

**Exemption No. 9586**

**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 § 25.1411(d)(2) of  
Title 14, Code of Federal Regulations

**Regulatory Docket No. FAA-2007-28292**

**GRANT OF EXEMPTION**

By letter dated August 22, 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 for the Embraer ERJ-170 airplane from the requirements of § 25.1411(d)(2) of Title 14 Code of Federal Regulations (14 CFR). If granted, the exemption would permit relief from the requirement for storing liferafts near exits through which they can be launched after an unplanned ditching.

**The petitioner requests relief from the following regulation:**

**Section 25.1411(d)(2), Amendment 25-79** - Requires storing liferafts near exits through which they can be launched after an unplanned ditching.

**The petitioner's supporting information is summarized below:<sup>1</sup>**

“Embraer petitions for exemption to the liferaft storage location requirements of 14 CFR 25.1411(d)(2), to allow one raft to be stored in a location other than near to the exits through which the rafts can be launched after an unplanned ditching.

“Discussion

“The following discussion describes how the Embraer proposal to locate one of the required life rafts near the aft exits will result in a more rapid evacuation of the airplane after ditching because

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<sup>1</sup> The complete petition submitted by Embraer is available in the federal government’s rulemaking website at [www.regulations.gov](http://www.regulations.gov) Click on Search for Dockets and enter docket number FAA-2007-28292 in the Docket ID space.

it will allow simultaneous evacuation from an additional exit. This means that the granting of this exemption petition will result in a safer configuration, when all relevant factors are considered, than locating all the rafts near the forward exits as compliance with § 25.1411(d)(2) would require.

#### “Postditching Flotation Characteristics of the ERJ 170-100

“[Section] 25.1411 (d)(2) requires that all life rafts be stored near the exits that are used in an unplanned ditching. The unplanned ditching scenario assumes that the airplane is at maximum takeoff weight which results in the ditched airplane sitting lower in the water (less distance between the door sill and the water).

“The guidance in draft [Advisory Circular] 25-17A defines "near" as physically nearby the exit as practicable, where its stowed location could be readily determined from the vicinity of the exit, and where a minimum of portaging of the raft would be necessary. To comply with this requirement for the ERJ-170, all rafts would have to be located as far forward as practical because the forward exits are those that are available immediately after an unplanned ditching.

“While the forward exits are the only ones available immediately after an unplanned ditching, the ERJ 170-100 will pitch nose-down as it sinks, so that the aft exits will rise above the waterline and be available soon after ditching. In addition, in a planned ditching, the ERJ 170-100 floats so that the aft exit is always above the waterline and it remains above the waterline as the aircraft pitches nose-down.

“The effect of this characteristic is that the aft exits are viable for use for both unplanned ditching (after a short period) and for planned ditching (at any time), so locating a raft closer to the aft exits will increase the number of egress paths for the passengers and reduce the total time for all passengers to exit the airplane and board the liferafts.

#### “Effect of Operating Regulations on the Need to Carry Rafts

“Life rafts are required to be carried on board only for those flights that operate further than 30 minutes flying time or 100 nautical miles from shore (14 CFR 91.509) or when operating commercially overwater (14 CFR 121.339). Because this overwater operation normally occurs during the cruise portion of flight, any emergency that required ditching would allow sufficient time to configure the airplane for ditching, i.e., the planned ditching scenario. As outlined in our original petition letter, the planned ditching will leave both the forward and aft exits available for evacuation, so that the aft placement of one of the life rafts will make it more readily available for exactly the same scenario when it is required by the operating regulation to be carried.

#### “Flight Attendant Location

“In the ERJ 170-100, there are three flight attendant seats provided. One is located on the aft face of the cockpit bulkhead directly in front of the main entrance door. The other two seats are at the aft end of the passenger cabin directly in front of the left and right hand emergency exits. For the passenger capacity of the ERJ 170-100, the applicable operating regulations require only

two flight attendants, but regardless there will be at least one flight attendant near the aft exits available to open the aft exit doors and prepare the exit for evacuation. Placing one raft near this flight attendant would aid in the rapid launching of all available rafts and evacuation of passengers into the rafts compared to locating all three rafts near the forward exits where they would probably have to be launched sequentially because only one flight attendant is available to deploy the rafts.

