[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2012-0413; Directorate Identifier 2011-NM-257-AD; Amendment 39-17441; AD 2013-08-23]**

**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 all The Boeing Company Model DC-10-10, DC-10-10F, DC-10-15, DC-10-30, DC-10-30F (KC-10A and KDC-10), DC-10-40, DC-10-40F, MD-10-10F, MD-10-30F, MD-11, and MD-11F airplanes. This AD was prompted by fuel system reviews conducted by the manufacturer. This AD requires adding design features to detect electrical faults and to detect a pump running in an empty fuel tank. We are issuing this AD to reduce the potential of ignition sources inside fuel tanks, which, in combination with flammable fuel vapors, could result in fuel tank explosions and consequent loss of the airplane.

**DATES:** This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**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:** Serj Harutunian, Aerospace Engineer, Propulsion Branch, ANM-140L, FAA, Los Angeles Aircraft Certification Office (ACO), 3960 Paramount Boulevard, Lakewood, California 90712-4137; phone: 562-627-5254; fax: 562-627-5210; email: serj.harutunian@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 April 18, 2012 (77 FR 23166). That NPRM proposed to require adding design features to detect electrical faults, to detect a pump running in an empty fuel tank, and to ensure that a fuel pump's operation is not affected by certain conditions.

**Comments**

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the proposal (77 FR 23166, April 18, 2012) and the FAA's response to each comment.

**Support for NPRM (77 FR 23166, April 18, 2012)**

Airline Pilots Association International (ALPA) supports the language and intent of the NPRM (77 FR 23166, April 18, 2012), and agreed that the proposed actions will enhance safety.

**Request to Delay AD Pending Release of Service Information**

Two commenters requested that we delay issuing the AD until Boeing has released service information. (Specific modifications and solutions were not included in the NPRM (77 FR 23166, April 18, 2012).)

Noting that Boeing had planned to issue several service bulletins to prevent the identified unsafe condition, FedEx requested that we delay issuing the AD until Boeing has released relevant service information. FedEx recommended that we coordinate with Boeing on recommendations to address the unsafe condition.

UPS requested that we extend the comment period until a minimum of 45 days after publication of all associated service bulletins to provide operators sufficient information to make the design changes.

We do not agree to delay issuance of this AD. We have identified a potential unsafe condition that needs to be corrected; however, Boeing has not finalized service information to address that condition. In light of the unsafe condition, we have determined that we cannot delay issuance of this AD, and must proceed without service information. We find that the 60-month time frame specified in paragraph (g) of this AD will provide adequate time for issuance and implementation of service information. We have not changed this final rule regarding this issue.

**Request to Revise Applicability**

FedEx and Boeing requested that we revise the applicability to specifically exclude airplanes on which the auxiliary fuel tanks have been removed. FedEx reported that it has modified several MD-11s and MD-10s by removing the forward auxiliary tanks or center auxiliary tanks, as well as the fuel pumps and related hardware.

We agree that removal of the auxiliary fuel tank eliminates the identified unsafe condition. We have changed paragraph (g) in this final rule to exclude airplanes when Boeing-installed auxiliary fuel tanks are removed.

**Request to Clarify Intent of Proposed Actions**

FedEx stated that certain language in the NPRM (77 FR 23166, April 18, 2012) may be too broad. By way of example, FedEx cited the requirement to add design

features “to detect electrical faults.” Inferring that this required detecting all electrical faults, FedEx asserted that, even if a device could detect all electrical faults, the cost of its installation would be prohibitive. FedEx recommended limiting the requirement to specify detecting “certain” electrical faults.

We disagree that it is necessary to change the AD. The NPRM (77 FR 23166, April 18, 2012) intentionally described certain failure conditions in broad terms. The intent was to provide operators unrestricted options to define design changes based on individual safety assessments. Certain electrical faults may be single failures or a combination of failures such as phase-to-phase shorts, phase-to-ground shorts, and over-voltage or over-current electrical failure conditions.

**Request to Revise Cost Estimate**

FedEx questioned how the FAA determined the estimated cost of the modification, since the NPRM (77 FR 23166, April 18, 2012) provided no information about specific proposed modifications or required parts. FedEx suggested that the estimated cost would be different for each fleet type. UPS questioned the accuracy of the cost estimates in the NPRM, given the lack of technical data.

Based on current efforts developing service information, Boeing estimated that modification labor costs could vary from 111 to 280 hours depending on the number of pumps on an airplane. Boeing also reported that the AD affects about 341 U.S.-registered airplanes (not 180 airplanes, as stated in the NPRM (77 FR 23166, April 18, 2012)). Boeing requested that we revise the costs of compliance accordingly.

