V′ = Clearance speed as defined by § 25.629(b)(2).
V″ = Clearance speed as defined by § 25.629(b)(1).

\[ Q_j = \frac{T_j}{P_j} \]

Where:
\[ T_j = \text{Average time spent in failure mode } j \text{ (in hours)} \]
\[ P_j = \text{Probability of occurrence of failure mode } j \text{ (per hour)} \]

Note: If \( P_j \) is greater than \( 10^{-3} \) per flight hour, then the flutter clearance speed must not be less than \( V′ \).

vi. Freedom from aeroelastic instability must also be shown up to \( V′ \) in Figure 3, above, for any probable system-failure condition, combined with any damage required or selected for investigation by § 25.571(b).

C. Consideration of certain failure conditions may be required by other sections of part 25 regardless of calculated system reliability. Where analysis shows the probability of these failure conditions to be less than \( 10^{-9} \) per flight hour, criteria other than those specified in this paragraph may be used for structural substantiation to show continued safe flight and landing.

4. Failure indications. For system-failure detection and indication, the following apply:

a. The system must be checked for failure conditions, not extremely improbable, that degrade the structural capability below the level required by part 25, or that significantly reduce the reliability of the remaining system. As far as reasonably practicable, the flightcrew must be made aware of these failures before flight. Certain elements of the control system, such as mechanical and hydraulic components, may use special periodic inspections, and electronic components may use daily checks, in lieu of detection and indication systems, to achieve the objective of this requirement. These certification-maintenance requirements must be limited to components that are not readily detectable by normal detection-and-indication systems, and where service history shows that inspections will provide an adequate level of safety.

b. The existence of any failure condition, not extremely improbable, during flight, that could significantly affect the structural capability of the airplane, and for which the associated reduction in airworthiness can be minimized by suitable flight limitations, must be signaled to the flightcrew. For example, failure conditions that result in a factor of safety between the airplane strength and the loads of part 25, subpart C below 1.25, or flutter margins below \( V″ \), must be signaled to the crew during flight.

5. Dispatch with known failure conditions. If the airplane is to be dispatched in a known system-failure condition that affects structural performance, or that affects the reliability of the remaining system to maintain structural performance, then the provisions of these special conditions must be met, including the provisions of special condition 2 for the dispatched condition, and special condition 3 for subsequent failures.

a. Expected operational limitations may be taken into account in establishing \( P_j \) as the probability of failure occurrence for determining the safety margin in Figure 1.

b. Flight limitations and expected operational limitations may be taken into account in establishing \( Q_j \) as the combined probability of being in the dispatched failure condition, and the subsequent failure condition, for the safety margins in Figures 2 and 3.

2. These limitations must be such that the probability of being in this combined failure state, and then subsequently encountering limit load conditions, is extremely improbable. No reduction in these safety margins is allowed if the subsequent system-failure rate is greater than \( 10^{-3} \) per flight hour.

Issued in Renton, Washington, on October 23, 2017.

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

[FR Doc. 2017-23699 Filed 10-31-17; 8:45 am]

BILLING CODE 4910-13-P

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA–2017–0718; Special Conditions No. 25–705–SC]

Special Conditions: The Boeing Company Model 777–8 and 777–9 Airplanes: Design Roll Maneuver for Electronic Flight Controls

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for The Boeing Company (Boeing) Model 777–8 and 777–9 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. This design feature is an electronic flight-control system (EFCS) that provides control of the airplane through pilot inputs to the flight computer. 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 Boeing on November 1, 2017. We must receive your comments by December 18, 2017.
Novel or Unusual Design Features

The Model 777–8 and 777–9 airplanes will incorporate the following novel or unusual design feature:

An electronic flight-control system that provides control of the airplane through pilot inputs to the flight computer. Current part 25 airworthiness regulations account for control laws where aileron deflection is proportional to control-stick deflection. The regulations do not address nonlinearities, such as situations where output does not change in the same proportion as input, or other effects on aileron actuation that may be caused by electronic flight controls.

