Dated: November 24, 2020.

Wilma M. Robinson,

Deputy Executive Secretary, Department of Health and Human Services.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA–2019–1054; Special Conditions No. 25–777–SC]

Special Conditions: Boeing Commercial Airplanes Model 777–9 Airplane; Overhead Flightcrew Rest Compartment Occupiable During Taxi, Takeoff, and Landing

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Boeing Commercial Airplanes (Boeing) Model 777–9 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 an overhead flightcrew rest (OFCR) compartment occupiable during taxi, takeoff, and landing (TT&L). 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 January 19, 2021.

FOR FURTHER INFORMATION CONTACT: Shannon Lennon, Airframe and Cabin Safety Section, AIR–675, Transport Standards Branch, Policy and Innovation Division, Aircraft Certification Service, Federal Aviation Administration, 2200 South 216th Street, Des Moines, Washington 98198; telephone and fax 206–231–3209; email *shannon.lennon@faa.gov.*

SUPPLEMENTARY INFORMATION:

Background

On December 6, 2013, Boeing applied for an amendment to Type Certificate No. T00001SE to include the new 777–9 airplane. The application date was extended to March 30, 2016, at Boeing's request. The Boeing Model 777–9 airplane, which is a derivative of the Boeing Model 777 airplane currently approved under Type Certificate No. T00001SE, is a twin-engine, transport-category airplane with seating for 495 passengers, and a maximum takeoff weight of 775,000 lbs.

Type Certification Basis

Under the provisions of title 14, Code of Federal Regulations (14 CFR) 21.101, Boeing must show that the 777–9 airplane, as changed, continues to meet the applicable provisions of the regulations listed in Type Certificate No. T00001SE, or the applicable regulations in effect on the date of application for the change, except for earlier amendments as agreed upon by the FAA.

If the Administrator finds that the applicable airworthiness regulations (*e.g.,* 14 CFR part 25) do not contain adequate or appropriate safety standards for the Boeing Model 777–9 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 Boeing Model 777–9 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 Boeing Model 777–9 airplane will incorporate the following novel or unusual design features:

An overhead flightcrew rest (OFCR) compartment occupiable during taxi, takeoff, and landing.

Discussion

Crew rest compartments have been previously installed and certificated on several Boeing airplane models in locations such as in the main passenger seating area, the overhead space above the main passenger-cabin seating area, and below the passenger-cabin seating area within the cargo compartment. In each case, the Administrator determined that the applicable regulations (*i.e.,* 14 CFR part 25) did not provide all of the necessary requirements, because each installation had unique features by virtue of its design, location, and use on the airplane.

For Boeing Model 777 airplanes, the FAA issued Special Conditions No. 25–260–SC, dated April 14, 2004, for OFCR compartments allowed to be occupied during TT&L, as well as during flight. However, after issuance of Special Conditions No. 25–260–SC, the FAA issued Special Conditions No. 25–418–SC for the Boeing Model 787–8 airplane, for the same novel design feature, with changes to better address oxygen systems and fire suppressors. Those special conditions reflected the methodology necessary to provide an equivalent level of safety for remote OFCR compartments. Therefore, new special conditions are issued for this design feature on Boeing Model 777–9 airplanes, in lieu of Special Conditions No. 25–260–SC.

For the Boeing Model 777–9 airplane, the OFCR compartment is located in the overhead space above the main passenger-cabin seating area immediately aft of the first pair of main-deck emergency exits (Door 1). The compartment includes two private berths and up to two seats. Occupancy of the compartment will be limited to a maximum of four trained crewmembers during flight, and two trained flightcrew members, one in each seat, during TT&L. The compartment will be accessed from the main deck by stairs through a vestibule. In addition, a secondary evacuation route, which opens directly into the main passenger seating area, will be available as an alternate route for evacuating occupants of the compartment. A smoke-detection system and an oxygen system will be provided in the compartment. Other optional features, such as a sink with cold-drink stowage or a lavatory, may be provided as well.

This Boeing Model 777–9 airplane OFCR compartment is novel or unusual to part 25 due to its design, location, and use on the airplane. This compartment is particularly novel or unusual in that it is located in the overhead area of the passenger compartment, and will be occupied by trained flightcrew during TT&L. Due to the novel or unusual features associated with the installation of this compartment, special conditions are considered necessary to provide a level

of safety equal to that established by the airworthiness regulations.

The 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.

Operational Evaluations and Approval

These special conditions establish requirements for OFCR-compartment design approvals administered by the FAA's Aircraft Certification Service. Before operational use of an OFCR compartment, the FAA's Flight Standards Service must evaluate and approve the ''basic suitability'' of the compartment for crew occupation. Additionally, if an operator wishes to use an OFCR compartment as ''sleeping quarters,'' the compartment must undergo an additional evaluation and approval (reference 14 CFR 121.485(a), 121.523(b), and 135.269(b)(5)). Compliance with these special conditions does not ensure that the applicant has demonstrated compliance with the requirements of parts 121 or 135.

To obtain an operational evaluation, the type certificate holder must contact the appropriate aircraft evaluation group (AEG) in the Flight Standards Service and request a ''basic suitability'' evaluation or a ''sleeping quarters'' evaluation of its OFCR compartment. The results of these evaluations should be documented in a Boeing Model 777–9 airplane flight standardization board (FSB) report appendix. Individual operators may reference these standardized evaluations in discussions with their FAA principal operating inspector as the basis for an operational approval, in lieu of an on-site operational evaluation.

Any changes to the approved OFCR compartment configuration that affect crewmember emergency egress, or any other procedures affecting safety of the occupying crewmembers or related emergency training, will require re-evaluation and approval. The applicant for an OFCR compartment design change that affects egress, safety procedures, or training is responsible for notifying the FAA's AEG that a new compartment evaluation is required. The results of a reevaluation should also be documented in a Boeing Model 777–9 airplane FSB report appendix.

