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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2017-0246; Product Identifier 2017-NM-011-AD; Amendment 39-19522; AD 2018-25-11]**

**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 777-200 and -300 series airplanes equipped with Rolls-Royce Model RB211-Trent 800 engines. This AD was prompted by reports of inadequate clearance between the thermal protection system (TPS) insulation blankets and the electronic engine control (EEC) wiring, which resulted in damaged wires. This AD requires repetitive inspections of the EEC wire bundles and clips, and corrective actions if necessary. We are issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective January 18, 2019.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of January 18, 2019.

**ADDRESSES:** For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; internet <https://www.myboeingfleet.com>. You may view this service information at the FAA, Transport Standards Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195. It is also available on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-0246.

#### **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-2017-0246; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the

regulatory evaluation, any comments received, and other information. The address for Docket Operations (phone: 800-647-5527) is Docket Operations, 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:** Kevin Nguyen, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3555; email: kevin.nguyen@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 777-200 and -300 series airplanes equipped with Rolls-Royce Model RB211-Trent 800 engines. The NPRM published in the Federal Register on April 10, 2017 (82 FR 17154). The NPRM was prompted by reports of inadequate clearance between the TPS insulation blankets and the EEC wiring, which resulted in damaged wires. The NPRM proposed to require repetitive inspections of the EEC wire bundles and clips, and corrective actions if necessary.

We are issuing this AD to address damaged wires, which could result in in-flight shutdown of the engine, or the inability to properly control thrust, and consequent reduced controllability of the airplane.

**Comments**

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

**Support for the Proposed Rule**

The Air Line Pilots Association, International (ALPA), Boeing, and Rolls-Royce all supported the NPRM.

**Request To Include Additional Service Information**

Air New Zealand (ANZ) suggested that paragraph (g) of the proposed AD could be complied with using either Boeing Special Attention Service Bulletin 777-78-0071; or Boeing Service Bulletin 777-78-0082; because certain configurations of thrust reversers (T/Rs) are not covered by Boeing Service Bulletin 777-78-0082, but are covered by Boeing Special Attention Service Bulletin 777-78-0071. ANZ noted that paragraph (h) of the proposed AD provided credit for previous actions if the previous inspections were performed in accordance with either Boeing Special Attention Service Bulletin 777-78-0071; or Boeing Service Bulletin 777-78-0082.

American Airlines (AAL) explained that Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015, is not effective to its fleet configuration and requested that paragraph (g) of the proposed AD be revised to include Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, as an additional method of compliance for those airplanes that are identified in Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, but not affected by Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015. AAL also provided the definitions for a general visual inspection and detailed inspection from Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, to support its justification that a general visual inspection would identify damage to components within the inspection area

identified in the service information and therefore offers an equivalent level of safety to that of a detailed inspection.

Delta Air Lines (DAL) explained that Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015, is not applicable to all the T/Rs affected by the proposed AD, and suggested that paragraph (g) of the proposed AD follow the same structure as AD 2016-11-16, Amendment 39-18543 (81 FR 39547, June 17, 2016) (“AD 2016-11-16”), which allows for the use of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, in paragraph (k)(1) of AD 2016-11-16 or Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015, in paragraph (k)(2) of AD 2016-11-16, according to airplane effectivity. DAL observed that the referenced service information was acknowledged in AD 2016-11-16 to provide the same acceptable level of safety, and DAL would prefer that either service bulletin be allowed as an acceptable method of compliance for the inspections required by paragraph (g) of this AD.

We do not agree with the commenter's request to include additional service information as an additional method of compliance for the inspections required by paragraph (g) of this AD. Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013; and Boeing Service Bulletin 777-78-0082, dated November 9, 2011; do not provide inspection requirements for engine configurations that have incorporated Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014. Only Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015, contains detailed inspection requirements and instructions that are applicable to engine configurations that either have or have not incorporated Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014. As a result, the EEC wire bundle inspections specified by Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015, are applicable to the ANZ, AAL, and DAL fleet configurations that are identified in Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013.

Consistent with the requirements of paragraph (k) of AD 2016-11-16, we determined that a general visual inspection as specified in Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013; and Boeing Service Bulletin 777-78-0082, dated November 9, 2011; accomplished prior to the effective date of this AD is acceptable when looking for damage of the EEC wire bundle and clips. On or after the effective date of this AD, a detailed inspection is required as specified in Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015. We have not changed the AD in this regard.

