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Done at Washington, DC, on November 16, 2010.

Alfred V. Almanza,

Administrator.

[FR Doc. 2010–29492 Filed 11–22–10; 8:45 am]

BILLING CODE 3410–DM–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM415; Special Conditions No. 25–414–SC]

Special Conditions: Boeing Model 787–8 Airplane; Lightning Protection of Fuel Tank Structure To Prevent Fuel Tank Vapor Ignition

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Boeing Model 787–8 airplane. This airplane will have novel or unusual design features when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. The Boeing Model 787–8 airplane will incorporate a fuel tank nitrogen generation system (NGS) that actively reduces flammability exposure within the main fuel tanks significantly below that required by the fuel tank flammability regulations. Among other benefits, this significantly reduces the potential for fuel vapor ignition caused by lightning strikes. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: *Effective Date:* December 23, 2010.

FOR FURTHER INFORMATION CONTACT: Mike Dostert, FAA, ANM–112, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington 98057–3356; telephone (425) 227–2132; facsimile (425) 227–1149.

SUPPLEMENTARY INFORMATION:

Background

On March 28, 2003, The Boeing Company applied for an FAA type certificate for its new Boeing Model 787–8 passenger airplane. The Boeing Model 787–8 airplane will be a new design, two-engine turbo-jet transport category airplane with a two-aisle cabin configuration. The maximum takeoff weight will be 484,000 pounds, and it will carry a maximum of 381 passengers.

Type Certification Basis

Under provisions of Title 14, Code of Federal Regulations (14 CFR) 21.17, Boeing must show that Boeing Model 787–8 airplanes (hereafter referred to as "the 787") meet the applicable provisions of 14 CFR part 25, as amended by Amendments 25–1 through 25–117, with three exceptions. Sections 25.809(a) and 25.812 will remain as amended by Amendment 25–115, and § 25.981, which will be as amended by Amendment 25–125 in accordance with 14 CFR 26.37.

If the Administrator finds that the applicable airworthiness regulations (*i.e.,* part 25) do not contain adequate or appropriate safety standards for the 787 because of novel or unusual design features, special conditions are prescribed under provisions of 14 CFR 21.16.

In addition to the applicable airworthiness regulations and special conditions, the 787 must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36. Finally, the FAA must also issue a finding of regulatory adequacy under § 611 of Public Law 92–574, the "Noise Control Act of 1972."

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type certification basis under § 21.17(a)(2).

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design features, the special conditions would also apply to the other model under § 21.101.

Novel or Unusual Design Features

The 787 will have a fuel tank NGS that is intended to control fuel tank flammability. This NGS is designed to provide a level of performance that will reduce the warm day fleet average wing fuel tank flammability significantly below the maximum wing fuel tank flammability limits set in § 25.981(b), as amended by Amendment 25–125. This high level of wing fuel tank NGS performance is an unusual design feature not envisioned at the time the regulations in the 787 certification basis were promulgated.

Existing Regulations

The certification basis of the 787 includes § 25.981, as amended by Amendment 25–125, as required by 14 CFR 26.37. This amendment includes the ignition prevention requirements in § 25.981(a), as amended by Amendment 25–102, and it includes revised flammability limits for the wing fuel tanks and new specific limitations on flammability of normally emptied fuel tanks located within the fuselage contour as defined in § 25.981(b), as amended by Amendment 25–125. (Section 25.981(c) contains an alternative to meeting paragraph (b)—vapor ignition mitigation—that is not applicable to the 787 design.)

Ignition Source Prevention

Section 25.981(a)(3) requires applicants to show that 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. This requirement was originally adopted in Amendment 25–102 and it requires the assumption that the fuel tanks are always flammable when showing the probability of an ignition source being present is extremely remote. (Amendment 25–102 included § 25.981(c) that required minimizing fuel tank flammability and this was defined in the preamble as being equivalent to unheated aluminum fuel tanks located in the wing.) This

requirement defines three types of scenarios that must be addressed in order to show compliance with § 25.981(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 of occurrence, in combination with any latent failure condition not shown to be at least extremely remote, 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. Demonstration of compliance with this requirement would typically require a structured, quantitative safety analysis. Design areas that have latent failure conditions typically would be driven by these requirements to have multiple fault tolerance, or "triple redundancy." This means that ignition sources are still prevented even after two independent failures.

