



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2012-1215; Special Conditions No. 25-12-482-SC]

Special Conditions: Embraer S.A., Model EMB-550 Airplanes; Flight Envelope Protection: High Speed Limiting.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Embraer S.A. Model EMB-550 airplane. This airplane will have a novel or unusual design feature, specifically an electronic flight control system which contains fly-by-wire control laws, including envelope protections, for the overspeed protection and roll limiting function. 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: **[Insert date 30 days after date of publication in the *Federal Register*].**

FOR FURTHER INFORMATION CONTACT: Joe Jacobsen, FAA, Airplane and Flight Crew Interface Branch, ANM-111, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98057-3356; telephone 425-227-2011; facsimile 425-227-1149.

SUPPLEMENTARY INFORMATION:

Background

On May 14, 2009, Embraer S.A. applied for a type certificate for their new Model EMB-550 airplane. The Model EMB-550 airplane is the first of a new family of jet airplanes designed for corporate flight, fractional, charter, and private owner operations. The aircraft has a conventional configuration with a low wing and T-tail empennage. The primary structure is metal with composite empennage and control surfaces. The Model EMB-550 airplane is designed for 8 passengers, with a maximum of 12 passengers. It is equipped with two Honeywell HTF7500-E medium bypass ratio turbofan engines mounted on aft fuselage pylons. Each engine produces approximately 6,540 pounds of thrust for normal takeoff. The primary flight controls consist of hydraulically powered fly-by-wire elevators, aileron and rudder, controlled by the pilot or copilot sidestick.

The longitudinal control law design of the Embraer S.A. Model EMB-550 airplane incorporates an overspeed protection system in the normal mode. This mode prevents the pilot from inadvertently or intentionally exceeding a speed approximately equivalent to V_{FC} or attaining V_{DF} . Current Title 14, Code of Federal Regulations (14 CFR) part 25 did not envision a high speed limiter that might preclude or modify flying qualities assessments in the overspeed region.

Type Certification Basis

Under the provisions of 14 CFR 21.17, Embraer S.A. must show that the Model EMB-550 airplane meets the applicable provisions of part 25, as amended by Amendments 25-1 through 25-127 thereto.

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 Model EMB-550 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 type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Model EMB-550 airplane 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 and the FAA must issue a finding of regulatory adequacy under section 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).

Novel or Unusual Design Features

The Model EMB-550 airplane will incorporate the following novel or unusual design feature: an electronic flight control system which contains fly-by-wire control laws, including envelope protections, for the overspeed protection and roll limiting function. Current part 25 requirements do not contain appropriate standards for high speed protection systems.

Discussion

As further discussed previously, a special condition is necessary in addition to the requirements of § 25.143 for the operation of the high speed protection. The general intent is that

the overspeed protection does not impede normal maneuvering and speed control and that the overspeed protection does not restrict or prevent emergency maneuvering. Therefore, 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.

Discussion of Comments

Notice of proposed special conditions No. 25-12-12-SC for the Embraer S.A. Model EMB-550 airplanes was published in the *Federal Register* on November 20, 2012 (77 FR 69572). No comments were received, and the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the Model EMB-550 airplane. Should Embraer S.A. 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.

Conclusion

This action affects only certain novel or unusual design features on one model 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.

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 Embraer S.A. Model EMB-550 airplanes.

1. In addition to § 25.143, the following requirement applies: Operation of the high speed limiter during all routine and descent procedure flight must not impede normal attainment of speeds up to overspeed warning.

Issued in Renton, Washington, on February 12, 2013.

Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service

[FR Doc. 2013-03676 Filed 02/15/2013 at 8:45 am; Publication Date: 02/19/2013]