



適航指令發布單

Airworthiness Directive Issuance Form

民航局 AD 編號 AD number	CAA-2020-09-010	發布日期 Date issued	2020/9/28
適用之航空產品 Applied to (models, serial numbers or part numbers, as applicable)	Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes, certificated in any category, excluding airplanes identified in paragraphs (c)(1) and (2) of this AD. (1) Airplanes equipped with a flammability reduction means (FRM) approved by the FAA as compliant with the fuel tank flammability reduction (FTFR) requirements of 14 CFR 25.981(b) or 26.33(c)(1). (2) Airplanes equipped with an ignition mitigation means (IMM) approved by the FAA as compliant with the FTFR requirements of 14 CFR 25.981(c) or 26.33(c)(2).		
主旨摘要	This AD requires modifying the fuel quantity indicating system (FQIS) to prevent development of an ignition source inside the center fuel tank due to electrical fault conditions. and also provides alternative actions for cargo airplanes.		
民航局 CAA <input type="checkbox"/> 本國產品 Native products <input type="checkbox"/> 其他個案 Other	設計國民航主管機構 Original Authorities <input checked="" type="checkbox"/> FAA <input type="checkbox"/> Germany LBA <input type="checkbox"/> EASA <input type="checkbox"/> CAA-NL <input type="checkbox"/> Brazil <input type="checkbox"/> UK CAA <input type="checkbox"/> Transport Canada Civil Aviation <input type="checkbox"/> Japan CAB <input type="checkbox"/> DGAC <input type="checkbox"/> CAA of Israel <input type="checkbox"/> Other _____		
	設計國 AD 編號 Original AD number	2020-18-13	
	1. 直接採用原 AD 之內容?(Is the original AD directly adopted?) <input checked="" type="checkbox"/> 是(Yes) <input type="checkbox"/> 否(No) _ a. 生效日期另訂為(Re-specify the effective <input type="checkbox"/> date as) : _____ b. 執行時限另訂為(Re-specify the compliance <input type="checkbox"/> time or period as) : _____ <input type="checkbox"/> 2. 使用人是否需要將 AD 執行結果向民航局提出報告?(Do <input type="checkbox"/> Users need to report the status of compliance to the CAA?) <input type="checkbox"/> 是(Yes) <input checked="" type="checkbox"/> 否(No)		
備註 Note	None		
註： 1. AD 內容後附。 2. 航空器產品使用人得向民航局提出豁免、替代符合方法、執行時限之展延之申請。 3. 如有任何問題，請聯絡交通部民用航空局初始適航科。Tel：(02)2349-6331~3, Fax：(02)2545-8464, e-mail： adcaa@mail.caa.gov.tw Note： 1. The AD text is enclosed. 2. Exemption, an alternative method of compliance or adjustment of the compliance time may be proposed to the CAA for approval. 3. For further information, please contact Civil Aeronautics Administration on Tel：(02)2349-6331~3, Fax：(02)2545-8464, e-mail： adcaa@mail.caa.gov.tw			

[Federal Register Volume 85, Number 186 (Thursday, September 24, 2020)]
[Rules and Regulations]
[Pages 60048-60057]
From the Federal Register Online via the Government Publishing Office [www.gpo.gov]
[FR Doc No: 2020-19809]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2016-6139; Product Identifier 2015-NM-061-AD; Amendment 39-21234; AD 2020-18-13]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain The Boeing Company Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes. This AD was prompted by the FAA's analysis of the Model 737 fuel system reviews conducted by the manufacturer. This AD requires modifying the fuel quantity indicating system (FQIS) to prevent development of an ignition source inside the center fuel tank due to electrical fault conditions. This AD also provides alternative actions for cargo airplanes. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective October 29, 2020.

ADDRESSES:

Examining the AD Docket

You may examine the AD docket on the internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2016-6139; 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, any comments received, and other information. The address for Docket Operations is 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: Jon Regimbal, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3557; email: Jon.Regimbal@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

The FAA 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 737-600, -700, -700C, -800, -900, and -900ER series airplanes. The NPRM published in the Federal Register on May 3, 2016 (81 FR 26485). The NPRM was prompted by the FAA's analysis of the Model 737 fuel system reviews conducted by the manufacturer. The NPRM proposed to require modifying the FQIS to prevent development of an ignition source inside the center fuel tank due to electrical fault conditions. The NPRM also proposed to provide alternative actions for cargo airplanes.

The FAA is issuing this AD to address ignition sources inside the center fuel tank, which, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

Comments

The FAA 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 NPRM

The Air Line Pilots Association, International (ALPA) and National Air Traffic Controllers Association (NATCA) supported the intent of the NPRM. Additional comments from NATCA are addressed below.

Request To Withdraw NPRM: Unjustified by Risk

Airlines for America and the Cargo Airline Association, in consolidated comments (A4A/CAA), and KLM Royal Dutch Airlines (KLM) requested that the FAA withdraw the NPRM. A4A/CAA cited comments submitted by Boeing to Docket No. FAA-2012-0187 in which Boeing stated that the risk is “less than extremely improbable” and that Boeing does not believe that an unsafe condition exists. A4A/CAA noted that they consider the Boeing comments to be applicable to the airplane models in the NPRM. KLM stated that the NPRM does not clarify the necessity of additional actions beyond current requirements. KLM added that it understands that Boeing is not able to explain or substantiate the rationale behind the NPRM.

The FAA disagrees with the commenters' request. The FAA notes that Boeing's comments were addressed in the supplemental NPRM (SNPRM) for Docket No. FAA 2012-0187 (80 FR 9400, February 23, 2015) in the comment response for “Request To Withdraw NPRM (77 FR 12506, March 1, 2012): Unjustified by Risk.” As explained in that comment response, in addition to examining average risk and total fleet risk, the FAA examines the individual flight risk on the worst reasonably anticipated flights. In general, the FAA issues ADs in cases where reasonably anticipated flights with preexisting failures (either due to latent failure conditions or allowable dispatch configurations) are vulnerable to a catastrophic event due to an additional foreseeable single failure condition. This is because the FAA considers operation of flights vulnerable to a potentially catastrophic single failure condition to be an excessive safety risk to the passengers on those flights. The FAA has determined that the current requirements, including airworthiness limitations and critical design configuration control limitations (CDCCLs) do not adequately address the unsafe condition identified in this AD and therefore it is necessary to issue this final rule. The FAA has not changed this AD regarding this issue.

