Exemption No. 9458

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98057-3356

In the matter of the petition of **Embraer** for an exemption from § 25.813(e) of Title 14, Code of Federal Regulations	**Regulatory Docket No. FAA-2007-27903**

GRANT OF EXEMPTION

By letter dated April 3, 2007, Mr. Sergio Augusto Viana de Carvalho, Certification Manager, Embraer, 12227-901, Sao Jose dos Campos, Brazil, petitioned the Federal Aviation Administration (FAA) for an exemption from the requirements of § 25.813(e) of Title 14 Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would permit the installation of doors in the passenger compartment on Embraer ERJ 190-100 ECJ airplanes. The proposed exemption is specifically for the installation of executive interiors on Embraer ERJ 190-100 ECJ airplanes that have been designated as "private, not-for-hire."

The petitioner requests relief from the following regulations:

> **Section 25.813(e), Amendment 25-88 –** No door may be installed in any partition between passenger compartments.

The petitioner's supporting information is as follows:

"Petition and General Information

"The Embraer Model 190-100 ECJ airplane is designed to the requirements of Part 25, for transport category airplanes. Those requirements are addressed basically to Transport Category airplanes that are used for the carriage of fare paying passengers from [the] general public and also must consider aircraft with passenger seating up to 500. The Part 25 regulations do not make any distinction between commercial airplanes used by airlines for fare paying passengers and airplanes specifically used for other operations like charter or private, not-for-hire.

"Embraer believes that airplanes specifically designed for private use should be eligible for the acceptance by exemption of cabin features and facilities which do not comply with certain portions of Part 25. In this case a similar level of safety is provided and can be demonstrated.

"Embraer further states that the following factors are unique to private use airplanes and provide compensating features that are not normally provided on a commercial airplane flight:

- "The passenger configuration in private use airplanes is significantly less than that of a traditional commercial airline configuration;
- "The passengers in private use airplanes are typically frequent fliers and familiar with the safety features of the specific airplane they are aboard;
- "The interior arrangement is static, allowing flight and cabin crews to become very familiar with the configuration of the airplane, emergency equipment provided, and the location and operation of the emergency exits. They also have regular contact with the "repeated" passengers, which has a positive influence on communicating safety issues;
- "Unlike an air carrier, the operator has control of and can restrict the population and/or selection of passengers.

"Justification

"Embraer also believes that many customers who purchase and operate Embraer airplanes consider privacy to be crucial. Therefore, it is important that portions of the cabin are configured with bedrooms and other privacy areas to accommodate very private meetings. The only plausible method of providing such privacy is through the use of doors that separate passenger compartments. When a privacy area is created within the passenger cabin, the doors separating the private area from the rest of the cabin will be located between passenger compartments.

"The cabin of the Embraer Model ERJ 190-100 ECJ is approximately 9 feet wide. It is necessary to divide the cabin full width laterally to produce a private area because a side corridor is impractical.

"The proposed doors will be installed across a longitudinal aisle and translate laterally to open and close. The doors will not obstruct the openings when they are open (i.e., stowed) complying with the aisle width requirements of 14 CFR §25.815 for the maximum possible passenger configuration.

"Embaer states that the doors will have the following additional safety features:

1. "Each interior door will be frangible, so that in the event that it is jammed in the deployed (i.e., spanning across the aisle) position, it will allow a 5^{th} percentile female to break the doors open in case of an emergency, creating a large enough opening that a 95^{th} percentile male can pass through.
2. "Each interior door will also be equipped with dual latching mechanisms to hold the door in the open position, such that the probability of unlatching due to distortion of the fuselage in an emergency landing will be minimized. Either latching means will

be able to withstand the loads imposed upon it when the door is subjected to the ultimate inertia forces specified in 14 CFR §25.561.

3. "When the doors are deployed (i.e., spanning across the aisle), there will not be a latching mechanism that keeps the doors in that position, obstructing the aisle. This will allow occupants to access the opposite side of the door without the use of any tools.
4. "An advisory CAS message "Door Pocket Not Open" will be provided for crew when an interior door is not open and latched for take off and landing. The doors will be placarded to be latched open during taxi, take-off and landing.
5. "The Airplane Flight Manual will provide procedures and limitations to ensure that the doors are in the proper position for taxi, takeoff and landing.

