[Federal Register Volume 85, Number 194 (Tuesday, October 6, 2020)]
[Rules and Regulations]
[Pages 62981-62990]
From the Federal Register Online via the Government Publishing Office [www.gpo.gov]
[FR Doc No: 2020-21996]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2016-6145; Product Identifier 2015-NM-056-AD; Amendment 39-21223; AD 2020-18-02]

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 747-400, 747-400D, and 747-400F series airplanes. This AD was prompted by the FAA's analysis of the Model 747 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 November 10, 2020.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of November 10, 2020.

ADDRESSES: For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminster 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, Airworthiness Products Section, Operational Safety 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 https://www.regulations.gov by searching for and locating Docket No. FAA-2016-6145.

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-2016-6145; 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 747-400, 747-400D, and 747-400F series airplanes. The NPRM published in the Federal Register on May 3, 2016 (81 FR 26490). The NPRM was prompted by the FAA's analysis of the Model 747 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 proposed AD 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), United Parcel Service (UPS) and KLM Royal Dutch Airlines (KLM) requested that the FAA withdraw the NPRM. A4A/CAA and UPS cited comments submitted by Boeing to Docket No. FAA-2012-0187 in which Boeing stated that the risk is “less than extremely improbable.” A4A/CAA added that Boeing does not believe that an unsafe condition exists. UPS stated the Boeing's comments demonstrate an unsafe condition does not exist. A4A/CAA and UPS noted that they consider the Boeing comments to be applicable to the airplane models in the NPRM. KLM added that it understands that Boeing is not able to explain or substantiate the rationale behind the NPRM.

KLM and Martinair stated that the NPRM does not clarify the necessity of additional actions beyond the currently mandated Special Federal Aviation Regulation (SFAR) No. 88 (in 14 CFR part 21), related service bulletins, airworthiness limitations, and critical design configuration control limitations. UPS stated that an agency is required to consider all relevant factors and articulate a satisfactory explanation for its action. UPS noted that the FAA is apparently basing its decision to issue the AD on historical SFAR 88 design reviews that have been superseded by the more recent Boeing analysis and favorable operational experience in the years since the SFAR 88 reviews were completed.

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 currently mandated SFAR 88 service bulletins, airworthiness limitations, and critical design configuration control limitations 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: No Unsafe Condition

Boeing requested that the FAA withdraw the NPRM. Boeing suggested that, by requiring center fuel tank FQIS wire separation for passenger airplanes that have not incorporated a nitrogen generating system (NGS), the NPRM specifically addresses airplanes regulated by the European Union Aviation Safety Agency (EASA) and other civil aviation authorities and the lack of a flammability reduction means (FRM) rule. Boeing stated that because it considered the use of FRM (NGS) to address unknown ignition sources as the final corrective action, Boeing has not developed center tank FQIS wire separation service instructions for passenger aircraft. Boeing stated that it believes no unsafe condition exists and does not feel that the lack of FRM rule harmonization should cause additional work and expense for airlines.

The FAA disagrees with the commenter's request. The FAA determined that an unsafe condition exists using the criteria in FAA Policy Memorandum ANM100-2003-112-15, "SFAR 88–Mandatory Action Decision Criteria," dated February 25, 2003.[1] That policy was used to evaluate the noncompliant design areas identified in the manufacturer's fuel system reviews and to determine which noncompliance issues were unsafe conditions that required corrective action under 14 CFR part 39. The FAA's unsafe condition determination was not based on an assessment of average risk or total fleet risk, but rather was driven by the qualitative identification of an unacceptable level of individual risk that exists on flights that are anticipated to occur with a preexisting latent in-tank failure condition and with a flammable center fuel tank. For these reasons, and based on further detailed responses to similar comments in the SNPRM for 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"), which addressed the same unsafe condition for Boeing Model 757 airplanes, the FAA has determined that it is necessary to issue this final rule.