Request To Withdraw NPRM: Probability Analysis Inconsistent With Regulatory Requirements

A4A/CAA requested that the FAA withdraw the NPRM. A4A/CAA stated that the assumption of a single failure regardless of probability is inconsistent with 14 CFR part 25 regulatory requirements. A4A/CAA referred to the phrase “regardless of probability” associated with single failures. A4A/CAA acknowledged that the term is used with single failures in FAA Advisory Circular (AC) 25.981-1C,¹ “Fuel Tank Ignition Source Prevention Guidelines,” but since that term does not appear in 14 CFR 25.981(a)(3), the commenter considered its use arbitrary, possibly introducing additional requirements not included in that section. A4A/CAA stated that the “worst reasonably anticipated flight” is a flight with a latent FQIS failure and a high-flammability tank, and this “latent plus one” failure—regardless of probability of a single failure—is not consistent with 14 CFR 25.981(a)(3).

The FAA disagrees with the commenter's request. The FAA notes that the commenter's assertion about the intent of 14 CFR 25.981(a)(3) is incorrect based on both the language of the rule and on the published rulemaking documents. The absence of a probabilistic qualifier in both the “from each single failure” clause and in the “from each single failure in combination with each latent failure not shown to be extremely remote” clause in 14 CFR 25.981(a)(3) in fact means just that—there is no probabilistic qualifier intended by the regulation. The intent for single failures in these two scenarios to be considered regardless of probability of the single failure was explicitly stated in the NPRM for 14 CFR 25.981, as amended by amendment 25-102 (66 FR 23085, May 7, 2001) (“amendment 25-102”). That NPRM stated, in pertinent part, that it would also add a new paragraph (a)(3) to require that a safety analysis be performed to demonstrate that the presence of an ignition source in the fuel tank system could not result from “any single failure, from any single failure in combination with any latent failure condition not shown to be extremely remote, or from any combination of failures not shown to be extremely improbable.” These new requirements would define three scenarios that must be addressed in order to show compliance with the proposed paragraph (a)(3). “The first scenario is that any single failure, regardless of the probability of occurrence of the failure, must not cause an ignition source. The second scenario is that any single failure, regardless of the probability occurrence, in combination with any latent failure condition not shown to be at least extremely remote (i.e., not shown to be extremely remote or extremely improbable), must not cause an ignition source. The third scenario is that any combination of failures not shown to be extremely improbable must not cause an ignition source.”

The preamble to the final rule for amendment 25-102 made a nearly identical statement, including the same uses of the phrase “regardless of probability.” The FAA has determined that it is necessary to proceed with issuance of this final rule as proposed. Further details and a description of the FAA's risk assessment can be found in responses to similar comments in a related SNPRM that addressed the same unsafe condition for Model 757 airplanes, in Docket No. FAA-2012-0187, and in the subsequently issued final rule, AD 2016-07-07, amendment 39-18452 (81 FR 19472, April 5, 2016) (“AD 2016-07-07”). No change to this AD was made in response to these comments.

Request To Withdraw NPRM: No New Data Since Fuel Tank Flammability Reduction (FTFR) Rulemaking

A4A/CAA requested that the FAA withdraw the NPRM based on a lack of new data since the issuance of the FTFR rule (73 FR 42444, July 21, 2008). A4A/CAA referred to the FTFR rule and decision to not require flammability reductions means (FRM) for all-cargo airplanes, and the FAA's intent to gather additional data and consideration of further rulemaking if flammability of these airplanes is excessive. A4A/CAA stated that since the FTFR rule, no additional data has been publicly introduced that would support or justify the applicability of this rulemaking to all-cargo aircraft. A4A/CAA also referred to the FAA's response to comments in the preamble to the SNPRM

¹ https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_25.981-1C.pdf.

for Docket No. FAA-2012-0187, which documented the FAA's decision on applicability of FRM and cost estimates. A4A/CAA stated that the FAA response was misleading and not factual since manufacturers did not begin detailed designs to address the proposed unsafe condition until after the FTFR rule was published. A4A/CAA added that the FAA did not discuss other changes to the FQIS system in the FTFR rule.

The FAA disagrees with the commenter's request. The FAA notes that the FTFR rule and FQIS ADs are two different issues with separate FAA actions. The intent of the FTFR rule was to provide an order of magnitude reduction in the rate of fuel tank explosions for the airplanes affected by that rule through adding a new airworthiness standard for the flammability of fuel tanks. The FAA notes that the FTFR rule was never intended to be a replacement for the issuance of ADs to address identified unsafe conditions. An unsafe condition due to the identified FQIS latent-plus-single failure issue in high-flammability fuel tanks was determined to exist during the Special Federal Aviation Regulation (SFAR) 88 AD Board held by the FAA in 2003 using the guidance in FAA Policy Memorandum ANM100-2003-112-15, "SFAR 88—Mandatory Action Decision Criteria," dated February 25, 2003,² for high-flammability fuel tanks, including the center fuel tank on Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes. That same issue was not considered to be an unsafe condition in low-flammability wing fuel tanks based on that same policy memorandum. The FAA has not changed this AD regarding this issue.

Request To Withdraw NPRM: Arbitrary and Inconsistent Wire Separation Standards

A4A/CAA requested that the FAA withdraw the NPRM based on a lack of consistent design standards for FQIS wire separation. A4A/CAA assumed that the approved standard for the retrofit is a 2-inch wire separation minimum, which the commenter considered arbitrary and inconsistently applied. A4A/CAA reported that the amount of wiring capable of meeting that separation standard varies widely among airplane models. A4A/CAA also acknowledged that other separation methods were used in areas not meeting the 2-inch wire separation requirement.

The FAA does not agree with the commenter's request. The degree of physical isolation of FQIS wiring from other wiring, whether provided by physical distance or barrier methods, that is necessary to eliminate the potential for hot shorts due to wiring faults is dependent on the materials used, the wire securing methods, and the possible types of wiring faults. The FAA relied on the manufacturer to assess the details of the design and to propose the appropriate isolation measures. While 2 inches of physical separation may appear to be an arbitrary number, it was the distance proposed by the manufacturer as appropriate for their design based on analysis of the design details. The FAA has not changed this AD regarding this issue.