Procedures must be developed to ensure that a crewmember, acting as firefighter, when entering the OFCR compartment through the stairway or vestibule to fight a fire, will examine the stairway or vestibule, and the adjacent galley or lavatory areas (if installed), for the source of the fire before entering the remaining areas of the compartment. This is intended to ensure that the source of the fire is not between the crewmember and the entrance to the OFCR compartment. If a fire source is not immediately evident to the firefighter, the firefighter should check for potential fire sources at areas closest to the OFCR compartment entrance first, then proceed to check areas in such a manner that the fire source, when found, will not be between the firefighter and their means of escape from the compartment. Procedures describing methods for searching the OFCR compartment for fire source(s) must be transmitted to operators for incorporation into their training programs and appropriate operational manuals.

Rescue-Crew Training Materials

Installation of an OFCR compartment that can be occupied during TT&L by flightcrew is unusual. Appropriate information must be provided to airport fire-rescue personnel so that they understand that this remote compartment may be occupied during an emergency landing. The applicant must provide rescue-crew training materials to the local FAA Airports Division, Safety and Standards Branch, to address this issue. The FAA Airports Division, Safety and Standards Branch, will ensure that these materials are distributed to appropriate airports, domestic and foreign. Special conditions are not considered appropriate to address this issue.

Discussion of the Special Conditions

These special conditions apply to OFCR compartments that are occupiable during TT&L and are installed immediately aft of the Door 1 exits on Boeing Model 777–9 airplanes. These special conditions for Boeing Model 777–9 airplanes supplement 14 CFR part 25. Except as noted below, these special conditions for Boeing Model 777–9 airplanes are identical to Boeing Model 777 airplane Special Conditions No. 25–260–SC.

Conditions 6 and 16 contain requirements for the exit signs that must be provided in the OFCR compartment. Symbols that satisfy the equivalent-level-of-safety finding established for Boeing Model 777–9 airplanes may be used in lieu of the text required by § 25.812(b)(1)(i). The FAA expects that the meaning of any symbolic exit sign will be reinforced as a part of crewmember training in evacuation procedures.

Condition 15 contains requirements for supplemental oxygen systems. Earlier Special Conditions No. 25–260–SC for Boeing Model 777–9 airplanes required that each berth be equipped with two oxygen masks. This was intended to address the case where a person not in a berth was moving around within the flightcrew rest compartment and needed quick access to an oxygen mask. For Boeing Model 777–9 airplanes, the requirement to have two masks per berth may not always meet the objective of having masks available to persons who are in transition within the compartment. Therefore, the wording of this condition has been modified to better state the objective, rather than specifying a two-masks-per-berth requirement. In addition, the requirement to have adequate illumination to retrieve an oxygen mask, while implied previously, is made explicit in these special conditions.

Condition 18 contains the requirements for materials used in the construction of the OFCR compartment. Special Conditions No. 25–260–SC stated that § 25.853, as amended by Amendment 25–83, is the appropriate regulation. Section 25.853 has since been further amended, and these special conditions reference the latest amendment level for § 25.853, Amendment 25–116.

Compliance with these special conditions does not relieve the applicant from the existing airplane certification-basis requirements. One particular area of concern is that installation of OFCR compartments changes the compartment volume in the overhead area of the airplane. The applicant must comply with the pressurized compartment loads requirements of § 25.365(e), (f), and (g) for the OFCR compartment, as well as for any other airplane compartments the decompression characteristics of which are affected by the installation of an OFCR compartment.

Compliance with § 25.813, emergency-exit access requirements, must be demonstrated for all phases of flight during which occupants will be present.

The configuration includes a seat installed adjacent to the OFCR compartment exit, with the compartment occupiable during TT&L. Note that the emergency-landing conditions requirements of §§ 25.561(d) and 25.562(c)(8) apply to this configuration. Deformations resulting from required static and dynamic structural tests must not impede rapid evacuation of the OFCR compartment occupants. Seat deformations must not prevent opening of the secondary escape

hatch or rapid evacuation through the secondary escape route.

Section 25.785(h)(2) mandates that the flight attendant seats required by the operating rules be located in a position that provides a direct view of the cabin area for which the flight attendant is responsible. Because the OFCR compartment will be occupied only by trained crewmembers, the FAA does not consider this requirement applicable to the seating area in the OFCR compartment.

Section 25.787(a) requires each stowage compartment in the passenger cabin, except for underseat and overhead stowage compartments for passenger convenience, to be completely enclosed. This requirement does not apply to the flight deck, because flightcrew members must be able to quickly access items to better perform their duties. Flightcrew members occupying the OFCR compartment will not be performing flight-deck duties however. Therefore, stowage compartments in the OFCR compartment, except for underseat compartments for occupant convenience, should be completely enclosed. This will provide occupants of the OFCR compartment a similar level of safety to that provided to passengers on the main deck. Condition 20 contains this requirement.

Section 25.811(c) requires that means be provided to assist occupants in locating the exits in conditions of dense smoke. Section 25.812(e) requires floor-proximity emergency-escape path marking to provide guidance for passengers when all sources of illumination above 4 feet from the cabin aisle floor are totally obscured. The FAA considers that the current OFCR compartment design is sufficient in regard to these regulations. The two OFCR compartment seats are only a couple of steps away from the stairway, and when a trained flightcrew member is at the top of the stairway, the stairway itself will guide them to the main deck. When the crewmember is on the main deck, floor proximity lighting and exit-marker signs, which are less than 4 feet above the floor, are provided.

Section 25.813(e) prohibits installation of interior doors between passenger compartments, but the FAA has historically found flightcrew rest-compartment doors to be acceptable, because flightcrew rest compartments are not passenger compartments. Conditions 2 and 16 provide requirements for flightcrew rest-compartment doors, conditions that are considered to provide an appropriate level of safety to OFCR compartment occupants.