### **Request To Clarify Paragraph (c) Applicability of the Proposed AD**

DAL found the “and/or” construction of paragraphs (c)(1) and (c)(2) of the proposed AD confusing, and requested clarification regarding the applicability of airplanes that meet one of the two conditions or both conditions specified in paragraphs (c)(1) and (c)(2) of the proposed AD.

We agree with DAL's request to clarify the applicability of this AD. We have revised paragraph (c) of this AD to include airplanes that have incorporated Boeing Alert Service Bulletin 777-78A0094, dated July 29, 2014, and the condition specified in paragraph (c)(1) or (c)(2) of this AD is met on any engine, or both conditions specified in (c)(1) and (c)(2) of this AD are met on any engine.

### **Request To Clarify the Intent of the Proposed AD**

DAL requested that we clarify that the intent of the proposed AD is to maintain the EEC wire bundles inspections described in paragraph (k) of AD 2016-11-16 until all three of the following terminating actions have been completed: (1) Incorporating Boeing Alert Service Bulletin 777-78A0094, dated July 29, 2014; (2) incorporating Work Package 7 of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013; or Part 8 or Part 9 of Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015; as applicable; and (3) incorporating Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014.

We agree to clarify that the intent of this AD is to maintain the EEC wire bundles repetitive inspections described in paragraph (k) of AD 2016-11-16 for certain airplanes. The repetitive

inspections required by paragraph (g) of this AD are no longer required after re-contoured insulation blankets part numbers (P/N) 315W5115-60, -62, and -64 are installed on the right T/R half by accomplishing either Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013; or Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015; and the EEC wire bundle and clip are re-routed on the engine by accomplishing Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014. No change to this AD is needed in this regard.

### **Request To Revise Paragraph (c) Applicability of the Proposed AD**

AAL requested that paragraph (c) of the proposed AD be revised to exclude airplanes with the following configuration combinations from the applicability of paragraph (g) of the proposed AD:

- Engines with or without incorporation of Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014; T/R halves that incorporated Boeing Alert Service Bulletin 777-78A0094, dated July 29, 2014; installed re-contoured insulation blankets (P/N 315W5115-60, -62, and -64 for the right half and P/N 315W5115-63, -59, and -61 for the left half) by incorporating Work Package 7 of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013; and accomplishment of EEC wire bundle and clip inspection using Work Package 6 of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, when that T/R was installed.
- Engines with incorporation of Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014, regardless of T/R half insulation blanket standards (re-contoured or non-re-contoured insulation blankets).

AAL provided the following justifications for their request. We have included our response to those justifications.

AAL explained that insulation blanket P/N 315W5115-60, -62, and -64 are optional re-contoured insulation blankets introduced by Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, to replace original P/N 315W5115-2, -6, or -20 non-re-contoured insulation blankets that caused the initial potential EEC wire bundle and clip fretting condition. AAL noted that the optional re-contoured insulation blankets were designed with the addition of rulon fretting protection on the insulation blanket face sheet to prevent potential EEC wire bundle and clip fretting at the inspection area of paragraph (g) of the proposed AD. AAL stated that the installation of the re-contoured insulation blankets therefore provides an equivalent level of safety to the repetitive EEC wire bundle and clip inspections.

AAL reasoned that Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014, changes the EEC wire bundle routing to provide additional clearance with the T/R non-re-contoured insulation blankets to eliminate the potential fretting in the area of inspection as specified in paragraph (g) of the proposed AD and provides an equivalent level of safety to the repetitive EEC wire bundle and clip inspections. AAL added that any existing harness damage will be or has been addressed during incorporation of this service bulletin during an engine shop visit.

We agree to clarify. We have determined that after accomplishing the work instructions in Boeing Alert Service Bulletin 777-78A0094, dated July 29, 2014, there is still not sufficient clearance between the insulation blankets and EEC wire bundle W0800 and its associated clip. The EEC wire bundle and clip could still be damaged from making contact with insulation blankets when one or both of the following conditions exist:

- The EEC wire and clip are not re-routed on the engine (did not incorporate Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014); or
- Non-re-contoured insulation blankets (P/N 315W5115-2, -6, and -20) are installed on the right T/R half.