Request To Withdraw NPRM: NPRM Arbitrary and Inconsistently Applied

A4A/CAA requested that the FAA withdraw the NPRM. A4A/CAA noted that airplanes with FRM are not included in the applicability, and the NPRM would therefore not fully address the unsafe condition. A4A/CAA added that the distinction between high- and low-flammability exposure time fuel tanks as used in the NPRM is arbitrary. A4A/CAA stated that an arbitrary differentiation of high- versus low-flammability as decisional criteria for the need for corrective action does not take into account the actual probability of the impact of the difference in flammability on the potential of catastrophic failure. A4A/CAA also stated that allowing the proposed alternative actions for cargo airplanes does not fully address the unsafe condition in the NPRM. A4A/CAA referenced the FAA's response to comments in AD 2016-07-07 regarding this issue. The commenter summarized numerical analysis showing no significant difference in risk between high- and low-flammability fuel tanks. A4A/CAA concluded that the FAA's risk analysis is arbitrary and an unsafe condition does not exist.

²[http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgPolicy.nsf/0/dc94c3a46396950386256d5e006aed11/\\$FILE/Feb2503.pdf](http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgPolicy.nsf/0/dc94c3a46396950386256d5e006aed11/$FILE/Feb2503.pdf).

The FAA disagrees with the assertion that the NPRM is arbitrary and inconsistent. The NPRM follows defined policy in FAA Policy Memorandum ANM100-2003-112-15, and consistently applies the policy to several airplane models with similar unsafe conditions, similar to AD 2016-07-07. The FAA defined the difference between low- and high-flammability exposure time fuel tanks based on recommendations from the Aviation Rulemaking Advisory Committee Fuel Tank Harmonization Working Group (FTHWG). The preamble to the final rule for amendment 25-102, which amended 14 CFR 25.981, defined this difference as based upon comparison of “the safety record of center wing fuel tanks that, in certain airplanes, are heated by equipment located under the tank, and unheated fuel tanks located in the wing.” The FTHWG concluded that the safety record of fuel tanks located in the wings was adequate and that if the same level could be achieved in center wing fuel tanks, the overall safety objective would be achieved.

In the response to comments in the preamble to the final rule for AD 2016-07-07 referenced by the commenter, the FAA described why FRM or alternative actions for cargo airplanes provide an acceptable level of safety, even if they do not completely eliminate the non-compliance with 14 CFR 25.981(a)(3).

The fuel tank explosion history for turbojet/turboprop powered transport airplanes fueled with kerosene type fuels, outside of maintenance activity, has consisted of explosions of tanks that (1) are not conventional aluminum wing tanks and (2) spend a considerable amount of their operating time empty. The service history of conventional aluminum wing tanks has been acceptable. The intent of the difference in decision criteria in FAA Policy Memorandum ANM100-2003-112-15 was intended to give credit for this satisfactory service experience, and to differentiate between tanks with a level of flammability similar to that of a conventional wing tank and those with a significantly higher level of flammability.

The numerical analysis provided by the commenter is inconsistent with the fuel tank explosion service history. There are at least three identifiable physics-based reasons for that inconsistency. First, low-flammability tanks on most types of airplanes are main tanks that are the last tanks used. During a large portion of their operating time, the systems and structural features that have the potential to be ignition sources in the event of a failure condition are covered with liquid fuel, and an ignition source, if it occurs, is likely to be submerged. When a potential ignition source in a main tank is uncovered, it is likely to be later in the flight when the tank is cool and no longer flammable. The commenter's analysis does not account for this significant effect. Second, the numerical analysis used by the commenter assumes that any given ignition source has a random occurrence in time at the estimated probability, and that, in order for an explosion to occur, that random occurrence of an ignition source needs to coincide with the tank being in a flammable state. In fact, many of the identified ignition threats do not simply occur briefly and then go away. Instead, a fault occurs that, until it is discovered and corrected, repeatedly creates an ignition source, and repeatedly tests whether flammable conditions exist.

Third, the flammability of low-flammability fuel tanks is typically dependent on weather, and a low-flammability fuel tank may operate for months without ever becoming flammable. This is not true of most high-flammability fuel tanks, which typically have significant on-airplane heat sources driving their temperature. This factor can mean that, on some airplanes, an in-tank latent failure can occur and, after some period of time, be detected and corrected without the low-flammability tank ever having flammable conditions. The numerical analysis provided by the commenter does not account for these significant factors. The difference in likelihood of a failure that results in repeated ignition source events causing a tank explosion is not simply proportional to difference in the fleet average flammability of the tank for the reasons stated above. The FAA has not changed this AD regarding this issue.

Request To Withdraw NPRM: Overestimate of Fleet Average Flammability Exposure for All-Cargo Fleet in Alaska

A4A/CAA requested that the FAA withdraw the NPRM. The commenter stated that the FAA did not properly analyze the fleet average flammability for the center wing tank on Model 737-700 airplanes. The commenter stated that the known U.S. registered 737-700 all-cargo fleet without FRM installed will be operated almost solely in the state of Alaska for the foreseeable future. A4A/CAA noted that the mean average ambient temperature in Alaska is much lower than that used in the FAA's analysis. The commenter added that the air conditioning packs in an all-cargo configuration generate significantly less heat transfer to the center wing tank during normal operations than during the normal operations assumed by the FAA's analysis. A4A/CAA concluded that these factors reduce the fleet average flammability exposure for the all-cargo Model 737-700 airplanes to the level of the main wing tanks, and therefore, the unsafe condition does not exist.

The FAA does not agree to withdraw the NPRM. More than 1,100 Model 737-700 airplanes have been produced. The FAA foresees that, as these airplanes are replaced in passenger service by newer airplanes, a significant portion of them will be converted to all-cargo service and will eventually fly throughout the U.S. and the world. Multiple cargo-conversion designs for these airplanes have been approved, and other conversion designs are in the approval process. The FAA does not agree to base its decision about whether an AD is necessary for these airplanes on a flammability analysis based solely on the initial cargo conversions currently being largely operated in Alaska.

