and all adverse impacts upon, airplane equipment, systems, networks, or other assets required for safe flight and operations.

2. The applicant must establish appropriate procedures to allow the operator to ensure that continued airworthiness of the airplane is maintained, including all post-type-certification modifications that may have an impact on the approved electronic-system security safeguards.

Issued in Renton, Washington, on February 10, 2017.

**Michael Kaszycki,**

*Assistant Manager, Transport Airplane Directorate, Aircraft Certification Service.*

[FR Doc. 2017–05333 Filed 3–16–17; 8:45 am]

**BILLING CODE 4910–13–P**

## DEPARTMENT OF TRANSPORTATION

## Federal Aviation Administration

## 14 CFR Part 25

**[Docket No. FAA–2016–6137; Special Conditions No. 25–644–SC]**

## Special Conditions: The Boeing Company Model 787–10 Airplane; Aeroelastic Stability Requirements, Flaps-Up Vertical Modal-Suppression System

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions.

**SUMMARY:** These special conditions are issued for the Boeing Company (Boeing) Model 787–10 airplane. This airplane 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 a flaps-up vertical modal-suppression system, which is in lieu of traditional methods of improving airplane flutter characteristics. 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 April 17, 2017.

**FOR FURTHER INFORMATION CONTACT:** Wael Nour, FAA, Airframe and Cabin Safety Branch, ANM–115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98057–3356; telephone 425–227–2143; facsimile 425–227–1320.

**SUPPLEMENTARY INFORMATION:**

### Background

On July 30, 2013, Boeing applied for an amendment to Type Certificate No. T00021SE to include the new Model 787–10 airplane. This twin-engine, transport-category airplane is a stretched-fuselage derivative of the 787–9, with maximum seating capacity of 440 passengers. The 787–10 has a maximum takeoff weight of 560,000 lbs.

### Type Certification Basis

Under the provisions of Title 14, Code of Federal Regulations (14 CFR) 21.101, Boeing must show that the Model 787–10 airplane meets 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.

In addition, the certification basis includes other regulations, special conditions, and exemptions that are not relevant to these proposed special conditions. Type Certificate No. T00021SE will be updated to include a complete description of the certification basis for this airplane model.

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 787–10 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 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, the Model 787–10 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.

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

The Model 787–10 airplane will incorporate the following novel or unusual design feature:

A flaps-up vertical modal suppression system.

### Discussion

The Boeing Model 787–10 will add a new flaps-up vertical modal-suppression (F0VMS) system to the Normal mode of the primary flight-control system (PFCS). The F0VMS system is needed to satisfy the flutter-damping margin requirements of § 25.629 and the means-of-compliance provisions in Advisory Circular (AC) 25.629–1B. This system will be used in lieu of typical methods of improving the flutter characteristics of an airplane, such as increasing the torsional stiffness of the wing or adding wingtip ballast weights.

The F0VMS system is an active modal-suppression system that will provide additional damping to an already stable, but low-damped, 3Hz symmetric wing, nacelle, and body aeroelastic mode of the airplane. This feedback-control system will maintain adequate damping margins to flutter. The F0VMS system accomplishes this by oscillating the elevators, and, when needed, the flaperons.

Because Boeing's flutter analysis shows that the 3Hz mode is stable and does not flutter, the F0VMS system is not an active flutter-suppression system, but, rather, a damping-augmentation system. At this time, the FAA is not prepared to accept an active flutter-suppression system that suppresses a divergent flutter mode in the operational or design envelope of the airplane.

This will be the first time an active modal-suppression system will be used for § 25.629 compliance. The use of this new active modal-suppression system for flutter compliance is novel or unusual when compared to the technology envisioned in the current airworthiness standards. Consequently, special conditions are required in consideration of the effects of this new system on the aeroelastic stability of the airplane, both in the normal and failed state, to maintain the level of safety intended by § 25.629.

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. 25–16–05–SC for the

Boeing Model 787–10 airplane was published in the **Federal Register** on September 20, 2016 (81 FR 64360). One substantive comment was received.

By letter no. B–H020–REG–16–TLM–68 dated November 1, 2016, Boeing stated that they ''. . . recommend that development of future requirements for the application of [active modal-suppression system for flutter compliance] technology be the subject of an Aviation Rulemaking Advisory Committee (ARAC).'' Boeing adds that ''. . . standard requirements should be developed which reflect this state-of-the-art system and apply to all airplane manufacturers. The development of these requirements would benefit from the collaborative effort of an ARAC.''

The FAA agrees with Boeing and currently has plans to task ARAC to develop recommendations on this subject.

**Applicability**

As discussed above, these special conditions are applicable to the Boeing Model 787–10 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 feature, these special conditions would apply to that model as well.

**Conclusion**

This action affects only a certain novel or unusual design feature on one model series of 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 Boeing Model 787–10 airplanes.