The estimated costs in the NPRM (77 FR 23166, April 18, 2012) were based on recent design change solutions installed on similar center wing tanks on transport category airplanes. We have revised the cost estimate in this final rule to reflect Boeing’s updated figures, including increased work hours (152 hours) and parts costs ($137,500), based on an average of 10 pumps per airplane. No single cost figure will be accurate for

all operators, however, since labor and parts costs will vary depending on the type of certified design change solutions provided by the operators.

**Request for Terminating Action**

UPS stated that overall safety would be better met if protective devices (fault current detectors) were installed for all 17 pumps on its Model MD-11 airplanes – regardless of tank location. UPS requested that we revise the NPRM (77 FR 23166, April 18, 2012) to specify that installing fault current detectors terminates the 18-month repetitive inspection requirement on the "epocast" fuel pump connector, part number (P/N) 60-84351, as mandated by AD 2002-13-10, Amendment 39-12798 (67 FR 45053, July 8, 2002), or AD 2011-11-05, Amendment 39-16704 (76 FR 31462, June 1, 2011). (Those ADs address the same unsafe condition identified in this AD, on the same affected airplanes.)

We agree that compliance with the requirements of this AD is considered terminating action for the two referenced ADs. Physical inspection of all pumps every 18 months would be labor intensive and time consuming. Further, Boeing has not provided service information to otherwise preclude use of any other pumps during flight. We have changed paragraph (g)(1) in this final rule to require protective devices on electrically powered alternate current (AC) fuel pumps installed in fuel tanks that normally empty during flight. (This proposed requirement in the NPRM (77 FR 23166, April 18, 2012) extended to any electrically powered fuel pump in those tanks.) We have added new paragraph (h) in this final rule to terminate the 18-month repetitive inspections for all pumps, regardless whether they are installed in a tank that normally empties, affected by AD 2002-13-10, Amendment 39-12798 (67 FR 45053, July 8, 2002), or AD 2011-11-05, Amendment 39-16704 (76 FR 31462, June 1, 2011), after accomplishment of paragraph (g)(1) of this AD.

**Request to Expand or Remove Automatic Shutoff Limits**

Paragraph (g)(2) of the NPRM (77 FR 23166, April 18, 2012) would require additional design features that will automatically shut off a dry-running pump in an empty tank within 60 seconds if the flight crew does not shut it off. FedEx and UPS stated that their Model MD-11 and MD-10 airplanes already have design features installed by the original equipment manufacturer (OEM) that shut off the affected pumps automatically, but will not meet the prescribed 60-second time limit. The commenters asserted that a system design change is not necessary.

We agree. Model MD-11 and MD-10 airplanes with two-person flight crews already have OEM-installed equipment designed to shut off the fuel pumps automatically. We agree that the automatic shut-off time for two-person flight-crew airplanes, which have design features that were originally installed by the airplane manufacturer, may exceed 60 seconds. But for airplanes with three-person flight crews, such as Model DC-10 airplanes that do not have OEM-installed equipment, any fuel pump running in an empty tank must be manually shut off by a flight crew within 60 seconds. In either case, regardless of the number of flight crew, all airplanes must be in compliance with the requirements of paragraph (g)(4) of this AD.

**Request to Require Airworthiness Limitations**

Boeing commented that the proposed rule does not mandate any airworthiness limitations instructions (ALIs) or critical design configuration control limitations (CDCCLs) regarding repetitive inspections or functional checks applicable to the proposed changes. Boeing recommended that we add a requirement to "incorporate and comply with any related Airworthiness Limitations."

We agree to provide clarification. Paragraph (g) in this final rule requires that the design changes be compliant with 14 CFR Section 25.981(a) and (b) at amendment level 25-125. These design changes including any associated ALIs or CDCCLs must be approved by the Manager of the Los Angeles Aircraft Certification Office.

**Additional Changes to NPRM (77 FR 23166, April 18, 2012)**

In response to requests by Boeing, we have revised paragraphs (g)(2) and (g)(3) in this final rule to clarify the requirements associated with the airplane flight manual supplement (AFMS), and we have revised paragraph (g)(4) in this final rule to clarify that the requirement is limited to airplanes with tanks that normally empty during flight.

We have revised the description of the required actions in the preamble of this final rule to remove the requirement to "ensure that a fuel pump's operation is not affected by certain conditions," because those requirements will be incorporated by compliance to 14 CFR Section 25.981(a) and (b) at amendment level 25-125. We disagree with the request to define certain conditions because the AD must allow for a broader interpretation for all airplanes affected by this AD. We have not changed 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. 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 341 airplanes of U.S. registry. We estimate the following costs to comply with this AD, based on the costs of similar supplemental type certificate (STC) installations, and considering an average of 10 pumps per airplane:

**Estimated costs**

| Action | Labor cost | Parts cost | Cost per product | Cost on U.S. operators |
|---|---|---|---|---|
| Installing design features | 152 work-hours X $85 per hour = $12,920 | $137,500 | $150,420 | $51,293,220 |

**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):

2013-08-23 **The Boeing Company**: Amendment 39-17441; Docket No. FAA-2012-0413; Directorate Identifier 2011-NM-257-AD.