The FAA also does not agree that a new analysis considering operation of only the initial cargo-converted airplanes would result in a determination that the center fuel tank of those airplanes has a level of flammability comparable to a wing tank of conventional aluminum construction, and that the center fuel tank on those airplanes could therefore legitimately be classified as a low-flammability fuel tank. In addition, the FAA considers the unsafe condition determination described in the SNPRM for Docket No. FAA-2012-0187, in the response to comments section under, "Request To Withdraw NPRM (77 FR 12506, March 1, 2012): Unjustified by Risk," to be applicable to these Model 737 airplanes.

Request To Remove Certain Business Jets From the Applicability

AMES Continuing Airworthiness Management Organization (AMES CAMO) requested that the proposed AD be revised to exclude Boeing Business Jets operated under 14 CFR part 91. AMES CAMO noted that the proposed AD excludes airplanes modified by the nitrogen generation system (NGS) system, but the NGS is mandated only on commercial airplanes operating under 14 CFR part 121. AMES CAMO suggested the proposed AD should only apply to airplanes operating under 14 CFR part 121.

The FAA disagrees with the commenter's request. Policy Memorandum ANM100-2003-112-15 is applicable to large transport airplanes except those specifically excluded by the Special Federal Aviation Regulation (SFAR) No. 88 regulation (in 14 CFR part 21). The FAA did not exclude non-air-carrier large transport airplanes from the other ADs determined to be necessary as a result of SFAR 88, and included non-air-carrier large transport airplanes in the FRM retrofit requirements added to 14 CFR part 125 in 2008. The unsafe condition addressed by this AD is applicable to Model 737 airplanes operated as business jets, except as specified in paragraph (c) of this AD. The FAA has not changed this AD regarding this issue.

Request To Require Cargo Airplane Option for All Airplanes

Boeing and All Nippon Airways (ANA) requested that the NPRM be revised to make the alternative actions for cargo airplanes specified in paragraph (h) of the proposed AD applicable to all airplanes. Boeing asked that the FAA provide a technical justification why the actions in paragraph

(h) of the proposed AD apply only to cargo airplanes. ANA asked that the actions in paragraph (h) of the proposed AD be allowed for passenger airplanes not subject to the FTFR rule, suggesting this would provide more choices regarding how to comply with the proposed AD.

The FAA disagrees with the commenters' requests. As discussed in the comment response in the SNPRM for Docket No. FAA-2012-0187, under the heading "Requests To Withdraw NPRM (77 FR 12506, March 1, 2012) Based on Applicability" the FAA does not consider the alternative action for cargo airplanes allowed by this AD to provide an adequate level of safety for passenger airplanes. The FAA is willing to accept a higher level of individual flight risk exposure for cargo flights that are not fail-safe due to the absence of passengers and the resulting significant reduction in occupant exposure on a cargo airplane versus a passenger airplane, and due to relatively low estimated individual flight risk that would exist on a cargo airplane after the corrective actions are taken. The FAA has not changed this AD regarding this issue.

Request To Exclude Certain Airplanes

United Airlines (UAL) noted that the FRM required by 14 CFR 121.1117 will have been installed on all affected airplanes in passenger configuration by December 26, 2018. The FAA infers UAL is requesting that the FAA revise the proposed AD to exclude airplanes that are affected by 14 CFR 121.1117. In addition, UAL suggested that the FAA either delete paragraph (g) of the proposed AD or make paragraph (g) of the proposed AD applicable only to airplanes in a cargo configuration that do not have an FRM installed and non-U.S.-registered airplanes that do not have to comply with FRM requirements.

The FAA disagrees with the commenter's request. There are other passenger-carrying airplanes operated under 14 CFR part 91 that are not required to install FRM. (The requirement to install FRM on all passenger-carrying airplanes operated by air carriers is in 14 CFR 121.1117.) The FAA notes that foreign air carriers may not have to comply with that requirement or similar requirements of their own civil aviation authority. The European Union Aviation Safety Agency (EASA), for example, has chosen not to require FRM to be retrofitted to in-service airplanes. This AD is intended to require any Model 737-600, -700, -700C, -800, -900, and -900ER series passenger airplane that does not have FRM, regardless of the rules under which it is operated, to address the FQIS latent-plus-one unsafe condition with a corrective action that fully complies with the FAA's airworthiness standards. This requirement fulfills the FAA's International Civil Aviation Organization to address unsafe conditions on all of the aircraft manufactured by the state of design, not just those aircraft whose operation is under the jurisdiction of the state of design. The FAA has not changed this AD regarding this issue.

Request To Clarify Certification Basis for Modification Requirements

NATCA recommended that the FAA revise paragraph (g) of the proposed AD to clearly state that the required FQIS design changes must comply with the fail-safe requirements of 14 CFR 25.901(c), as amended by amendment 25-46 (43 FR 50597, October 30, 1978); and 14 CFR 25.981(a) and (b), as amended by amendment 25-102; NATCA added that these provisions are required by SFAR 88.

The FAA does not agree to change paragraph (g) of this AD. While the FAA agrees that modifications to comply with paragraph (g) of this AD should be required to comply with the referenced regulations, that requirement already exists in 14 CFR part 21. No change to this AD is necessary.

Request To Address Unsafe Condition on All Fuel Tanks

NATCA recommended that the FAA require design changes that eliminate unsafe FQIS failure conditions on all fuel tanks on the affected models, regardless of fuel tank location or the percentage of time the fuel tank is flammable. NATCA referred to four fuel tank explosions in low-flammability

exposure time fuel tanks identified by the FAA during FTFR rulemaking. NATCA stated that neither FRM nor alternative actions for cargo airplanes (e.g., BITE checks (checks of built-in test equipment) followed by applicable repairs before further flight and modification of the center fuel tank FQIS wiring within 60 months) would bring the airplane into full regulatory compliance. NATCA added that the combination of failures described in the NPRM meets the criteria for “known combinations” of failures that require corrective action in FAA Policy Memorandum ANM100-2003-112-15.

The FAA disagrees with the commenter's request. The FAA has determined that according to Policy Memorandum ANM100-2003-112-15, the failure condition for the airplanes affected by this AD should not be classified as a “known combination.” While the FQIS design architecture is similar to that of the early Boeing Model 747 configuration that is suspected of contributing to the TWA Flight 800 fuel tank explosion, significant differences exist in the design of FQIS components and wire installations between the affected Boeing models and the early Model 747 airplanes such that the intent of the “known combinations” provision for low-flammability fuel tanks in the policy memorandum is not applicable. Therefore, this AD affects only the identified Boeing airplanes with high-flammability exposure time fuel tanks, as specified in paragraph (c) of this AD. The FAA provided a detailed response to similar comments in the preamble of the final rule for AD 2016-07-07. The FAA has not changed this final rule regarding this issue.