The following special conditions are proposed to address the aeroelastic stability of the 787–10 airplane with the F0VMS system as an integral part of the PFCS Normal mode:

**Analytical Flutter-Clearance Requirements**

1. The airplane in the PFCS Normal mode (which includes F0VMS) must meet the nominal (no failures) flutter and aeroelastic stability requirements of § 25.629(b)(1), and the damping-margin criteria of AC 25.629–1B, Section 7.1.3.3. Figure 1, below, illustrates the Damping versus Airspeed plot.

a. The aeroservoelastic analysis must take into account the effect of the following items:

i. Significant structural and aerodynamic nonlinearities.

ii. Significant F0VMS nonlinearities, including control-surface rate and displacement saturation, and blowdown.

iii. The range of design maneuver load factors.

iv. Control surface freeplay.

v. Any other items that may affect the performance of the F0VMS system in maintaining adequate modal damping margins.

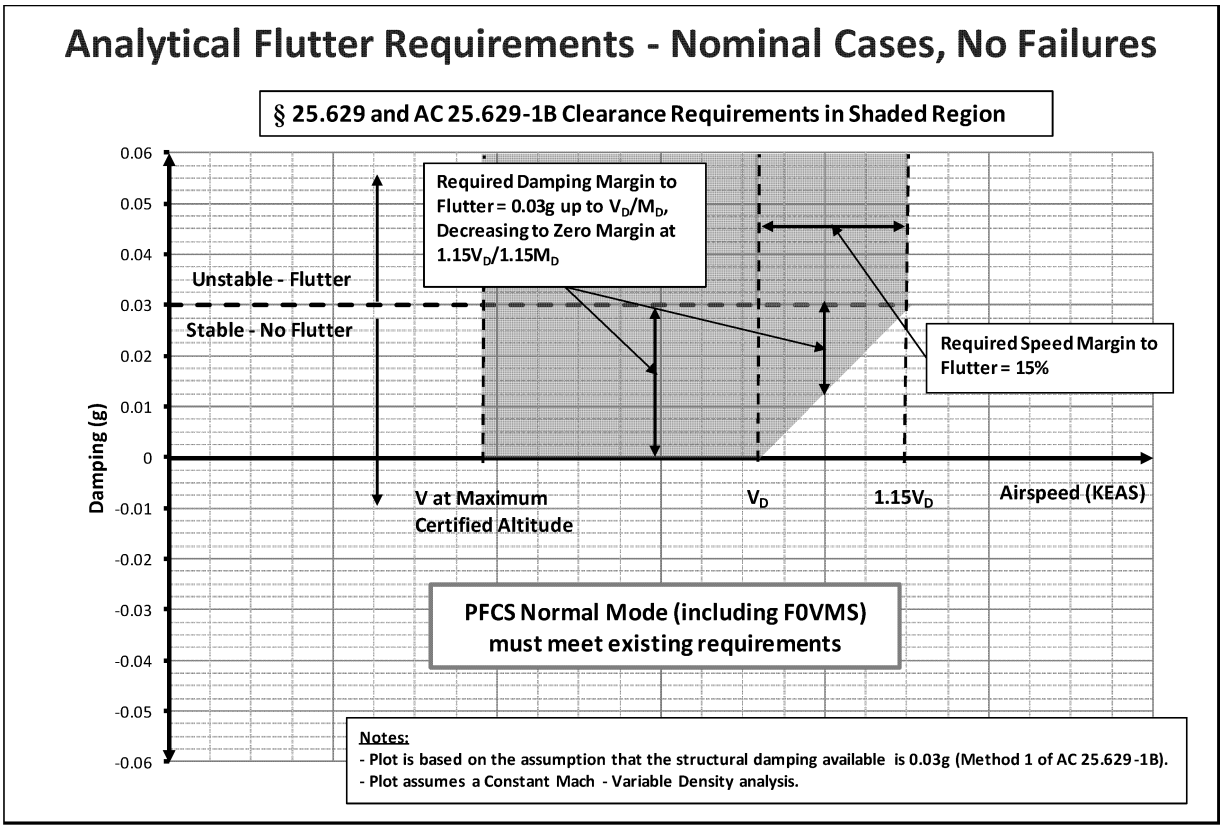


**Figure 1: Damping vs. Airspeed; PFCS Normal mode, F0VMS system operative**

2. The airplane in the PFCS Normal mode, but with the F0VMS system inoperative, must exhibit a damping margin to flutter of 0.015g within the $V_D/M_D$ envelope, linearly decreasing (in KEAS) to zero damping margin to flutter at 1.15 $V_D$/1.15 $M_D$, limited to Mach 1.0. That is, the 3Hz mode should not cross the g = 0.015 line below $V_D$, or the g = 0.03 line below 1.15 $V_D$, assuming the use of analysis Method 1 of AC 25.629–1B, Section 7.1.3.3. Figure 2, below, illustrates the Damping versus Airspeed plot.

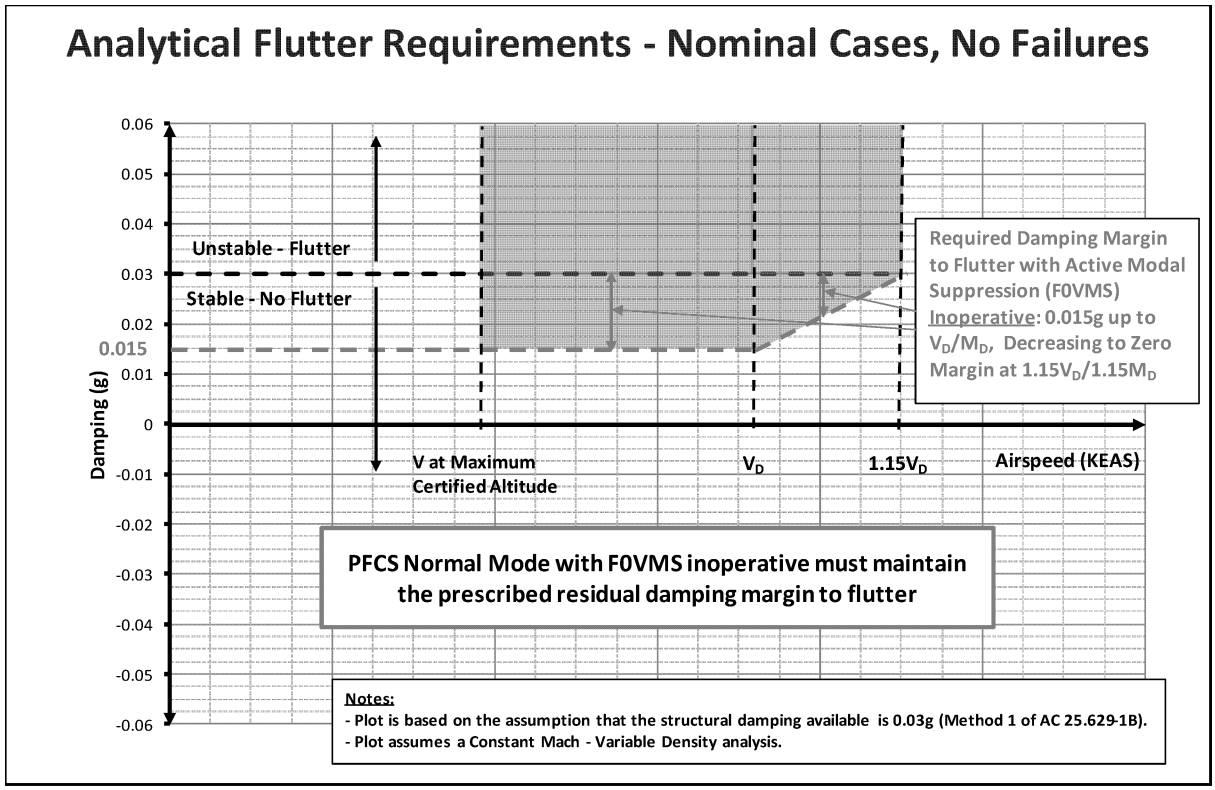


**Figure 2: Damping vs. Airspeed; PFCS Normal mode, F0VMS system inoperative**

3. The airplane in the PFCS Normal mode (which includes F0VMS) must meet the fail-safe flutter and aeroelastic stability requirements of § 25.629(b)(2), and the damping-margin criteria of AC 25.629–1B, Section 7.1.3.5.

4. The airplane in the PFCS Secondary and Direct modes must meet the fail-safe flutter and aeroelastic-stability requirements of § 25.629(b)(2), and the damping-margin criteria of AC 25.629–1B, Section 7.1.3.5.

Issued in Renton, Washington, on February 10, 2017.

**Michael Kaszycki,**

*Assistant Manager, Transport Airplane Directorate, Aircraft Certification Service.*

[FR Doc. 2017–05326 Filed 3–16–17; 8:45 am]

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## DEPARTMENT OF TRANSPORTATION

## Federal Aviation Administration

## 14 CFR Part 25

**[Docket No. FAA–2016–9403; Special Conditions No. 25–643–SC] Special Conditions: Embraer, S.A., Model ERJ 190–300 Airplane; Dive-Speed Definition with High-Speed-Protection System**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions; request for comments.

**SUMMARY:** These special conditions are issued for the Embraer, S.A., (Embraer) Model ERJ 190–300 airplane. This airplane 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 a high-speed-protection system. 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 Embraer on March 17, 2017. We must receive your comments by May 1, 2017.

**ADDRESSES:** Send comments identified by docket number FAA–2016–9403 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