

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM412 Special Conditions No. 25-419-SC]

Special Conditions: Boeing Model 787-8 Airplane; Overhead Crew-Rest Compartment

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Boeing Model 787-8 airplane. This airplane will have novel or unusual design features associated with installation of an overhead crew-rest (OCR) compartment. 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. Additional special conditions will be issued for other novel or unusual design features of the Boeing Model 787-8 airplanes.

EFFECTIVE DATE: March 28, 2011.

FOR FURTHER INFORMATION CONTACT: Jeff Gardlin, FAA, Airframe/Cabin Safety Branch, ANM-115, Transport Standards Staff, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98055-4056; telephone (425) 227-2136; facsimile (425) 227-1320.

SUPPLEMENTARY INFORMATION:

Background

On March 28, 2003, The Boeing Commercial Airplane Group (hereafter referred to as “Boeing”) applied for an FAA type certificate for its new Boeing Model 787-8 passenger airplane. The company applied for an extension of time for the type certificate on March 9, 2009, and was granted that extension on March 13, 2009. The Boeing Model 787-8 airplane will be an all-new, two-engine, jet transport airplane with a two-aisle cabin. The maximum takeoff weight will be 476,000 pounds, with a maximum passenger capacity of 381.

Type Certification Basis

Under provisions of Title 14 Code of Federal Regulations (14 CFR) 21.17, Boeing must show that the Boeing Model 787-8 airplane (hereafter referred to as "the 787") meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25-1 through 25-117, 25-120, 25-124, 25-125 and 25-128, except that § 25.1309 remains at Amendment 25-117 for cargo-fire protection systems. If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the 787 because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to complying with the applicable airworthiness regulations and special conditions, the 787 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. In addition, the FAA must issue a finding of regulatory adequacy pursuant to section 611 of Public Law 92-574, the “Noise Control Act of 1972.”

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 § 21.17(a)(2).

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 features, the special conditions would also apply to the other model under provisions of § 21.101.

Novel or Unusual Design Features

Crew-rest compartments have been installed and certificated on several Boeing airplane models in locations as varied as 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 has 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. The special conditions contain safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

Most recently for the Boeing Model 777 series airplanes, the FAA has issued Special Conditions No. 25-230-SC, dated April 9, 2003, for crew-rest compartments allowed to be occupied by crewmembers and flight crewmembers during flight, and Special Conditions No. 25-260-SC, dated April 14, 2004, for crew-rest compartments allowed to be occupied by crewmembers and flight crewmembers during TT&L, as well as during flight.

The OCR compartment on the 787 identified by Boeing as an overhead flight-attendant rest is located above the main passenger cabin, adjacent to Door 4, and will be accessed from the main deck by stairs through a vestibule. This OCR compartment will contain six private berths, an emergency hatch that opens directly into the main passenger-cabin area, a smoke-detection system, an oxygen system, and various occupant amenities. This OCR compartment will only be

occupied by trained crewmembers in flight. It will not be occupied during taxi, takeoff, or landing.

This 787 OCR compartment is unique to part 25 because of its design, location, and use on the airplane.

Because of the novel or unusual features associated with installation of this compartment, special conditions are considered necessary to provide a level of safety equal to that established by the airworthiness regulations.

These special conditions do not negate the need to address other applicable part 25 regulations.

Discussion of Comments

Notice of proposed special conditions 25-09-08-SC for the Boeing Model 787 series airplanes was published in the Federal Register on January 4, 2010. No comments were received, and these special conditions are adopted as proposed.

Operational Evaluations and Approval

These special conditions outline requirements for OCR-compartment design approvals administered by the FAA's Aircraft Certification Service. Before operational use of an OCR 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 OCR 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 OCR compartment. The results of these evaluations should be documented in a 787 flight standardization board (FSB) report appendix. Individual operators may reference these standardized evaluations in discussions with their FAA principal operating inspector (POI) as the basis for an operational approval, in lieu of an on-site operational evaluation.

Any changes to the approved OCR 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 OCR 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 re-evaluation should also be documented in a 787 FSB report appendix.

Procedures must be developed to ensure that a crewmember entering the OCR compartment through the stairway/vestibule to fight a fire will examine the stairway/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 OCR 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 OCR 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 his or her way to get out of the compartment. Procedures describing methods for searching the OCR compartment for fire source(s) must be transmitted to operators for incorporation into their training programs and appropriate operational manuals.