Request To Require Modification on All Production Airplanes

NATCA recommended that the FAA require designs that comply with 14 CFR 25.901(c) and 25.981(a)(3) on all newly produced transport airplanes. NATCA stated that continuing to grant exemptions to 14 CFR 25.901(c), as amended by amendment 25-40 (42 FR 15042, March 17, 1977); and 14 CFR 25.981(a)(3), as amended by amendment 25-102; has allowed continued production of thousands of airplanes with this known unsafe condition.

The FAA disagrees with the commenter's request. The recommendation to require production airplanes to fully comply with 14 CFR 25.901(c) and 14 CFR 25.981(a)(3) is outside the scope of this rulemaking. In addition, the FAA has implemented requirements for all large transport airplanes produced after September 2010 to include flammability reduction methods for tanks that would otherwise be high-flammability fuel tanks. Boeing incorporated this change into the Model 737 series airplanes that are still in production and the FAA has excluded those models from the applicability of this AD. The FAA has not changed this final rule regarding this issue.

Request To State That an Exemption is Required

Boeing requested that paragraph (h) of the proposed AD be revised to state that an exemption is required to accomplish the specified actions. Boeing stated that the FAA has identified that the BITE procedure and wire separation design changes specified in the proposed AD are not sufficient for compliance to 14 CFR 25.981(a) at the FQIS level. Boeing stated that an exemption is therefore needed prior to approval of the related design change.

The FAA agrees to clarify. The BITE check is not a type design change or alteration, so no exemption from the airworthiness standards is required for that action. The design data approval of any partial wire separation modification would require an exemption. That exemption would be obtained by the party seeking approval of the alteration data, and no further exemption would be required for the party using that data to alter an aircraft. Obtaining such an exemption would be part of the certification process for such a change, so, the FAA does not find it necessary to include such information in paragraph (h) of this AD. In addition, some parties may choose to comply with the AD using a design change that fully complies with the airworthiness standards. The FAA also notes that the commenter appears to misunderstand why an exemption is needed for the required modification. The exemption is needed because, even with the modification, the FQIS does not comply with 14 CFR 25.901(c) and 14 CFR 25.981(a). The exemption does not authorize evaluation of a partial

system for compliance with the system level requirement. The FAA has not changed this AD regarding this issue.

Request To Exclude Airplanes That Have Installed an Ignition Mitigation Means (IMM) or Flammability Impact Mitigation Means (FIMM)

AerSale stated that the Costs of Compliance section of the NPRM only cites the requirements in 14 CFR 121.1117 to install FRM, but 14 CFR 121.1117 paragraph (d)(1) states that IMM, FRM, or FIMM may be installed. AerSale suggested that all IMM, FRM, or FIMM installations with the approval of the FAA Oversight Office would meet the requirements of 14 CFR 121.1117. The FAA infers AerSale is requesting that the proposed AD be revised to exclude airplanes on which IMM or FIMM has been installed.

The FAA partially agrees with the commenter's request. The FAA agrees that IMM provides a level of risk reduction at least as great as that provided by FRM. The FAA does not agree that airplanes should be excluded from paragraph (c) of this AD based on the installation of FIMM alone. FIMM is applicable to design changes only, and is intended to ensure that, if a fuel tank design change would otherwise have increased the flammability of a fuel tank, the associated FIMM would ensure that the flammability of that tank is not increased by the design change. Therefore, FIMM itself does not address the need for FRM for the original tank design. The FAA has revised paragraph (c) of this AD to clarify that airplanes with an IMM approved by the FAA as compliant with certain regulations are excluded from this AD. This revision includes adding paragraphs (c)(1) and (2) of this AD.

Request To Record Only Certain Codes

Boeing requested that paragraph (h)(1) of the proposed AD be revised to only require corrective actions if a nondispatchable fault code pertaining to the center wing tank is recorded (as opposed to any nondispatchable fault code being recorded). Boeing stated that all FQIS wire separation changes in the proposed AD are limited to the center wing tank, therefore only built-in test equipment (BITE) check messages pertaining to the center wing tank are applicable to the proposed AD. In addition, Boeing stated that a final rule should be postponed until the FAA develops a list of "nondispatchable fault codes" in conjunction with Boeing.

The FAA agrees that the unsafe condition addressed by this AD is limited to the center wing tank. However, the FAA does not agree that the AD should be changed as proposed by Boeing. It is not clear to the FAA whether there may be FQIS BITE fault codes that are not clearly identified as related to the center wing tank but that may impact center tank circuits. Therefore, the FAA has determined that all nondispatchable fault codes recorded prior to the BITE check or as a result of the BITE check required by paragraph (h)(1) of this AD must be addressed. Operators or Boeing may request an alternative method of compliance (AMOC) under the provisions of paragraph (i) of this AD if they can provide sufficient data that a particular fault code does not pertain to the unsafe condition addressed by this AD.

Regarding the requirement to record and address fault codes read immediately prior to running the BITE check procedure, the FAA notes that the normal Boeing procedure for performing an FQIS BITE check is to first erase all of the existing fault codes, then perform the BITE check and troubleshoot any resulting new fault codes. For this AD, the FAA did not want any already stored fault codes to be potentially ignored due to erasure at the first step because some of the failures of concern can be intermittent. This AD therefore requires operators to record the existing codes before doing the BITE check, then do the BITE check and record the new codes that result from that BITE check, and then do the appropriate troubleshooting and corrective action for both sets of codes per the manufacturer's guidance. The FAA has not changed this AD regarding this issue.

