



Federal Aviation Administration

Memorandum

Date: July 20, 2015

To: Manager, International Branch, ANM-116

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Jayson Claar, ANM-115

Subject: INFORMATION: Step-down distance outside the airplane for the Type III exit located on the right side of the airplane, FAA Project # TC0717IB-T and #AT10256IB-T

ELOS Memo#: TC0717IB-T-C-1

Regulatory Ref: § 25.807

Revision Description: The FAA revised the memo to add the Embraer Model EMB-545.

This memorandum informs the certificate management aircraft certification office of an evaluation made by the Transport Airplane Directorate (TAD) on the establishment of an equivalent level of safety (ELOS) finding for the Embraer Model EMB-550 and EMB-545 airplanes.

Background

The Embraer Model EMB-550 airplane is designed for a maximum of 12 passengers and the Model EMB-545 is designed for a maximum of 9 passengers (both models are including the toilet seat). Given the seating capacity, the over-the-wing exit must be a Type III or larger emergency exit. The step-down distance onto the wing surface is approximately 31.6 inches, for the Model EMB-550 and approximately 29.6 inches, for the Model EMB-545 which is greater than the 27 inch maximum step-down distance for a Type III exit permitted by Title 14, Code of Federal Regulations (14 CFR) 25.807(a)(3).

Applicable regulation(s)

§ 25.807

Regulation(s) requiring an ELOS finding

§ 25.807(a)(3)

Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)

Embraer has proposed that the Model EMB-550 airplane have seating for a maximum of 12 passengers and the Model EMB-545 have a maximum of 9 passengers. 14CFR 25.807(g)(3) requires that for an airplane with a passenger seating configuration of 10 to 19 seats, there must be at least one Type III or larger exit in each side of the fuselage. The left-hand exit for the airplane is a floor-level Type II exit. The right-hand exit is located in the lavatory in the aft end of the airplane, and is approximately 22 inches wide and 38 inches high. The toilet is located directly inboard of, and directly below, the exit, forming a step-up inside the airplane of 16.8 inches. The step-down onto the wing is 31.6 inches for Model EMB-550 and 29.6 inches for Model EMB-545. Except for the excessive step-down distance, the exit on the right side of the airplane meets the requirements of a Type III exit. With a passenger seating configuration of nine or less, the overwing exit could be de-rated to a Type IV exit, which can have a maximum step-down outside of the airplane of 36 inches per § 25.807(a)(4).

The available step-up area on the toilet can mitigate the increased step-down distance to the wing. The configuration will be demonstrated by a comparative substantiation in order to demonstrate that the egress capability of the airplane would be not compromised due to the greater step-out distance.

Explanation of how design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation

The FAA has evaluated Type III exit rate data and has defined test criteria to determine if the proposed exit configuration is acceptable with a maximum of 12 passengers and 2 flight crew for a total of 14 occupants for the Model EMB-550 and 9 passengers and 2 flight crew for the Model EMB-545. An evacuation demonstration will be performed to demonstrate the flow rate for the exit configuration is at least 32 passengers per minute.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned ELOS finding in project issue paper C-1. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The TAD has assigned a unique ELOS memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS memorandum number should be listed in the type certificate data sheet (TCDS) under the Certification Basis section (TC's & ATC's). An example of an appropriate statement is provided below.

Equivalent Level of Safety Findings have been made for the following regulation(s):
 § 25.807 Step-down distance outside the airplane for the Type III exit located on the right side of the airplane (documented in TAD ELOS Memo TC0717IB-T-C-1)

Original Signed by

Suzanne Masterson

July 20, 2015

Transport Airplane Directorate,
 Aircraft Certification Service

Date

ELOS Originated by:	Todd Thompson	ANM-116
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