Sections 25.1443, 25.1445, and 25.1447 describe oxygen requirements for flightcrew, passengers, and cabin attendants. Flightcrew members occupying the OFCR compartment are not on duty, and therefore are considered passengers in determining compliance with these oxygen regulations.

Discussion of Comments

The FAA issued Notice of Proposed Special Conditions No. 25–20–07–SC for the Boeing Model 777–9 airplane, which was published in the **Federal Register** on June 30, 2020 (85 FR 39100). The FAA received responses from three commenters.

The Air Line Pilots Association (ALPA) believes the special conditions contradict exemptions for mini-suites that prohibit the occupation of the OFCR during TT&L, and suggests that the special conditions be modified to provide consideration for Exemption No. 17634A, including a prohibition of occupancy of the OFCR during TT&L for airplanes fitted with high-walled mini-suites, as well as a requirement of applicable placarding to be visibly installed in the OFCR, and related limitations be published within the AFM.

The FAA partially agrees with this comment. The FAA's intends to prohibit occupancy of an OFCR during TT&L should any egress path from the crew rest fall into a mini-suite on the main deck as stated in FAA Exemption No. 17634A. However, such a limitation is not established solely by the installation of an OCFR. The necessity of such a limitation would be established by the installation of a mini-suite and the subsequent assessment of the egress paths from the OFCR relative to the mini-suite location. For this reason, and the because the subject of these special conditions is the OFCR and not mini-suite installations, the prohibition of occupancy of the OFCR during TT&L when mini-suites are installed will not be restated in these special conditions. The FAA does agree, however, that the special conditions should acknowledge that occupancy during TT&L may be further restricted for purposes of maintaining consistency with related exemptions. As such, these special conditions have been revised to include Condition 1.d.

Boeing recommends revising the title of the special conditions as follows:

Special Conditions: Boeing Commercial Airplanes Model 777–9 Airplane; Overhead Flightcrew Rest Compartment.

The FAA does not agree with the proposed change because the title, as written, differentiates the scope of these special conditions from other special conditions issued for Boeing Model 777 series airplanes with OFCR that are not to be occupied for taxi, takeoff, and landing, as is the case with Special Conditions No. 25–230–SC. These special conditions allow occupancy of the OFCR during taxi, takeoff, and landing, but there is no condition that requires occupancy of the OFCR such that it is permissible for the rest to be unoccupied during taxi, takeoff, and landing.

Boeing further comments that the Compliance by Inspection in Condition 4.a. states, in part,

Because a berth is required to have two separate exits, a fire within a berth that blocks an occupant of that berth from only one exit or the other need not be considered.

Boeing believes that the proposed wording implies a requirement for two exits out of each berth (with berth meaning each bunk), which they further believe is not the intent of this condition, recommending replacing the proposed text with the following:

A fire within a berth that only blocks the occupant of that berth from exiting the berth need not be considered.

The FAA recognizes that the current wording is cause for confusion and agrees with the recommended wording, which is consistent with Boeing Model 787 airplane Special Conditions No. 25–418–SC.

An individual commenter stated that Condition 1.b. appears to be inconsistent with Condition 1.a.iv. concerning smoking restriction and ashtray requirements, and recommends deleting Condition 1.b.

The FAA does not agree with the recommendation to remove Condition 1.b. Even though condition 1.a.iv prohibits smoking in the OFCR, the requirement of one ashtray on both the inside and outside of the OFCR entrance is a measure that is intended to further discourage smoking in the OFCR and to prevent improper disposal of smoking materials in the OFCR by providing a suitable disposal receptacle.

The commenter notes that Condition 15.d requires that the supplemental oxygen system ''provide an aural and visual alert to warn occupants of the OFCR compartment to don oxygen masks in the event of decompression,'' for each berthing area, to alert sleeping crewmembers. The aural alert is required to sound continuously for a period no less than 5 minutes or ''until a reset switch within the OFCR compartment is activated.''

The commenter recommends providing a means to prevent accidental

berth-occupant deactivation of the alerting system, to prevent deactivation of the oxygen-mask-alert reset switch due to turbulence or movement of a sleeping occupant. The commenter recommends that the reset-alarm switch be located away from the normal reach and position of an occupant in the berthing area, and that a physical guard, or similar means to prevent inadvertent deactivation, be provided.

While the FAA recognizes that an alarm-reset switch may be subject to inadvertent activation if not optimally placed, the FAA does not agree that an additional requirement for the location or design of the alert-reset switch is necessary. The reset switch in the OFCR is out of reach of the berth occupants and is placed out of the way of normal movement within the compartment, as dictated by the limited space within the OFCR, as well as placement of the OFCR interior features.

The commenter further states that crewmembers within the OFCR compartment should be provided immediate access to lifesaving equipment, such as personal flotation devices, adding that the special conditions do not appear to consider crew accessibility to such personal protective equipment.

The FAA agrees that crewmembers within the OFCR should be provided immediate access to personal flotation devices. However, the installation of flotation devices in the OFCR is not within the scope of these special conditions. Rather, the existing requirements for life-vest installations which address access of the life vest by OFCR occupants can be found in §§ 25.1411(f) and 25.1415(b). Other flotation means are addressed in 25.1415(e).

Except as discussed above, the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the Boeing Model 777–9 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 airplane model. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

Authority Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(f), 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 777–9 airplanes with an OFCR compartment installed adjacent to, or immediately aft of, the first pair of exits (Door 1).