Request To Withdraw NPRM: Probability Analysis Inconsistent With Regulatory Requirements

A4A/CAA and UPS requested that the FAA withdraw the NPRM. The commenters stated that the assumption of a single failure regardless of probability is inconsistent with 14 CFR part 25 regulatory requirements. The commenters referred to the phrase "regardless of probability" associated with single failures. A4A/CAA and UPS acknowledged that the term is used with single failures in FAA Advisory Circular (AC) 25.981-1C,[2] "Fuel Tank Ignition Source Prevention

[1] https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgPolicy.nsf/0/dc94c3a46396950386256d5e006aed11/$FILE/Feb2503.pdf.

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

Guidelines," but since that term does not appear in 14 CFR 25.981(a)(3), the commenters considered its use arbitrary, possibly introducing additional requirements not included in that section. A4A/CAA and UPS 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 commenters' request. The FAA notes that the commenters' 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 and UPS 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). The commenters referred to the FTFR rule and decision to not require 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. UPS 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. The commenters also referred to the FAA's response to comments in the preamble to the SNPRM for Docket No. FAA-2012-0187, which documented the FAA's decision on applicability of FRM and cost estimates. The commenters 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. The commenters added that the FAA did not discuss other changes to the FQIS system in the FTFR rule.

The FAA disagrees with the commenters' 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 SFAR 88 AD Board held by the FAA in 2003 using the guidance in FAA Policy Memorandum ANM100-2003-112-15 for high-flammability fuel tanks, including the center fuel tank on Model 747-400 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 and UPS requested that the FAA withdraw the NPRM based on a lack of consistent design standards for FQIS wire separation. The commenters assumed that the approved standard for the retrofit is a 2-inch wire separation minimum, which the commenters considered arbitrary and inconsistently applied. The commenters reported that the amount of wiring capable of meeting that separation standard varies widely among airplane models. A4A/CAA and UPS 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 commenters' 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 and UPS requested that the FAA withdraw the NPRM. The commenters noted that airplanes with FRM are not included in the applicability, and the NPRM would therefore not fully address the unsafe condition. The commenters added that the distinction between high- and low-flammability exposure time fuel tanks as used in the NPRM is arbitrary. The commenters 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. The commenters also stated that allowing the proposed alternative actions for cargo airplanes does not fully address the unsafe condition in the NPRM. The commenters referenced the FAA's response to comments in AD 2016-07-07 regarding this issue. The commenters summarized numerical analysis showing no significant difference in risk between high- and low-flammability fuel tanks. The commenters concluded that the FAA's risk analysis is arbitrary and an unsafe condition does not exist.

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 commenters, 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/turbofan 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 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 commenters 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 commenters' analysis does not account for this significant effect. Second, the numerical analysis used by the commenters 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 commenters 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: Inadequate Fleet Exposure and Cost Estimates

Boeing requested that the FAA withdraw the NPRM. Boeing stated that the fleet exposure for the affected fleet continues to decrease due to aging airplanes and production stopping on Model 747-400 airplanes. Boeing added that the estimated costs in the NPRM do not take into account the costs of compliance for passenger airplanes without FRM installed.

The FAA disagrees with the commenter's request. The FAA did not base its unsafe condition determination on fleet risk but instead on individual risk. This is discussed in detail in the response to comments in the SNPRM for Docket No. FAA-2012-0187, under the heading “Request To Withdraw NPRM (77 FR 12506, March 1, 2012): Unjustified by Risk.” Therefore, the age of the airplane and its current production stoppage do not affect the determination that an unsafe condition still exists on an individual airplane.