Discussion of Special Conditions

These special conditions initially apply to an OCR compartment installed adjacent to the Door 4 exits on the 787. These special conditions supplement 14 CFR part 25. Except as noted below, these special conditions for the 787 closely resemble Boeing 777 Special Conditions No. 25-230-SC.

Special Conditions 4 and 14 contain requirements for the exit signs that must be provided in the OCR compartment. Symbols that satisfy the equivalent level of safety finding established for the 787 may be used in lieu of the text required by § 25.812(b)(1)(i). The FAA expects that crewmembers will learn the meaning of any symbolic exit sign as a part of their training in evacuation procedures.

Special Condition 13 contains requirements for supplemental oxygen systems. Special Conditions No. 25-260-SC, for the overhead flightcrew rest compartments, required that each berth be provided with two oxygen masks. This was intended to address the case where a person not in a berth was moving around in the crew-rest compartment and needed quick access to the oxygen. For the designs used in the model 777, this requirement was sufficient. However, for the 787, 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 special condition has been modified to better state the objective rather than specify that two masks be provided per berth. In addition, the requirement to have adequate illumination to retrieve the mask, while implied previously, is made explicit in these special conditions.

Special Condition 17 contains the requirement for materials used in the construction of the OCR compartment and states that § 25.853 as amended by Amendment 25-116 is the appropriate regulation. Amendment 25-116 is the latest amendment level for § 25.853.

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 OCR 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 OCR compartment, as well as for any other airplane compartments whose decompression characteristics are affected by the installation of an OCR compartment. Compliance with § 25.813 emergency exit access requirements must be demonstrated for all phases of flight during which occupants will be present.

Section 25.813(e) prohibits installation of interior doors between passenger compartments, but the FAA has historically found crew rest-compartment doors to be acceptable, because crew rests are not passenger compartments. Special Conditions 1 and 14 provide requirements for crew rest-compartment doors which are considered to provide an appropriate level of safety to OCR compartment occupants.

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

Applicability

As discussed above, these special conditions are applicable to the 787. 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 features, these special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features of the 787. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, the Federal Aviation Administration (FAA) proposes the following special conditions as part of the type certification basis for the Boeing Model 787-8 airplanes with an overhead crew-rest (OCR) compartment installed above the main passenger cabin adjacent to an exit door.

1. Occupancy of the OCR compartment is limited to the total number of installed bunks and seats in each compartment. An approved seat or berth, able to withstand the maximum flight loads when occupied for each occupant permitted in the OCR compartment, must be available. Maximum occupancy in the OCR compartment is six crewmembers during flight.
 - (a) Appropriate placards must be located inside and outside each entrance to the OCR compartment to indicate:
 - (1) The maximum number of occupants allowed during flight.
 - (2) Occupancy is restricted to crewmembers who are trained in the evacuation procedures for the OCR compartment.
 - (3) Occupancy is prohibited during taxi, take-off, and landing.
 - (4) Smoking is prohibited in the OCR compartment.

- (5) Stowage in the OCR 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 OCR compartment.
 - (c) A limitation in the airplane flight manual must be established to restrict occupancy to crewmembers the pilot in command has determined to be both trained in the emergency procedures for the OCR compartment and able to rapidly use the evacuation routes of the OCR compartment.
 - (d) A means must be in place for any door installed between the OCR compartment and the passenger cabin to be quickly opened from inside the compartment, even when crowding occurs at each side of the door.
 - (e) For all doors installed in the OCR compartment, a means must be in place to preclude anyone from being trapped inside the OCR 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 OCR compartment at any time.
 - (f) The means of opening doors and hatches to the OCR compartment must be simple and obvious. The OFCR compartment doors and hatches must be able to be closed from the main passenger cabin. Doors or hatches that separate the overhead crew-rest 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.
2. At least two emergency evacuation routes must be available and which could be used by each occupant of the OCR 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 OCR compartment to minimize the possibility of an event either inside or outside of the crew-rest compartment rendering both routes inoperative.

Compliance with requirements of Special Condition 2(a) may be shown by inspection or by analysis. Regardless of which method is used, the maximum acceptable distance between crew-rest compartment outlets is 60 feet.

Compliance by Inspection

Inspection may be used to show compliance with Special Condition 2(a). An inspection finding that an OCR compartment has evacuation routes located so that each occupant of the seats and berths has an unobstructed route to at least one of the crew-rest compartment outlets, 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, crew rest-compartment outlets that are located at absolute opposite ends (i.e., adjacent to opposite end walls) of the OCR compartment would require no further review or analysis with regard to exit separation.