1. During flight, occupancy of the OFCR compartment is limited to the total number of installed bunks and seats in the compartment, and that are approved to the maximum flight-loading conditions. During TT&L, occupancy of the OFCR compartment is limited to the total number of installed seats approved for the flight and ground-load conditions, and emergency-landing conditions. Therefore, the OFCR compartment is limited to a maximum of four crewmembers during flight, and two flightcrew members during TT&L.

a. Appropriate placards must be located inside and outside each entrance to the OFCR compartment to indicate:

i. Occupancy is limited to flightcrew members (pilots) during TT&L.

ii. The maximum number of crewmembers allowed during flight, and the maximum number of flightcrew members allowed during TT&L.

iii. Occupancy is restricted to crewmembers the pilot in command has determined to be both trained in the emergency procedures for the OFCR compartment and able to rapidly use the evacuation routes.

iv. Smoking is prohibited in the OFCR compartment.

v. Stowage in the OFCR compartment area is limited to crew personal luggage. The stowage of cargo or passenger baggage is not allowed.

b. At least one ashtray must be located on both the inside and the outside of any entrance to the OFCR compartment.

c. A limitation in the airplane flight manual must restrict occupancy to crewmembers the pilot in command has determined to be both trained in the emergency procedures for the OFCR compartment and able to rapidly use the evacuation routes of the OFCR compartment.

d. If mini-suites with doors are installed on the main deck beneath the OFCR, occupancy of the OFCR may be prohibited during TT&L due to the conditions of an exemption that allows installation of mini-suites. If occupancy of the OFCR during TT&L is further restricted by exemption, the placard required in Condition 1.a must reflect that occupancy of the OFCR is not allowed during TT&L in lieu of Condition 1.a.i, stating occupancy is limited to flightcrew members (pilots) during TT&L.

2. The following requirements are applicable to OFCR compartment doors:

a. A means must be provided for any door installed between the OFCR compartment and the passenger cabin to be opened quickly from inside the OFCR compartment, and when crowding from an emergency evacuation occurs at each side of the door.

b. Doors installed across emergency egress routes must have a means to latch them in the open position. The latching means must be able to withstand the loads imposed upon it when the door is subjected to the ultimate inertia forces, relative to the surrounding structure, listed in § 25.561(b).

c. A placard must be displayed in a conspicuous place on the outside of the entrance door of the OFCR compartment, and on any other door(s) installed across emergency egress routes of the OFCR compartment, requiring those doors to be latched open when the OFCR compartment is occupied during TT&L.

i. This requirement does not apply to emergency-escape hatches installed in the floor of the OFCR compartment.

ii. A placard must be displayed in a conspicuous place on the outside of the entrance door to the OFCR compartment, and that requires the compartment door to be closed and locked when it is not occupied.

iii. Procedures for meeting these requirements must be transmitted to the operator for incorporation into its training programs and appropriate operational manuals.

d. For all doors installed in the OFCR compartment, a means must be provided to prevent anyone from being trapped inside the OFCR compartment. If a locking mechanism is installed, it must be capable of being unlocked from the outside without the aid of special tools. The lock must not prevent opening from the inside of the OFCR compartment at any time.

3. In addition to the requirements of § 25.562 for seats that are occupiable during takeoff and landing, and restraint systems, the OFCR compartment structure must be compatible with the loads imposed by the seats as a result of the conditions specified in § 25.562(b).

4. At least two emergency evacuation routes must be available for use by each occupant of the OFCR compartment to

rapidly evacuate to the main cabin. These evacuation routes must be able to be closed from the main passenger cabin after evacuation. In addition:

a. The routes must be located with sufficient separation within the OFCR compartment to minimize the possibility of an event either inside or outside of the OFCR compartment rendering both routes inoperative.

Compliance with requirements of Condition 4.a. of these special conditions may be shown by inspection or by analysis. Regardless of which method is used, the maximum acceptable distance between OFCR compartment exits is 60 feet.

Compliance by Inspection

Inspection may be used to show compliance with Condition 4.a. of these special conditions. An inspection finding that an OFCR compartment has evacuation routes located so that each occupant of the seats and berths has an unobstructed route to at least one of the OFCR compartment exits, regardless of the location of a fire, would be reason for a finding of compliance. A fire within a berth that only blocks the occupant of that berth from exiting the berth need not be considered. Therefore, OFCR compartment exits that are located at opposite ends (*i.e.,* adjacent to opposite-end walls) of the OFCR compartment would require no further review or analysis with regard to exit separation.

Compliance by Analysis

Analysis must show that the OFCR compartment configuration and interior features allow all occupants of the OFCR compartment to escape the compartment in the event of a hazard inside or outside of the compartment. Elements to consider in this evaluation are as follows:

i. Fire inside or outside the OFCR compartment, considered separately, and the design elements used to reduce the available fuel for the fire.

ii. Design elements used to reduce fire-ignition sources in the OFCR compartment.

iii. Distribution and quantity of emergency equipment within the OFCR compartment.

iv. Structural failure or deformation of components that could block access to the available evacuation routes (*e.g.,* seats, folding berths, contents of stowage compartments, etc.).

v. An incapacitated person blocking the evacuation routes.

vi. Any other foreseeable hazard not identified above that could cause the evacuation routes to be compromised.

Analysis must consider design features affecting access to the evacuation routes. Possibilities for design components affecting evacuation that should be considered include, but are not limited to, seat deformations (reference §§ 25.561(d) and 25.562(c)(8)), seat-back break-over, rigid structure that reduces access from one part of the compartment to another, and items known to be the cause of potential hazards. Factors that also should be considered are availability of emergency equipment to address fire hazards; availability of communications equipment; supplemental restraint devices to retain items of mass that, if broken loose, could hinder evacuation; and load-path isolation between components containing evacuation routes.

Analysis of fire threats should be used in determining placement of required fire extinguishers and protective breathing equipment (PBE). This analysis should consider the possibility of fire in any location in the OFCR compartment. The location and quantity of PBE equipment and fire extinguishers should allow occupants located in any approved seats or berths access to the equipment necessary to fight a fire in the OFCR compartment.

The intent of this condition is to provide sufficient exit-route separation. Therefore, the exit-separation analysis described above should not be used to approve OFCR-compartment exits that have less physical separation (measured between the centroid of each exit opening) than the minimums prescribed below, unless compensating features are identified and submitted to the FAA for evaluation and approval.