Flammability Limits

Section 25.981(b) states that no fuel tank fleet average flammability exposure may exceed 3 percent of the flammability exposure evaluation time calculated using the method in part 25, Appendix N, or the fleet average flammability of a fuel tank within the wing of the airplane being evaluated, whichever is greater. If the wing is not a conventional unheated aluminum wing, the analysis must be based on an assumed equivalent construction conventional unheated aluminum wing. In addition, for fuel tanks that are normally emptied during operation and that have any part of the tank located within the fuselage contour, the fleet average flammability for warm days (above 80° F) must be limited to 3 percent as calculated using the method in part 25, Appendix M.

Application of Existing Regulations Inappropriate Due to Impracticality

Since the issuance of § 25.981(a)(3), as amended by Amendment 25–102, the FAA has conducted certification projects in which applicants found it impractical to meet the requirements of that regulation for some areas of lightning protection for fuel tank structure. Partial exemptions were issued for these projects. These same difficulties exist for the 787 project.

The difficulty of designing multiple-fault-tolerant structure, and the difficulty of detecting failures of hidden structural design features in general, makes compliance with § 25.981(a)(3) uniquely challenging and impractical for certain aspects of the electrical bonding of structural elements. Such bonding is needed to prevent occurrence of fuel tank ignition sources from lightning strikes. The effectiveness and fault tolerance of electrical bonding features for structural joints and fasteners is partially dependent on design features that cannot be effectively inspected or tested after assembly without damaging the structure, joint, or fastener. Examples of such features include a required interference fit between the shank of a fastener and the hole in which the fastener is installed, metal foil or mesh imbedded in composite material, a required clamping force provided by a fastener to pull two structural parts together, and a required faying surface bond between the flush surfaces of adjacent pieces of structural material such as in a wing skin joint or a mounting bracket installation. In addition, other features that can be physically inspected or tested may be located within the fuel tanks; therefore, it is not practical to inspect for failures of those features at short intervals. Examples of such failures include separation or loosening of cap seals over fastener ends and actual structural failures of internal fasteners. This inability to practically detect manufacturing errors and failures of structural design features critical to lightning protection results in degraded conditions that occur and remain in place for a very long time, possibly for the remaining life of the airplane.

Accounting for such long failure latency periods in the system safety analysis required by § 25.981(a)(3) would require multiple fault tolerance in the structural lightning protection design. As part of the design development activity for the 787, Boeing has examined possible design provisions to provide multiple fault tolerance in the structural design to prevent ignition sources from occurring in the event of lightning attachment to the airplane in critical locations. Boeing has concluded from this examination that providing multiple fault tolerance for some structural elements is not practical. Boeing has also identified some areas of the 787 design where it is impractical to provide even single fault tolerance in the structural design to prevent ignition sources from occurring in the event of lightning attachment after a single failure. The FAA has reviewed this examination with Boeing in detail and has agreed that providing fault tolerance beyond that in the proposed 787 design for these areas would be impractical.

As a result of the 787 and other certifications projects, the FAA has now determined that compliance with § 25.981(a)(3) is impractical for some areas of lightning protection for fuel tank structure, and that application of § 25.981(a)(3) to those design areas is therefore inappropriate. The FAA plans further rulemaking to revise § 25.981(a)(3). As appropriate, the FAA plans to issue special conditions or exemptions, for certification projects progressing before the revision is complete. This is discussed in FAA Memorandum ANM–112–08–002, Policy on Issuance of Special Conditions and Exemptions Related to Lightning Protection of Fuel Tank Structure, dated May 26, 2009.[1]

Application of Existing Regulations Inappropriate Due to Compensating Feature That Provides Equivalent Level of Safety

Section 25.981(b) sets specific standards for fuel tank flammability as discussed above under "Flammability Limits." Under that regulation, the fleet average flammability exposure of wing main tanks on the 787 may not exceed 3 percent of the flammability exposure evaluation time calculated using the method in part 25, Appendix N, or the fleet average flammability of a wing main tank within an equivalent construction conventional unheated aluminum wing fuel tank, whichever is greater. The typical fleet average fuel tank flammability of fuel tanks located in the wing ranges between 1 and 5 percent. If it is assumed that a 787 equivalent conventional unheated aluminum wing fuel tank would not exceed a fleet average flammability time of 3 percent, the actual composite airplane wing fuel tank design would be required to comply with the 3 percent fleet average flammability standard and therefore a means to reduce the flammability to 3 percent would be required. However, the proposed 787 design includes a wing tank NGS that will also be shown to meet the additional, more stringent warm day average flammability standard in part 25, Appendix M, which is only required for normally emptied fuel tanks with some part of the tank within the fuselage contour. Fuel tanks that meet this requirement typically have average fuel tank flammability levels well below the required 3 percent.

