Rules and Regulations

Federal Register
Vol. 84, No. 111
Monday, June 10, 2019

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA–2019–0236; Special Conditions No. 25–745–SC]

Special Conditions: Boeing Model 787 Series Airplanes; Seats With Inertia Locking Devices

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Boeing Model 787 series airplane. These airplanes will have a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for transport-category airplanes. This design feature is seats with inertia locking devices. 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 June 10, 2019.

FOR FURTHER INFORMATION CONTACT: Shannon Lennon, Cabin and Airframe Safety Section, AIR–675, Transport Standards Branch, Policy and Innovation Division, Aircraft Certification Service, Federal Aviation Administration, 2200 South 216th Street, Des Moines, Washington 98198; telephone and fax 206–231–3209; email *shannon.lennon@faa.gov.*

SUPPLEMENTARY INFORMATION:

Background

On February 14, 2019, Boeing applied for a change to Type Certificate No. T00021SE for seats with inertia locking devices in Model 787 series airplanes. The Model 787 series airplane is a twin-engine transport-category airplane with a maximum takeoff weight of 560,000 pounds and seating for 440 passengers.

Type Certification Basis

Under the provisions of title 14, Code of Federal Regulations (14 CFR) 21.101, Boeing must show that the Model 787 series airplanes, as changed, continue to meet the applicable provisions of the regulations listed in Type Certificate No. T00021SE, or the applicable regulations in effect on the date of application for the change, except for earlier amendments as agreed upon by the FAA.

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

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 novel or unusual design feature, or should any other model already included on the same type certificate be modified to incorporate the same novel or unusual design feature, these special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, Boeing Model 787 series airplanes 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.

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 § 21.101.

Novel or Unusual Design Features

Boeing Model 787 series airplanes will incorporate the following novel or unusual design features:

Seats with inertia locking devices (ILD).

Discussion

Boeing will install, in Model 787 series airplanes, Thompson Aero Seating Ltd. passenger seats that can be translated in the fore and aft direction by an electrically powered motor (actuator) that is attached to the seat primary structure. Under typical service-loading conditions, the motor internal brake is able to translate the seat and hold the seat in the translated position. However, under the inertial loads of emergency-landing loading conditions specified in 14 CFR 25.562, the motor internal brake may not be able to maintain the seat in the required position. The ILD is an ''active'' device intended to control seat movement (*i.e.,* a system that mechanically deploys during an impact event) to lock the gears of the motor assembly in place. The ILD mechanism is activated by the higher inertial load factors that could occur during an emergency landing event. Each seat place incorporates two ILDs; one on either side of the seat pan. Only one ILD is required to hold an occupied seat in position during worst-case dynamic loading specified in § 25.562.

The ILD will self-activate only in the event of a predetermined airplane loading condition such as that occurring during crash or emergency landing, and will prevent excessive seat forward translation. A minimum level of protection must be provided if the seat-locking device does not deploy.

The normal means of satisfying the structural and occupant protection requirements of § 25.562 result in a non-quantified, but predictable, progressive structural deformation or reduction of injury severity for impact conditions less than the maximum specified by the rule. A seat using ILD technology, however, may involve a step change in protection for impacts below and above that at which the ILD activates and deploys to retain the seat pan in place. This could result in structural deformation or occupant injury output being higher at an intermediate impact condition than that resulting from the maximum impact condition. It is acceptable for such step-change characteristics to exist, provided the resulting output does not exceed the maximum allowable criteria at any condition at which the ILD does or does not deploy, up to the maximum severity pulse specified by the requirements.

The ideal triangular maximum severity pulse is defined in Advisory Circular (AC) 25.562–1B. For the evaluation and testing of less-severe

pulses for purposes of assessing the effectiveness of the ILD deployment setting, a similar triangular pulse should be used with acceleration, rise time, and velocity change scaled accordingly. The magnitude of the required pulse should not deviate below the ideal pulse by more than 0.5g until 1.33 t_1 is reached, where t_1 represents the time interval between 0 and t_1 on the referenced pulse shape as shown in AC 25.562–1B. This is an acceptable method of compliance to the test requirements of the special conditions.