The NPRM for this proposed rule did contain a cost estimate for passenger airplanes that was based on the estimate provided by Boeing for the Model 757 and Model 767 airplanes, which have an FQIS of similar design. The FAA notes that Boeing asserted that the cost to operators of modifying an airplane's FQIS to be fully compliant with the airworthiness standards would be similar to the cost of installing Boeing's NGS flammability reduction system. Based on that, Boeing requested that the

FAA agree to not require Boeing to develop service information for a fully compliant FQIS modification. However, the FAA used Boeing's estimate of the cost to modify the Model 757 and Model 767 FQIS to a fully part-25-compliant configuration to provide the estimated costs in the NPRM, based on an assumption that the cost for Model 747 airplanes would be similar. At the time, Boeing concurred with this estimate. This is discussed in detail in the response to comments in the SNPRM for Docket No. FAA-2012-0187. Therefore, the FAA has not changed this AD regarding this issue.

Request To Withdraw NPRM: Insufficient Justification for AD

Based on an assertion that the FAA did not sufficiently explain how the unsafe condition justifies AD rulemaking, UPS requested that the FAA withdraw the NPRM. UPS stated that the FTFR rule did not suggest that any future modifications of FQIS systems had been considered. UPS contended that all-cargo operators were surprised and prejudiced by costly proposed FQIS modifications that are unsupported by both an updated risk assessment and full cost/benefit analysis that consider the pertinent facts. UPS alleged that the FAA did not fully explain or justify its decision making for the NPRM, and concluded that the NPRM is arbitrary and does not reflect properly reasoned agency action.

The FAA disagrees with the commenter's request. A review of the rulemaking record shows that the commenter's first assertion is not correct. The FAA notes that Section III.K.5. of the preamble of the FTFR rule states that “the findings from the analysis required by SFAR 88 showed that most transport category airplanes with high-flammability fuel tanks needed transient suppression units (TSUs) to prevent electrical energy from airplane wiring from entering the fuel tanks in the event of a latent failure in combination with a single failure.” In addition, the NPRM for the FTFR rule (70 FR 70922, November 23, 2005) states: “As part of the safety reviews of SFAR 88, we have identified other models that likewise would need a transient suppression device.” These statements indicate that the FAA expects to take AD action on multiple airplane models to address FQIS issues identified through the SFAR 88 analyses. The preamble of the FTFR rule also states that the proposed FRM has the potential to reduce the industry cost associated with those expected ADs because the installation of an FRM likely would eliminate the need to further address the FQIS issue through AD actions.

The purpose of those statements was to note that there would be some cost savings to industry resulting from the elimination of other actions required to address an unsafe condition for the airplanes affected by the proposed rules, and to point out that the FAA did not take credit for those potential cost reductions in assessing the cost of the FTFR rule because the costs were not well understood at the time. That statement was not a commitment by the FAA to forego issuing ADs if necessary to address an identified unsafe condition on the airplanes but rather to not require the affected airplanes to incorporate FRM. As noted previously, the NPRM for the FTFR rule and the FTFR rule both made statements indicating that the FAA expects to issue AD actions on multiple airplane models to address FQIS issues identified through the SFAR 88 analyses. The FAA explained the unsafe condition and the risk on anticipated flights with a pre-existing latent failure condition in the NPRM to this final rule. The FAA also provided an estimate of the costs associated with the proposed AD in accordance with FAA rulemaking policy and the Administrative Procedures Act. The FAA has not changed this AD regarding this issue.

Request To Require Cargo Airplane Option for All Airplanes

Boeing 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, including passenger airplanes with FRM not installed due to differences in foreign regulations. In addition, Boeing requested that the actions specified in paragraph (h) of the proposed AD become the primary means of compliance for all airplanes, not an alternative method of compliance for some airplanes. In addition, KLM proposed that the FAA review if the “Alternative Actions for Cargo Airplanes” as

described in paragraph (h) of the proposed AD is a possible acceptable means of compliance for passenger airplanes.

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 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.

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.

