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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2015-5808; Directorate Identifier 2015-NM-111-AD; Amendment 39-18585; AD 2016-14-04]**

**RIN 2120-AA64**

#### **Airworthiness Directives; The Boeing Company Airplanes**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

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**SUMMARY:** We are adopting a new airworthiness directive (AD) for certain The Boeing Company Model 787-8 airplanes. This AD was prompted by reports of water leakage from the potable water system due to improperly installed waterline couplings, and water leaking into the electronics equipment (EE) bays from above the floor in the main cabin, resulting in water on the equipment in the EE bays. This AD requires replacing the potable waterline couplings above the forward and aft EE bays with new, improved couplings. This AD also requires sealing the main cabin floor areas above the aft EE bay, installing drip shields and foam blocks, and rerouting the wire bundles near the drip shields above the equipment in the aft EE bay. We are issuing this AD to prevent a water leak from an improperly installed potable water system coupling, or main cabin water source, which could cause the equipment in the EE bays to become wet, resulting in an electrical short and potential loss of system functions essential for safe flight.

**DATES:** This AD is effective August 12, 2016.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of August 12, 2016.

**ADDRESSES:** For service information identified in this final rule, 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-2015-5808.

## **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-2015-5808; 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 Docket 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:** Susan L. Monroe, Aerospace Engineer, Cabin Safety and Environmental Systems Branch, ANM-150S, FAA, Seattle Aircraft Certification Office (ACO), 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6457; fax: 425-917-6590; email: [susan.l.monroe@faa.gov](mailto:susan.l.monroe@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 November 19, 2015 (80 FR 72393), ("the NPRM"). The NPRM was prompted by reports of water leakage from the potable water system due to improperly installed waterline couplings, and water leaking into the EE bays from above the floor in the main cabin, resulting in water on the equipment in the EE bays. The NPRM proposed to require replacing the potable waterline couplings above the forward and aft EE bays with new, improved couplings. The NPRM also proposed to require sealing the main cabin floor areas above the aft EE bay, installing drip shields and foam blocks, and rerouting the wire bundles near the drip shields above the equipment in the aft EE bay. We are issuing this AD to prevent a water leak from an improperly installed potable water system coupling, or main cabin water source, which could cause the equipment in the EE bays to become wet, resulting in an electrical short and potential loss of system functions essential for safe flight.

## **Comments**

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

## **Support for the NPRM**

The Airline Pilots Association International stated that it concurs with the contents of the NPRM. United Airlines (UAL) stated that it supports the compliance time of 60 months to accomplish the actions proposed by the NPRM.

## **Requests To Revise Compliance Times**

Mr. Geoffrey Barrance requested that we revise the compliance times specified in the NPRM to before further flight. Mr. Barrance stated that, in view of the effect of common mode faults to nullify the safety design of critical avionics systems housed in the avionics bay, this matter needs to be treated with the greatest urgency and that the correction of the problem should be required with far greater urgency than the timescales proposed in the NPRM. Mr. Barrance stated an example of the automatic landing function of the automatic flight control system that does not and cannot take into account common mode faults such as water ingress into multiple line replaceable units (LRUs), which are

present to provide functional redundancy and fault tolerance. Mr. Barrance stated that no probability can be assessed for unwanted behavior resulting from water ingress into multiple redundant LRUs.

UAL requested that we extend the proposed compliance time from 24 months to 30 months for accomplishing the actions specified in Boeing Alert Service Bulletin B787-81205-SB380009-00, Issue 001, dated March 26, 2015. UAL stated that if maintenance requires an unforeseen disassembly of the airplane for access or to correct a test failure, a 30-month period is required to schedule the clamp inspection and replacement in a heavy check.