We have determined that in order to have proper clearance between the insulation blankets and the EEC wiring, and to prevent damage, Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014, must be incorporated to re-route the EEC wire bundle and clip on the engine; and re-

contoured insulation blankets P/N 315W5115-60, -62, and -64 must be installed on the right T/R half by accomplishing either Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013; or Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015.

AAL pointed out that the insulation blankets have repetitive airworthiness limitation inspection requirements as specified by Boeing Maintenance Planning Document (MPD) D622W001-9, Section 9, Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), Airworthiness Limitation Item (ALI) 78-AWL-01 that maintain the blanket rulon material condition. AAL noted that T/Rs that incorporate Work Package 7 of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, for installing re-contoured insulation blankets no longer have a T/R configuration specified by Boeing Special Attention Service Bulletin 777-78-0071, dated November 25, 2009; or Boeing Special Attention Service Bulletin 777-78-0071, Revision 1, dated September 8, 2010; and are not applicable to the EEC wire bundle and clip inspection as specified in Work Package 6 of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013.

AAL also noted that Rolls-Royce Model RB211-Trent 800 engine EEC wire runs already receive repetitive zonal general visual inspections as specified by Boeing MPD D622W001, Section 3, Zonal Inspection Program, item 71-864-01 and item 71-878-02, and receive repetitive detailed inspections as specified by Boeing MPD D622W001, Section 1, System Maintenance Program, item 20-540-01 and item 20-540-02, as part of a Lightning/High Intensity Radiated Fields maintenance program. AAL stated that these inspections are regulated by the 14 CFR 121.1111 required electrical wiring interconnection systems (EWIS) maintenance program requirements.

In regards to AAL's reference to Boeing MPD D622W001-9, Section 9, AWLs and CMRs, ALI 78-AWL-01, we note that Boeing MPD D622W001-9, Section 9, AWLs and CMRs, ALI 78-AWL-01 has requirements to inspect the insulation blankets for damage, but it does not directly inspect the EEC wire bundle and clip for damage. The intent of this AD is to specifically inspect the EEC wire bundle and clip for damage. We agree with AAL's justification that T/Rs with re-contoured insulation blankets installed no longer have a T/R configuration as specified by Boeing Special Attention Service Bulletin 777-78-0071, November 25, 2009; or Boeing Special Attention Service Bulletin 777-78-0071, Revision 1, dated September 8, 2010. Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, does not have clear information and instructions to do a detailed EEC inspection for T/R halves with re-contoured blankets. However, as explained by Boeing and Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015, instructions, and reinforced by the requirements in this AD, EEC wire bundles and clips are to be inspected when one or both of the previously described conditions exists where the EEC wire bundle and clip could still be damaged from making contact with insulation blankets. We note that this AD mandates the use of Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015, to do the EEC wire bundle and clip detailed inspections, which is applicable to airplanes in a configuration specified in Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013.

We infer that AAL is suggesting that the existing inspections in Boeing MPD D622W001, Section 3, Zonal Inspection Program, item 71-864-01 and item 71-878-02, and detailed inspections in Boeing MPD D622W001, Section 1, System Maintenance Program, item 20-540-01 and item 20-540-02 provide an equivalent level of safety to the repetitive wire bundle and clip inspections. We disagree with that suggestion. We note that part of the EWIS maintenance program requirement for operators is to maintain continued airworthiness of the electrical wiring interconnection systems on the airplane, including the engine. The EWIS maintenance program requirement is based on the assumption that the type design is compliant and is not expected to create wiring problems if the original configuration is maintained. This AD was proposed because the existing design was found to have details that are expected to lead to a wiring chafing problem on at least some airplanes. Therefore, we determined that more frequent and detailed inspections are necessary to address this unsafe condition. The inspections in Boeing MPD D622W001, Section 3, Zonal Inspection Program, item 71-864-01 and item 71-878-02; and Boeing MPD D622W001, Section 1, System Maintenance Program, item 20-540-01 and item 20-540-02; are not sufficient to address the identified unsafe

condition of this AD. The repetitive inspection intervals for Boeing MPD D622W001, Section 1, System Maintenance Program, item 20-540-01 and item 20-540-02; and Boeing MPD D622W001, Section 3, Zonal Inspection Program, item 71-864-01 and item 71-878-02; are longer than the 2,000 flight-hour repetitive inspection interval specified in paragraph (g) of this AD, and they can be escalated to a longer interval without FAA ACO Branch approval. In accordance with 14 CFR part 39 (§ 39.5 and § 39.13), this AD is issued to address the unsafe condition identified in paragraph (e) of this AD.