"Embraer believes that the basic issues of a passenger finding and reaching an exit in an emergency are addressed by the above additional safety features and by the existing safety parameters inherent in the operation of private use airplanes. Embraer also believes that even if some extreme condition should result in a door being closed or partially closed after an accident, there are simple means to get through the door to reach the exit(s). For this reason, the exemption, as requested, would provide a level of safety for passengers in the Embraer Model ERJ 190-100 ECJ that would be equal to that required for passengers of airplanes in commercial operation.

"Public Interest

"Because the design features listed above provide adequate passenger protection, the granting of this petition would allow Embraer to provide the type interior layouts expected in the class of airplane while simultaneously providing an adequate level of safety. Allowing the installation of more comfortable and useful cabin interiors, while maintaining an adequate level of passenger protection, is in the public interest.

"Denial of this petition would negatively impact American manufacturers involved in the production of the ERJ 190-100 ECJ. While this airplane is not manufactured in its entirety in the United States, a significant portion of the aircraft, including the engines, avionics, and interiors, are manufactured by American companies. Denial of this petition would result in the loss of revenue for the American suppliers and have an adverse impact on the American balance of trade, both of which are counter to public interest.

"Together, these factors satisfy the requirement of §§ 11.81(d) and (e).

"Justification to Bypass Notice of Exemption Petition in the Federal Register

"Because this exemption petition is identical in substance to several exemptions that have been issued in the past, granting of this proposed exemption would not raise new issues or set any legal precedent. Accordingly Embraer requests that the FAA not delay granting of this exemption for publication of the petition summary in the Federal Register, as allowed by § 11.87.

"Operation outside the United States

"As a manufacturer and not an operator, Embraer does not intend to operate outside the United States under the terms of the exemption which we are requesting, but our operators will certainly fly ERJ 190-100 ECJ internationally. The granting of the petition will not conflict with any of the terms of ICAO Annex 8, so the FAA will not need to file a difference with ICAO, as described in § 11.83.

"Conclusions

"EMBRAER S.A believes that the combination of the interior design of this airplane, which is specifically for private use; the operation of the airplane for private use; and the proposed occupant safety features should justify the grant of this exemption. EMBRAER S. A also notes that the proposed occupant safety features provide an acceptable level of safety for the intended use of this airplane."

Public Comment

A summary of this petition was not published in the Federal Register. The nature of this exemption is effectively identical to those of previous petitions for which there were no public comments received.

The FAA's analysis/summary is as follows:

The FAA considers the petitioner's proposal to be in the public interest for the same reasons as those previously stated by the petitioner.

As more and more transport category airplanes have been configured (or re-configured) for "private use, not-for-common-carriage," the FAA has given considerable attention to the issue of appropriate regulation of such airplanes. Some of the current regulations governing design certification of transport category airplanes are not compatible with "private use, not-for-common carriage." Given this situation, the FAA has received a number of petitions for exemption from certain regulations. The FAA has granted such exemptions when it finds that to do so is in the public interest and does not adversely affect the level of safety provided by the regulations. In the future, the FAA intends to propose regulations governing transport category airplanes in private use, obviating the need for case-by-case review of individual petitions for exemption.

The placement of interior doors is clearly quite significant to the owner and operator of the airplane. The flexibility to partition the airplane into individual rooms, such as meeting rooms or bedrooms, is paramount to an acceptable interior. The FAA acknowledges the desirability of these features from the operator's point of view.

When the regulations pertaining to interior doors were adopted, they did not necessarily consider "rooms." They considered two possible types of interior doors in a passenger compartment. The

first type is an interior door between passenger compartments. The second type is an interior door between the exit and the passenger compartment.

Until recently, only the first type of door was prohibited by § 25.813(e). However, part 25, as amended by Amendment 25-116, prohibits interior doors between the exit and the passenger compartment. In addition, Amendment 121-306 prohibits these doors in airplanes manufactured after November 27, 2006, and operated under 14 CFR part 121. Amendments 25-116 and 121-306, titled "Miscellaneous Cabin Safety Changes," were published in the Federal Register on October 27, 2004.

In terms of airplanes configured for "private use, not-for-common-carriage," there are four different categories of doors in passenger cabins.

1. Category 1 is a door in a room, and the room is less than the full width of the airplane. There will be an aisle on the outside of the room. This type of room may be occupied during takeoff and landing, and only the occupants of the room must use the door to reach an exit.

2. Category 2 is a door in a room and is the same as Category 1, except that there is a single emergency exit or pair of emergency exits within the room.

3. Category 3 is a door or doors in a compartment, and the compartment is the full width of the airplane. There are passengers seated on both sides of the door(s) and the main aisle leads out of or passes through the compartment. The compartment does not have any emergency exits. This type of compartment may be occupied during takeoff and landing.

4. Category 4 is a door in a room, and the room is the full width of the airplane. Passengers are seated on both sides of the door, and there is a pair of emergency exits at one end. This type of room may be occupied during takeoff and landing.

After considerable deliberation, the FAA has concluded that, in regard to the installation of interior doors between passenger compartments, not all interior doors are equivalent. With respect to such interior doors, the FAA has determined that the following requirements will produce an adequate level of safety:

1. In order to maximize the level of safety, doors in Category 2, 3, or 4 which are installed across the main cabin aisle must open and close in a transverse direction; that is, the direction of motion of the door must be at a right angle to the longitudinal axis of the airplane. A "pocket door" is one example of such a design. This will tend to minimize the chance that the inertia forces of an accident could force the door closed.

2. Redundant means are necessary to latch doors open for takeoff and landing. Each latching means must have the capability of retaining the door in the takeoff and landing position under the inertia forces of § 25.561.

3. Each interior door must be frangible, in the event that it is jammed in the closed position in flight or during taxi, takeoff, or landing. Frangibility is intended to ensure that if a door is jammed closed occupants can escape in either direction and emergency equipment can be moved. Frangibility may be demonstrated in either of the following ways:

    - A 5th percentile female can break through the door, creating a large enough opening that a 95th percentile (or larger) male can pass through. (See Advisory Circular 25-17, "Transport Airplane Cabin Interiors Crashworthiness Handbook," paragraph 43(b)(2).)

    - A 5th percentile female can break a hinge on the door or a hinge on a smaller door within the door such that the door can swing, so as to allow a 95th percentile (or larger) male to pass through the opening with the door swung open. This evaluation must be made with any cabin furnishing or equipment that could limit the swing arc of the door installed and then placed in the most adverse position. In using this approach, one must consider the possibility that the door is physically jammed in the closed position by distortion of the fuselage or furnishings. This possibility must be considered, even if the door normally translates into the open and closed positions.

4. Doors in Category 1 must be in the open position during taxi, takeoff, and landing only when the room is occupied.

5. Doors in Categories 2, 3, or 4 must be in the open position during taxi, takeoff, and landing, regardless of occupancy.

6. With respect to the possibility that a door will remain closed when it should not be, the FAA has determined that a higher level of awareness is required to address this issue. Due to the relative complexity of the cabin interior, the FAA has determined that inspection by flight attendants prior to takeoff and landing is not sufficient to verify that interior doors are in the proper position. Consequently, some type of remote indication is considered necessary. The petitioner's proposal to provide remote indication to the flightcrew is considered adequate.

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in § 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator, Embraer is hereby granted an exemption from 14 CFR § 25.813(e), Amendment 25-88. The petition is granted to the extent necessary to allow Embraer to install an executive interior on Embraer ERJ 190-100 ECJ airplanes. Specifically, the exemption allows relief from the prohibition of interior doors between passenger compartments. This exemption is subject to the following conditions:

1. The airplane is not operated for hire or offered for common carriage. This provision does not preclude the operator from receiving remuneration to the extent consistent with 14 CFR parts 125 and 91, subpart F, as applicable.

2. Each door between passenger compartments must be frangible.

3. Doors in Category 1 must be in the open position during taxi, takeoff, and landing only when the room is occupied or when passengers must pass through the room to reach an emergency exit.

4. Doors in Categories 2, 3, or 4 must be in the open position during taxi, takeoff, and landing, regardless of occupancy.

5. Appropriate procedures must be established to signal the flightcrew that a door between passenger compartments is closed and to prohibit takeoff or landing when a door between passenger compartments is not in the proper position.

6. Doors between passenger compartments must have dual means to retain them in the open position, each of which must be capable of withstanding the inertia loads specified in § 25.561.

7. Doors in Categories 2, 3, or 4 which are installed across a longitudinal aisle must translate laterally to open and close.

Issued in Renton Washington, on August 2, 2007.

s/s Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service