We do not agree to revise the compliance times required by this AD. In developing appropriate compliance times for this AD, we considered not only the safety implications, including evaluation of the hazards associated with water ingress into multiple redundant LRUs, but the manufacturer's recommendations, the availability of required parts, and the practical aspect of accomplishing the required actions within an interval of time that corresponds to typical scheduled maintenance for affected operators. After considering all the available information, we have determined that the compliance times, as proposed, represent appropriate intervals of time in which the required actions can be performed in a timely manner within the affected fleet, while still maintaining an adequate level of safety. Operators are always permitted to accomplish the requirements of an AD at a time earlier than the specified compliance time. Operators wanting additional time to comply with the requirements of an AD may request adjustments to the compliance time under the provisions of paragraph (k) of this AD. We will consider requests for an adjustment of the compliance time if data are submitted to substantiate that such an adjustment would provide an acceptable level of safety. We have not changed this AD in this regard.

### **Request To Use Alternative Moisture Barrier Tape**

UAL requested that we approve the use of flame retardant (FR) moisture barrier tapes Nitto 11611-MB polyurethane tape or BMS8-346 Type II, Class 4 tape (3M 8657) as alternates to the BMS8-346 Type 1, Class 1 moisture barrier tape (Patco D9100) specified in Boeing Alert Service Bulletin B787 81205 SB530029-00, Issue 001, dated March 26, 2015. UAL stated that during a supplemental type certificate test for a Model 737 airplane, burn testing was performed on the Patco D9100 tape by Zodiac Northwest Aerospace Technologies, and it failed the 12-second vertical test. UAL stated that, therefore, the Patco D9100 tape could not be certified to meet the 14 CFR 25.853 flammability requirements.

We do not agree with UAL's request. We have contacted Boeing who provided evidence that BMS8-346 Type 1, Class 1 moisture barrier tape (Patco D9100) material passed the 12-second vertical burn test. UAL did not submit specific evidence to substantiate that Nitto 11611-MB polyurethane tape or BMS8-346 Type II, Class 4 tape (3M 8657) is compliant and that BMS8-346 Type 1, Class 1 moisture barrier tape (Patco D9100) material is non-compliant. Under the provisions of paragraph (k) of this AD, we will consider requests for approval of an alternative method of compliance (AMOC) if sufficient data are submitted to substantiate that alternative tapes are compliant. We have not changed this AD in this regard.

### **Requests To Use Revised Service Information**

Boeing and UAL requested that we revise the NPRM to refer to Boeing Alert Service Bulletin B787-81205-SB380009-00, Issue 002, dated December 9, 2015; Boeing Alert Service Bulletin B787-81205-SB530029-00, Issue 002, dated January 26, 2016; and Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 002, dated March 16, 2016.

We agree with the commenters' requests to use the most current service information. We have revised this AD as described below.

- Boeing Alert Service Bulletin B787-81205-SB380009-00, Issue 002, dated December 9, 2015, adds notes, revises the waiting time in the leak test, and corrects typographical errors. We have revised paragraphs (c) and (g) of this AD to reference this service information.

- Boeing Alert Service Bulletin B787-81205-SB530029-00, Issue 002, dated January 26, 2016, extends the 24-month compliance time for sealing floor panels and seat tracks to 60 months; clarifies installation of components, revises tape requirements; revises sealant callouts; and corrects kit contents. We have revised paragraphs (c) and (h)(1) of this AD to reference this service information.
- Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 002, dated March 16, 2016, extends the 24-month compliance time for installing drip shields and foam blocks to 60 months. This service information also revises the airplane groups into configurations to account for airplanes on which the drip shield between the floor beams at station (STA) 1233 and STA 1257 was not installed due to interference with wire bundles over the P100 panel. This service information also clarifies certain instructions, revises certain task hour estimates, and removes one airplane from the effectivity. This service information erroneously specifies "Group 6, Configuration 1" airplanes where it should specify "Group 7, Configuration 1" airplanes for Task 29 in multiple places. We have revised paragraphs (c) and (h)(2) of this AD to reference Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 002, dated March 16, 2016. We have added new paragraph (i) to specify an exception for Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 002, dated March 16, 2016.

We have also added new paragraph (j) of this AD to provide credit for actions done prior to the effective date of this AD using Boeing Alert Service Bulletin B787-81205-SB380009-00, Issue 001, dated March 26, 2015; Boeing Alert Service Bulletin B787-81205-SB530029-00, Issue 001, dated March 26, 2015; and Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 001, dated March 26, 2015; as applicable. We have redesignated subsequent paragraphs accordingly.

