DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM259; Special Condition No. 25–249–SC]

Special Conditions: Bombardier Aerospace Model BD–100–1A10; Side-Facing Single Occupancy Seats

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Bombardier Aerospace Model BD–100–1A10 airplane. This airplane as modified by Learjet Inc. (Subsidiary of Bombardier Aerospace) will have novel or unusual design features associated with side-facing single-occupant seats. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for these 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.

EFFECTIVE DATE: October 6, 2003.

FOR FURTHER INFORMATION CONTACT: Michael Thompson, FAA, Airframe/Cabin Safety Branch, ANM–115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98055–4056; telephone (425) 227–1157; facsimile (425) 227–1149.

SUPPLEMENTARY INFORMATION:

Background

On April 11, 2003, Learjet Inc. (subsidiary of Bombardier Aerospace) applied for a supplemental type certificate for installation of single-occupant side-facing seats on Bombardier BD–100–1A10 airplanes. Bombardier Aerospace requested that special conditions be issued for these seats and that the special conditions be listed on the type certificate data sheet of the BD–100–1A10 airplane. The Model BD–100–1A10 is a twin engine, turbofan powered, transport category airplane which is currently the subject of a type certification program.

Section 25.785(a) at Amendment 25–64 requires that each seat ''at each station designated as occupiable during takeoff and landing must be designed so that persons occupying these seats will not suffer serious injury in an emergency landing as a result of the inertia forces specified in §§ 25.561 and 25.562.'' Additionally, § 25.562 requires dynamic testing of all seats that are occupied during takeoff and landing. However, side-facing seats are considered a novel design for transport category airplanes that include Amendment 25–64 in the certification basis and were not considered when those airworthiness standards were promulgated. Hence, the existing regulations do not provide adequate or appropriate safety standards for occupants of side-facing seats. In order to provide a level of safety that is equivalent to that afforded occupants of forward and aft facing seats, additional airworthiness standards in the form of special conditions are necessary.

These special conditions are applicable only to single-occupant side-facing seats. They are not sufficient or intended to be used for the certification of multiple-occupant side-facing divans or sofas.

Type Certification Basis

Under the provisions of § 21.101, Learjet Inc. (subsidiary of Bombardier Aerospace) must show that the Model BD–100–1A10 airplane, as changed, continues to meet the applicable provisions of the regulations incorporated by reference in T00005NY or the applicable regulations in effect on the date of application for the change. The regulations incorporated by reference in the type certificate are commonly referred to as the ''original type certification basis.'' The regulations incorporated by reference in T00005NY are as follows:

14 CFR part 25, effective February 1, 1965, as amended by Amendments 25–1 through 25–98; 14 CFR part 34, effective September 10, 1990.

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 Bombardier Aerospace Model BD–100–1A10 because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Bombardier Aerospace Model BD–100–1A10 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.

Special conditions, as defined in § 11.19, are issued in accordance with § 11.38 and become part of the type certification basis in accordance with § 21.101.

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, the special conditions would also apply to the other model.

Novel or Unusual Design Features

Bombardier Aerospace will install single-occupant side-facing seats on BD–100–1A10 airplanes. Section 25.785(b) requires that each seat ''at each station designated as occupiable during takeoff and landing must be designed so that persons occupying these seats will not suffer serious injury in an emergency landing as a result of the inertia forces specified in §§ 25.561 and 25.562.'' Additionally, § 25.562 requires dynamic testing of all seats that are occupied during takeoff and landing. However, side-facing seats are considered a novel design for transport category airplanes that include Amendment 25–64 in the certification basis, and were not considered when those airworthiness standards were promulgated. Hence, the existing regulations do not provide adequate or appropriate safety standards for occupants of side-facing seats. In order to provide a level of safety that is equivalent to that afforded occupants of forward and aft facing seats, additional airworthiness standards, in the form of special conditions, are necessary.

Discussion

The following special conditions are considered to provide occupants of single-occupancy side-facing seats a level of safety that is equivalent to that afforded occupants of forward and aft facing seats. These special conditions supplement 14 CFR part 25 and, more specifically, they supplement §§ 25.785 and 25.562.

Comments

Notice of proposed special conditions No. 25–03–06-SC for the Bombardier Aerospace Model BD–100–1A10 airplane was published in the **Federal Register** on August 26, 2003 (68 FR 51203). No comments were received, and these special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the Bombardier Aerospace Model BD–100–1A10 airplane. Should Bombardier Aerospace apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Under standard practice, the effective date of final special conditions would be 30 days after the date of publication in the **Federal Register**; however, as the certification date for the Bombardier Aerospace Model BD–100–1A10 airplane is imminent, the FAA finds that good cause exists to make these special conditions effective upon issuance.