For an OFCR compartment with one exit located near the forward or aft end of the compartment (as measured by having the centroid of the exit opening within 20 percent of the forward or aft end of the total OFCR-compartment length), the exit separation from one exit to the other should not be less than 50 percent of the total OFCR compartment length.

For OFCR compartments with neither required OFCR compartment exit located near the forward or aft end of the compartment (as measured by not having the centroid of either exit opening within 20 percent of the forward or aft end of the total OFCR compartment length), the exit separation from one exit to the other should not be less than 30 percent of the total OFCR-compartment length.

b. The evacuation routes must be designed to minimize the possibility of blockage, which might result from fire, mechanical or structural failure, or persons standing below or against the OFCR-compartment exits. One of the two OFCR-compartment exits should not be located where normal movement or evacuation by passengers occurs (main aisle, cross aisle, or galley complex, for example) that would impede egress from the OFCR compartment. If an evacuation route is in an area where normal movement or evacuation of passengers occurs, it must be demonstrated that passengers would not impede egress to the main deck. If low headroom is at or near the evacuation route, provisions must be made to prevent or to protect occupants of the OFCR compartment from head injury. Use of evacuation routes must not depend on any powered device. If an OFCR-compartment exit is over an area of passenger seats, a maximum of five passengers may be displaced from their seats temporarily during the process of evacuating an incapacitated person(s). If such an evacuation procedure involves the evacuee stepping on seats, the seats must not be damaged to the extent that they would not be acceptable for occupancy during an emergency landing.

c. Emergency evacuation procedures, including procedures for emergency evacuation of an incapacitated occupant from the OFCR compartment, must be established. The applicant must transmit all of these procedures to the operator for incorporation into its training programs and appropriate operational manuals.

d. A limitation must be included in the airplane flight manual or other suitable means to require that crewmembers are trained in the use of the OFCR-compartment evacuation routes. This training must instruct crew to ensure that the OFCR compartment (including seats, doors, etc.) is in its proper TT&L configuration during TT&L.

e. In the event no flight attendant is present in the area around the door to the OFCR compartment, and also during an emergency, including an emergency evacuation, a means must be available to prevent passengers on the main deck from entering the OFCR compartment.

f. Doors or hatches separating the OFCR compartment from the main deck must not adversely affect evacuation of occupants on the main deck (slowing evacuation by encroaching into aisles, for example) or cause injury to those occupants during opening or while opened.

g. The means of opening doors and hatches to the OFCR compartment must be simple and obvious. The OFCR compartment doors and hatches must be

able to be closed from the main passenger cabin.

5. A means must be available for evacuating an incapacitated person, representative of a 95th percentile male, from the OFCR compartment to the passenger cabin floor. Such an evacuation must be demonstrated for all evacuation routes. A crewmember (a total of one assistant within the OFCR compartment) may provide assistance in the evacuation. Additional assistance may be provided by up to three persons in the main passenger compartment. These additional assistants must be standing on the floor while providing assistance. For evacuation routes with stairways, the additional assistants may ascend up to one half the elevation change from the main deck to the OFCR compartment, or to the first landing, whichever is lower.

6. The following signs and placards must be provided in the OFCR compartment and they must meet the following criteria:

a. At least one exit sign, located near each OFCR compartment exit, meeting the emergency lighting requirements of § 25.812(b)(1)(i). One allowable exception would be a sign with reduced background area of no less than 5.3 square inches (excluding the letters), provided that it is installed so that the material surrounding the exit sign is light in color (white, cream, light beige, for example). If the material surrounding the exit sign is not light in color, a sign with a minimum of a one-inch-wide background border around the letters would be acceptable. Another allowable exception is a sign with a symbol that the FAA has determined to be equivalent for use as an exit sign in an OFCR compartment.

b. An appropriate placard located conspicuously on or near each OFCR-compartment door or hatch that defines the location and the operating instructions for access to and operation of the door or hatch.

c. Placards must be readable from a distance of 30 inches under emergency lighting conditions.

d. The door or hatch handles, and operating-instruction placards required by Condition 6.b. of these special conditions, must be illuminated to at least 160 microlamberts under emergency lighting conditions.

7. A means must be available, in the event of failure of the airplane main power system, or of the normal OFCR-compartment lighting system, for emergency illumination to be automatically provided for the OFCR compartment.

a. This emergency illumination must be powered independently of the main lighting system.

b. The sources of general cabin illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency lighting system is independent of the power supply to the main lighting system.

c. The illumination level must be sufficient to allow occupants of the OFCR compartment to locate and move to the main passenger cabin floor by means of each evacuation route.

d. The illumination level must be sufficient, with the privacy curtains in the closed position, for each occupant of the OFCR compartment to locate a deployed oxygen mask.

8. A means must be available for two-way voice communications between crewmembers on the flight deck and occupants of the OFCR compartment. Two-way communications must also be available between occupants of the OFCR compartment and each flight attendant station in the passenger cabin that is required, per § 25.1423(g), to have a public-address-system microphone. In addition, the public-address system must include provisions to provide only the relevant information to the crewmembers in the OFCR compartment (*e.g.,* fire in flight, aircraft depressurization, preparation of the compartment for landing, etc.). That is, provisions must be made so that occupants of the OFCR compartment will not be disturbed with normal, non-emergency announcements made to the passenger cabin.

9. A means must be available for manual activation of an aural emergency-alarm system, audible during normal and emergency conditions, to enable crewmembers on the flight deck and at each pair of required floor-level emergency exits to alert occupants of the OFCR compartment of an emergency situation. Use of a public address or crew interphone system will be acceptable, provided an adequate means of differentiating between normal and emergency communications is incorporated. The system must be powered in flight, after the shutdown or failure of all engines and auxiliary power units, for a period of at least ten minutes.