Therefore, we do not agree to revise paragraph (c) of this AD as proposed by the commenter. We did not change the AD in this regard.

### **Request To Include Terminating Action**

DAL requested that we include terminating action for airplanes that accomplish the modification in paragraphs (c)(1) and (c)(2) of the proposed AD. DAL explained that paragraph (c) of the proposed AD states that if airplanes with Rolls-Royce engines, which have accomplished the action in Boeing Alert Service Bulletin 777-78A0094, dated July 29, 2014, have neither the condition in paragraph (c)(1) of the proposed AD nor the condition in paragraph (c)(2) of the proposed AD, that the rule is not applicable. DAL noted that there is no terminating action paragraph in the proposed AD.

We agree to clarify the requirements of this AD. As discussed in the above comments: For any affected airplane on which the modification specified in paragraph (c)(2) of this AD, and the replacement of all affected parts (non-re-contoured insulation blankets) identified in paragraph (c)(1) of this AD with non-affected parts (re-contoured insulation blankets) have been accomplished on both engines, that airplane is no longer affected by this AD. For clarity, we have added paragraph (i) to this AD to specify terminating actions for the repetitive inspections required by paragraph (g) of this AD and redesignated subsequent paragraphs accordingly.

### **Request To Extend the Compliance Time**

AAL requested that for engines that have not incorporated Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014, the inspection required by paragraph (g) of this AD be required within 2,000 flight hours, rather than 500 flight hours, after the effective date of the AD, if re-contoured insulation blankets (P/N 315W5115-60, -62, -64) were installed on the T/R by Work Package 7 of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, and, during installation of the insulation blanket on the T/R halves, the EEC wire bundle inspection was accomplished on the engine in accordance with Work Package 6 of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013.

We do not agree with the commenter's request because we have determined that both the EEC wiring modification specified in Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014, and installation of the re-contoured insulation blankets specified in Work Package 7 of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013, are necessary to prevent the chafing condition that is the subject of this AD. In the absence of both of those modifications, we have determined that a 2,000 flight hour inspection interval is necessary. The 500 flight hours is meant to be a grace period for those airplanes on which the interval has lapsed (due to inspections being terminated in AD 2016-11-16), as well as airplanes that are nearing the end of the inspection interval. AAL did not provide adequate justification for a longer grace period. We did not change this AD in this regard.

## **Request To Clarify the Requirements of Paragraph (g) of the Proposed AD for a Certain Repaired Wire Condition**

For engines which require inspections as specified in paragraph (g) of this AD, AAL requested clarification that the inspection of the wire bundle can be accomplished without removal of any harness polytetrafluoroethylene (PTFE) tape protection applied to the wire bundle, provided that the PTFE tape protection is not damaged, and provided the wire bundle had received an inspection and was repaired if damaged prior to application of the protective tape wrap. AAL explained that it had already identified the potential wire bundle interference condition through its continuous airworthiness maintenance program (CAMP) prior to release of Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013. As a result, AAL accomplished a fleet-wide general visual inspection of the EEC wire bundle W0800 for damage in the inspection area, accomplished any required repairs, and then wrapped the W0800 harness with PTFE tape in accordance with the approved procedures in its CAMP.

We do not agree with the commenter's request because we do not have sufficient information in the AAL request to clarify nor expand paragraph (g) of this AD for wire bundles that have been modified by AAL's CAMP. We do not consider it appropriate to include various provisions in an AD applicable only to individual airplane configurations or to a single operator's unique use of an affected airplane. However, AAL and others may request an alternative method of compliance (AMOC) in accordance with the procedures specified in paragraph (j) of this AD, provided sufficient data are submitted to substantiate that the AMOC would provide an acceptable level of safety. We did not change this AD in this regard.

## **Request To Clarify Requirements of Paragraph (g) of the Proposed AD for Engine Inspection in the Shop**

AAL requested clarification to paragraph (g) of the proposed AD to confirm that after the effective date of this AD, installation of an engine that had a shop visit meets the requirements of an inspection, and in that case, that the next inspection is required within 2,000 hours of engine installation.