Since the proposed wing tank NGS on the 787 provides performance that meets part 25, Appendix M, the FAA has determined that the risk reduction

[1] The memorandum may be viewed at: *http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgPolicy.nsf/0/12350AE62D393B7A862575C300709CA3?OpenDocument&Highlight=anm-112-08-002.*

provided by this additional performance will provide compensation for some relief from the ignition prevention requirements of § 25.981(a)(3) while still establishing a level of safety equivalent to that established in the regulations.

In determining the appropriate amount of relief from the ignition prevention requirements of § 25.981(a), the FAA considered the original overall intent of Amendment 25–102, which was to ensure the prevention of catastrophic events due to fuel tank vapor explosion. These special conditions are intended to achieve that objective through a prescriptive requirement that fault tolerance (with respect to the creation of an ignition source) be provided for all structural lightning protection design features where providing such fault tolerance is practical, and through a performance-based standard for the risk due to any single failure vulnerability that exists in the design. In addition, for any structural lightning protection design features for which Boeing shows that providing fault tolerance is impractical, these special conditions would require Boeing to show that a fuel tank vapor ignition event due to the summed risk of all non-fault-tolerant design features is extremely improbable. Boeing would be required to show that this safety objective is met by the proposed design using a structured system safety assessment similar to that currently used for demonstrating compliance with §§ 25.901 and 25.1309.

Discussion of the Final Special Conditions

Given these novel design features, and the compliance challenges noted earlier in this document, the FAA has determined that application of § 25.981(a)(3) is inappropriate in that it is neither practical nor necessary to apply the ignition source prevention provisions of § 25.981(a)(3) to the specific fuel tank structural lightning protection features of the 787. However, without the § 25.981(a)(3) provisions, the remaining applicable regulations in the 787 certification basis would be inadequate to set an appropriate standard for fuel tank ignition prevention. Therefore, in accordance with provisions of § 21.16, the FAA has determined that, instead of § 25.981(a)(3), alternative fuel tank structural lighting protection requirements be applied to fuel tank lightning protection features that are integral to the airframe structure of the 787. These alternative requirements are intended to provide the level of safety intended by § 25.981(a)(3), based on our recognition, as discussed above, that a highly effective NGS for the fuel tanks makes it unnecessary to assume that the fuel tank is always flammable. As discussed previously, the assumption that the fuel tanks are always flammable was required when demonstrating compliance to the ignition prevention requirements of § 25.981(a)(3).

One resulting difference between these special conditions and the § 25.981(a)(3) provisions they are meant to replace is the outcome being prevented—fuel vapor ignition versus an ignition source. These special conditions acknowledge that the application of fuel tank flammability performance standards will reduce fuel tank flammability to an extent that it is appropriate to consider the beneficial effects of flammability reduction when considering design areas where it is impractical to comply with § 25.981(a)(3).

One of the core requirements of these special conditions is a prescriptive requirement that structural lightning protection design features must be fault tolerant. (An exception wherein Boeing can show that providing fault tolerance is impractical, and associated requirements, is discussed below.) The other core requirement is that Boeing must show that the design, manufacturing processes, and airworthiness limitations section of the instructions for continued airworthiness include all practical measures to prevent, and detect and correct, failures of structural lightning protection features due to manufacturing variability, aging, wear, corrosion, and likely damage. The FAA has determined that, if these core requirements are met, a fuel tank vapor ignition event due to lightning is not anticipated to occur in the life of the airplane fleet. This conclusion is based on the fact that a critical lightning strike to any given airplane is itself a remote event, and on the fact that fuel tanks must be shown to be flammable for only a relatively small portion of the fleet operational life.