10. A means, readily detectable by seated or standing occupants of the OFCR compartment, must be in place to indicate when seat belts should be fastened. Seatbelt-type restraints must be provided for berths and must be compatible with the sleeping position during cruise conditions. A placard on each berth must require that these restraints be fastened when occupied. If compliance with any of the other requirements of these special conditions is predicated on specific head position, a placard must identify that head position.

11. Protective breathing equipment must be provided in accordance with § 25.1439, except that in lieu of a device for each crewmember, the following must be provided: Two PBE devices approved to Technical Standard Order (TSO)-C116 or equivalent, suitable for firefighting, or one PBE for each hand-held fire extinguisher, whichever is greater. The following equipment must also be provided in the OFCR compartment:

a. At least one approved hand-held fire extinguisher appropriate for the kinds of fires likely to occur.

b. One flashlight.

Note: Additional PBE devices and fire extinguishers in specific locations, beyond the minimum numbers prescribed in Condition 11 of these special conditions, may be required as a result of the egress analysis accomplished to satisfy Condition 4.a. of these special conditions.

12. A smoke- or fire-detection system (or systems) must be provided that monitors each occupiable space within the OFCR compartment, including those areas partitioned by curtains or doors. Flight tests must be conducted to show compliance with this requirement. If a fire occurs, each system (or systems) must provide:

a. A visual indication to the flight deck within one minute after the start of a fire.

b. An aural warning in the OFCR compartment.

c. A warning in the main passenger cabin. This warning must be readily detectable by a flight attendant, taking into consideration the locations of flight attendants throughout the main passenger compartment during various phases of flight.

13. A means to fight a fire must be provided. This can be either a built-in extinguishing system or a manual, hand-held extinguishing system.

a. For a built-in extinguishing system:

i. The system must have adequate capacity to suppress a fire considering the fire threat, volume of the compartment, and the ventilation rate. The system must have sufficient extinguishing agent to provide an initial knockdown and suppression environment per the minimum performance standards that have been established for the agent being used. In addition, certification flight testing will verify the acceptable duration that the

suppression environment can be maintained.

ii. If the capacity of the extinguishing system does not provide effective fire suppression that will last for the duration of flight from the farthest point in route to the nearest suitable landing site expected in service, an additional manual firefighting procedure must be established. For the built-in extinguishing system, the time duration for effective fire suppression must be established and documented in the firefighting procedures in the airplane flight manual. If the duration of time for demonstrated effective fire suppression provided by the built-in extinguishing agent will be exceeded, the firefighting procedures must instruct the crew to:

1. Enter the OFCR compartment at the time that demonstrated fire suppression effectiveness will be exceeded.

2. Check for and extinguish any residual fire.

3. Confirm that the fire is out.

b. For a manual, hand-held extinguishing system (designed as the sole means to fight a fire or to supplement a built-in extinguishing system of limited suppression duration) for the OFCR compartment:

i. A limitation must be included in the airplane flight manual or other suitable means requiring that crewmembers be trained in the firefighting procedures.

ii. The OFCR compartment design must allow crewmembers equipped for firefighting to have unrestricted access to all parts of the OFCR compartment.

iii. The time for a crewmember on the main deck to react to the fire alarm, don the firefighting equipment, and gain access to the OFCR compartment must not exceed the time it would take for the compartment to become filled with smoke, thus making it difficult to locate the fire source.

iv. Approved procedures describing methods for searching the OFCR compartment for fire source(s) must be established. These procedures must be transmitted to the operator for incorporation into its training programs and appropriate operational manuals.

14. A means must be provided to prevent hazardous quantities of smoke or extinguishing agent originating in the OFCR compartment from entering any other occupiable compartment.

a. Small quantities of smoke may penetrate from the OFCR compartment into other occupied areas during the one-minute smoke-detection time.

b. A provision in the firefighting procedures must ensure that all doors and hatches at the OFCR compartment are closed after evacuation of the compartment and during firefighting to minimize smoke and extinguishing agent entering other occupiable compartments.

c. All smoke entering any occupiable compartment when access to the OFCR compartment is open for evacuation must dissipate within five minutes after the access to the OFCR compartment is closed.

d. Hazardous quantities of smoke may not enter any occupied compartment during access to manually fight a fire in the OFCR compartment. The amount of smoke entrained by a firefighter exiting the OFCR compartment is not considered hazardous.

e. Flight tests must be conducted to show compliance with this requirement.

15. A supplemental oxygen system within the OFCR compartment must provide the following:

a. At least one mask for each seat and berth in the OFCR compartment.

b. If a destination area (such as a changing area) is provided in the OFCR compartment, an oxygen mask must be readily available for each occupant who can reasonably be expected to be in the destination area (with the maximum number of required masks within the destination area being limited to the placarded maximum occupancy of the OFCR compartment).

c. An oxygen mask must be readily accessible to each occupant who can reasonably be expected to be moving from the main cabin into the OFCR compartment, moving around within the OFCR compartment, or moving from the OFCR compartment to the main cabin.

d. The system must provide an aural and visual alert to warn occupants of the OFCR compartment to don oxygen masks in the event of decompression. The aural and visual alerts must activate concurrently with deployment of the oxygen masks in the passenger cabin. To compensate for sleeping occupants, the aural alert must be heard in each section of the OFCR compartment and must sound continuously for a minimum of 5 minutes or until a reset switch within the OFCR compartment is activated. A visual alert that informs occupants that they must don an oxygen mask must be visible in each section.

e. A means must be in place by which oxygen masks can be manually deployed from the flight deck.

f. Approved procedures must be established for OFCR occupants in the event of decompression. These procedures must be transmitted to the operator for incorporation into its training programs and appropriate operational manuals.

g. The supplemental oxygen system for the OFCR compartment must meet the same 14 CFR part 25 regulations as the supplemental oxygen system for the passenger cabin occupants, except for the 10 percent additional masks requirement of 14 CFR 25.1447(c)(1).

h. The illumination level of the normal OFCR-compartment lighting system must automatically be sufficient for each occupant of the compartment to locate a deployed oxygen mask.