Finally, the FAA does not agree to delay the final rule while Boeing proposes and obtains FAA agreement on a list of nondispatchable fault codes. The FAA requested service information from

Boeing in 2016 to support the option for all-cargo airplanes on all of the Boeing models for which similar FQIS ADs were planned. Boeing chose at that time to develop service information only for the Model 747-400, 757, and 767 airplanes because at that time only those airplanes had affected cargo configuration for which Boeing was the design approval holder. The FAA agreed at that time to not require Boeing to develop a BITE check service bulletin for the Model 737 airplanes because Boeing had not yet developed a cargo conversion service bulletin or supplemental type certificate (STC) for the Model 737 airplanes. The FAA also considered that, because the BITE check instructions already existed in the Model 737 AMM, a BITE check service bulletin could be developed quickly at a later date if needed. In addition, the process for obtaining FAA agreement on a list of nondispatchable fault codes for the models Boeing chose to support took less than 30 days. If any service information is developed to support compliance with paragraph (h) of this AD it will be evaluated for approval using the AMOC process specified in paragraph (i) of this AD.

Request To Clarify Required Modification

ANA and Thomson Airways requested that the FAA provide clarification regarding how to accomplish the modification specified in paragraph (g) of the proposed AD. ANA noted that paragraph (h) of the proposed AD provides clear alternative actions for cargo airplanes. ANA stated that it could not identify how to modify the FQIS in passenger airplanes not subject to the FTFR rule. ANA noted that it contacted Boeing for clarification and Boeing stated that the FRM (which Boeing calls NGS) retrofit is the method of compliance for these airplanes. ANA asked that the FAA either clarify how to modify the FQIS system or accept an FRM retrofit as terminating action. Thomson Airways asked if the intent of the proposed AD is to install an NGS on affected airplanes. Thomson Airways also asked for clarification regarding the FQIS modification, stating that the proposed AD does not provide detail regarding modifying the FQIS itself, only the FQIS wiring.

The FAA agrees to clarify. As noted in paragraph (c) of this AD, airplanes on which FRM or IMM that meets certain FAA airworthiness standards is installed are excluded from this AD. Paragraph (g) of this AD requires modification of the FQIS on passenger airplanes to prevent development of an ignition source inside the center fuel tank due to electrical fault conditions. The specifics of this modification may vary as long as the modification addresses the unsafe condition identified in this AD and the procedures specified in paragraph (i) of this AD are used to approve the modification method. Operators may choose to install an FRM or IMM that meets the criteria specified in paragraph (c), which would then remove that airplane from the applicability of this AD, negating the need to do the modification specified in paragraph (g) of this AD. Otherwise, operators must obtain an AMOC as specified in paragraph (i) of this AD and modify their airplane accordingly. The FAA has not changed this AD regarding this issue.

Request To Provide a Detailed Cost-Effective Method of Compliance

Korean Air Lines (KAL), KLM, AMES CAMO, and Duco Schiere requested that the FAA provide a detailed and cost-effective method of compliance for passenger airplanes. KAL, AMES CAMO, and Duco Schiere noted that the proposed AD does not provide a clear means of compliance for the modification, such as a Boeing service bulletin. AMES CAMO noted that without a clear method of compliance, it is difficult to determine the extent of the required work. KAL and KLM noted that the majority of non-FAA operators are not required to retrofit the NGS system. KLM stated that since 2008 the level of fuel tank safety has been improved by the implementation of several costly SFAR 88 service bulletins, implementation of airworthiness limitations into the maintenance program and implementation of CDCCLs into maintenance documents. KLM mentioned that the modification would require an airplane to be out of service for a lengthy time. KLM added that the modification would add weight to the airplane and require additional fuel usage. KAL and KLM requested that the FAA encourage Boeing to develop an acceptable cost-effective method of compliance that does not require installation of an NGS.

The FAA agrees that the lack of service information for FQIS modifications makes it difficult to assess the required work to modify the FQIS, and acknowledges the high cost of NGS. However, the FAA disagrees with the commenters' requests. For passenger-carrying airplanes, the cost per airplane of providing a modification of the FQIS that fully complies with the airworthiness standards was estimated by Boeing and their FQIS vendor (Goodrich) prior to the issuance of the NPRM to be comparable to the cost of installing NGS. Based on that cost estimate, Boeing proposed that they not be required to develop a fully compliant FQIS modification for passenger airplanes because it would not provide significant savings to operators and NGS would provide a greater safety benefit. The FAA agreed.

The FAA's understanding is that Boeing's current position is the same, and that they do not plan to develop a fully compliant FQIS modification for passenger airplanes to address paragraph (g) of this AD. However, if service information is developed, approved, and available in the future, operators may request approval under the provisions of paragraph (i) of this AD to use approved service instructions as an AMOC for the requirements of this AD, or the FAA may approve the service information as a global AMOC for this AD.

Request To Clarify Intent of Different Requirements in Paragraphs (g) and (h) of the Proposed AD

Boeing asked that the FAA clarify the intent of the differences between the requirements in paragraphs (g) and (h) of the proposed AD. Boeing stated that it is unclear what change is expected for compliance with paragraph (g) of the proposed AD versus paragraph (h) of the proposed AD. Boeing suggested that one possibility is that paragraph (g) of the proposed AD is intended to cover development of transient suppression, while paragraph (h) of the proposed AD is intended to cover compliance via FQIS wire separation and BITE checks.

The FAA agrees to clarify. Paragraph (g) of this AD is intended to require, for passenger airplanes that are subject to this AD, a modification to the FQIS that makes it fully compliant with 14 CFR 25.981(a), as amended by amendment 25-102. A fully compliant FQIS modification might include wire separation or transient suppression devices, but due to the system design, either option would likely require changes to the FQIS processor.

Paragraph (h) of this AD is intended to allow, as an optional method of compliance for all-cargo airplanes only, a change that isolates the center fuel tank circuit wiring between the FQIS processor and the fuel tanks from other wiring that is connected to a sufficient power source to create an ignition source in the event of a hot short between the wiring. Such a change would not be fully compliant with the airworthiness regulations (hence the requirement to obtain a partial exemption from 14 CFR 25.901(c) and 14 CFR 25.981(a) for any such design change), but would provide a level of risk reduction that the FAA considers acceptable for all-cargo airplanes and would significantly reduce the costs relative to a fully compliant modification.

Request To Change Compliance Time

A4A/CAA and Thomson Airways requested that the FAA extend the compliance time for the modifications specified in paragraphs (g) and (h)(2) of the proposed AD to 72 months. A4A/CAA stated that the compliance time should match that of AD 2016-07-07 because the unsafe condition and corrective actions are similar. A4A/CAA stated that although service information was not yet available, the compliance time should align with major maintenance schedules, but should be not less than 72 months after service information is available. Thomson Airways noted that 72 months would provide operators a better opportunity to work within existing maintenance program schedules.