For any non-fault-tolerant features proposed in the design, Boeing must show that eliminating these features or making them fault tolerant is impractical. The requirements and considerations for showing it is impractical to provide fault tolerance are described in FAA Memorandum ANM–112–08–002. This requirement is intended to minimize the number of non-fault tolerant features in the design.

For areas of the design where Boeing shows that providing fault tolerant structural lighting protection features is impractical, non-fault-tolerant features will be allowed provided Boeing can show that a fuel tank vapor ignition event due to the non-fault-tolerant features is extremely improbable when the sum of probabilities of those events due to all non-fault-tolerant features is considered. Boeing will be required to submit a structured, quantitative assessment of fleet average risk for a fuel tank vapor ignition event due to all non-fault-tolerant design features included in the design. This will require determination of the number of non-fault tolerant design features, estimates of the probability of the failure of each non-fault-tolerant design feature, and estimates of the exposure time for those failures. This analysis must include failures due to manufacturing variability, aging, wear, corrosion, and likely damage.

It is acceptable to consider the probability of fuel tank flammability, the probability of a lightning strike to the airplane, the probability of a lightning strike to specific zones of the airplane (for example, Zone 2 behind the nacelle, but not a specific location or feature), and a distribution of lightning strike amplitude in performing the assessment provided the associated assumptions are acceptable to the FAA. The analysis must account for any dependencies among these factors, if they are used. The assessment must also account for operation with inoperative features and systems, including any proposed or anticipated dispatch relief. This risk assessment requirement is intended to ensure that an acceptable level of safety is provided given the non-fault-tolerant features in the proposed design.

Part 25, Appendix N, as adopted in Amendment 25–125, in conjunction with these special conditions, constitutes the standard for how to determine flammability probability. In performing the safety analysis required by these special conditions, relevant § 25.981(a)(3) compliance guidance is still applicable. Appropriate credit for the conditional probability of environmental or operational conditions occurring is normally limited to those provisions involving multiple failures, and this type of credit is not normally allowed in evaluation of single failures. However, these special conditions would allow consideration of the probability of occurrence of lightning attachment and flammable conditions when assessing the probability of structural failures resulting in a fuel tank vapor ignition event.

The FAA understands that lightning protection safety for airplane structure is inherently different from lightning protection for systems. We intend to apply these special conditions only to

structural lightning protection features of fuel systems. We do not intend to apply the alternative standards used under these special conditions to other areas of the airplane design evaluation.

Requirements Provide Equivalent Level of Safety

In recognition of the unusual design feature discussed above, and the impracticality of requiring multiple fault tolerance for lightning protection of certain aspects of fuel tank structure, the FAA has determined that an equivalent level of safety to direct compliance with § 25.981(a)(3) will be achieved for the 787 by applying these requirements. The FAA considers that, instead of only concentrating on fault tolerance for ignition source prevention, significantly reducing fuel tank flammability exposure in addition to preventing ignition sources is a better approach to lightning protection for the fuel tank. In addition, the level of average fuel tank flammability achieved by compliance with these special conditions is low enough that it is not appropriate or accurate to assume in a safety analysis that the fuel tanks may always be flammable.

Section 25.981(b), as amended by Amendment 25–125, sets limits on the allowable fuel tank flammability for the 787. Paragraph 2(a) of these special conditions applies the more stringent standard for warm day flammability performance applicable to normally emptied tanks within the fuselage contour from § 25.981(b) and part 25, Appendix M, to the wing tanks of the 787.

Because of the more stringent fuel tank flammability requirements in these special conditions, and because the flammability state of a fuel tank is independent of the various failures of structural elements that could lead to an ignition source in the event of lightning attachment, the FAA has agreed that it is appropriate in this case to allow treatment of flammability as an independent factor in the safety analysis. The positive control of flammability and the lower flammability that is required by these special conditions exceeds the minimum requirements of § 25.981(b). This offsets a reduction of the stringent standard for ignition source prevention in § 25.981(a)(3), which assumes that the fuel tank is flammable at all times.

Given the stringent requirements for fuel tank flammability, the fuel vapor ignition prevention and the ignition source prevention requirements in these special conditions will prevent "* * * catastrophic failure * * * due to ignition of fuel or vapors" as stated in § 25.981(a). Thus, the overall level of safety achieved by these special conditions is considered equivalent to that which would be required by compliance with § 25.981(a)(3) and (b).