Request To Exclude Certain Airplanes

Delta Airlines (DAL) requested that the FAA revise the proposed AD to exclude airplanes that are affected by 14 CFR 121.1117. DAL and 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. DAL suggested modifying paragraph (c) of the proposed AD to clarify that the proposed AD is only applicable to aircraft that are not affected by 14 CFR 121.1117. UAL also 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 commenters' requests. 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. EASA, for example, has chosen not to require FRM to be retrofitted to in-service airplanes. This AD is intended to require any Model 747-400 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 airworthiness standards. This requirement fulfills the FAA's International Civil Aviation Organization (ICAO) obligation 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 Change Compliance Time

A4A/CAA 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. The commenter 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.

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 A4A/CAA's requests 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 the 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 Exclude Airplanes To Be Retired

Virgin Atlantic Airways (VAA) and British Airways (BA) requested that the proposed AD be revised to provide dispensation for aircraft to be retired. VAA specifically asked for dispensation for aircraft to be retired before 2022, noting that a costly retrofit is a real concern and a penalty to continued operation of aircraft that are scheduled for retirement in the coming years.

The FAA disagrees with the commenters' request. As previously mentioned, the FAA has revised this AD to provide 72 months from the effective date of this AD for incorporation of the required modification. This compliance time extends several years beyond the 2022 date requested by VAA, and appears to be beyond the 747-400 fleet retirement time planned by BA based on media reports. Therefore, the FAA has determined that special dispensation for aircraft to be retired is not needed. The FAA has not changed this AD regarding this issue.

Request To Extend Repetitive BITE Check Interval

Boeing, KLM, and Martinair 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 Boeing Service Bulletin 747-28-2340, dated June 6, 2014. KLM and Martinair requested that the repetitive check interval be extended to 1,000 flight hours to match A-check intervals.

The FAA agrees to extend the repetitive check interval to 750 flight hours to match the repetitive intervals specified in Boeing Service Bulletin 747-28-2340, dated June 6, 2014. The FAA intended to propose a 750 flight hour interval, but inadvertently specified 650 flight hour intervals in the proposed AD. The FAA disagrees with extending the repetitive check interval to 1,000 flight hours because the 750 flight hours was agreed to during discussion of the risk assessment and service information for the cargo airplane option with Boeing. The FAA has revised paragraph (h)(1) of this AD to specify repetitive intervals of 750 flight hours.

Request To Add an Optional Method of Compliance

Boeing requested that paragraph (h) or (i) of the proposed AD be revised to add Boeing Service Bulletin 747-28-2344, dated October 12, 2018, as an optional method of compliance. Boeing noted that the proposed AD does not specify any authority for how to perform the required modification. Boeing noted that Boeing Service Bulletin 747-28-2344, dated October 12, 2018, provides a certified design and procedure for accomplishing the wire separation modification and will ensure the modification is performed to specified requirements.

The FAA agrees with the commenter's request. The FAA has revised paragraph (h)(2) of this AD to specify that Boeing Service Bulletin 747-28-2344, dated October 12, 2018, is an acceptable method of compliance. This revision includes adding paragraphs (h)(2)(i) and (ii) of this AD. The FAA has also revised the Estimated Costs for Alternative Actions table in this final rule to include the estimated costs for the inspections and wire separation modification specified in Boeing Service Bulletin 747-28-2344, dated October 12, 2018, if operators choose to comply using that method.

The FAA notes that this cost estimate is based on data provided in Boeing Service Bulletin 747-28-2344, dated October 12, 2018, while the cost estimate provided for a modification using methods approved in accordance with the procedures specified in paragraph (h)(2)(i) of this AD (paragraph (h)(2) of the proposed AD) is based on data provided by the manufacturer for Model 757 and 767 airplanes. 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.

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 The Boeing Company 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 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 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. This AD applies only to Model 747-400, 747-400D, and 747-400F series airplanes, which are no longer in production. 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 747 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 Provide Cost-Effective Method of Compliance

Korean Air Lines (KAL), VAA, KLM, and BA requested that the FAA encourage Boeing to provide a cost-effective method of compliance for passenger airplanes. KAL noted that the proposed AD does not provide a clear means of compliance for the modification, such as a Boeing service bulletin. KAL and VAA noted that the majority of non-FAA operators are not required to retrofit the NGS system. The commenters requested that the FAA encourage Boeing to develop an acceptable cost-effective method of compliance that does not require installation of an NGS. KLM and Martinair also noted that EASA only adopted the FAA operational requirement to equip an FRM on newly delivered airplanes.