Conversely, NATCA recommended that the FAA reject requests for a compliance time longer than 5 years as proposed in the NPRM. Assuming final rule issuance in 2016, NATCA estimated that a 5-year compliance time would result in required compliance by 2021-25 years after the TWA Flight

800 fuel tank explosion that led to the requirements in SFAR 88, and 20 years after issuance of SFAR 88.

The FAA agrees with Thomson Airways and A4A/CAA's request to extend the compliance time, and disagrees with NATCA's request. The FAA received similar requests to extend the compliance time from several commenters regarding the NPRMs for the FQIS modification on other airplanes. The FAA disagrees with establishing a compliance time based on issuance of any service information that is not yet approved or available. The FAA has determined that a 72-month compliance time is appropriate and will provide operators adequate time to prepare for and perform the required modifications without excessive disruption of operations. The FAA has determined that the requested moderate increase in compliance time will continue to provide an acceptable level of safety. The FAA has changed paragraphs (g) and (h)(2) of this AD accordingly.

Request To Change Compliance Time Relative to Receipt of Exemption

Boeing requested that the FAA revise the compliance time for the proposed AD to “60 months after an exemption from [14 CFR 25.981(a)(3)] is FAA-approved.” Boeing suggested that it would take 6 months to develop an exemption petition and 6 months for the FAA to approve that exemption. Boeing added that the FAA has previously identified that the BITE checks procedure and wire separation design were not sufficient for compliance with 14 CFR 25.981(a)(3).

The FAA disagrees with the commenter's request. An AD typically does not include a compliance time that is based on an optional action that an operator or manufacturer might choose to take. In addition, the FAA notes that Boeing has already received exemptions for the Model 747-400, 757, and 767 airplanes, and could quickly petition for and obtain approval of a similar exemption for the Model 737 airplanes using an almost identical petition. The FAA's flow time to disposition such a petition would be approximately 90 days, during which time Boeing could still proceed with development of the modification. In addition, as noted above, the compliance time for paragraph (h)(2) of this AD has been extended to 72 months, giving additional time for operators or manufacturers to obtain an exemption.

Request To Extend Repetitive BITE Check Interval

Boeing requested that paragraph (h)(1) of the proposed AD be revised to extend the repetitive check interval for the BITE checks. Boeing requested that the repetitive interval be extended to 750 flight hours to match the repetitive intervals specified in the service information for a related AD.

The FAA agrees for the reason provided, and because 750 flight hours better aligns with most operators' maintenance programs. The FAA intended to propose a 750 flight hour interval, but inadvertently specified 650 flight hour intervals in the proposed AD. The FAA has revised paragraph (h)(1) of this AD to specify repetitive intervals of 750 flight hours.

Request To Revise Costs of Compliance Section To Account for Cargo Conversions

A4A/CAA noted that the Costs of Compliance section in the NPRM stated all U.S.-registered airplanes are currently operated as passenger airplanes and that “because of the requirement in 14 CFR 121.1117 to install FRM on U.S. air-carrier passenger airplanes by the end of 2017, it is likely that no U.S. airplanes would actually be affected by this proposed AD.” A4A/CAA noted that 14 CFR 121.1117 does not require FRM to be installed on all-cargo airplanes. The commenter stated that U.S.-registered Model 737-700 all-cargo airplanes without FRM installed will be operated by 2017. The FAA infers that A4A/CAA is requesting that the Costs of Compliance section be revised to reflect the number of all-cargo U.S.-registered airplanes.

The FAA agrees that there are currently U.S.-registered Model 737-700 all-cargo airplanes operating without FRM installed. The FAA has revised the Costs of Compliance section of this AD to reflect these airplanes.

Request To Acknowledge Impacts on Intrastate Aviation in Alaska

A4A/CAA stated that the proposed AD will interrupt aviation transportation to remote Alaskan communities not serviced by other modes of transportation, contrary to the statement that the proposed AD “will not affect intrastate aviation in Alaska.” A4A/CAA noted that, beginning in 2017, Model 737-700 airplanes in an all-cargo configuration and without FRM installed will provide transportation to remote Alaskan communities. A4A/CAA added that these airplanes would be required to be removed from service for an extended time while accomplishing the proposed modification, which the FAA estimates would take 1,200 work-hours.

The FAA acknowledges that, since the NPRM was issued, at least one major operator began using converted Model 737-700 cargo airplanes for intrastate flights in Alaska. The few remote communities in Alaska that have airports suitable for a Model 737-700 are unlikely to be served solely by Model 737-700 airplanes. The FAA has considered the potential for impact to these communities due to Model 737-700 airplanes being temporarily out of service for the required modification actions, and considers the safety concern to outweigh those potential impacts. This AD was developed with regard to minimizing the economic impact on operators to the extent possible, consistent with the safety objectives of this AD. In any event, the Federal Aviation Regulations (14 CFR part 39) require operators to correct an unsafe condition identified on an airplane to ensure operation of that airplane in an airworthy condition. The FAA has determined in this case that the requirements are necessary and the indirect costs would be outweighed by the safety benefits of the AD. The FAA considers the 72 month compliance adequate time for operators to schedule the required modifications without excessive disruption of service to those communities. However, if an operator considers that a moderate delay in the incorporation of the required modification would significantly reduce the impact on their operations or the impact on service to a remote community in Alaska while still providing an acceptable level of safety, that operator can use the procedures in paragraph (i) of this AD to explain those impacts and request approval of an extension of the compliance time.

Request To Require Design Changes From Manufacturers

NATCA recommended that the FAA follow the agency's compliance and enforcement policy to require manufacturers to develop the necessary design changes soon enough to support operators' ability to comply with the proposed requirements. NATCA noted that SFAR 88 required manufacturers to develop all design changes for unsafe conditions identified by their SFAR 88 design reviews by December 2002, or within an additional 18 months if the FAA granted an extension.

The FAA acknowledges the commenter's concerns. However, any enforcement action is outside the scope of this rulemaking. The FAA has not changed this final rule regarding this issue.