Discussion of Comments

Notice of proposed special conditions No. 25–09–11–SC for the Boeing Model 787–8 airplanes was published in the **Federal Register** on October 14, 2009 (74 FR 52698). Several comments were received from two commenters (Cessna and NATCA).

Cessna #1

Cessna requested additional wording be added to the discussion of the proposed special conditions to clarify the fuel tank flammability requirements proposed in the special conditions would only be applied specifically to special conditions. Cessna referred to FAA Policy Memo ANM–112–08–002 and noted the flammability levels of Appendix M are not defined as a precondition for petitions for exemptions. Cessna proposed the following text:

"Since the proposed wing tank NGS on the 787 provides performance that meets part 25, Appendix M, the FAA has determined that the risk reduction provided by this additional performance will provide compensation for some relief from the ignition prevention requirements of § 25.981(a)(3) while still establishing a level of safety equivalent to that established in the regulations."

The additional wording proposed by the commenter clarifies that the safety level provided by the special conditions is equivalent to that established in the regulation. Part 21 only allows the FAA to propose special conditions when equivalent safety to the applicable airworthiness standards has been demonstrated. We agree with the accuracy of the commenters proposed text and modified the wording of the discussion in the special conditions as suggested by the commenter.

As we have already stated in FAA Policy Memo ANM–112–08–002 (Policy on Issuance of Special Conditions and Exemptions Related to Lightning Protection of Fuel Tank Structure), for traditional airplanes that do not have active flammability reduction systems, where the applicant shows that full compliance with § 25.981 is impractical, we intend to allow a similar reduction in the number of ignition-prevention features using the exemption process. Exemptions are needed because reducing the number of ignition-prevention features without reducing the fuel-tank flammability does not provide equivalent safety to § 25.981.

No change to the proposed special conditions was made as a result of this comment.

Cessna #2

Cessna recommended that the alternative requirements for special conditions and exemptions to § 25.981(a)(3) include considerations for both structure and systems, with regards to both lightning and electrostatics protection. They supported their comment with the rationale that electrostatic protection methods rely upon bonding techniques similar to those employed for lightning protection, and pose similar practicality issues. Each additional redundant bonding provision is itself another potential failure mode, and the over-complication of increased redundancy presents maintenance and operational issues.

Cessna requested that the proposed Special Condition No. 1, Definitions, be changed to broaden the applicability of the special conditions to include "systems internal to the fuel tank." We have already addressed this comment in developing FAA Policy Memo ANM–112–08–002. The public comments to FAA Policy Memo ANM–112–08–002 and our disposition of those comments are available at *http://rgl.faa.gov*. Click on "Policy," then search (By Policy Number) for ANM–112–08–002. The commenter has provided no new information, and no change was made to the proposed special conditions as a result of this comment.

Cessna #3

Cessna recommended the FAA include reference to guidance material developed by the Society of Automotive Engineers (SAE) AE–2 Lightning Committee directly in exemptions and special conditions. The FAA participated on the SAE committee that prepared the guidance material. However, at this time the FAA has not completed its review of the AE–2 guidance. We will review the proposed guidance material and publish it for comment if we determine it to be a viable means of showing compliance to special conditions or exemptions. In the mean time, this guidance is not necessary for the adoption of, or compliance with, these special conditions.

NATCA #1

The National Air Traffic Controller Association (NATCA) requested the proposed special conditions be withdrawn since they believe the information provided in the special condition's Background section does not support the FAA finding that the

proposed special conditions provide equivalent safety to the existing part 25 safety standards for transport airplanes.

We have already addressed this request to not publish the proposed special conditions in developing FAA Policy Memo ANM–112–08–002. For the reasons stated in that policy memo and the associated disposition of comments, we believe these special conditions do establish an equivalent level of safety.

NATCA #2 & #3

NATCA provided an alternative to the proposed special conditions. They requested the proposed special conditions be withdrawn and revised and suggested the following requirements replace those proposed by the FAA:

(1) Eliminate the allowance for single failures that can result in an ignition source, unless the fuel tank is shown to have a flammability reduction means that prevents the tanks from becoming flammable or,

(2) Do not allow dispatch of any airplane with the inerting system that is not functioning if the design does not have two independent features that will prevent an ignition source.