We agree to clarify paragraph (g) of this AD. If, during a shop visit, an EEC wire bundle and clamp inspection was done as specified in Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013; or Boeing Service Bulletin 777-78-0082, dated November 9, 2011; or Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015; then the next inspection can be done within 2,000 flight hours from the last inspection done in the shop. However, if an inspection other than the one specified in Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013; or Boeing Service Bulletin 777-78-0082, dated November 9, 2011; or Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015; was done, operators must request an AMOC in accordance with the procedures specified in paragraph (j) of this AD. No change to this AD is needed.

## **Request To Modify Relationship to Affected ADs**

DAL requested that AD 2005-07-24, Amendment 39-14049 (70 FR 18285, April 11, 2005) (“AD 2005-07-24”) and AD 2016-11-16 be added to paragraph (b) of the proposed AD. DAL also requested that the proposed AD be incorporated as a revision to AD 2016-11-16 or a supersedure to AD 2016-11-16 in order to provide a clear relationship between the actions required. DAL observed that paragraph (b) of the proposed AD states that no ADs are affected by this rule, but paragraph (l) of AD 2016-11-16 states that accomplishment of Boeing Alert Service Bulletin 777-78A0094, dated July 29, 2014, will terminate paragraph (k) of AD 2016-11-16. DAL also submitted that paragraph (k) of AD 2016-11-16 pertains to the EEC wire bundle inspections that are described in the “Discussion” section of the proposed rule. DAL stated that paragraph (q) of AD 2016-11-16

describes accomplishments that are terminating actions to AD 2005-07-24, which include the EEC wire bundle inspections as described in paragraph (k) of AD 2016-11-16. DAL contended that the proposed rule reinstates these inspections and therefore affects the requirements of AD 2005-07-24 as described in paragraph (q) of AD 2016-11-16.

We do not agree with the commenter's request because this AD is a stand-alone AD and does not impact nor change the requirements of AD 2005-07-24 or AD 2016-11-16. The T/R inner wall and TPS configuration, and certain engine configurations affected by the actions in this AD are not configurations affected by AD 2005-07-24 or AD 2016-11-16. This AD is only applicable to airplanes with certain T/R halves on which the actions in Boeing Alert Service Bulletin 777-78A0094, dated July 29, 2014, have been accomplished, and the condition specified in paragraph (c)(1) or (c)(2) of this AD is met on any engine, or both conditions specified in (c)(1) and (c)(2) of this AD are met on any engine. This AD is not applicable to airplanes with T/R halves of certain inner wall and TPS configurations specified in AD 2005-07-24 and AD 2016-11-16 on which the actions specified in Boeing Alert Service Bulletin 777-78A0094, dated July 29, 2014, have not been accomplished. Therefore, this AD has no direct relationship to and does not change the requirements of AD 2005-07-24 or AD 2016-11-16.

After accomplishing paragraph (l) of AD 2016-11-16 to install serviceable thrust reverser halves (by accomplishing Boeing Alert Service Bulletin 777-78A0094, dated July 29, 2014), and paragraph (n) of AD 2016-11-16 to revise the maintenance or inspection program, the repetitive inspection requirements of AD 2016-11-16 are terminated. However, Boeing and the FAA have determined that inadequate clearance between the TPS non-re-contoured insulation blankets and the EEC wiring still exists after completing the actions required by AD 2016-11-16, which will result in damaged wires, and an unsafe condition still exists.

We have determined not to revise or supersede AD 2016-11-16 because of the high rate of inner wall failures and the urgency of the safety issue. We have also determined that the required actions must be accomplished to ensure continued safety. Revising this AD as requested would necessitate (under the provisions of the Administrative Procedure Act) reissuing the notice, reopening the period for public comment, considering additional comments subsequently received, and eventually issuing a final rule. In light of this, and in consideration of the unsafe condition, we have determined that further delay of this AD is not appropriate. 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 final rule with the change 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 addressing 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 final rule.

## **Related Service Information Under 1 CFR Part 51**

We reviewed Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015. The service information describes, among other things, procedures for repetitive inspections of the EEC wire bundles and clips, and corrective actions if necessary.

We also reviewed Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013. This service information describes, among other things, procedures for installing re-contoured insulation blankets on the right T/R halves and performing an EEC wire bundle and clip inspection.



We also reviewed Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014. This service information describes procedures for modifying the engine by rerouting the EEC wire bundle and clip.