## **Request To Review Airplane Certification Procedures**

Mr. Geoffrey Barrance requested that we conduct an internal review and a review with the manufacturer as to why the airplane equipment bay design was not reviewed and required to protect the avionics LRUs from water ingress at the time of certification. Mr. Barrance stated that this is not a new issue and must be a standard check item on design reviews and certification signoff. Mr. Barrance stated that this is a design and certification omission, not primarily a problem with the quality of work by the people doing the installation of the potable waterlines.

We partially agree with Mr. Barrance's request. We agree that this is a design issue that increased the likelihood of mis-installation, and not primarily a problem with the quality of work by personnel installing the potable waterlines. We asked the manufacturer to conduct a root-cause analysis to determine how it permitted design issues that created the unsafe condition. We are working with the manufacturer to determine if their company processes must be updated to better identify these hazards. The actions required by this AD address only the results of that analysis that directly relate to the identified design issues, and mandate changes to correct those issues.

We disagree that the EE bay design was not reviewed and required to protect the avionics LRUs from water ingress at the time of certification. A hazard analysis was completed for these systems, as part of the certification process, which required known hazards to be addressed. This event shows that despite the hazard analysis during the design and certification phase, further improvement is needed to remove the unsafe condition. Airplane manufacturers are responsible for the safety of their products and services, and must be in compliance with applicable safety requirements. As a component of our safety management system, we verify that the safety systems of the design approval holder meet applicable requirements. Working with approval holders during the design development process, we strive to avoid unsafe conditions in the first place. The design for this system was evaluated during the certification process and found at the time to be compliant. We also verify that the approval holders' processes, products, and services continue to maintain safety of their product during the operational phases of their service life. In this regard, we have evaluated the issues related to this system and acted on them.

We are continuously evaluating our certification system and procedures and improving them when problems are found. In addition, if the FAA is made aware of issues occurring on a certificated product, we conduct an investigation, evaluate the manufacturer's root-cause analysis, and make a determination whether or not an unsafe condition exists. We then take appropriate action to mitigate the unsafe condition. We have not changed this 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 this 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 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 AD.

## Related Service Information Under 1 CFR Part 51

We reviewed the following service information.

- Boeing Alert Service Bulletin B787-81205-SB380009-00, Issue 002, dated December 9, 2015.
- Boeing Alert Service Bulletin B787-81205-SB530029-00, Issue 002, dated January 26, 2016.
- Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 002, dated March 16, 2016.

This service information describes procedures for replacing the potable waterline couplings above the forward and aft EE bays with new, improved couplings; sealing the floors, seat tracks, and lavatories above the aft EE bay; installing drip shields and foam blocks; and rerouting the wire bundles adjacent to the drip shields above the aft EE bay. 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.

## Costs of Compliance

We estimate that this AD affects 17 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
Replace waterline couplings	Up to 24 work-hours × \$85 per hour = up to \$2,040	\$3,195	Up to \$5,235	Up to \$88,995
Seal floors and seat tracks	Up to 108 work-hours × \$85 per hour = up to \$9,180	137	Up to \$9,317	Up to \$158,389
Install drip shields and reroute wiring	Up to 42 work-hours × \$85 per hour = up to \$3,570	34,594	Up to \$38,164	Up to \$648,788

According to the manufacturer, some 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.

## **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):



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**2016-14-04 The Boeing Company:** Amendment 39-18585; Docket No. FAA-2015-5808; Directorate Identifier 2015-NM-111-AD.

**(a) Effective Date**

This AD is effective August 12, 2016.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to The Boeing Company Model 787-8 series airplanes, certificated in any category, as identified in the service information specified in paragraphs (c)(1), (c)(2), and (c)(3) of this AD.

(1) Boeing Alert Service Bulletin B787-81205-SB380009-00, Issue 002, dated December 9, 2015.