16. The following additional requirements apply to OFCR compartments that are divided into several sections by the installation of curtains or partitions:

a. A placard is required adjacent to each curtain that visually divides or separates, for example, for privacy purposes, the OFCR compartment into multiple sections. The placard must require that the curtain(s) remains open when the section it creates is unoccupied. The vestibule section adjacent to the stairway is not considered a private section and, therefore, does not require a placard.

b. For each section of the OFCR compartment created by the installation of a curtain, the following requirements of these special conditions must be met with the curtain open or closed:

i. No-smoking placard requirement (Condition 1).

ii. Emergency illumination requirement (Condition 7).

iii. Emergency alarm-system requirement (Condition 9).

iv. Seatbelt-fasten signal or return-to-seat signal as applicable requirement (Condition 10).

v. Smoke- or fire-detection system requirement (Condition 12).

vi. Oxygen-system requirement (Condition 15).

c. OFCR compartments that are visually divided to the extent that evacuation could be adversely affected must have exit signs directing occupants to the exit at the primary stairway. The exit signs must be provided in each separate section of the OFCR compartment, except for curtained bunks, and must meet requirements of § 25.812(b)(1)(i). An exit sign with reduced background area or a symbolic exit sign, as described in Condition 6.a. of these special conditions, may be used to meet this requirement.

d. For sections within an OFCR compartment created by the installation of a rigid partition with a door separating the sections, the following requirements of these special conditions must be met with the door open or closed:

i. A secondary evacuation route from each section to the main deck, or the applicant must show that any door between the sections precludes anyone

from being trapped inside a section of the compartment. Removal of an incapacitated occupant from within this area must be considered. A secondary evacuation route from a small room designed for only one occupant for a short time duration, such as a changing area or lavatory, is not required, but removal of an incapacitated occupant from within such a small room must be considered.

ii. Any door between the sections must be shown to be openable when crowded against, even when crowding occurs at each side of the door.

iii. No more than one door may be located between any seat or berth and the primary stairway door.

iv. In each section, exit signs meeting requirements of § 25.812(b)(1)(i), or shown to have an equivalent level of safety, must direct occupants to the exit at the primary stairway. An exit sign with reduced background area or a symbolic exit sign, as described in Condition 6.a. of these special conditions, may be used to meet this requirement.

v. Conditions 1 (no-smoking placards), 7 (emergency illumination), 9 (emergency alarm system), 10 (fasten-seatbelt signal or return-to-seat signal as applicable), 12 (smoke- or fire-detection system), and 15 (oxygen system) must be met with the OFCR compartment door open or closed.

vi. Conditions 8 (two-way voice communication) and 11 (emergency firefighting and protective equipment) must be met independently for each separate section, except for lavatories or other small areas that are not intended to be occupied for extended periods of time.

17. If a waste-disposal receptacle is fitted in the OFCR compartment, it must be equipped with an automatic fire extinguisher that meets the performance requirements of § 25.854(b).

18. Materials (including finishes or decorative surfaces applied to the materials) must comply with the requirements of § 25.853 as amended by Amendment 25–116. Seat cushions and mattresses must comply with the requirements of § 25.853(c) as amended by Amendment 25–116, and the test requirements of part 25, appendix F, part II, or other equivalent methods.

19. The addition of a lavatory within the OFCR compartment would require the lavatory to meet the same requirements as those for a lavatory installed on the main deck, except with regard to Condition 12 of these special conditions for smoke detection.

20. Each stowage compartment in the OFCR compartment, except for underseat compartments for occupant convenience, must be completely enclosed. All enclosed stowage compartments within the OFCR compartment that are not limited to stowage of emergency equipment or airplane-supplied equipment (*i.e.,* bedding) must meet the design criteria described in the table below. Enclosed stowage compartments greater than 200 ft.[3] in interior volume are not addressed by this special condition. The in-flight accessibility of very large, enclosed stowage compartments, and the subsequent impact on the crewmembers' ability to effectively reach any part of the compartment with the contents of a hand-held fire-extinguishing system, will require additional fire-protection considerations similar to those required for inaccessible compartments such as Class C cargo compartments.

DESIGN CRITERIA FOR ENCLOSED STOWAGE COMPARTMENTS NOT LIMITED TO STOWAGE OF EMERGENCY OR AIRPLANE-SUPPLIED EQUIPMENT

Fire protection features	Applicability of fire protection requirements by interior volume		
	Less than 25 cu. ft.	25 cu. ft. to less than 57 cu. ft.	57 cu. ft. to 200 cu. ft.
Compliant Materials of Construction [1]	Yes	Yes	Yes.
Smoke or Fire Detectors [2]	No	Yes	Yes.
Liner [3]	No	Conditional	Yes.
Fire Location Detect [4]	No	Yes	Yes.

[1] *Compliant Materials of Construction:* The material used in constructing each enclosed stowage compartment must at least be fire resistant and must meet the flammability standards established for interior components (*i.e.,* 14 CFR part 25 Appendix F, Parts I, IV, and V) per the requirements of § 25.853. For compartments less than 25 ft.[3] in interior volume, the design must ensure the ability to contain a fire likely to occur within the compartment under normal use.

[2] *Smoke or Fire Detectors:* Enclosed stowage compartments equal to or exceeding 25 ft.[3] in interior volume must be provided with a smoke- or fire-detection system to ensure that a fire can be detected within a one-minute detection time. Flight tests must be conducted to show compliance with this requirement. Each system (or systems) must provide:

(a) A visual indication in the flight deck within one minute after the start of a fire.

(b) An aural warning in the OFCR compartment.