Discussion

These special conditions differ from current regulatory requirements in that they require that the roll maneuver results from defined movements of the cockpit roll control, as opposed to defined aileron deflections. These special conditions also require an additional load condition at design maneuvering speed (\(V_{\text{M}}\)), in which the cockpit roll control is returned to neutral following the initial roll input. These special conditions differ from similar special conditions previously issued on this topic. These special conditions are limited to the roll axis only, whereas other special conditions also included pitch and yaw axes. Special conditions are not required for the pitch or yaw axes, because § 25.331 at Amendment 25–141, and § 25.351 at Amendment 25–91, take into account the effects of an electronic flight-control system.

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 Boeing Model 777–8 and 777–9 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 certain novel or unusual design features 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 777–8 and 777–9 airplanes.

In lieu of compliance to 14 CFR 25.349(a), the Model 777–8 and 777–9 airplanes must comply with the following:

The following conditions, speeds, and cockpit roll control motions (except as the motions may be limited by pilot effort) must be considered in combination with an airplane load factor of zero, and of two-thirds of the positive maneuvering factor used in design. In determining the resulting control-surface deflections, the torsional flexibility of the wing must be considered in accordance with § 25.301(b).

1. Conditions corresponding to steady rolling velocities must be investigated. In addition, conditions corresponding to maximum angular acceleration must be investigated for airplanes with engines or other weight concentrations outboard of the fuselage. For the angular acceleration conditions, zero rolling velocity may be assumed in the absence of a rational time history investigation of the maneuver.

2. At \( V_a \), sudden movement of the cockpit roll control up to the limit is assumed. The position of the cockpit roll control must be maintained until a steady roll rate is achieved and then must be returned suddenly to the neutral position.

3. At \( V_c \), the cockpit roll control must be moved suddenly and maintained so as to achieve a roll rate not less than one third of that obtained in condition 2, above.

4. At \( V_b \), the cockpit roll control must be moved suddenly and maintained so as to achieve a roll rate not less than one third of that obtained in condition 2, above.

Issued in Renton, Washington, on October 25, 2017.

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

[FR Doc. 2017–23701 Filed 10–31–17; 8:45 am]

BILLING CODE 4910–13–P

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; correction.

SUMMARY: This document corrects an error that appeared in Docket No. FAA–2016–9403, Special Conditions No. 25–643–SC, which was published in the Federal Register on March 17, 2017 (82 FR 14117). The error is an incorrect citation of a section in a cited advisory circular.

DATES: The effective date of this correction is November 1, 2017.


SUPPLEMENTARY INFORMATION:

Background


Correction

In the final special conditions document (FR Doc. 2017–05329), published on March 17, 2017 (82 FR 14117), make the following correction.

On page 14119, second column, correct the last sentence in special condition no. 2 to read:

The upset maneuvers described in Advisory Circular 25–7C, “Flight Test Guide for Certification of Transport Category Airplanes,” Chapter 2, section 8, paragraph 32, sub-paragraphs c(3)(a) and (c), may be used to comply with this requirement.

Issued in Renton, Washington, on October 25, 2017.

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

[FR Doc. 2017–23697 Filed 10–31–17; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71


Amendment of Class E Airspace; Lemoore NAS, CA

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule, technical amendment, correction.

SUMMARY: This action corrects a final rule, technical amendment published in Federal Register on September 21, 2017, that removes the Notice to Airmen (NOTAM) part-time status information contained in the legal description of Class E airspace designated as an extension at Lemoore NAS (Reeves Field), Lemoore, CA. The airspace description contained the following wording in error: “. . . within a 5.2-mile radius of Lemoore NAS (Reeves Field), and . . . “ This wording is removed. This action does not affect the charted boundaries or operating requirements of the airspace.

DATES: Effective 0901 UTC, November 1, 2017. The Director of the Federal Register approves this incorporation by reference action under title 1, Code of Federal Regulations, part 51, subject to the annual revision of FAA Order 7400.11 and publication of conforming amendments.

FOR FURTHER INFORMATION CONTACT: Robert LaPlante, Federal Aviation Administration, Operations Support Group, Western Service Center, 1601 Lind Avenue SW., Renton, WA 98057; telephone (425) 203–4566.

SUPPLEMENTARY INFORMATION: