



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2017-0126; Special Conditions No. 25-654-SC]

**Special Conditions: VT DRB Aviation Consultants, Boeing Model 777-200 Airplanes;
Installation of an Airbag System in Shoulder Belts**

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Boeing Model 777-200 airplane. This airplane, as modified by VT DRB Aviation Consultants (VT DRB), 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 an airbag system installed in shoulder belts. 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: This action is effective on VT DRB Aviation Consultants on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. We must receive your comments by **[INSERT DATE 45 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Send comments identified by docket number FAA-2017-0126 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 Web site, 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), as well as at <http://DocketsInfo.dot.gov/>.

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: John Sheldon, FAA, Airframe and Cabin Safety Branch, ANM-115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98057-3356; telephone 425-227-2785; facsimile 425-227-1320.

SUPPLEMENTARY INFORMATION: The FAA has determined that notice of, and opportunity for prior public comment on, these special conditions is impracticable because these procedures would significantly delay issuance of the design approval and thus delivery of the affected airplanes.

In addition, the substance of these special conditions has been subject to the public-comment process in several prior instances with no substantive comments received. The FAA therefore finds that good cause exists for making these special conditions effective 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 July 10, 2015, VT DRB applied for a supplemental type certificate to install an airbag system in shoulder belts on Boeing Model 777-200 airplanes. The Boeing Model 777-200 airplane, as modified by VT DRB, is a very-important-person (VIP) interior-design derivative of

the Boeing Model 777 airplanes currently approved under Type Certificate No. T00001SE. The modified airplane will have seating for 52 passengers and 7 crewmembers.

Type Certification Basis

Under the provisions of Title 14, Code of Federal Regulations (14 CFR) 21.101, VT DRB must show that the Boeing Model 777-200 airplane, as changed, continues to meet the applicable provisions of the regulations listed in Type Certificate No. T00001SE 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 the Boeing Model 777-200 airplane 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 applicant apply for a supplemental type certificate to modify any other model included on the same type certificate 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, the Boeing Model 777-200 airplane, as changed, 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 Feature

The Boeing Model 777-200 airplane will incorporate the following novel or unusual design feature: An airbag system in shoulder belts of multiple-place side-facing seats. Inflatable airbag devices are designed to limit occupant forward excursion in the event of an accident. While their use is now standard in the automotive industry, their use is novel or unusual for commercial aviation.

Discussion

The applicant is installing, as a voluntary safety measure in the VT DRB interior, airbags (inflatable restraints) in the shoulder belts of multiple-place side-facing seats. The applicable airworthiness regulations have no regulations for this particular feature. Therefore, special conditions are necessary.

The certification basis of this modification includes Special Federal Aviation Regulation (SFAR) 109, section 4(b), which specifies the injury criteria for this seating orientation. These special conditions, like special conditions previously issued on airplanes with side-facing seats incorporating airbag systems, address the safety issues inherent in this seating orientation when using airbag systems to meet the injury criteria.

SFAR 109, section 4(b) incorporates by reference the requirements of § 25.562(c)(1) through (c)(6). Section 25.562(c) requires that the restraints remain on the shoulders and pelvises of the occupants during impact. Advisory Circular (AC) 25.562-1B, “Dynamic Evaluation of Seat Restraint Systems and Occupant Protection on Transport Airplanes,” dated January 10, 2006, clarifies this requirement by stating that restraints must remain on the shoulders and pelvises when loaded by the occupants. This criterion is necessary to protect the occupants from

serious injuries that could be caused by lap-belt contact forces applied to soft tissue, or by ineffectively restraining the upper torsos in the event the upper-torso restraints slide off the shoulders. In forward-facing seats (the type specifically addressed in that AC), occupant motion during rebound, and any subsequent re-loading of the belts, is limited by interaction with the seat backs. However, in side-facing seats subjected to a forward impact, the restraint systems may be the only means of limiting the occupants' rearward (rebound) motion.

Also as discussed by the FAA in previous special conditions, the installation of airbag systems in shoulder belts have two additional safety concerns: that the systems perform properly under foreseeable operating conditions, and that the systems do not perform in a manner or at such times as would constitute a hazard to the occupants. These special conditions address those concerns.

These special conditions are derived not only from similar previously-issued special conditions, but also from special conditions the FAA has issued for airbag systems on lap belts, with some changes to address the issues specific to side-facing seats.

The special conditions are not an installation approval. Therefore, while the special conditions relate to each such system installed, the overall installation approval is a separate finding and must consider the combined effects of all such systems installed.

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.

Applicability

As discussed above, these special conditions are applicable to the Boeing Model 777-200 airplane as modified by VT DRB. Should VT DRB apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. T00001SE to incorporate 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 of airplane. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of this feature on the airplane.

The substance of these special conditions has been subject to the notice and comment period in several prior instances, and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. Therefore, because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon publication in the **Federal Register**. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

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 Boeing Model 777-200 airplanes modified by VT DRB Aviation Consultants.

1. For seats with an airbag system in the shoulder belts, show that the airbag system in the shoulder belt will deploy and provide protection under crash conditions where it is necessary to prevent serious injury. The means of protection must take into consideration a range of stature from a 2-year-old child to a 95th percentile male. The airbag system in the shoulder belt must provide a consistent approach to energy absorption throughout that range of occupants. When the seat system includes an airbag system, that system must be included in each of the certification tests as it would be installed in the airplane. In addition, the following situations must be considered:
 - a. The seat occupant is holding an infant.
 - b. The seat occupant is a pregnant woman.
2. The airbag system in the shoulder belt must provide adequate protection for each occupant regardless of the number of occupants of the seat assembly, considering that unoccupied seats may have an active airbag system in the shoulder belt.
3. The design must prevent the airbag system in the shoulder belt from being either incorrectly buckled or incorrectly installed, such that the airbag system in the shoulder belt would not properly deploy. Alternatively, it must be shown that such deployment is not hazardous to the occupant, and will provide the required injury protection.

4. It must be shown that the airbag system in the shoulder belt is not susceptible to inadvertent deployment as a result of wear and tear, or inertial loads resulting from in-flight or ground maneuvers (including gusts and hard landings), and other operating and environmental conditions (vibrations, moisture, etc.) likely to occur in service.
5. Deployment of the airbag system in the shoulder belt must not injure the seated occupant, including injuries that could impede rapid egress. This assessment should include an occupant whose belt is loosely fastened.
6. It must be shown that inadvertent deployment of the airbag system in the shoulder belt, during the most critical part of the flight, will either meet the requirement of § 25.1309(b) or not cause a hazard to the airplane or its occupants.
7. It must be shown that the airbag system in the shoulder belt will not impede rapid egress of occupants 10 seconds after airbag deployment.
8. The airbag system must be protected from lightning and high-intensity radiated fields (HIRF). The threats to the airplane specified in existing regulations regarding lightning, § 25.1316, and HIRF, § 25.1317, are incorporated by reference for the purpose of measuring lightning and HIRF protection.
9. The airbag system in the shoulder belt must function properly after loss of normal aircraft electrical power, and after a transverse separation of the fuselage at the most critical location. A separation at the location of the airbag system in the shoulder belt does not have to be considered.
10. It must be shown that the airbag system in the shoulder belt will not release hazardous quantities of gas or particulate matter into the cabin.

11. The airbag system in the shoulder-belt installation must be protected from the effects of in-flight fire such that no hazard to occupants will result.
12. A means must be available for a crewmember to verify the integrity of the airbag system in the shoulder-belt activation system prior to each flight, or it must be demonstrated to reliably operate between inspection intervals. The FAA considers that the loss of the airbag-system deployment function alone (i.e., independent of the conditional event that requires the airbag-system deployment) is a major-failure condition.
13. The inflatable material may not have an average burn rate of greater than 2.5 inches/minute when tested using the horizontal flammability test defined in part 25, appendix F, part I, paragraph (b)(5).
14. The airbag system in the shoulder belt, once deployed, must not adversely affect the emergency-lighting system (i.e., block floor proximity lights to the extent that the lights no longer meet their intended function).

Issued in Renton, Washington, on March 31, 2017.

/s/

Michael Kaszycki
Assistant Manager, Transport Airplane Directorate
Aircraft Certification Service

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