**(a) Effective Date**

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

Accomplishment of the requirements of this AD terminates certain requirements of AD 2002-13-10, Amendment 39-12798 (67 FR 45053, July 8, 2002), and AD 2011-11-05, Amendment 39-16704 (76 FR 31462, June 1, 2011).

**(c) Applicability**

This AD applies to all The Boeing Company Model DC-10-10, DC-10-10F, DC-10-15, DC-10-30, DC-10-30F (KC-10A and KDC-10), DC-10-40, DC-10-40F, MD-10-10F, MD-10-30F, MD-11, and MD-11F airplanes; certificated in any category.

**(d) Subject**

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 28, Fuel.

**(e) Unsafe Condition**

This AD was prompted by fuel system reviews conducted by the manufacturer. We are issuing this AD to reduce the potential of ignition sources inside fuel tanks, which, in combination with flammable fuel vapors, could result in fuel tank explosions and consequent loss of the airplane.

**(f) Compliance**

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

**(g) Criteria for Operation**

As of 60 months after the effective date of this AD, no person may operate any airplane affected by this AD unless an amended type certificate or supplemental type certificate that incorporates the design features and requirements described in paragraphs (g)(1) through (g)(4) of this AD has been approved by the Manager, Los Angeles Aircraft Certification Office (ACO), FAA, and those design features are installed on the airplane to meet the criteria specified in 14 CFR Section 25.981(a) and (d), at amendment level 25-125. For airplanes on which Boeing-installed auxiliary fuel tanks are removed, the actions specified in this AD are not required.

(1) For all airplanes: Each electrically powered alternate current (AC) fuel pump installed in any fuel tank that normally empties during flight – such as center wing tanks, auxiliary fuel tanks installed by the airplane manufacturer, and tail tanks – must have a protective device installed to detect electrical faults that can cause arcing and burn through of the fuel pump housing and pump electrical connector. The same device must shut off the pump by automatically removing electrical power from the pump when such faults are detected. When a fuel pump is shut off resulting from detection of an electrical fault, the device must stay latched off, until the fault is cleared through maintenance action and the pump is verified safe for operation.

(2) For airplanes with a 2-person flight crew: Additional design features, if not originally installed by the airplane manufacturer, must be installed to meet 3 criteria: to

detect a running fuel pump in a tank that is normally emptied during flight, to provide an indication to the flight crew that the tank is empty, and to automatically shut off that fuel pump. The prospective pump indication and shutoff system must automatically shut off each pump in case the flight crew does not shut off a pump running dry in an empty tank within 60 seconds after each fuel tank is emptied. An airplane flight manual supplement (AFMS) that includes flight crew manual pump shutoff procedures in the Limitations Section of the AFMS must be submitted to the Los Angeles ACO, FAA, for approval.

(3) For airplanes with a 3-person flight crew: Additional design features, if not originally installed by the airplane manufacturer, must be installed to detect when a fuel pump in a tank that is normally emptied during flight is running in an empty fuel tank, and provide an indication to the flight crew that the tank is empty. The flight engineer must manually shut off each pump running dry in an empty tank within 60 seconds after the tank is emptied. The AFMS Limitations section must be revised to specify that this pump shutoff must be done by the flight engineer.

(4) For all airplanes with tanks that normally empty during flight: Separate means must be provided to detect and shut off a pump that was previously commanded to be shut off automatically or manually but remained running in an empty tank during flight.

**(h) Terminating Action in Related ADs**

Accomplishment of the actions required by paragraph (g)(1) of this AD terminates the 18-month repetitive inspections and tests required by paragraph (a) of AD 2002-13-10, Amendment 39-12798 (67 FR 45053, July 8, 2002), and the 18-month repetitive inspections required by paragraph (j) of AD 2011-11-05, Amendment 39-16704 (76 FR 31462, June 1, 2011), for pumps affected by those ADs, regardless whether the pump is installed in a tank that normally empties, provided the remaining actions required by those two ADs have been accomplished.

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

(1) The Manager, Los Angeles 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.

(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.

**(j) Related Information**

For more information about this AD, contact Serj Harutunian, Aerospace Engineer, Propulsion Branch, ANM-140L, FAA, Los Angeles ACO, 3960 Paramount Boulevard, Lakewood, California 90712-4137; phone: 562-627-5254; fax: 562-627-5210; email: serj.harutunian@faa.gov.

**(k) Material Incorporated by Reference**

None.

Issued in Renton, Washington, on April 10. 2013.

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

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