#### “Public Interest

“As described in the original petition, the public interest would be directly served by this petition because locating one raft closer to the aft exit results in a higher overall level of safety than placing all of the rafts near the front exits. As described above, the aft exits are available after a planned ditching which is the scenario envisioned by the operating regulations that prescribe the carriage of rafts during overwater operations. Providing increased evacuation rates for the operations and scenarios more likely to experience ditching is in the public interest.

#### “Timeframe when Exemption is Needed

“Embraer is planning to publish a service bulletin in November 2007 that will provide an aft storage location for one raft.

#### “Operating with the Exemption outside the United States

“As an airplane manufacturer, Embraer will not operate under this exemption outside the United States. Owners and operators of US-registered EMB-170s which will hold US certificates of airworthiness will operate outside the United States.

“ICAO Annex 8 does not include a requirement specifying that liferafts must be placed near the unplanned ditching exits. Section 4.1.7.4 of Part IIIA of Annex 8 states only that:

“On aeroplanes certificated for ditching conditions, provisions shall be made in the design to give maximum practicable assurance that safe evacuation from the aeroplane of passengers and crew can be executed in case of ditching.

As described above, the location of the third raft in an aft location results in an overall safer condition for post-ditching egress, so the granting of this petition does not affect compliance with that ICAO standard.

#### “Summary

“Placing one raft nearer to the aft exit has the advantage of making the aft exits more viable when the aft exits are above the waterline, such as during a planned ditching when the deployment of the rafts will actually augment passenger survival. Having the raft placed aft will allow each of the three rafts to be deployed simultaneously rather than have one raft have to wait at the forward exits for the first two to be launched. Since the forward exits will be the first to

flood as the airplane sinks, it is actually less safe to place the third raft forward if the aft exits are available.

“The only disadvantage is that this raft will have to be portaged forward if, for some reason, only the forward exits are used. Even in this case the "delivery" of the raft to the forward exit is no different than if it was stored further forward. The waiting passenger queue is going to obstruct access to the forward doors in either case. Distributing the rafts more evenly results in an overall greater ability to rapidly egress the airplane considering all ditching scenarios.”

### **Public Comment**

A summary of this petition was published in the Federal Register on October 26, 2007. A single comment supporting the petition was received from the Air Line Pilots Association.

### **The FAA’s analysis/summary is as follows:**

The FAA has reviewed the information provided by Embraer and finds that it has merit. The term “unplanned ditching” is not explicitly defined in the regulations. Over the years, the term has become associated with a ditching that occurs with little warning, such that there is no time to prepare the airplane by, for example, jettisoning fuel or closing outflow valves. Thus, an unplanned ditching is virtually always associated with a takeoff or landing.

The regulations require that ditching exits be available for an unplanned ditching as well as for a ditching for which there is time to prepare, i.e., a planned ditching. In the latter case, procedures such as jettisoning fuel can be employed. Liferafts are required only when ditching compliance is requested, and the airplane is operated on extended overwater routes. Thus, liferafts are intended to be used to address the planned ditching scenario. For most airplanes, the exits available are the same for either type of ditching. Therefore, the reference to unplanned ditching has had no practical effect on the location of the liferaft stowage.

For the Embraer ERJ-170 (for which the passenger capacity requires three liferafts), there are fewer exits available for an unplanned ditching than for a planned ditching. Strict compliance with the regulation, using the current interpretation of an unplanned ditching, would require that liferafts be stowed away from exits that are available for launching liferafts in a planned ditching. The aft exits are not immediately available in an unplanned ditching, because under some circumstances they will be temporarily submerged. Since the planned ditching is the scenario for which liferafts are intended, it is counterproductive to have the liferafts remote from the exits that contribute in the planned ditching scenario. As noted by Embraer, the distribution of crewmembers as well as the distribution of available exits clearly favors having liferafts in the forward *and* aft sections of the airplane.

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 § 25.1411(d)(2), Amendment 25-79. The petition is granted to the extent necessary to allow Embraer to install a liferaft near the rear exits of the ERJ-170 airplane.

Issued in Renton Washington, on January 18, 2008.

Ali Bahrami  
Manager  
Transport Airplane Directorate  
Aircraft Certification Service