Request To Clarify the Applicability

Duco Schiere stated the NPRM is not clear about which configurations (passenger/cargo, with/without NGS installed) of Model 737 airplanes are applicable to the AD. The FAA infers the commenter is requesting the FAA clarify the applicability.

The FAA agrees to clarify. This AD applies to The Boeing Company Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes (including passenger and cargo airplanes) except for airplanes having configurations identified in paragraphs (c)(1) and (2) of this AD. Airplanes with an installed NGS that meets the criteria specified in paragraph (c)(1) of this AD are excluded from this AD. Airplanes with an installed IMM such as fuel tank explosion suppression foam that meets the criteria specified in paragraph (c)(2) of this AD are also excluded from this AD.

Clarification of BITE Check Compliance Time

The FAA has revised paragraph (h)(1) of this AD to clarify the compliance time for the BITE check relative to the requirement to record the fault codes. The FAA recognized that operators might interpret the proposed requirements for alternative actions for cargo airplanes as allowing additional flights prior to performing the BITE check after first recording the fault codes. The FAA intended for operators to perform the BITE check immediately after recording the fault codes to address both the fault codes that exist prior to performing the BITE check and any new codes that are identified during the BITE check.

Clarification of Costs of Compliance

The FAA had previously determined, as specified in the NPRM, that the work involved for the cargo airplane wire separation modification would take 230 work-hours. Boeing has since provided an updated estimate of 74 work-hours for the alternative modification for cargo airplanes. The FAA has revised the cost estimate for the modification accordingly in this final rule.

Conclusion

The FAA reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule with the changes described previously and minor editorial changes. The FAA has 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.

The FAA also determined that these changes will not increase the economic burden on any operator or increase the scope of this final rule.

Costs of Compliance

There are approximately 1,393 U.S.-registered Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes in service. Several of those airplanes are currently operated as cargo airplanes. Beginning with line number 2620, however, Boeing has delivered airplanes with FRM/NGS installed. The FAA estimates that 831 affected airplanes on the U.S. Register were delivered without FRM installed, but the agency does not know the number of airplanes that have had FRM installed post-production. Because of the requirement in 14 CFR 121.1117 to install FRM on U.S. air-carrier passenger airplanes by the end of 2017, it is likely that no U.S. passenger airplanes would actually be affected by this AD. However, U.S.-registered cargo airplanes may be affected by this AD. For any affected airplane, the FAA estimates the following costs to comply with this AD:

Estimated Costs: Required Actions

Action	Labor cost	Parts cost	Cost per product
Modification	1,200 work-hours × \$85 per hour = \$102,000	\$200,000	\$302,000

Estimated Costs: Alternative Actions

Action	Labor cost	Parts cost	Cost per product
BITE check	1 work-hour \times \$85 per hour = \$85 per check	\$0	\$85 per check (4 checks per year, \$340 per year)
Wire separation	74 work-hours \times \$85 per hour = \$6,290	\$10,000	\$16,290

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.

The FAA is 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) Will not affect intrastate aviation in Alaska, and
- (3) 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):



2020-18-13 The Boeing Company: Amendment 39-21234; Docket No. FAA-2016-6139; Product Identifier 2015-NM-061-AD.

(a) Effective Date

This AD is effective October 29, 2020.

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes, certificated in any category, excluding airplanes identified in paragraphs (c)(1) and (2) of this AD.

(1) Airplanes equipped with a flammability reduction means (FRM) approved by the FAA as compliant with the fuel tank flammability reduction (FTFR) requirements of 14 CFR 25.981(b) or 26.33(c)(1).

(2) Airplanes equipped with an ignition mitigation means (IMM) approved by the FAA as compliant with the FTFR requirements of 14 CFR 25.981(c) or 26.33(c)(2).

(d) Subject

Air Transport Association (ATA) of America Code 28, Fuel.

(e) Unsafe Condition

This AD was prompted by the FAA's analysis of the Model 737 fuel system reviews conducted by the manufacturer. The FAA is issuing this AD to prevent ignition sources inside the center fuel tank, which, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

(f) Compliance

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

(g) Modification

Within 72 months after the effective date of this AD, modify the fuel quantity indicating system (FQIS) to prevent development of an ignition source inside the center fuel tank due to electrical fault conditions, using a method approved in accordance with the procedures specified in paragraph (i) of this AD.

(h) Alternative Actions for Cargo Airplanes

For airplanes used exclusively for cargo operations: As an alternative to the requirements of paragraph (g) of this AD, do the actions specified in paragraphs (h)(1) and (2) of this AD, using methods approved in accordance with the procedures specified in paragraph (i) of this AD. To exercise this alternative, operators must perform the first inspection required under paragraph (h)(1) of this AD within 6 months after the effective date of this AD. To exercise this alternative for airplanes returned to service after conversion of the airplane from a passenger configuration to an all-cargo configuration more than 6 months after the effective date of this AD, operators must perform the first inspection required under paragraph (h)(1) of this AD prior to further flight after the conversion.

(1) Within 6 months after the effective date of this AD, record the existing fault codes stored in the FQIS processor and before further flight thereafter do a BITE check (check of built-in test equipment) of the FQIS. If any nondispatchable fault code is recorded prior to the BITE check or as a result of the BITE check, before further flight, do all applicable repairs and repeat the BITE check until a successful test is performed with no nondispatchable faults found, using a method approved in accordance with the procedures specified in paragraph (i) of this AD. Repeat these actions thereafter at intervals not to exceed 750 flight hours. Modification as specified in paragraph (h)(2) of this AD does not terminate the repetitive BITE check requirement of this paragraph.

(2) Within 72 months after the effective date of this AD, modify the airplane by separating FQIS wiring that runs between the FQIS processor and the center tank wing spar penetrations, including any circuits that might pass through a main fuel tank, from other airplane wiring that is not intrinsically safe, using methods approved in accordance with the procedures specified in paragraph (i) of this AD.

(i) 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 certification office, send it to the attention of the person identified in paragraph (j) 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 Company 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.

(j) Related Information

For more information about this AD, contact Jon Regimbal, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3557; email: Jon.Regimbal@faa.gov.

(k) Material Incorporated by Reference

None.

Issued on August 26, 2020.

Lance T. Gant,

Director, Compliance & Airworthiness Division, Aircraft Certification Service.

[FR Doc. 2020-19809 Filed 9-23-20; 8:45 am]