Conditions 1 through 5 address ensuring that the ILD activates when intended in order to provide the necessary protection of occupants. This includes protection of a range of occupants under various accident conditions. Conditions 6 through 10 address maintenance and reliability of the ILD, including any outside influences on the mechanism, to ensure it functions as intended.

The 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.

Discussion of Comments

The FAA issued Notice of Proposed Special Conditions No. 25–19–03–SC, for the Boeing Model 787 series airplane, which was published in the **Federal Register** on April 29, 2019 (84 FR 17977). The FAA received responses from two commenters.

One commenter writes:

Seats are dynamically tested in upright positions to show compliance with 14 CFR part 25.562. In this specific installation, there is a mechanical or electrical actuation of the movement of the seat, and the following points of concern may raise:

(1) If the motor loses electrical power before a crash during an actuation, can it lock the seat in a position other than that considered for [taxi, takeoff, and landing] TTL?

(2) There should be included a Special Condition to address possible interference of lightning and high-intensity radiated fields on the motor or its commands;

(3) Design features should be demanded to avoid the seat to be locked in an intermediate position (for example, because of fail in link between the seat structure and the actuator).

The FAA clarifies, regarding the commenter's concerns about seat-actuator motor disability and impact on the seat position due to loss of power or other conditions, the seat design includes a manual-override feature to restore the seat in the required position. However, while the actuator motor is part of the seat-actuation system, this feature is not the subject of the proposed special conditions. Rather, the special conditions address the ILDs, which are a different component of the seat-actuation system and are intended to ensure that the seat position is maintained in the event that the structural capability of the actuator motor brake is exceeded during emergency-landing conditions. The ILDs are a mechanical interlock feature and are not affected by loss of power or external electrical forces.

Another commenter asks if such extra safety precautions as ILDs may potentially be implemented in other airplane models, adding that seats with inertia locking devices likely enhance air-travel safety.

The FAA agrees that ILDs enhance airplane safety. It is possible that ILDs potentially will be incorporated into seat designs intended for installation on other airplane models. Incorporation of such a feature is contingent on the airplane manufacturer's determination to install seats that include ILDs as part of a seat-actuation system.

The comments do not change the special conditions, and the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to Boeing Model 787 series airplanes. 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 feature, these special conditions would apply to that model as well.

Conclusion

This action affects only one novel or unusual design feature on one model series of airplanes. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

Authority Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(f), 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 Boeing Model 787 series airplanes.

In addition to the requirements of § 25.562, passenger seats incorporating an inertia locking device (ILD) must meet the following:

1. Level of Protection Provided by ILD—It must be demonstrated by test that the seats and attachments, when subject to the emergency-landing dynamic conditions specified in § 25.562, and with one ILD not deployed, do not experience structural failure that could result in:

a. Separation of the seat from the airplane floor.

b. Separation of any part of the seat that could form a hazard to the seat occupant or any other airplane occupant.

c. Failure of the occupant restraint or any other condition that could result in the occupant separating from the seat.

2. Protection Provided Below and Above the ILD Actuation Condition—If step-change effects on occupant protection exist for impacts below and above that at which the ILD deploys, tests must be performed to demonstrate that the occupant is shown to be protected at any condition at which the ILD does or does not deploy, up to the maximum severity pulse specified by § 25.562. Test conditions must take into account any necessary tolerances for deployment.

3. Protection Over a Range of Crash Pulse Vectors—The ILD must be shown to function as intended for all test vectors specified in § 25.562.

4. Protection During Secondary Impacts—The ILD activation setting must be demonstrated to maximize the probability of the protection being available when needed, considering a secondary impact that is above the severity at which the device is intended to deploy up to the impact loading required by § 25.562.

5. Protection of Occupants other than 50th Percentile—Protection of occupants for a range of stature from a two-year-old child to a ninety-five percentile male must be shown.