(c) A warning in the main passenger cabin. This warning must be readily detectable by a flight attendant, taking into consideration the locations of flight attendants throughout the main passenger compartment during various phases of flight.

[3] *Liner:* If material used in constructing the stowage compartment can be shown to meet the flammability requirements of a liner for a Class B cargo compartment (*i.e.,* § 25.855 at Amendment 25–116, and Appendix F, part I, paragraph (a)(2)(ii)), then no liner would be required for enclosed stowage compartments equal to or greater than 25 ft.[3] but less than 57 ft.[3] in interior volume. For all enclosed stowage compartments equal to or greater than 57 ft.[3] in interior volume but less than or equal to 200 ft.[3], a liner must be provided that meets the requirements of § 25.855 for a Class B cargo compartment.

[4] *Fire Location Detector:* If an OFCR compartment has enclosed stowage compartments exceeding 25 ft.[3] interior volume that are located separately from the other stowage compartments (located, for example, away from one central location, such as the entry to the OFCR compartment or a common area within the OFCR compartment, where the other stowage compartments are), that OFCR compartment would require additional fire-protection features and/or devices to assist the firefighter in determining the location of a fire.

Issued in Des Moines, Washington, on December 4, 2020.

James E. Wilborn,

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

[FR Doc. 2020–27107 Filed 12–16–20; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2020–1122; Project Identifier MCAI–2020–00972–T; Amendment 39–21357; AD 2020–26–02]

RIN 2120–AA64

Airworthiness Directives; Yaborã Indústria Aeronáutica S.A. (Type Certificate Previously Held by Embraer S.A.) Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain Yaborã Indústria Aeronáutica S.A. (type certificate previously held by Embraer S.A.) Model ERJ 190–400 airplanes. This AD was prompted by a report of an in-flight shutdown (IFSD) due in part to failure in the low-pressure compressor (LPC) rotor 1 during operation in high altitude at high thrust settings. This AD requires amending the airplane flight manual (AFM) to incorporate a new limitation and revise certain normal procedures, as specified in an Agência Nacional de Aviação Civil (ANAC) AD, which is incorporated by reference. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD becomes effective January 4, 2021.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of January 4, 2021.

The FAA must receive comments on this AD by February 1, 2021.

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- *Federal eRulemaking Portal:* Go to *https://www.regulations.gov.* Follow the instructions for submitting comments.
- *Fax:* 202–493–2251.
- *Mail:* U.S. Department of Transportation, Docket Operations, M–30, West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590.
- *Hand Delivery:* Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For the material incorporated by reference (IBR) in this AD, contact National Civil Aviation Agency (ANAC), Aeronautical Products Certification Branch (GGCP), Rua Dr. Orlando Feirabend Filho, 230—Centro Empresarial Aquarius—Torre B—Andares 14 a 18, Parque Residencial Aquarius, CEP 12.246–190—São José dos Campos—SP, BRAZIL, Tel: 55 (12) 3203–6600; Email: *pac@anac.gov.br;* internet *www.anac.gov.br/en/.* You may find this IBR material on the ANAC website at *https://sistemas.anac.gov.br/certificacao/DA/DAE.asp.* You may view this IBR material at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206–231–3195. It is also available in the AD docket at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2020–1122.

Examining the AD Docket

You may examine the AD docket at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2020–1122; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, any comments received, and other information. The street address for Docket Operations is listed above.

FOR FURTHER INFORMATION CONTACT: Krista Greer, Aerospace Engineer, Large Aircraft Section, International Validation Branch, FAA, 2200 South 216th St., Des Moines, WA 98198; telephone and fax 206–231–3221; email *krista.greer@faa.gov.*

SUPPLEMENTARY INFORMATION:

Background

The ANAC, which is the aviation authority for Brazil, has issued ANAC AD 2020–07–01, effective July 15, 2020 (ANAC AD 2020–07–01) (also referred to as the Mandatory Continuing Airworthiness Information, or the MCAI), to correct an unsafe condition for certain Yaborã Indústria Aeronáutica S.A. (type certificate previously held by Embraer S.A.) Model ERJ 190–400 airplanes.

This AD was prompted by a report of an IFSD due in part to failure in the LPC rotor 1 during operation in high altitude at high thrust settings. The FAA is issuing this AD to address uncontained release of the LPC rotor 1 and damage to the engine and airplane structure, which could result in loss of control of the airplane. See the MCAI for additional background information.

Related Service Information Under 1 CFR Part 51

ANAC AD 2020–07–01 describes procedures for amending the AFM to incorporate a new limitation and revise the normal procedures to limit the engine N1 setting for flights above 33000 ft. This material is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the **ADDRESSES** section.

FAA's Determination

This product has been approved by the aviation authority of another country, and is approved for operation in the United States. Pursuant to the FAA's bilateral agreement with the State of Design Authority, the FAA has been notified of the unsafe condition described in the MCAI referenced above. The FAA is issuing this AD because the FAA evaluated all pertinent information and determined the unsafe condition exists and is likely to exist or develop on other products of the same type design.

Requirements of This AD

This AD requires accomplishing the actions specified in the MCAI described previously, as incorporated by reference, except for any differences identified as exceptions in the regulatory text of this AD.

Explanation of Required Compliance Information

In the FAA's ongoing efforts to improve the efficiency of the AD process, the FAA initially worked with Airbus and EASA to develop a process to use certain EASA ADs as the primary source of information for compliance with requirements for corresponding FAA ADs. The FAA has since coordinated with other manufacturers and civil aviation authorities (CAAs) to use this process. As a result, ANAC AD 2020–07–01 is incorporated by reference in this final rule. This AD, therefore, requires compliance with ANAC AD 2020–07–01 in its entirety, through that incorporation, except for any differences identified as exceptions in the regulatory text of this AD. Service information specified in ANAC AD 2020–07–01 that is required for compliance with ANAC AD 2020–07–01 is available on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2020–1122.