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 55 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
Inspection	Up to 6 work-hours × \$85 per hour = \$510 per inspection cycle	\$0	Up to \$510 per inspection cycle	Up to \$28,050 per inspection cycle.

We have received no definitive data that would enable us to provide cost estimates for the repairs specified in this AD. We estimate the following costs to do any necessary replacements that would be required based on the results of the inspection. We have no way of determining the number of aircraft that might need these repairs or replacements:

#### On-Condition Costs

Action	Labor cost	Parts cost	Cost per product
Replacement of EEC wire harness	1 work-hour × \$85 per hour = \$85	\$8,500	\$8,585

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.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to transport category airplanes and associated appliances to the Director of the System Oversight Division.

## **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):



**2018-25-11 The Boeing Company:** Amendment 39-19522; Docket No. FAA-2017-0246; Product Identifier 2017-NM-011-AD.

**(a) Effective Date**

This AD is effective January 18, 2019.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to The Boeing Company Model 777-200 and -300 series airplanes, certificated in any category, equipped with Rolls-Royce Model RB211-Trent 800 engines, on which the actions specified in Boeing Alert Service Bulletin 777-78A0094 have been incorporated, and the condition specified in paragraph (c)(1) or (c)(2) of this AD is met on any engine, or both conditions specified in (c)(1) and (c)(2) of this AD are met on any engine.

(1) Thermal protection system (TPS) non-re-contoured insulation blankets having part numbers (P/N) 315W5115-2, -6, or -20 are installed on the thrust reverser (T/R) inner wall.

(2) Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014, has not been incorporated on the engine.

**(d) Subject**

Air Transport Association (ATA) of America Code 78, Engine exhaust.

**(e) Unsafe Condition**

This AD was prompted by reports of inadequate clearance between the TPS insulation blankets and the electronic engine control (EEC) wiring, which resulted in damaged wires. We are issuing this AD to address damaged wires, which could result in in-flight shutdown of the engine, or the inability to properly control thrust, and consequent reduced controllability of the airplane.

**(f) Compliance**

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

**(g) Repetitive EEC Wire Bundle Inspection**

Within 2,000 flight hours since the most recent EEC wire bundle inspection done as specified in Boeing Special Attention Service Bulletin 777-78-0071; or Boeing Service Bulletin 777-78-0082; or within 500 flight hours after the effective date of this AD, whichever occurs later: Do a detailed inspection for damage of the EEC wire bundles and clips, and do all applicable corrective actions, in accordance with the Accomplishment Instructions of Boeing Service Bulletin 777-78-0082, Revision

1, dated June 15, 2015. Do all applicable corrective actions before further flight. Repeat the inspection thereafter at intervals not to exceed 2,000 flight hours.

**(h) Credit for Previous Actions**

This paragraph provides credit for the actions specified in paragraph (g) of this AD, if those actions were performed before the effective date of this AD using the service information specified in paragraph (h)(1) or (h)(2) of this AD.

- (1) Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013.
- (2) Boeing Service Bulletin 777-78-0082, dated November 9, 2011.

**(i) Optional Terminating Action**

Accomplishing the actions in paragraph (i)(1) and (i)(2) of this AD terminates the repetitive inspections required by paragraph (g) of this AD for the modified engine installation only.

(1) Installing re-contoured insulation blankets P/N 315W5115-60, -62, and -64 on the right T/R halves in accordance with the Accomplishment Instructions of either Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013; or Boeing Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015.

(2) Modifying an engine in accordance with the Accomplishment Instructions of Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014.

**(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in paragraph (k)(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, modification, or alteration 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 Branch, FAA, to make those findings. 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.

**(k) Related Information**

(1) For more information about this AD, contact Kevin Nguyen, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3555; email: kevin.nguyen@faa.gov.

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

**(l) 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 Service Bulletin 777-78-0082, Revision 1, dated June 15, 2015.

(ii) Boeing Special Attention Service Bulletin 777-78-0071, Revision 2, dated July 23, 2013.

(iii) Rolls-Royce Service Bulletin RR.211-71-H824, dated July 30, 2014.

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; internet <https://www.myboeingfleet.com>.

(4) You may view this service information at the FAA, Transport Standards Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

(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 Des Moines, Washington, on November 29, 2018.

James Cashdollar,  
Acting Director, System Oversight Division,  
Aircraft Certification Service.