation

Within 6 months after the effective date of this AD: Do the actions specified in paragraph (g)(1), (g)(2), (g)(3), or (g)(4) of this AD.

(1) Use the onboard data load function (ODLF) to install FCM Block Point 3 software (including FCM operational program software (OPS), FCM loadable diagnostic information (LDI) database (DB) software, and FCM air data reference function (ADRF) DB software), in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 002, dated February 12, 2015.

(2) Use the ODLF to install FCM Block Point 4 software (including FCM OPS, FCM LDI DB software, FCM ADRF DB software, and central maintenance computer function (CMCF) LDI DB software), in accordance with the Accomplishment Instructions of Boeing Service Bulletin B787-81205-SB270023-00, Issue 001, dated July 24, 2014.

(3) Use the ODLF to install FCM Common Block Point 1 software (including FCM OPS, FCM LDI DB software, FCM Compatibility DB software, and CMCF LDI DB software), in accordance with the Accomplishment Instructions of Boeing Service Bulletin B787-81205-SB270027-00, Issue 002, dated March 9, 2015.

(4) Install any later FAA-approved FCM software version using a method approved in accordance with the procedures specified in paragraph (k) of this AD.

(h) Concurrent Requirements

For Group 1 airplanes, as identified in Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 002, dated February 12, 2015: Prior to or concurrently with accomplishing the actions required by paragraph (g) of this AD, use the ODLF to install FCM OPS, FCM LDI DB, and CMCF LDI DB software, or at a minimum install the FCM LDI DB and CMCF LDI DB software, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin B787-81205-SB270017-00, Issue 001, dated September 18, 2013.

(i) Parts Installation Prohibition

After installation of the software specified in paragraphs (g) and (h) of this AD, no person may install any previous versions of the FCM OPS, FCM LDI DB, FCM ADRF DB, or CMCF LDI DB software, on any airplane.

(j) Credit for Previous Actions

This paragraph provides credit for actions required by paragraph (g) of this AD, if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin B787-81205-SB270020-00, Issue 001, dated February 6, 2014; or Boeing Service Bulletin B787-81205-SB270027-00, Issue 001, dated September 26, 2014; which are not incorporated by reference in 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 paragraph (l) 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.

(3) If the service information contains steps that are labeled as RC (Required for Compliance), those steps must be done to comply with this AD; any steps that are not labeled as RC are recommended. Those steps that are not labeled as RC may be deviated from using accepted methods different from those identified in the specified service information without obtaining approval of an AMOC, provided the steps labeled as RC can be done and the airplane can be put back in a serviceable condition. Any substitutions or changes to steps labeled as RC require approval of an AMOC.

(l) Related Information

(1) For more information about this AD, contact Douglas Tsuji, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, Seattle Aircraft Certification Office (ACO), FAA, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6546; fax: 425-917-6590; email: douglas.tsuji@faa.gov.

(2) Service information identified in this AD that is not incorporated by reference is available at the addresses specified in paragraphs (m)(3) and (m)(4) of this AD.

(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 Alert Service Bulletin B787-81205-SB270020-00, Issue 002, dated February 12, 2015.

(ii) Boeing Service Bulletin B787-81205-SB270023-00, Issue 001, dated July 24, 2014.

(iii) Boeing Service Bulletin B787-81205-SB270027-00, Issue 002, dated March 9, 2015.

(iv) Boeing Alert Service Bulletin B787-81205-SB270017-00, Issue 001, dated September 18, 2013.

(3) For Boeing service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P.O. Box 3707, MC 2H-65, Seattle, WA 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, WA. 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 July 2, 2015.

Jeffrey E. Duven,
Manager, Transport Airplane Directorate,
Aircraft Certification Service.