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' request. 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. In addition, as noted previously, Boeing has issued Service Bulletin 747-28-2344, dated October 12, 2018, for all-cargo airplanes, and the FAA has revised paragraph (h)(2)(ii) of this AD to specify that Boeing Service Bulletin 747-28-2344, dated October 12, 2018, is an acceptable method of compliance.

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.

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 Applicability

The FAA has revised paragraph (c) of this AD to clarify that airplanes equipped with an ignition mitigation means (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. The FAA intended for airplanes with compliant IMM to be excluded from the actions required by this AD. The FAA has determined that the installation of an approved IMM provides a level of risk reduction at least as great as that provided by FRM and adequately addresses the unsafe condition.

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.

Related Service Information Under 1 CFR Part 51

The FAA reviewed Boeing Service Bulletin 747-28-2340, dated June 6, 2014. This service information describes procedures for a BITE check (check of built-in test equipment) of the FQIS.

The FAA also reviewed Boeing Service Bulletin 747-28-2344, dated October 12, 2018. This service information describes procedures for a general visual inspection for any damage to the FQIS wire bundle, repair of damaged FQIS wire bundles, and modification of the airplane by separating FQIS wiring that runs between the FQIS processor and the center tank wing spar penetrations from other airplane wiring.

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

The FAA estimates that this AD affects 71 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

Estimated Costs for Required Actions

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Modification	1,200 work-hours × $85 per hour = $102,000	$200,000	$302,000	$21,442,000

Estimated Costs for Alternative Actions

Action	Labor cost	Parts cost	Cost per product
BITE check	1 work-hours × $85 per hour = $85 per check	$0	$340 per year (4 checks per year)
Inspection and wire separation (using service information)	Up to 41 work-hours × $85 per hour = Up to $3,845	4,220	Up to $8,065
Wire separation	74 work hours × $85 per hour = $6,290	10,000	$16,290

The FAA has received no definitive data that would enable us to provide cost estimates for the on-condition actions specified in this AD.

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):

2020-18-02 The Boeing Company: Amendment 39-21223; Docket No. FAA-2016-6145; Product Identifier 2015-NM-056-AD.

(a) Effective Date

This AD is effective November 10, 2020.

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 747-400, -400D, and -400F series airplanes, certificated in any category, excluding the 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 747 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. 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, in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-28-2340, dated June 6, 2014. 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, in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-28-2340, dated June 6, 2014. 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, do the actions specified in paragraph (h)(2)(i) or (ii) of this AD.

(i) 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.

(ii) Do a general visual inspection for any damage to the FQIS wire bundle and all applicable repairs; and 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; in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-28-2344, dated October 12, 2018. Do all applicable repairs before further flight.

(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)(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 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.

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

(i) The steps labeled as RC, including substeps under an RC step and any figures identified in an RC step, must be done to comply with the AD. If a step or substep is labeled “RC Exempt,” then the RC requirement is removed from that step or substep. An AMOC is required for any deviations to RC steps, including substeps and identified figures.

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

(j) Related Information

(1) 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.

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

(k) 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 747-28-2340, dated June 6, 2014.

(ii) Boeing Service Bulletin 747-28-2344, dated October 12, 2018.

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminster 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, Airworthiness Products Section, Operational Safety 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, email fedreg.legal@nara.gov, or go to: https://www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued on August 19, 2020.

Gaetano A. Sciortino,

Deputy Director for Strategic Initiatives, Compliance & Airworthiness Division, Aircraft Certification Service.

[FR Doc. 2020-21996 Filed 10-5-20; 8:45 am]