NATCA provided comments in support of its suggested change to the special conditions discussed above that would not "allow dispatch of any airplane with the inerting system that is not functioning if the design does not have independent features that will prevent an ignition source." They suggested a means of meeting their proposed special conditions could be achieved by "a combination of eliminating the single failures through design improvements and limiting airplane operation on warmer days with the NGS inoperative could essentially eliminate the chance of a fuel tank explosion due to a lightning strike." They supported their comment by stating design improvements implemented by Boeing have reduced the number of ignition sources and further design improvements implemented on later production airplanes could eliminate single failures. They proposed that once the single failures were eliminated, the restriction on dispatch of airplanes with the inerting system inoperative could be removed. They stated this would be a practical way to implement new technology because a small number of airplane flights could be impacted by flight delays caused by an inoperative fuel tank inerting system.

We have already addressed the proposal to restrict dispatch with the inerting system inoperative in developing FAA Policy Memo ANM–112–08–002. In short, determining appropriate dispatch relief, if any, is the function of the Flight Operations Evaluation Board and not the function of special conditions.

NATCA #4

NATCA requested extension of the comment period because guidance material regarding means of compliance with the proposed special conditions was not available to the public prior the closing of the comment period. We do not agree with the request to extend the comment period but do agree that public comment on future policy should be sought. These special conditions are specific to the 787 and means of compliance are dependent upon specific proprietary design details of the airplane that cannot be released to the public.

NATCA #5

NATCA provided comments that the number of single failures on the 787 had been reduced through design changes and that earlier exemptions issued by the FAA did not allow single failures. They questioned the FAA's determination that it is impractical to eliminate single failures in the 787 design. They offered specific examples of possible methods of preventing certain single failures discussed in the preamble to the proposed special conditions, including use of monitoring aids consisting of overlays that are on the outside the fuel tank where failure could be easily detected and therefore failure of the features would not be latent.

From this comment the FAA infers the commenter believes preventing all single failures is practical. While NATCA is correct that previously issued exemptions did not explicitly allow for single failures, at the time those exemptions were issued, we were not aware of the particular failure modes that could result in single failures that could create ignition sources. As stated in the proposed special conditions and in the discussion in FAA Policy Memo ANM–112–08–002, we now recognize that eliminating all single failures in airplane structure using current state-of-the-art design practices is not always practical.

The FAA therefore does not agree that the proposed allowance for single failure conditions should be eliminated.

NATCA #7

NATCA requested that "the FAA make available to the public all documentation supporting the impracticality findings for each ignition prevention feature that will not be fail-safe, as well as why it is impractical (costs) to issue special conditions requiring the 787 inerting system be operating on warmer days on any airplane that has been produced with known single failures." No change to the special conditions was requested in this comment. General information supporting the impracticality of eliminating single failures, as well as considerations for operating airplanes with the NGS inoperative, was previously discussed in FAA Policy Memo ANM–112–08–002. The specific design issues associated with the design of the 787 are likely to be proprietary, but that determination can only be made in the context of a Freedom of Information Act request. The special conditions, with clarifications discussed above, are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the Boeing Model 787–8 airplane. Should Boeing apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design features, these special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features of the Boeing Model 787–8 airplane. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

■ The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for the Boeing Model 787–8 airplane.

1. Definitions

Most of the terms used in Special Condition No. 2, Alternative Fuel Tank Structural Lightning Protection Requirements, either have the common dictionary meaning or are defined in Advisory Circular 25.1309–1A, System Design and Analysis, dated June 21, 1988.

The following definitions are the only terms intended to have a specialized meaning when used in Special Condition No. 2:

(a) *Basic Airframe Structure.* Includes design elements such as structural members, structural joint features, and fastener systems including airplane skins, ribs, spars, stringers, etc., and associated fasteners, joints, coatings, and sealant. Basic airframe structure may also include those structural elements that are expected to be removed for maintenance, such as exterior fuel tank access panels and fairing attachment features, provided maintenance errors that could compromise associated lightning protection features would be evident upon an exterior preflight inspection of the airplane and would be corrected prior to flight.