Compliance by Analysis

Analysis must show that the OCR compartment configuration and interior features allow all occupants of the OCR 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:

- (1) Fire inside or outside the OCR compartment, considered separately, and the design elements used to reduce the available fuel for the fire.
- (2) Design elements used to reduce fire-ignition sources in the OCR compartment.

- (3) Distribution and quantity of emergency equipment within the OCR compartment.
- (4) 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.).
- (5) An incapacitated person blocking the evacuation routes.
- (6) 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-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 OCR 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 OCR compartment.

The intent of this special condition is to provide sufficient exit-route separation. Therefore, the exit-separation analysis described above should not be used to approve OCR-compartment outlets 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 OCR compartment with one outlet 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 OCR-compartment length), the outlet separation from one outlet to the other should not be less than 50 percent of the total OCR-compartment length.

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

- (b) The 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 crew-rest compartment outlets. One of the two OCR evacuation routes should not be located where, during times when occupancy is allowed, normal movement by passengers occurs (i.e., main aisle, cross aisle or galley complex, for example) that would impede egress from the OCR compartment. If an evacuation route is in an area where normal movement 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 OCR compartment from head injury. Use of evacuation routes must not depend on any powered device. If an OCR-compartment outlet 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 OCR 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 OCR-compartment evacuation routes.
3. A means must be available for evacuating an incapacitated person (representative of a 95th percentile male) from the OCR compartment to the passenger cabin floor.
- (a) Such an evacuation must be demonstrated for all evacuation routes. A crewmember (a total of one assistant within the OCR 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 OCR compartment, or to the first landing, whichever is lower.
4. The following signs and placards must be provided in the OCR compartment and they must meet the following criteria:
- (a) At least one exit sign, located near each OCR compartment outlet, 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 OCR compartment.

- (b) An appropriate placard located conspicuously on or near each OCR-compartment door or hatch that defines the location and the operating instructions for access to and operation of the outlet 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 Special Condition 4(b) of these special conditions must be illuminated to at least 160 microlamberts under emergency lighting conditions.
5. A means must be available, in the event of failure of the aircraft's main power system, or of the normal OCR compartment lighting system, for emergency illumination to be automatically provided for the OCR compartment.
- (a) This emergency illumination must be independent 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 OCR 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 OCR compartment to locate a deployed oxygen mask.
6. A means must be available for two-way voice communications between crewmembers on the flight deck and occupants of the OCR compartment. Two-way communications must also be available between occupants of the OCR compartment and each flight attendant station in the passenger cabin 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 OCR compartment (e.g., fire in flight, aircraft depressurization, preparation of the compartment occupants for landing, etc.).
 7. 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 OCR 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.
 8. A means, readily detectable by seated or standing occupants of the OCR compartment, must be in place to indicate when seat belts should be fastened. If the OCR compartment has no seats, at least one means must be provided to cover anticipated turbulence (e.g., sufficient handholds). Seatbelt-type restraints must be provided for berths and must be compatible for 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.

9. In lieu of the requirements specified in § 25.1439(a) pertaining to isolated compartments, and to provide a level of safety equivalent to that provided to occupants of an isolated galley, the following equipment must be provided in the OCR compartment:

- (a) At least one approved hand-held fire extinguisher appropriate for the kinds of fires likely to occur.
- (b) Two PBE devices suitable for firefighting, or one PBE for each hand-held fire extinguisher, whichever is greater. All PBE devices must be approved to Technical Standard Order (TSO)-C116 or equivalent.
- (c) One flashlight.

Note: Additional PBE devices and fire extinguishers in specific locations, beyond the minimum numbers prescribed in Special Condition 9, may be required as a result of the egress analysis accomplished to satisfy Special Condition 2(a).

10. A smoke- or fire-detection system (or systems) must be provided that monitors each occupiable area within the OCR 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 flightdeck within one minute after the start of a fire.
- (b) An aural warning in the OCR 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.

11. 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:

- (1) 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.
- (2) 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:
 - (i) Enter the OCR compartment at the time that demonstrated fire suppression effectiveness will be exceeded.
 - (ii) Check for and extinguish any residual fire.
 - (iii) 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 OCR:
 - (1) A limitation must be included in the airplane flight manual or other suitable means requiring that crewmembers be trained in the firefighting procedures.
 - (2) The compartment design must allow crewmembers equipped for firefighting to have unrestricted access to all parts of the compartment.
 - (3) The time for a crewmember on the main deck to react to the fire alarm, don the firefighting equipment, and gain access to the OCR 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.
 - (4) Approved procedures describing methods for searching the OCR 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.