(2) Boeing Alert Service Bulletin B787-81205-SB530029-00, Issue 002, dated January 26, 2016.

(3) Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 002, dated March 16, 2016.

**(d) Subject**

Air Transport Association (ATA) of America Code 38, Water/Waste; and Code 53, Fuselage.

**(e) Unsafe Condition**

This AD was prompted by reports of water leakage from the potable water system due to improperly installed waterline couplings, and water leaking into the electronics equipment (EE) bays from above the floor in the main cabin, resulting in water on the equipment in the EE bays. We are issuing this AD to prevent a water leak from an improperly installed potable water system coupling, or main cabin water source, which could cause the equipment in the EE bays to become wet, resulting in an electrical short and potential loss of system functions essential for safe flight.

**(f) Compliance**

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

**(g) Replace Potable Waterline Couplings**

Within 24 months after the effective date of this AD: Replace the existing potable waterline couplings located above the forward and aft EE bays with new, improved couplings, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin B787-81205-SB380009-00, Issue 002, dated December 9, 2015. Before further flight after doing the replacement, do a potable water system leak test and repair any leaks found before further flight, in accordance with the

**(h) Seal Floor Panels and Seat Tracks/Install Drip Shields and Reroute Wiring**

Within 60 months after the effective date of this AD: Do the actions specified in paragraphs (h)(1) and (h)(2) of this AD.

(1) Apply sealant to the main cabin floor areas located above the aft EE bay, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin B787-81205-SB530029-00, Issue 002, dated January 26, 2016.

(2) Install drip shields and foam blocks, and reroute the wire bundles above the equipment in the aft EE bay, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 002, dated March 16, 2016, except as specified in paragraph (i) of this AD.

**(i) Exception to Certain Service Information**

Where Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 002, dated March 16, 2016, specifies "Group 6, Configuration 1" airplanes in reference to Task 29, the correct airplane group identification is "Group 7, Configuration 1" airplanes.

**(j) Credit for Previous Actions**

This paragraph provides credit for the corresponding actions specified in paragraphs (g) and (h) of this AD, if those actions were performed before the effective date of this AD using the applicable service information specified in paragraphs (j)(1), (j)(2), and (j)(3) of this AD. This service information is not incorporated by reference in this AD.

(1) Boeing Alert Service Bulletin B787-81205-SB380009-00, Issue 001, dated March 26, 2015.

(2) Boeing Alert Service Bulletin B787-81205-SB530029-00, Issue 001, dated March 26, 2015.

(3) Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 001, dated March 26, 2015.

**(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)(1) 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) An AMOC that provides an acceptable level of safety may be used for any repair, alteration, or modification required by this AD if it is approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO to make those findings. For a repair method to be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(4) For service information that contains steps that are labeled as Required for Compliance (RC), the provisions of paragraphs (k)(4)(i) and (k)(4)(ii) apply.



(i) The steps labeled as RC, including substeps under an RC step and any figures identified in an RC step, must be done to comply with the AD. An AMOC is required for any deviations to RC steps, including substeps and identified figures.

(ii) Steps not labeled as RC may be deviated from using accepted methods in accordance with the operator's maintenance or inspection program without obtaining approval of an AMOC, provided the RC steps, including substeps and identified figures, can still be done as specified, and the airplane can be put back in an airworthy condition.

#### **(l) Related Information**

(1) For more information about this AD, contact Susan L. Monroe, Aerospace Engineer, Cabin Safety and Environmental Systems Branch, ANM-150S, FAA, Seattle Aircraft Certification Office (ACO), 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6457; fax: 425-917-6590; email: susan.l.monroe@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-SB380009-00, Issue 002, dated December 9, 2015.

(ii) Boeing Alert Service Bulletin B787-81205-SB530029-00, Issue 002, dated January 26, 2016.

(iii) Boeing Alert Service Bulletin B787-81205-SB530031-00, Issue 002, dated March 16, 2016.

(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 June 23, 2016.

Dorr M. Anderson,  
Acting Manager, Transport Airplane Directorate,  
Aircraft Certification Service.