(b) *Permanent Systems Supporting Structure.* Includes static, permanently attached structural parts (such as brackets) that are used to support system elements. It does not include any part intended to be removed, or any joint intended to be separated, to maintain or replace system elements or other parts, unless that part removal or joint separation is accepted by the FAA as being extremely remote.

(c) *Manufacturing Variability.* Includes tolerances and variability allowed by the design and production specifications as well as anticipated errors or escapes from the manufacturing and inspection processes.

(d) *Extremely Remote.* Conditions that are not anticipated to occur to each airplane during its total life, but which may occur a few times when considering the total operational life of all airplanes of one type. Extremely remote conditions are those having an average probability per flight hour on the order of 1×10^{-7} or less, but greater than on the order of 1×10^{-9}.

(e) *Extremely Improbable.* Conditions that are so unlikely that they are not anticipated to occur during the entire operational life of all airplanes of one type. Extremely improbable conditions are those having an average probability per flight hour of the order of 1×10^{-9} or less.

2. Alternative Fuel Tank Structural Lightning Protection Requirements

For lightning protection features that are integral to fuel tank basic airframe structure or permanent systems supporting structure, as defined in Special Condition No. 1, Definitions, for which The Boeing Company shows and the FAA finds compliance with § 25.981(a)(3) to be impractical, the following requirements may be applied in lieu of the requirements of § 25.981(a)(3):

(a) The Boeing Company must show that the airplane design meets the requirements of part 25, Appendix M, as amended by Amendment 25–125, for all fuel tanks installed on the airplane.

(b) The Boeing Company must show that the design includes at least two independent, effective, and reliable lightning protection features (or sets of features) such that fault tolerance to prevent lightning-related ignition sources is provided for each area of the structural design proposed to be shown compliant with these special conditions in lieu of compliance with the requirements of § 25.981(a)(3). Fault tolerance is not required for any specific design feature if:

(1) For that feature, providing fault tolerance is shown to be impractical, and

(2) Fuel tank vapor ignition due to that feature and all other non-fault-tolerant features, when their fuel tank vapor ignition event probabilities are summed, is shown to be extremely improbable.

(c) The applicant must perform an analysis to show that the design, manufacturing processes, and airworthiness limitations section of the instructions for continued airworthiness include all practical measures to prevent, and detect and correct, failures of structural lightning protection features due to manufacturing variability, aging, wear, corrosion, and likely damage. Issued in Renton, Washington, on November 15, 2010.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 2010–29409 Filed 11–22–10; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2010–0725; Directorate Identifier 2010–NE–18–AD]; Amendment 39–16528; AD 2010–24–09]

RIN 2120–AA64

Airworthiness Directives; Pratt & Whitney PW4000 Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for the products listed above. This AD requires a one-time visual inspection of the No. 3 bearing oil pressure tube, part number (P/N) 51J041–01, P/N 50J604–01, or P/N 50J924–01. Tubes that are found cracked or repaired must be removed from service. This AD also prohibits repaired tubes from being installed. This AD results from one report of a repaired No. 3 bearing oil tube that caused an engine in-flight shutdown, seven reports of repaired No. 3 bearing oil pressure tubes found cracked that led to unscheduled engine removals, and one report of a test cell event from a repaired tube that cracked. We are issuing this AD to prevent cracking of No. 3 bearing oil pressure tubes, which could result in internal oil fire, failure of the high-pressure turbine (HPT) disks, uncontained engine failure, and damage to the airplane.

DATES: This AD is effective December 28, 2010.

Examining the AD Docket

You may examine the AD docket on the Internet at *http://www.regulations.gov;* or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800–647–5527) is Document Management Facility, U.S. Department of Transportation, Docket Operations, M–30, West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue, SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: James Gray, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; telephone (781) 238–7742; fax (781) 238–7199; e-mail: *james.e.gray@faa.gov.*

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an airworthiness directive (AD) that would apply to the specified products. That NPRM published in the **Federal Register** on June 3, 2010 (75 FR 31330). That NPRM proposed to require:

- A one-time visual inspection of the No. 3 bearing oil pressure tube, P/N 51J041–01, P/N 50J604–01, or P/N 50J924–01; and
- Removal from service if found cracked or repaired, or if suspected that the tube was repaired; and
- A prohibition on installing repaired tubes.