Conclusion

This action affects only certain novel or unusual design features on one model of airplanes. It is not a rule of general applicability, and it affects only the applicant who applied to the FAA for approval of these features on the airplane.

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, the Federal Aviation Administration (FAA) issues the following special conditions as part of the type certification basis for Bombardier Aerospace Model BD–100–1A10 airplanes. In addition to the airworthiness standards of §§ 25.562 and 25.785, the minimum acceptable standards for dynamic certification of Model BD–100–1A10 single-occupant side-facing seats are proposed as follows:

Injury Criteria

(a) *Existing Criteria:* All injury protection criteria of § 25.562(c)(1) through (c)(6) apply to the occupant of a side-facing seat. Head Injury Criterion (HIC) assessments are required only for head contact with the seat and/or adjacent structures.

(b) *Body-to-Wall/Furnishing Contact:* The seat must be installed aft of a structure, such as an interior wall or furnishing, that will support the pelvis, upper arm, chest, and head of an occupant seated next to the structure. A conservative representation of the structure and its stiffness must be included in the tests. It is recommended, but not required, that the contact surface of this structure be covered with at least two inches of energy absorbing protective padding (foam or equivalent), such as Ensolite.

(c) *Thoracic Trauma:* The Thoracic Trauma Index (TTI) injury criterion must be substantiated by dynamic test or by rational analysis, based on a previous test or tests of a similar seat installation. Testing must be conducted with a Side Impact Dummy (SID), as defined by 49 CFR part 572, subpart F, or its equivalent. TTI must be less than 85, as defined in 49 CFR part 572, subpart F. TTI data must be processed as defined in Federal Motor Vehicle Safety Standard (FMVSS) Part 571.214, section S6.13.5.

(d) *Pelvis:* Pelvic lateral acceleration must be shown by dynamic test or by rational analysis based on previous test(s) of a similar seat installation to not exceed 130g. Pelvic acceleration data must be processed as defined in FMVSS Part 571.214, section S6.13.5.

(e) *Shoulder Strap Loads:* Where upper torso straps (shoulder straps) are used for occupants, tension loads in individual straps must not exceed 1,750 pounds. If dual straps are used for restraining the upper torso, the total strap tension loads must not exceed 2,000 pounds.

Test Requirements

The above performance measures must not be exceeded during the following dynamic tests:

(a) Conduct a longitudinal test per § 25.562(b)(2) with a SID, undeformed floor, no yaw, and with all lateral structural supports (armrests/walls).

Pass/fail injury assessments: TTI and pelvic acceleration.

(b) Conduct a longitudinal test per § 25.562(b)(2) with the Hybrid II ATD, deformed floor, 10 degrees yaw, and with all lateral structural supports (armrests/walls).

Pass/fail injury assessments: HIC, upper torso restraint load, restraint system retention and pelvic acceleration.

(c) Conduct a downward vertical test per § 25.562(b)(1) with a modified Hybrid II ATD with existing pass/fail criteria.

Issued in Renton, Washington, on October 6, 2003.

Ali Bahrami,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM249; Special Conditions No. 25–250–SC]

Special Conditions: Embraer Model ERJ–170 Series Airplanes; Electronic Flight Controls (Command Signal Integrity)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Embraer Model ERJ–170 series airplanes. These airplanes will have novel or unusual design features when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. These design features are associated with electronic flight control systems. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for these 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. Additional special conditions will be issued for this and other novel or unusual design features of Embraer Model 170 series airplanes.

EFFECTIVE DATES: October 6, 2003.

FOR FURTHER INFORMATION CONTACT: Tom Groves, FAA, International Branch, ANM–116, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington 98055–4056; telephone (425) 227–1503; facsimile (425) 227–1149; e-mail *tom.groves@faa.gov.*

SUPPLEMENTARY INFORMATION:

Background

On May 20, 1999, Embraer applied for a type certificate for its new Model ERJ–170 airplane. Two basic versions of the Model ERJ–170 are included in the application. The ERJ–170–100 airplane is a 69–78 passenger, twin-engine regional jet with a maximum takeoff weight of 81,240 pounds. The ERJ–170–200 is a derivative with a lengthened fuselage. Passenger capacity for the ERJ–170–200 is increased to 86, and maximum takeoff weight is increased to 85,960 pounds.

Type Certification Basis

Under the provisions of 14 CFR 21.17, Embraer must show that the Model ERJ–