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

- (a) Small quantities of smoke may penetrate from the OCR 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 OCR compartment outlets are closed after evacuation of the compartment and during firefighting to minimize smoke and extinguishing agent entering other occupiable compartments.

- (c) 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 OCR compartment. The amount of smoke entrained by a firefighter exiting the OCR compartment is not considered hazardous.
- (e) Flight tests must be conducted to show compliance with this requirement.

13. A supplemental oxygen system within the OCR compartment must provide the following:

- (a) At least one mask for each seat and berth in the OCR compartment.
- (b) If a destination area (such as a changing area) is provided in the OCR 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 OCR compartment, moving around within the OCR compartment, or moving from the OCR compartment to the main cabin.
- (d) The system must provide an aural and visual alert to warn occupants of the OCR 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 OCR compartment and must sound continuously for a minimum of five minutes or until a reset switch within the OCR 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 OCR 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 OCR 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 OCR compartment-lighting system must automatically be sufficient for each occupant of the compartment to locate a deployed oxygen mask.

14. The following additional requirements apply to OCR 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 privacy purposes, the OCR compartment into small sections. The placard must require that the curtain(s) remains open when the private section it creates is unoccupied. The vestibule section adjacent to the stairway is not considered a private area and, therefore, does not require a placard.
- (b) For each section of the OCR compartment created by the installation of a curtain, the following requirements of these special conditions must be met with the curtain open or closed:

- (1) No-smoking placard requirement (Special Condition 1).
 - (2) Emergency illumination requirement (Special Condition 5).
 - (3) Emergency alarm-system requirement (Special Condition 7).
 - (4) Seatbelt-fasten signal or return-to-seat signal as applicable requirement (Special Condition 8).
 - (5) Smoke- or fire-detection system requirement (Special Condition 10).
 - (6) Oxygen-system requirement (Special Condition 13).
- (c) OCR compartments that are visually divided to the extent that evacuation could be affected must have exit signs directing occupants to the primary stairway outlet. The exit signs must be provided in each separate section of the OCR 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 Special Condition 4(a), may be used to meet this requirement.
- (d) For sections within an OCR compartment created by the installation of a rigid partition with a door physically separating the sections, the following requirements of these special conditions must be met with the door open or closed:
- (1) A secondary evacuation route from each section to the main deck, or alternatively, the applicant must show that any door between the sections has been designed to preclude 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.

- (2) Any door between the sections must be shown to be openable when crowded against, even when crowding occurs at each side of the door.
- (3) No more than one door may be located between any seat or berth and the primary stairway door.
- (4) 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 primary stairway outlet. An exit sign with reduced background area or a symbolic exit sign, as described in Special Condition 4(a), may be used to meet this requirement.
- (5) Special Conditions 1 (no-smoking placards), 5 (emergency illumination), 7 (emergency alarm system), 8 (fasten-seatbelt signal or return-to-seat signal as applicable), 10 (smoke- or fire-detection system), and 13 (oxygen system) must be met with the door open or closed.
- (6) Special Conditions 6 (two-way voice communication) and 9 (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.

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

16. Materials (including finishes or decorative surfaces applied to the materials) must comply with flammability requirements of § 25.853(a) as amended by Amendment 25-116. Seat cushions and mattresses must comply with the flammability 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.

17. The addition of a lavatory within the OCR compartment would require the lavatory to meet the same requirements as those for a lavatory installed on the main deck except with regard to Special Condition 10 for smoke detection.
18. Each stowage compartment in the OCR compartment, except for underseat compartments for occupant convenience, must be completely enclosed. All enclosed stowage compartments within the OCR 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 ft³ 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 Cubic Feet	25 Cubic Feet to Less than 57 Cubic Feet	57 Cubic Feet to 200 Cubic Feet
Compliant Materials of Construction ¹	Yes	Yes	Yes
Smoke or Fire Detectors ²	No	Yes	Yes
Liner ³	No	Conditional	Yes
Fire Location Detector ⁴	No	Yes	Yes

¹Compliant 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.

²Smoke 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.

³Liner

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.

⁴Fire 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 Renton, Washington, on February 15, 2011.

/s/ K. C. Yanamura

K. C. Yanamura
Acting Manager, Transport Airplane Directorate
Aircraft Certification Service.