6. Inadvertent Operation—It must be shown that any inadvertent operation of the ILD does not affect the performance of the device during a subsequent emergency landing.

7. Installation Protection—It must be shown that the ILD installation is protected from contamination and interference from foreign objects.

8. Reliability—The performance of the ILD must not be altered by the effects of wear, manufacturing tolerances, aging or drying of lubricants, and corrosion.

9. Maintenance and Functional Checks—The design, installation, and operation of the ILD must be such that it is possible to functionally check the

device in place. Additionally, a functional check method and a maintenance check interval must be included in the seat installer's instructions for continued airworthiness (ICA) document.

10. Release Function—If a means exists to release an inadvertently activated ILD, the release means must not introduce additional hidden failures that would prevent the ILD from functioning properly.

Issued in Des Moines, Washington, on June 5, 2019.

Paul Siegmund,

Acting Manager, Transport Standards Branch, Policy and Innovation Division, Aircraft Certification Service.

[FR Doc. 2019–12121 Filed 6–7–19; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA–2019–0424; Special Conditions No. 25–748–SC]

Special Conditions: Mitsubishi Aircraft Corporation, Model MRJ–200 Airplane; Operation Without Normal Electrical Power

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Mitsubishi Aircraft Corporation (MITAC), Model MRJ–200 airplanes. These airplanes will have a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. These design features are electrical and electronic systems that perform critical functions, the loss of which could be catastrophic to the airplane. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design features. 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: This action is effective on MITAC on June 10, 2019. Send comments on or before July 25, 2019.

ADDRESSES: Send comments identified by Docket No. FAA–2019–0424 using any of the following methods:

- *Federal eRegulations Portal:* Go to *http://www.regulations.gov/* and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M–30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue SE, Room W12–140, West Building Ground Floor, Washington, DC, 20590–0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* Fax comments to Docket Operations at 202–493–2251.

Privacy: The FAA will post all comments it receives, without change, to *http://www.regulations.gov/*, including any personal information the commenter provides. Using the search function of the docket website, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the **Federal Register** published on April 11, 2000 (65 FR 19477–19478).

Docket: Background documents or comments received may be read at *http://www.regulations.gov/* at any time. Follow the online instructions for accessing the docket or go to Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Dean Thompson, Airplane and Flight Crew Interface Section, AIR–671, Transport Standards Branch, Policy and Innovation Division, Aircraft Certification Service, Federal Aviation Administration, 2200 South 216th Street, Des Moines, Washington 98198; telephone and fax 206–231–3165; email *Dean.R.Thompson@faa.gov.*

SUPPLEMENTARY INFORMATION: The substance of these special conditions has been published in the **Federal Register** for public comment in several prior instances with no substantive comments received. Therefore, the FAA has determined that prior public notice and comment are unnecessary, and finds that, for the same reason, good cause exists for adopting these special conditions upon publication in the **Federal Register**.

Comments Invited

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

We will consider all comments we receive by the closing date for comments. We may change these special conditions based on the comments we receive.

Background

On March 3, 2015, MITAC applied for a type certificate for their new Model MRJ–200 airplanes. The MITAC Model MRJ–200 airplane is a low-wing, conventional-tail design with two wing-mounted turbofan engines. The airplane has seating for 92 passengers and a maximum takeoff weight of 95,000 lbs.

Type Certification Basis

Under the provisions of title 14, Code of Federal Regulations (14 CFR) 21.17, MITAC must show that the Model MRJ–200 airplanes meet the applicable provisions of part 25, as amended by amendments 25–1 through 25–141; and part 26 continued airworthiness certification requirements, as amended by Amendments 26–1 through 26–6.

If the Administrator finds that the applicable airworthiness regulations (*i.e.,* 14 CFR part 25) do not contain adequate or appropriate safety standards for the MITAC MRJ–200 airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

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 novel or unusual design feature, these special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the MITAC MRJ–200 airplanes 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.

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).

Novel or Unusual Design Features

The MITAC Model MRJ–200 airplanes will incorporate the following novel or unusual design features: